MINISTRY OF LOCAL GOVERNMENT (MoLG)
PALESTINIAN AUTHORITY

PREPARATORY SURVEY
ON THE PROJECT FOR
IMPROVEMENT OF
COLLECTION AND TRANSPORT SYSTEM
FOR SOILD WASTE MANAGEMENT
IN PALESTINE

FINAL REPORT

APRIL 2019

JAPAN INTERNATIONAL COOPERATION AGENCY

YACHIYO ENGINEERING CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to Yachiyo Engineering Co., LTD.

The survey team held a series of discussions with the officials concerned of the Palestinian Authority, and conducted a field investigations. As a result of further studies in Japan, 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.

Finally, I wish to express my sincere appreciation to the officials concerned of the Palestinian Authority for their close cooperation extended to the survey team.

April, 2019

Megumi Muto
Director General
Global Environment Department
Japan International Cooperation Agency

Summary

1. Overview of Palestine

The Palestinian Authority (hereinafter referred to as "Palestine") has an area of 6,020km^2 (West bank area: 5,655km^2, Gaza Strip area: 365km^2). It has a population of 4.95 million people, approx. 3 million people in the West Bank and approx. 1.95 million people in the Gaza Strip (2017, the Palestinian Central Bureau of Statistics (hereinafter referred to as "PCBS")). In addition, there are approx. 2.44 million refugees in Palestine (2017, UNRWA), 2.9 million in Jordan, 620,000 in Syria, and 530,000 in Lebanon.

The country is divided into the West Bank area of the Jordan River and the Gaza area facing the Mediterranean Sea. Topographically a hill extends north and south in the center of the West Bank area. The west side of the West Bank and the Gaza area have a rainfall in the winter with a Mediterranean climate, but the eastern and southern parts of the West Bank area are desert climates. The central hill of the West Bank area has an average altitude of 800 m and is cold in winter.

GDP is about 15 billion USD (2017, IMF estimate), per capita GDP is 3,031 USD (2017, IMF estimate), real GDP growth rate is 2.9% (2017, IMF estimate). There is a large difference in the economy in the West Bank and Gaza Strip, Gaza unemployment reaches 40% or more. Exports are cement, limestone, olive, the export value is about 1.04 billion USD (2017, PCBS), imported products are petroleum products, grain, nonmetallic mineral products, import value is about 5.3 billion USD (2017, PCBS).

Industry structure is biased toward tertiary industry. The primary industry [agriculture/fishery (3.2%)], the secondary industry [industrial (13.1%), construction industry (7.2%)], tertiary industry [retail/trade (18.5%), business (4.1%), public/defense (12.5%), service industry (20.0%), transportation /telecommunications industry (1.8%)] (Percentage of GDP in 2015, PCBS).

2. Background to and Outline of the Project

In Palestine, solid waste management has been carried out by local governments with support of Ministry of Local Government (hereinafter referred to as "MoLG"). The Palestinian Local Government Law of 1997 allows Local Government Unit (hereinafter referred to as "LGU") to organize a Joint Service Council (hereinafter referred to as "JSC") related to local administration services. For solid waste management, small-scale LGUs have cooperated with each other to conduct the waste management services because it is difficult to provide the services on their own. Japan International Cooperation Agency (hereinafter referred to as "JICA") implemented "The Project for Capacity Development on Solid Waste Management in Jericho and Jordan River Rift Velley in Palestine" (Phase-1 Project) from 2005 to 2010. In the course of the Phase-1 Project, Jericho JSC was established, and begun solid waste management works from 2007, including collection, transportation and construction of a final disposal site. Following Jericho JSC, other JSCs were made in other areas, and solid waste management services were implemented and strengthened with support from various donors. "The Project for Capacity Development in Solid Waste Management in Palestine" (Phase-2 Project) was then implemented by JICA from 2014 to 2018 to provide technical assistance to 5 JSCs: Nablus, Tubas, Qalqiliya, and newly organized two Jerusalem areas (North and Northwest (N&NW) Jerusalem, and Northeast and Southeast (NE&SE) Jerusalem). However, improvement of the services has faced difficulties in expansion of the service area and the efficiency etc. due to shortage of equipment, and its improper utilization against topographic features such as steep hills, narrow roads, and long distance of transportation.

National Strategy for Solid Waste Management in Palestine 2017-2022, enacted in 2017, set the target of 100% sanitary landfill by 2022 in conjunction with closing or environmentally improving small dump sites scattered over Palestine, as one of the important policies. 84 random dump sites in Palestine should be closed. Up to now, wastes is discharged at 3 sanitary landfill sites in the West Bank area and 3 final disposal sites in Gaza area, approaching to the end of their lifetimes. Construction of new disposal sites or prolonging life plans of the existing landfill sites should be inevitable.

Consequently, the Palestine requested Japan's Grant Aid for procurement of vehicles and equipment for

waste collection and transportation, and environmental improvement of disposal sites. JICA decided to conduct a preparatory survey for the grant aid project. The goal of the survey is to confirm the necessity and relevance of the grant aid project, to conduct a field survey, and to study an equipment plan, procurement conditions, an implementation plan, and the implementation schedule. Outline design of the equipment and the project cost estimation will be also prepared.

3. Summary of the Survey Result and Contents of the Project

JICA dispatched a survey team to Palestine to conduct the first-phase survey (between March 23th and May 3th, 2018). The team confirmed the contents of the request and conducted a field survey for the selection of equipment. After returning to Japan, the team analyzed the data collected in the field survey, prepared an outline design with the project cost estimation. The team conducted an Outline Design Survey in Palestine between November 16th and 22th, 2018 on the basis of the result of the analysis.

This Project Survey Team established the basic components of the Project as mentioned below on the basis of the results of the field surveys and the discussion with the Palestine side, after returning to Japan.

(1) Project Component

The project component of the waste collection and final disposal site improvement equipment as shown in Table-1. Collection vehicles for improvement of waste collection are for all JSC and the equipment for improvement of landfilling is for Beit-anan controlled dump site of N&NW Jerusalem JSC.

Table-1 Project Component of Waste Collection and Disposal Site Improvement Equipment

Equipment Item	Unit	Quantity	Breakdown of quantity													
			N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	North Gaza	South Gaza	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah
Waste Collection Improvement Equipment																
Small Compactor ($8m^3$)	set	24	3	5	3	3	3	0	0	0	0	3	0	0	4	0
Medium Compactor ($13m^3$)	set	63	3	3	3	6	2	3	3	4	2	2	6	4	9	13
Large Compactor ($21m^3$)	set	10	0	1	1	2	0	0	0	1	0	0	0	2	3	0
Container ($1.1m^3$)	set	970	60	90	70	110	50	30	30	50	20	50	60	60	160	130
Final Disposal Site Improvement Equipment																
Dump Truck ($15m^3$)	set	1	1													
Landfill Compactor (25ton)	set	1	1													
Backhoe Loader (8ton)	set	1	1													

Note: Including spare parts
Source: JICA Survey Team

(2) Soft Component

Proper and steady operation and maintenance (O/M) system with appropriate organization, manpower, technique and financial management is indispensable in order to operate the vehicles and equipment provided properly in long term. Without such a system, the vehicles and equipment would stop its operation in a short time, before the expected lifetime. Many JSCs were organized not long before having limited manpower and financial capacity only to operate the existing equipment.

The soft component will be described in detail as follows:

Strengthening Technical O/M System

- Support for Preventive Maintenance
- Support for Repair Management System
- Support for Spare Parts Management System

- Support for Vehicle Operation Plan

4. Project Period and Project Cost Estimation

This part is closed due to the confidentiality for one year until final verification of the contract of the supplier. The cost of implementing this Project is estimated at 0.02 million JPY (0.02 million JPY to be borne by Palestine sides, respectively). The obligations of the Palestine side shall be the procurement of the containers for the container carriers and the payment of bank commissions. A period of approx. 24 months is required for the implementation of this Project, from the field survey and detailed design to the completion (including the Soft Component).

5. Project Evaluation

(1) Relevance

1) Beneficiaries of the Project
The number of direct beneficiaries of this Project are 3.3 million, 1.9 million people in Palestine.

2) Urgency
In Palestine, the amount of waste discharged is increasing, but collection and disposal has not been implemented and the living environment is getting worse. The collection rate for the amount of generated waste is only around 62%, and there are also uncollected areas. Despite this situation, collecting and transporting equipment is becoming obsolete, and urgent improvement by this project implementation is required.

3) Project Contributing to the Waste National Strategy
Strategic goal 3 of the waste national strategy (2017-2022) formulated in 2010 is "effective and safe waste management service (implementation)". This project contributes to the achievement of the above items by procuring equipment necessary for collection, transportation and disposal.

4) Consistency with the Assistance Policies and Strategies of the Government of Japan
As the 2016-to-priority areas of assistance in the Palestine country assistance strategy (medium target), "(1) consumer of stability", "(2) administrative capacity building" are shown.

This project improves the hygiene environment, improves waste management capacity and service of the administration, and it is consistent with Japan's ODA policies and policies.

(2) Effectiveness

1) Quantitative Effects
Table-2 shows the indicators of the quantitative effects expected from this Project together with the current (standard) values and the target values of the indicators after completion of the Project.

Table-2 Quantitative Effects Expected from the Implementation of this Project

Indicator	Baseline (2016) (Actual)	Target (2024) (Three years after project completion)
Amount of wastes collected by JSC (t/day)	1,609	1,952

Source: JICA Survey Team

2) Qualitative Effects
The qualitative effects described below can be expected from the implementation of the Project.

(1) Improvement of living environment and natural environment decreasing open waste burning
(2) Improvement of administrative services

Because the Project is expected to have sufficient beneficial effects as mentioned above, the relevance of implementing this Project with grant aid from the Government of Japan has been confirmed.

Implementation of the Project with higher efficiency and effectiveness than similar projects in the past shall require establishment of a system for the operation and maintenance of the waste collection vehicles, employment and assignment of appropriate personnel to the system without delay and allocation of required amount of budget to the operation/maintenance.

Preparatory Survey

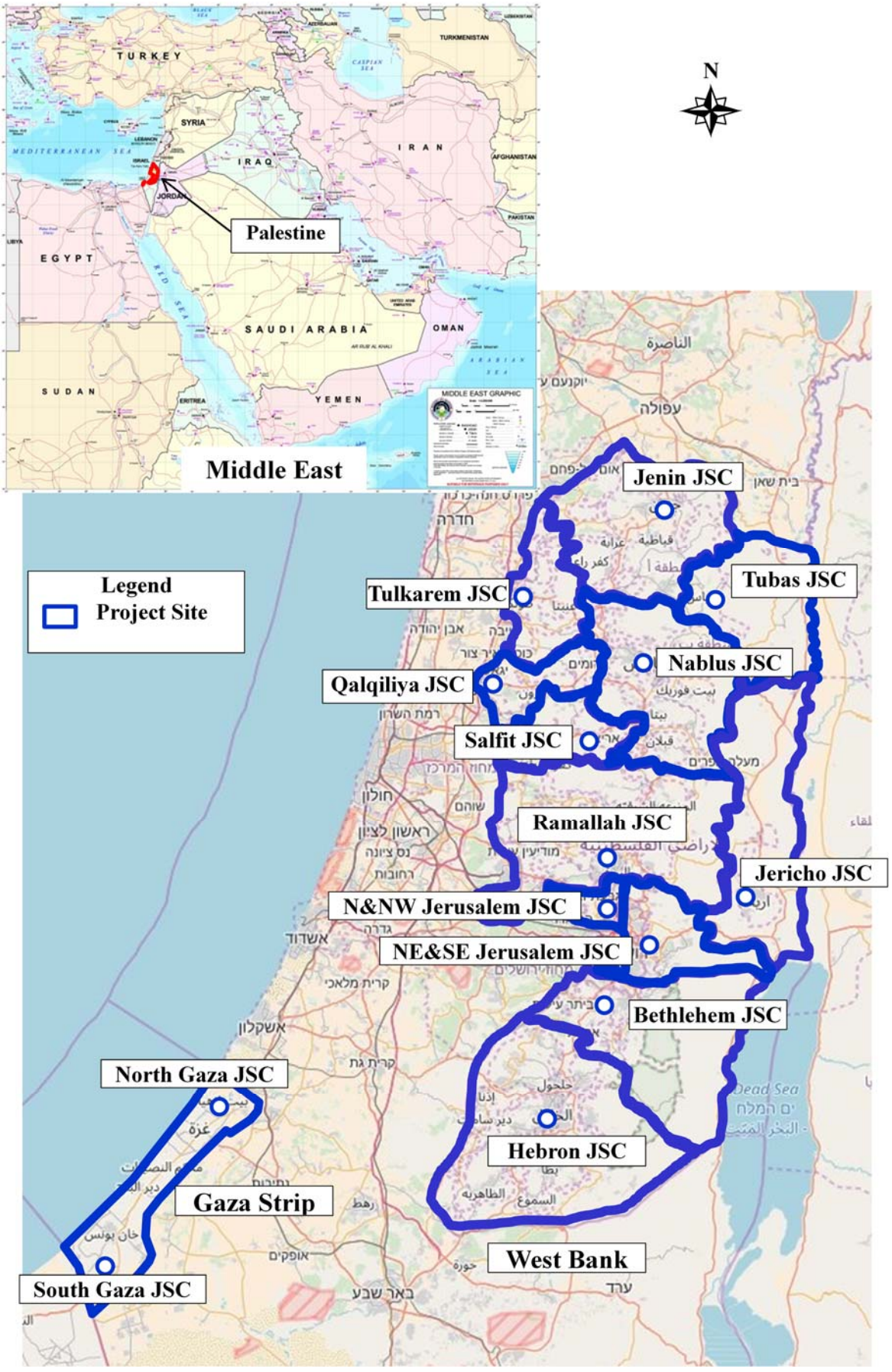
on the Project for

Improvement of Collection and Transport System for Solid Waste Management in Palestine

FINAL REPORT

Contents

Annex



Location of Map

List of Figures and Tables

Abbreviations

Abbreviation	Title
AFD	French Development Agency
A/P	Irrevocable Authorization to Pay
B/A	Banking Arrangement
CIF	Cost Insurance and Freight
COGAT	Coordination of Government Activities in the Territories (Israel)
DJSC	Department of Joint Service Council
E/N	Exchange of Note
EU	European Union
EUR	EURO
G/A	Grant Agreement
GDP	Gross domestic product
GIZ	German Development Agency (Gesellschaft für Internationale Zusammenarbeit)
GOJ	Government of Japan
GSWMP	Gaza Solid Waste Management Project
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
JSC	Joint Service Council
KfW	German Development Bank
LGU	Local Government Unit
MDP	Municipal Development Project
MDLF	Municipal Development and Lending Fund of Palestine
MoFP	Ministry of Finance and Planning
MoLG	Ministry of Local Government
M/D	Minutes of Discussion
NIS	New Israel Shekel
O/M	Operation and maintenance
PCBS	Palestinian Central Bureau of Statistics
ROJ	Representative Office of Japan to Palestine
SAE	The Society for Automotive Engineers
UNDP	United Nations Development Programme
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
USAID	United States Agency for International Development
USD	US Dollar
WB	World Bank
WtE	Waste-to-Energy

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Original and Revised Component

1-1-1 Requested and Revised Component

(1) Background

In Palestine, solid waste management has been carried out by local governments with support of Ministry of Local Government (hereinafter referred to as "MoLG"). The Palestinian Local Government Law of 1997 allows Local Government Unit (hereinafter referred to as "LGU") to organize a Joint Service Council (hereinafter referred to as "JSC") related to local administration services. For solid waste management, small-scale LGUs have cooperated with each other to conduct the waste management services because it is difficult to provide the services on their own. Japan International Cooperation Agency (hereinafter referred to as "JICA") implemented "The Project for Capacity Development on Solid Waste Management in Jericho and Jordan River Rift Velley in Palestine" (Phase-1 Project) from 2005 to 2010. In the course of the Phase-1 Project, Jericho JSC was established, and begun solid waste management works from 2007, including collection, transportation and construction of a final disposal site. Following Jericho JSC, other JSCs were made in other areas, and solid waste management services were implemented and strengthened with support from various donors. "The Project for Capacity Development in Solid Waste Management in Palestine" (Phase-2 Project) was then implemented by JICA from 2014 to 2018 to provide technical assistance to 5 JSCs: Nablus, Tubas, Qalqiliya, and newly organized two Jerusalem areas (North and Northwest (N&NW) Jerusalem, and Northeast and Southeast (NE&SE) Jerusalem). However, improvement of the services has faced difficulties in expansion of the service area and the efficiency etc. due to shortage of equipment, and its improper utilization against topographic features such as steep hills, narrow roads, and long distance of transportation.

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This Project Survey Team established the basic components of the Project as mentioned below on the basis of the results of the surveys and the discussion with the Palestine side, after returning to Japan.

(2) Original Component Requested

The original component requested by MoLG is shown in Table 1-1 and Table 1-2.

Table 1-1 Request List of Landfill Site Construction

No.	Items	Location	Qty	Specification
1	Establish stations to treat leachate	Zahret Al Finjan landfill	1	220 m^3/day
		Al minyah landfill	1	
2	Establish new cell in landfills	Zahret Al Finjan landfill	1	Area 50 donms
		Al minyah landfill	1	Area 50 donms
3	Establish and complete system of biogas treatment	Zahret Al Finjan landfill (Establish)	1	Collection and generation system
		Al minyah landfill (complementation)	1	Generation system
		Yatta (complementation)	1	Generation system
4	Restart operation of organic waste separation station to produce	Zahret Al Finjan landfill	1	Rehabilitation and operation of waste separation in Zahret Al Finjan landfill
5	Roller for the landfill	Zahret Al Finjan landfill	1	

Source: JICA Survey Team

Table 1-2 Request List of Waste Collection Equipment

JSC	No.	Items	Qty	Specification
Nablus	1	Establish of transfer station	1	Control room/ Balance works / Compaction Unit works / Electric works. In addition to Hydraulic pressure machine, 40 ton containers, and scale.
	2	Containers 1.1 m^3	700	Size of 1.1 m^3
	3	Backhoe loader for the transfer station	1	Backhoe Loader Range (3CX ECO 4WD)
	4	Compacter vehicles	10	Size of 12 m^3
			4	Size of 21 m^3
			2	Size of 5 m^3
Tubas	1	Equipping of transfer station	1	Control room/ Balance works / Compaction Unit works / Electric works. In addition to Hydraulic pressure machine, 40 ton containers, and scale.
	2	Transfer vehicle	1	
	3	Trailer	1	
	4	Metallic containers	10	Size of 4 m^3
			500	Size of 1.1 m^3
	5	Compactors vehicles	4	Size of 12 m^3
			1	Size 5 m^3
	6	Compactor vehicles	1	Size of 12 m^3
Qalqiliya	1	Transfer station and separation unit	1	Control room/ Balance works / Compaction Unit works / Electric works. In addition to Hydraulic pressure machine, 40 ton containers, and scale.
	2	Waste collection vehicles compactors	7	Size of 12 m^3
			2	Size of 8 m^3
	3	Transfer vehicle	1	20m^3
	4	Trailer	1	20m^3
	5	Plastic containers	200	Size of 360 liter
	6	Metallic containers	500	Size of 1.1 m^3
	7	Backhoe loader	1	Backhoe Loader Range (3CX ECO 4WD)
NE&SE Jerusalem	1	Transfer vehicles	1	
	2	Trailer	1	
	3	Backhoe loader	1	
	4	Ramsa (Container carrier)	1	Ramsa (Container carrier) size of 4 m^3
	5	Container 1.1 m^3	600	Size of 1.1 m^3
	6	Compacter 12 m^3	6	Size of 12 m^3
	7	Compacter 19 m^3	2	Size of 19 m^3
	8	Skid Stir loading	1	
	9	Small Ramsa vehicles	1	
N&NW Jerusalem	1	Equipping of transfer station	1	
	2	Transfer vehicles	1	
	3	Trailer	1	
	4	Backhoe loader	1	
	5	Ramsa (Container carrier) size of 4m^3	1	
	6	Container 1.1 m^3	600	
	7	Compacter 12 m^3	6	
	8	Compacter 19 m^3	2	
	9	Skid Stir loading	1	

JSC	No.	Items	Qty	Specification
	10	Small Ramsa (Container carrier)	1	
Tulkarm	1	Equipping of transfer station	1	
	2	Compactors 12 m^3	7	
	3	Compactors 19 m^3	2	
	4	Transfer vehicle	1	
	5	Trailer	1	
	6	Plastic containers	400	
	7	Containers 1.1 m^3	600	
	8	Loading truck	1	
	9	Backhoe loader	1	
Jenin	1	Equipping of transfer station and	1	
	2	Compactors 12 m^3	8	
	3	Compactors 19 m^3	3	
	4	Transfer vehicle	1	
	5	Trailer	1	
	6	Plastic containers	600	
	7	Containers 1.1 m^3	700	
	8	Loading truck	1	
	9	Backhoe loader	1	
Salfit	1	Plastic containers 240 lt	300	
	2	Containers 1.1 m^3	400	
	3	Equipping of transfer station and separation unit	1	
Hebron	1	Compactors 12 m^3	12	
	2	Compactors 19 m^3	2	
	3	Transfer vehicle	2	
	4	Trailer	2	
	5	Plastic containers	600	
	6	Containers 1.1 m^3	1200	
	7	Backhoe loader	2	
Bethlehem	1	Compactors 12 m^3	4	
	2	Compactors 19 m^3	1	
	3	Plastic containers	500	
	4	Containers 1.1 m^3	500	
	5	Loading truck	1	
	6	Backhoe loader	1	
Ramallah	1	Equipping of transfer station and separation unit	1	
	2	Compactors 12 m^3	8	
	3	Compactors 19 m^3	2	
	4	Transfer vehicle	2	
	5	Trailer	2	
	6	Plastic containers	500	
	7	Containers 1.1 m^3	700	
	8	Loading truck	1	
	9	Backhoe loader	1	
Jericho	1	Plastic containers	500	
	2	Containers 1.1 m^3	500	
North Gaza	1	Compactor truck 24m^3	10	
	2	Grapple truck	2	
	3	Hook lift truck (Double trailer truck)	2	
	4	Dumpster truck	2	
	5	Supply of containers for solid waste (lump-sum)	800	
South Gaza	1	Tipper crane truck with 20m^3	4	
	2	Compactor trucks with crane	2	
	3	Roll on/off truck for Rafah T.S	1	
	4	Containers	800	

Source: JICA Survey Team

(3) Component Revised

The revised component agreed in Technical Note, dated 30 April 2018 during the field survey, is shown in Table 1-3. It has been agreed with the counterpart (C/P) that the project component only include

equipment, not facility construction.

Table 1-3 Project Component Agreed on Technical Note

No.	Item	Quantity
1	Vehicles for waste collection with 1.1m^3 containers • Compactors (8 m^3) • Compactors (13 m^3) • Compactors (21 m^3) • 10 containers with no lid per compactor • Spare parts	Vehicles: 97 sets in total
2	Heavy equipment for Beit-anan controlled dump site • Landfill compactor (25-ton class) • Backhoe loader (8-ton class) • Dump truck (15m^3) • Spare parts	1 set
3	Soft component (technical assistance)	1 set

Source: JICA Survey Team

1-2 Conditions at and around the Project Sites

1-2-1 Condition of Relevant Infrastructure

(1) Port

The equipment procured by the project will be unloaded at Ashdod Port in Israel. Ashdod Port is a facility adequate for unloading equipment and customs work.

(2) Road

The national highway in the project site and the main road in the city center are paved. Roads of residential areas mixed with agricultural land are paved only in the center. There are many unpaved farm roads, and many roads with sharp curves and gentle slopes. Access roads to relay facilities and final disposal sites are paved, so there is no problem with traffic of large vehicles. The road from Ashdod port to each project target area is paved and there is no problem in inland transportation of equipment.
In Palestine, there are Israeli military checkpoints on the roads in the Israel region, and it is necessary to obtain permission for transportation beforehand. A transportation schedule assuming that it takes a long time to pass through the checkpoint is necessary.

1-2-2 Climate of the Project Sites

Climate of the project site is different depending on the location and elevation of the area. Jericho is a deep valley at an altitude of -200 to 300 meters. The weather conditions of the project sites are shown in Table 1-4.

Table 1-4 Atmospheric Temperature and Rainfall in the Project Areas (2016)

	Jenin	Tubas	Tulkarem	Nablus	Ramallah	Jericho	Hebron	Bethlehem
Average maximum temperature (℃)	26	29	26	24	24	31	21	24
Average minimum temperature (℃)	16	18	18	14	13	18	12	13
Average rainfall (mm)	459	182	556	612	611	138	470	499

Source: Palestinian Meteorological Department, Ministry of Transport

1-3 Environmental and Social Consideration

The component of this project includes collection vehicles for waste collection and heavy equipment for operation of the new controlled dump site. Therefore, environmental and social impact caused by the

equipment provision is not expected, and no environmental permission is necessary.

During the field survey, no waste picker has been observed at random dump sites, landfill sites, and street containers. Random dump sites in the West Bank are mostly located in steep slope, and it looks very hard for waste pickers to work there. It is very unlikely that the project equipment give impact on waste pickers although it is still possible that waste pickers exist at such areas.

In Gaza Strip, primary collection is often done with a donkey cart. The project will provide collection vehicles for replacement, so impact on livelihood of donkey cart workers is not expected.

CHAPTER 2 CONCEPT OF THE PROJECT

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objective

Project Objective	JSCs for solid waste management provide solid waste management services to citizens for sound environment and healthy life.
Outcome	Required vehicles, containers and equipment for the above are provided to JSCs in Palestine (West Bank: Nablus, Qalqiliya, N&NW Jerusalem, SE&NE Jerusalem, Tubas, Jenin, Tulkarem, Salfit, Ramallah, Jericho, Bethlehem, Hebron JSCs; Gaza Strip: North Gaza and South Gaza JSCs)
Project Outcome Indicator	1. Waste collection improvement (1) Improvement of collection service management and the service expansion ・ Amount of wastes collected by JSC (ton/day) (2) Improvement of living environment 2. Environmental improvement of disposal sites (1) Improvement of surrounding environment (2) Effective management and operation of disposal sites

Source: JICA Survey Team

2-1-2 Outline of the Project

(1) Proposed Components

The number of waste collection vehicles and containers to be procured by the project is summarized in Table 2-1. Equipment for final disposal is to be provided to Beit-anan controlled dump site operation in N&NW Jerusalem JSC, which is single on-going controlled dump site in the West Bank Area.

Table 2-1 Preliminary Plan of Equipment to be Procured

Equipment Item	Unit	Quantity	Breakdown of quantity													
			N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	North Gaza	South Gaza	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah
Waste Collection Improvement Equipment																
Small Compactor ($8m^3$)	set	24	3	5	3	3	3	0	0	0	0	3	0	0	4	0
Medium Compactor ($13m^3$)	set	63	3	3	3	6	2	3	3	4	2	2	6	4	9	13
Large Compactor ($21m^3$)	set	10	0	1	1	2	0	0	0	1	0	0	0	2	3	0
Container ($1.1m^3$)	set	970	60	90	70	110	50	30	30	50	20	50	60	60	160	130
Final Disposal Site Improvement Equipment																
Dump Truck ($15m^3$)	set	1	1													
Landfill Compactor (25ton)	set	1	1													
Backhoe Loader (8ton)	set	1	1													

Note: Including spare parts
Source: JICA Survey Team

(2) Soft Component

- Strengthening Technical Operation and Maintenance System
  - Support for Preventive Maintenance
  - Support for Repair Management System
  - Support for Spare Parts Management System
  - Support for Vehicle Operation Plan

2-2 Outline Design of the Requested Assistance

2-2-1 Design Policy

2-2-1-1 Basic Policies

Solid waste management capacity shall be improved through procurement of necessary equipment for priority 5 JSCs supported by Project for technical assistance in solid waste management in Palestine, Phase 2 (Phase-2 Project) (Nablus, Tubas, Qalqiliya, N&NW Jerusalem, NE&SE Jerusalem) and other 9 JSCs (Jenin, Tulkarem, Salfit, Ramallah, Jericho, Bethlehem, Hebron, North Gaza and South Gaze). The target year is 2022, and the target waste is municipal waste of household waste and business waste (school, commercial and office).

2-2-1-2 Policy on the Natural Environmental Conditions

In the project area the specific gravity of solid waste is small as annual rainfall is not large, so no special specification for equipment will be required.

2-2-1-3 Policy on the Socio-Economic Conditions

In the project area, many JSCs use containers when loading into compactors for waste collection. The compactor shall have specification that enable to load existing containers.

2-2-1-4 Policy on Construction and Procurement Conditions

Considering the following conditions, the equipment will be procured from the counties mainly in Europe other than Japan nor Palestine.

- The equipment shall meet Israel emission standards (EURO standards) while considering special condition for Gaza.
- There are no maintenance service system of Japanese manufacturers in Palestine.

2-2-1-5 Policy on Employment of Local Companies

Containers for the compactor will be produced and procured from local companies. Local transport companies will be used for inland transportation.

2-2-1-6 Policy on Operation and Maintenance

As the JSCs are operating and maintaining the existing equipment, no problem is anticipated for O/M basically. O/M will be improved and strengthened through the soft component.

2-2-1-7 Policy on Selection of Grades of Equipment

The existing vehicles and equipment are of standard grade with no special specification. So the project equipment will be designed with normal grade.

2-2-1-8 Policy on Procurement Method and Project Schedule

The project equipment will be procured from mainly Europe.

The project implementation schedule is planned considering the period of designing, bidding, equipment manufacturing, transportation, custom clearance, inspection, delivery, initial operation guidance and soft component etc. It is important to take into account Israel procedure and approval.

2-2-2 Basic Plan (Procurement Plan)

2-2-2-1 Basic Policy

(1) Strengthening and Improving Solid Waste Management Considering Pressing Necessity of Equipment

The project will support Palestinian side to cope with following major issues in solid waste management taking into account the National Strategy, by providing necessary collection vehicles and heavy equipment.

- Large number of collection vehicles have been depreciated.
- JSCs cannot expand their services due to shortage of collection vehicles.
- Remaining capacity of the existing landfill sites are very limited: new landfill site installation, the existing landfill site expansion, or controlled dump site establishment is essential together with closing random dump sites.

(2) Securing Feasibility and Sustainability

Implementation of the project-provided vehicles and heavy equipment shall be secured in terms of procurement, O/M and handing-over to Palestinian side, i.e., the vehicles and equipment shall be cleared from the customs, properly transported to final destinations, and operated for a long time. In addition, in case of Gaza Strip the project will take into account other donor's experiences, and special circumstances between Israel and Gaza to determine vehicles to be provided.

(3) Direct Contribution to Improving Efficiency and Effectiveness

1) Waste Collection

Aiming at proper secondary solid waste collection by JSCs, following actions will be taken in the project.

- Replace depreciated vehicles to new and more economical vehicles
- Provide new vehicles to solve excessive use of vehicles and service area expansion

5 target JSCs of Phase-2 Project (Tubas, Nablus, Qalqiliya, N&NW Jerusalem, and NE&SE Jerusalem) are prioritized as the first priority group due to serious shortage of collection vehicles. The other JSCs will be then considered depending on the necessity and efficiency.

2) Final Disposal Sites (Sanitary landfill sites, controlled dump sites and random dump sites)

The project will consider provision of heavy equipment to controlled dump sites for improvement of its environment and operation as more urgent needs. Preparation of controlled dump sites would be a temporary solution until the extension of the existing landfill sites or installation of Ramoun landfill site is completed. Controlled dump sites are either under construction (in Beit-anan site of N&NW Jerusalem JSC) or at the planning stage (in Salfit, Ramallah, and Nablus JSCs).

3) Transfer Station

The project will not provide vehicles or equipment for transfer station operation and focus on waste collection services to citizen, considering following circumstances.

- Private sector may transfer wastes from transfer stations to final disposal sites, and operate transfer stations; in fact, some JSCs have hired private companies for that purpose.
- Although many JSCs use or planning to use transfer stations, future waste transfer plan is still unclear in the target year because of critical situation for the final disposal sites, preparation of new controlled dump sites and continuous use of existing dump sites with rehabilitation, and therefore it is hard to confirm sustainable use of new equipment at this time.

2-2-2-2 Criteria for the Component

The project provides waste collection vehicles and heavy equipment to JSCs based on following criteria.

Sample containers and essential spare parts for 1 or 2 years are supplementary provided. Standardized specification of the vehicles is used in the bid document.

(1) Collection Vehicles and Containers

a) The vehicles is provided to:
   - 5 JSCs (NE&SE Jerusalem, Qalqiliya, Tubas, N&NW Jerusalem, and Nablus) for replacement of depreciated vehicles and expansion of the service. In case of Nablus, vehicles for the expansion of the services considering its O/M capacity (70% replacement).
   - Other JSCs for 60% replacement of depreciated vehicles.

b) The target year of the calculation for vehicle necessity is set at the year 2022 (the target year of the National Strategy). Increase of waste generation based on population forecast in 2022 is taken into account in the calculation.

c) Old and deteriorated vehicles are replaced to new ones (100% replacement for the vehicles manufactured year before 2010, 50% between 2011 and 2015, and 0% after 2016, which is equivalent to 0%, 50%, and 100% of effective rate respectively). It is expected that there would be no or few additional drivers or workers for the replaced vehicles, and that O/M cost would decrease.

d) Standard size of the compactors is set at 8 m^3 (for narrow and steep roads), 13 m^3, and 21 m^3 (for large quantity of waste generation and direct transfer to final disposal).

e) Container carrier of chain lift type is not considered due to safety reason.

f) Provision of containers per compactor will be supplied as samples (10 containers with the size 1.1 m^3 per compactor).

(2) Equipment for Final Disposal

A set of heavy equipment (landfill compactor, backhoe loader, and dump truck) is supplied to N&NW Jerusalem JSC for Beit-anan controlled dump site operation. Other sites in Ramallah, Salfit and Nablus need more concrete plans and commitment.

2-2-2-3 Preliminary Equipment Plan (Equipment for Waste Collection)

(1) Procurement Plan of Waste Collection Vehicles

The procurement quantity of waste collection equipment was examined by the following method.

(1) Calculating the amount of waste generated per JSC in 2022
(2) Calculating waste collection capacity of existing vehicles per JSC in 2022
(3) Setting the collection insufficient capacity to be covered by the new procurement vehicle
(4) Setting three types of compactor (large, medium and small) with each number of trip considering road conditions (narrow or steep), accumulated volume of waste and distance to the final disposal site.
(5) Setting 10 containers (1.1 m^3) per compactor as samples for immediate use

Most existing collection vehicles are old (more than 12 years) and deteriorated causing expensive maintenance cost and operation problems. The equipment plan for waste collection is formulated in accordance with the methodology shown below, carefully examining the age and condition of the existing vehicles and capacity needed for future waste amount.

Waste collection capacity of each collection vehicle is estimated with the method shown below.

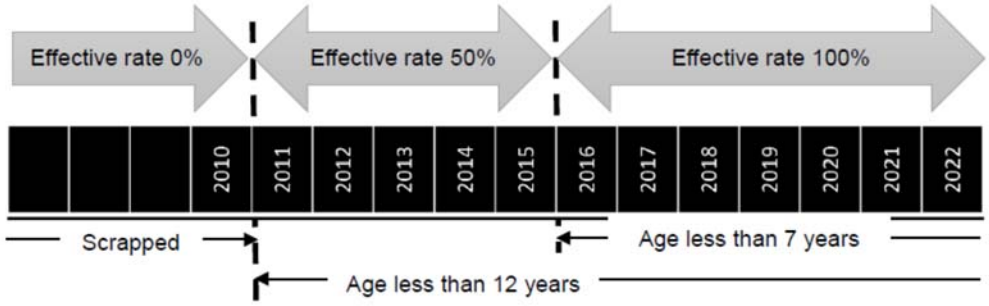
Capacity = [Vehicle volume (m^3)] x [No. of trips] x [Loading density (t/m^3)] x [Loading rate] x [Operation rate] x [Effective rate]

Loading rate, operation rate, and effective rate are defined as follows:

Loading rate:	Nominal capacity per trip per vehicle is 100%. 90% of loading rate is applied considering actual loading volume.
Operation rate:	Working days 100% are those having no day-off, no stand-by-day and no repair day. 86% (6 days per weeks) of operation rate is applied considering actual working days.

Effective rate: Considering the fact that a vehicle will need more repair suspending operation as it gets older, the following effective rate is applied:

Equipment age in the target Year (2022)	Effective Rate
Less than 7 years (Manufactured year in or after 2016)	100%
7-11 years (Manufactured year between 2011 and 2015)	50%
12 years or more (Manufactured year before 2010)	0% (Scrapped)



Design loading density of the waste collection vehicles are shown in Table 2-2.

Table 2-2 Loading Density of Wastes on Waste Collection Vehicles

Vehicles	Density (t/m^3)
Compactor	0.625
Dump truck	0.250

Source: JICA Survey Team

(2) Waste Collection Plan

The planned generation amount of wastes in 2022 (which is equal to the waste collection amount) are summarized in Table 2-3, and Table 2-4. The service population in 2016 is estimated based on the official projection of PCBS with adjustment of actual condition. The unit generation rate of waste of JSCs at present is used for the rate in 2022.

Table 2-3 Waste Collection Plan in 2022 (First Priority Group)

Items	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus*	Tubas	**Total**
Target population in 2022	58,374	204,283	126,630	362,137	70,989	**822,413**
Severed population in 2022	58,374	203,384	126,630	253,496	70,989	**712,873**
Planned waste generation amount (t/d) in 2022	63	133	126	177	48	**54747**
Unit generation rate (kg/day/capita) in 2022	1.08	0.66	0.99	0.70	0.68	**0.77**

Source: PCBS 2016, JICA Survey Team

Note) *: Considering the current Nablus JSC's O/M situation, the planned waste collection rate and service rate in 2022 are set at 70%.

Table 2-4 Waste Collection Plan in 2022 (Second Priority Group)

Items	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah*1	South Gaza	North Gaza*2	**Total**	**Ground Total**
Target Population in 2022	170,563	85,738	54,344	237,641	846,396	381,480	393,817	795,534	1,117,236	**4,032,749**	**4,855,162**
Severed Population in 2022	126,837	85,738	54,344	175,357	580,039	343,603	157,527	419,792	279,309	**2,426,468**	**3,139,341**
Waste Generation amount (t/d) in 2022	97	80	47	174	418	297	98	205	275	**1,784**	**2,331**
Unit Generation Rate (kg/day/capita) in 2022	0.76	0.93	0.86	0.99	0.72	0.86	0.62	0.49	0.98	**0.73**	**0.75**

Source: PCBS 2016, JICA Survey Team
Note) *1: Ramallah JSC is planning to implement all services by 2022.
*2: North Gaza JSC is planning to implement 25% service in the future plan of 2022.

(3) Effective Collection Capacity of Existing Vehicles in the Target Year

Effective collection capacity of the existing vehicles in 2022 is shown in Table 2-4 and Table 2-5. The number of trips will be similar as present, but assuming at least two trips in average or more will be operated. Consequently, the effective capacity by the existing vehicles in 2022 is calculated as 516 ton/day.

Table 2-5 Effective Collection Capacity of Existing Vehicles in 2022 (First Priority Group)

Unit: ton/day

Items	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Sub-Total
Compactor	17	14	15	11	6	63

Source: JICA Survey Team

Table 2-6 Effective Collection Capacity of Existing Vehicles in 2022 (Second Priority Group)

Unit: ton/day

Items	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	North Gaza	South Gaza	Sub-Total	**Total**
Compactor	40	20	23	38	166	9	72	0	71	439	**502**
Dump Truck	0	-	2	2	10	-	-	0	-	14	**14**
Tipper Crane Truck	-	-	-	-	-	-	-	-	0	0	**0**
Grapple Truck	-	-	0	-	-	-	-	-	-	0	**0**
Total	**40**	**20**	**25**	**40**	**176**	**9**	**72**	**0**	**71**	**453**	**516**

Source: JICA Survey Team

(4) Procurement Plan of New Vehicles

As a result of comparison between the planned collection amount and the effective capacity of the existing vehicles, shortage of the capacity in 2022 is calculated as 1,816 ton/day as shown below.

Table 2-7 Required Capacity for New Vehicles in 2022 (First Priority Group)

Items	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Sub-Total
Planned collection amount (t/d) in 2022	63	133	126	177	48	548
Existing vehicle (t/d) in 2022	17	14	15	11	6	63
New vehicle (Shortage capacity) in 2022	46	119	111	166	42	485

Source: JICA Survey Team

Table 2-8 Required Capacity for New Vehicles in 2022 (Second Priority Group)

Items	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	North Gaza	South Gaza	Sub-Total	**Total**
Planned collection amount (t/d) in 2022	97	80	47	174	418	297	409	205	57	1,784	**2,332**
Existing vehicle (t/d) in 2022	40	20	25	40	176	9	72	71	0	453	**516**
New vehicle (shortage capacity) in 2022	57	60	22	134	242	288	337	134	57	1,331	**1,816**

Source: JICA Survey Team

The large compactors (21m^3) are assumed to operate average 1~2 trips daily for direct transportation to waste disposal sites. The medium compactors (13 m^3) and the small compactors (8 m^3) are assumed to operate average 1~3 trips daily as shown in Table 2-9.

Table 2-9 Number of Trips of New Vehicles in 2022

Items	Trip/day	Remarks
Large Compactor (21m^3)	1 to 2	・ Collect waste along wide roads ・ Transport waste directly to waste disposal sites
Medium Compactor (13m^3)	1 to 3	・ Collect waste along relatively narrow roads ・ Transport waste to transfer stations or to waste disposal sites
Small Compactor (8m^3)	1 to 3	・ Collect waste along narrow roads ・ Transport waste to transfer stations or to vicinity waste disposal sites

Source: JICA Survey Team

Lifetime of the existing vehicles is expected for 12 years or more. Under the conditions discussed above, the number of new vehicles to be procured is calculated as shown in the table below. If the numbers need to be further adjusted for any JSCs, following concepts may be applied.

- First Priority Group : No component change
- Second Priority Group: Prioritize replacement for older vehicles or JSCs with small number of vehicles provided

Table 2-10 Number of Vehicles Procured by the Project

Group	JSC	Replacement	Expansion	Compactor			**Total**
				21m³	13m³	8m³	
First Priority	N&NW Jerusalem	6	0	0	3	3	**6**
	NE&SE Jerusalem	9	0	1	3	5	**9**
	Qalqiliya	7	0	1	3	3	**7**
	Nablus	3	8	2	6	3	**11**
	Tubas	3	2	0	2	3	**5**
Second Priority	North Gaza*	3	0	0	3	0	**3**
	South Gaza*	3	0	0	3	0	**3**
	Tulkarem	5	0	1	4	0	**5**
	Salfit	2	0	0	2	0	**2**
	Jericho	5	0	0	2	3	**5**
	Bethlehem	6	0	0	6	0	**6**
	Hebron	2	4	2	4	0	**6**
	Jenin	16	0	3	9	4	**16**
	Ramallah	13	0	0	13	0	**13**
Total		83	14	10	63	24	**97**

Note) *: The number of equipment for Gaza was set in reference to the procurement of equipment by the World Bank, regulation of Israel, and transportation procedure to Gaza.

1) Nablus JSC

Nablus JSC has only 5 old vehicles for large population with low service coverage. In case 100% collection coverage will be realized, the expansion of the organization and the accounting size will be very large. Therefore, the collection coverage rate of Nablus JSC in 2022 was set to 70% as affordable and sustainable.

2) South Gaza JSC and North Gaza JSC in Gaza Strip

It is necessary to consider the import restrictions and procedures of Israel for Gaza Strip. Considering the conditions that equipment shall be reloaded at the check point of Gaza border etc., three very old vehicles (two compactors manufactured in 1992 and one truck with crane manufactured in 1995) of North Gaza JSC and three trucks with cranes manufactured in 1995 will be replaced.

(5) Expected Collection Amount after Vehicle Provision

The expected collection amount for each type of vehicles in 2022 is summarized in Table 2-11 and Table 2-12. It will be required to cover the difference of 380 ton/day with support of donors or self-effort in order to attain 100% collection.

Table 2-11 Existing and New Vehicles of Collection Amount in 2022 (First Priority Group)

Unit: ton/day

Items	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Sub-Total
Existing Vehicles						
Compactor	17	14	15	11	6	63
New Vehicles						
Large Compactor Type (21m³)	0	20	20	40	0	80
Medium Compactor Type (13m³)	18	39	57	104	12	230
Small Compactor Type (8m³)	24	40	36	8	24	132
Total	59	113	128	163	42	505

Source: JICA Survey Team

Table 2-12 Existing and New Vehicle of Collection Amount in 2022 (Second Priority Group and Total)

Unit: ton/day

Items	Tulkarem	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	North Gaza	South Gaza	Sub-Total	**Total**
Existing vehicles											
Compactor	40	20	23	38	166	9	72	0	71	439	**502**
Dump Truck	0	-	2	2	10	-	-	0	-	14	**14**
Tipper Crane Truck	-	-	-	-	-	-	-	-	0	0	**0**
Grapple Truck	-	-	0	-	-	-	-	-	-	0	**0**
Total	40	20	25	40	176	9	72	0	71	453	**516**
New vehicles											
Large Compactor Type ($21m^3$)	10	0	0	0	40	60	0	0	0	110	**190**
Medium Compactor Type ($13m^3$)	52	38	12	114	76	171	247	57	57	824	**1,054**
Small Compactor Type ($8m^3$)	0	0	12	0	0	48	0	0	0	60	**192**
Sub-Total	62	38	24	114	116	279	247	57	57	994	**1,436**
Total	**102**	**58**	**49**	**154**	**292**	**288**	**319**	**57**	**128**	**1,447**	**1,952**

Source: JICA Survey Team

(6) Containers Provided with Compactors

The capacity of containers for exclusive use with compactors is set as 1.1 m^3 in consideration of interchangeability with existing containers and local practices. The quantity of the containers provided is planned at 10 units per compactor. The total numbers to be provided in each JSC is shown in Table 2-13.

Table 2-13 Number of containers to be provided

Group	JSC	Containers ($1.1m^3$)
First priority	N&NW Jerusalem	60
	NE&SE Jerusalem	90
	Qalqiliya	70
	Nablus	110
	Tubas	50
Second priority	North Gaza	30
	South Gaza	30
	Tulkarem	50
	Salfit	20
	Jericho	50
	Bethlehem	60
	Hebron	60
	Jenin	160
	Ramallah	130
	Total	**970**

Source: JICA Survey Team

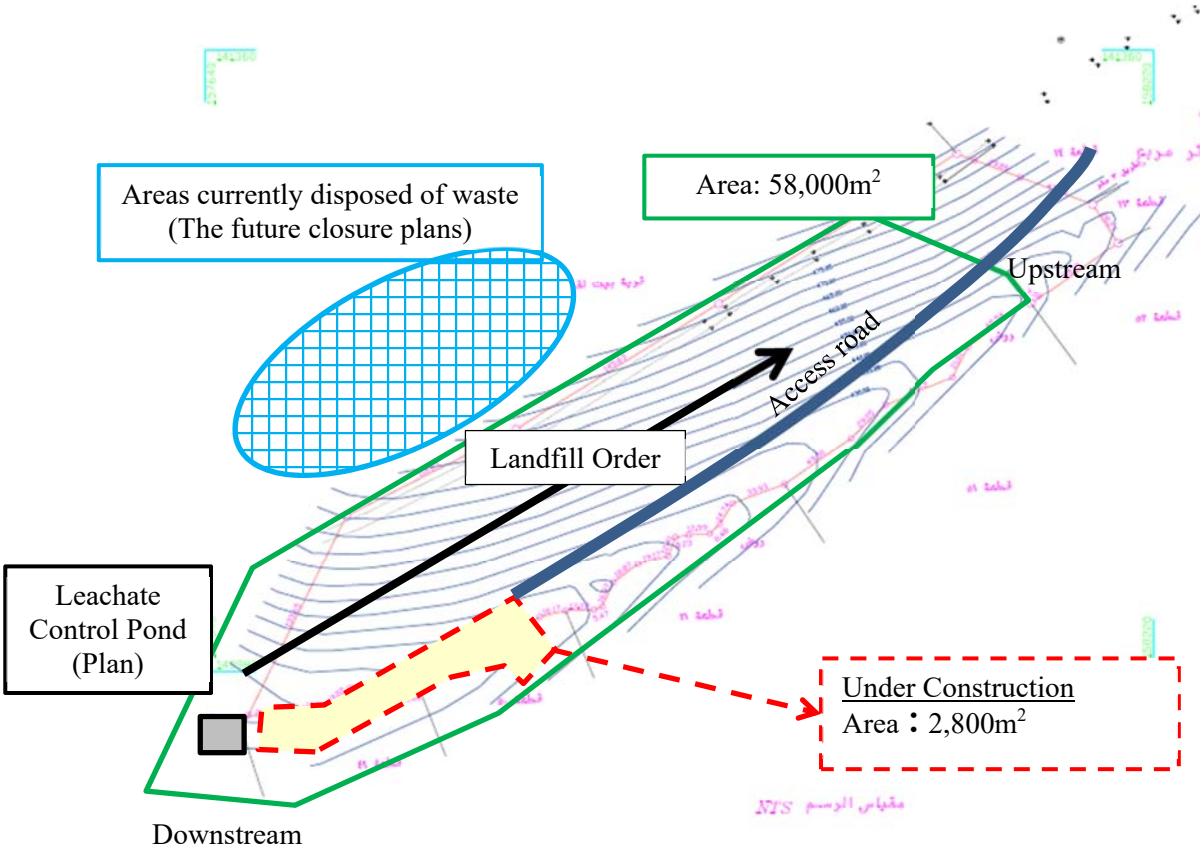
2-2-2-4 Preliminary Equipment Plan (Equipment for Final Disposal)

The procurement quantity of the final disposal improvement equipment was examined with the following method.

(1) Calculating the amount of landfill at the disposal site (Transported waste amount)
(2) Calculating the necessary soil covering amount
(3) Setting the quantity and capabilities required (Setting landfill compactor from waste landfill amount and setting backhoe loader and dump truck from covering amount)

Beit-anan controlled dump site summary is shown below.

Items	Summary
Area	58,000m^2
Volume	1,450,000m^3
Lifetime	11 years
Condition	Waste landfilled: 300m^3/day (279 ton/day) Soil cover: 60m^3/day (45 ton/day)



Source: JICA Survey Team based on the plan by N&NW Jerusalem JSC

Figure 2-1 Plant of Beit-anan Controlled Dump Site

Source : JICA Survey Team

Figure 2-2 Construction Work of Beit-anan Controlled Dump Site (April, 2018)

For the final disposal site equipment, it was feasibility of landfill work in final disposal site equipment.

Table 2-14 Contents of the Final Disposal Site Maintenance Equipment

Equipment	Quantity	Function
Landfill Compactor	1	Scattering and compacting of waste and compacting and grading of covering soil.
Backhoe Loader	1	Excavation of soil and transportation and loading of waste and covering soil. It is possible to use in construction work.
Dump Truck	1	Transportation of excavated soil. It is possible to use in construction work.

Source: JICA Survey Team

(1) Procurement Plan of Final Disposal Site

In 2021, Beit-anan controlled dump site will receive approximately 93 ton/day of wastes. The operation plan of the dump site is as follows:

- Opening hours of the sites: 8 hours/day, 6 days per week
- Working hours of the equipment: 8 hours x 1 shift (actual working hours: 6 hours x 1 shift)

1. Cover soil: 10% of incoming solid wastes (soil layer with 20 cm thickness to 2 m thickness of disposed waste)
2. Heavy equipment:
   - Landfill compactor is used for spreading and compacting waste and covering soil.
   - Backhoe loader is used for moving wastes in the dump site, and for excavating and transporting covering soils.

Required work volumes for the heavy equipment are shown in Table 2-15.

Table 2-15 Required Work Volume of Heavy Equipment

Items	Unit	Plan in Beit-anan Controlled Dump Site	Remark
a. Planned disposal amount	ton/day	279	
b. Waste density ratio before compacting	-	0.5	
c. Planned disposal amount before compacting	m^3/day	558	
d. Waste density ratio after compaction	-	1.0	
e. Planned disposal amount after compaction	m^3/day	279	
f. Cover soil after compaction	m^3/day	28	10% of planned disposal amount
g. Cover soil before compaction	m^3/day	36	130%
Required work volume			
for Landfill Compactor	m^3/day	594	= c. + g.
for Backhoe loader	m^3/day	36	= g.

Source: JICA Survey Team

One landfill compactor and one backhoe loader is provided in Beit-anan controlled dump site, assuming effective operation volumes in 2021 as shown below. The heavy equipment will not operate at night due to no lighting system on them, while Beit-anan controlled dump site receives wastes for 24 hours. Operation time for the heavy equipment should be limited to 1 shift (6 hours x 1 shift = 6 hours). Standard work volumes of the heavy equipment are based on Japanese guidelines.

a) Landfill Compactor
Standard work volume of 25 ton class landfill compactor is 540m^3/day.

b) Backhoe Loader
Standard work volume of backhoe loader is calculated by the formula below.

$$Q = 3{,}600 \times q_0 \times K \times f \times E / C_m$$

Q: Standard work volume (m^3/hour)
q_0: Bucket capacity (m^3)
K: Bucket coefficient (0.8)
f: Conversion factor of soil (1.0/1.25)
E: Operation efficiency (0.8)
C_m: Cycle time (32 sec)

In case of 0.8 m^3 of bucket capacity, the standard work volume is calculated 46 m^3/hour.
$Q = 3{,}600 \times 0.8 \times 0.8 \times (1/1.25) \times 0.8 / 32 = 46$ m^3/hour

The required work volume and the effective capacity of landfill compactor is as shown inTable 2-16.

Table 2-16 Capacity for Landfill Compactor

Site	Required work volume	New Landfill Compactor					Total (m^3/d)
		Unit	Operating Weight (ton)	Standard work volume (m^3/d)	No. of shift	Capacity (m^3/d)	
Beit-anan site	594	1	21	540	1	540	540

Source: JICA Survey Team

The required work volume and the effective capacity of backhoe loader is as shown in Table 2-17.

Table 2-17 Capacity for Backhoe Loader

Site	Required work volume	New Backhoe Loader					Total (m^3/d)
		Unit	Bucket capacity (m^3)	Standard work volume (m^3/h)	No. of shift	Capacity (m^3/d)	
Beit-anan site	36	1	0.8	46	1	46	46

Source: JICA Survey Team

Approximately 36m^3 of covering soil to Beit-anan site is necessary on daily basis. Procurement of one dump truck for soil transportation from a soil pit is included in the project to ensure the routine soil transportation. One 15m^3 dump truck is selected considering local availability and maintenance.

2-2-3 Outline Design

The specifications equipment of the waste collection and Final Disposal site to be procured by the Project shall be as follows:

(1) **Large Compactor (21 m^3)**

- Body capacity: 21m^3 class
- Gross vehicle weight: 26 ton or more
- Engine: 270kW or more

(2) **Medium Compactor (13 m^3)**

- Body capacity: 13m^3 class
- Gross vehicle weight: 18 ton or more
- Engine: 180kW or more

(3) **Small Compactor (8 m^3)**

- Body capacity: 8m^3 class
- Gross vehicle weight: 15 ton or more
- Engine: 160kW or more

(4) **Container (1.1 m^3 class)**

- Type: DIN/European standard container, welded steel plate construction (without lid)
- Body volume: nominal 1.1 m^3 or more
- Load-bearing: 500 kg or more

(5) **Dump Truck**

- Maximum load: 15 m^3 or more
- Gross vehicle weight: 26 ton or more

- Engine: 270 kW or more

(6) **Landfill Compactor**

- Operating weight: 25 ton or more
- Engine: 200 kW or more

(7) **Backhoe Loader**

- Operating weight: 8 ton or more
- Loader: $1m^3$ or more
- Backhoe: Becket 180 letter or more
- Engine: 65kW or more

The emission standards of the equipment shall be based on local standards, and the survey is as follows.

Table 2-18 Emission standards of equipment in Palestine (procured equipment in this plan) (As of November 2018)

Items	West Bank JSC (N&NW Jerusalem, SE&NE Jerusalem, Nablus, Qalqiliya, Tubas, Jenin, Tulkarem, Salfit, Ramallah, Jericho, Bethlehem, Hebron)	Gaza strip JSC (North Gaza, South Gaza)
Compactor (Small, Medium, Large) Dump Truck	Euro VI *1	Euro III *2
Landfill Compactor Backhoe Loader	Euro Stage IV *1	- (Not applicable)

*1: Euro VI is the standard for vehicles and Euro Stage IV is for heavy equipment such as landfill compactor.
*2: Euro III is the standard for Gaza, with presumption of Israeli restriction.
Source: JICA Survey Team

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Project Implementation Organizations

After conclusion of the Exchange of Notes (E/N) and Grant Agreement (G/A) on the grant aid cooperation of the Project, Palestine shall select a consultant and a supplier and conclude contracts with them. After the completion of detailed design and bidding documents, contract with Japanese supplier decided by bidding will be concluded and procurement of the equipment will be implemented.

1) Responsible Organization

The Ministry of Local Government (MoLG) shall be the organization responsible for the implementation of the Project. It is necessary to construct a comprehensive management organization in order to smooth implementation the project while Japanese consultant and supplier will have closely contact and discussion with MoLG.

2) Implementing Organization

The implementing organization of this project shall be MoLG and the actual operation and maintenance organization shall be 14 JSCs. Each JSC needs to work on the Project by establishing contact and cooperation with MoLG, Japanese consultant and supplier.

(2) Consultant

The Japanese consultant shall conclude a contract with MoLG, for preparation of detailed designs and supervision of procurement in order to facilitate the procedure and management in this Project. The consultant shall prepare bid documents and coordinate bidding on behalf of MoLG. The responsibilities

of the consultant at each stage of the project implementation are described below.

1) Detailed Designs

The consultant shall prepare detailed designs from the outline design and prepare bid documents. The consultant shall also provide answers to technical questions on the contents of the bid documents and evaluate the technical proposals submitted by bidders.

2) Procurement Supervision

The consultant shall supervise procurement of the equipment. The consultant shall inspect procured equipment in terms of quality, functions, quantities and damage on the exterior surface caused during the transportation. If abnormality is found in the inspection, the consultant shall prepare a report on the abnormality without delay and parties concerned shall have discussion on measures to cope with.

(3) Supplier

A Japanese company selected by the Palestine side as the supplier of this Project in a general open bid implemented in accordance with the scheme of the grant aid program of Japan. Sufficient attention shall be paid to communication and coordination with the counterparts after the handover of the materials, equipment and facilities concerned as after-services such as provision of spare parts and responses to malfunctions will be required in the future after the completion of the Project.

2-2-4-2 Implementation Condition

(1) Initial Operation Guidance to Palestine Side

Engineers from the manufactures of the equipment shall provide initial operation guidance to Palestine staff (operators and mechanics of waste collection vehicles) to transfer technologies concerning the procured equipment after the delivery.

(2) Exemption of Customs Duties and Taxes

Palestine shall take actions required for tax exemption (including value added tax) on equipment to be procured by this Project. However, the supplier shall have to monitor the progress of the processing of the application for the tax exemption, because the delay in the processing may result in extension of the project period.

(3) Equipment Procurement to Gaza Strip

Importing equipment to Palestine shall clear security checks of COGAT (Coordination of Government Activities in the Territories) of Israel. The checking of equipment to Gaza Strip is very strict and will take time.

1) Security Check of COGAT

After the final specification of the equipment to import is completed, required documents will be submitted to COGAT. The final specifications describing the model chassis number, parts and materials in detail will be required. Materials used for military purposes, communication equipment, heavy machinery, 4WD vehicles and some spare parts will be more stringent, so such items should be excluded from equipment in the Gaza Strip.

2) Security Check Procedure

Documents for security check procedures are as follows. It is difficult to assume the time required for approval by COGAT.

Palestine Custom ⇨ Israel Custom ⇨ COGAT

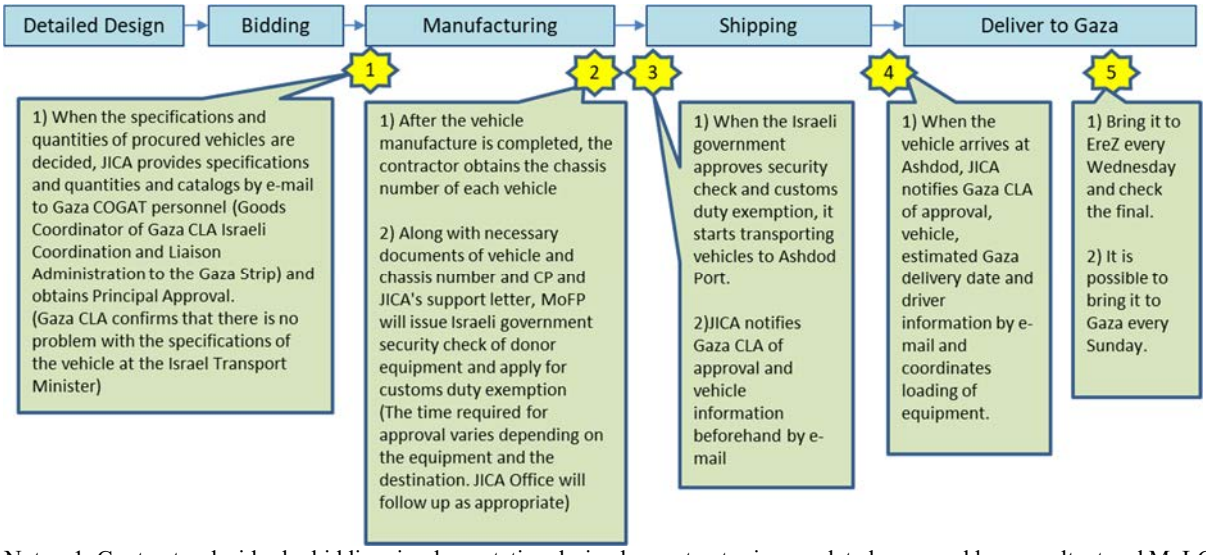
Validity period after approval of security check is reported as one year. The supplier should proceed transportation of equipment after getting approval of security check. The supplier should also coordinate with COGAT at the end of the final specification of the equipment.

3) Security Consideration

Based in the overseas security guideline of the Ministry of Foreign Affairs of Japan, it will be considered that Japanese consultant and supplier would not enter Gaza Strip and that procurement management, initial operation guidance, other inspections would be conducted by the local staff employed by the consultant or the supplier.

4) Basic Flow and Procedure of Procurement of Vehicles to Gaza

Basic flow and procedure of procurement of vehicles to Gaza are as follows. Contractor is to prepare the necessary documents without delay. It is necessary to cooperate with JICA and consultants and proceed with the procedure.



Notes: 1: Contractor decides by bidding, implementation design by contractor is completed, approval by consultant and MoLG is finished
2: Since the information on the chassis number is manufactured separately for the vehicle part and the gantry part, there is a possibility that it can be obtained at the manufacturing stage
*1: To load equipment and goods other than vehicles to Gaza, apply from Gaza CLA's website (www.gazacla.org). Normal equipment is brought in from Kerem Shalom. Website registration (ID · PW) is held by the JICA Palestine office.
*2: Apply for vehicle spare parts from website. It is also possible to carry from Erez along with the vehicle and spare parts. It is necessary to inform Gaza CLA of the IM number (the registration number issued on the website above) and the equipment list beforehand, and adjustment is necessary.

Source: JICA Survey Team

Figure 2-3 Basic Flow and Procedure of Procurement of Vehicles to Gaza

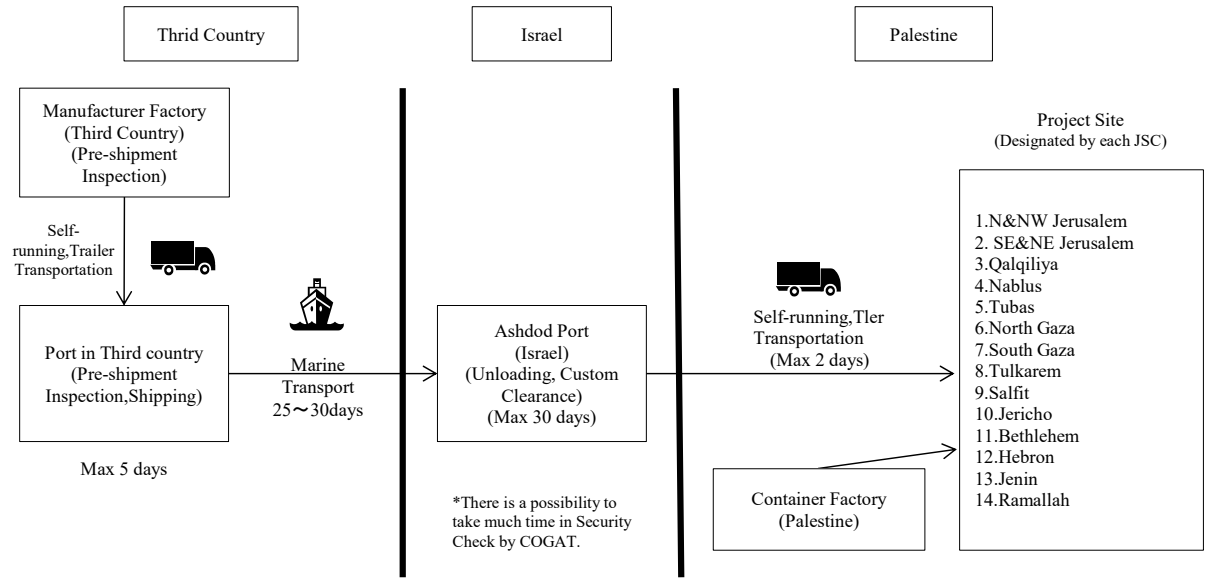
5) Countermeasures in case of disturbance to transport into Gaza

Just in case that the supplier will make proper procedure but difficulties will occur to enter the equipment into Gaza, it is agreed that the supplier will transport the equipment (vehicles) to appropriate place in West Bank and MoLG will receive them and transport them to Gaza later.

(4) Transportation Plan

Transportation of equipment from production country to the main port of Israel (Ashdod Port) is basically planned using RO-RO (roll-on/roll-off) ship of maritime transport. The transportation period is assumed to be 60 days including custom clearance.

The equipment will be transported from Ashdod port to each JSC by trailer and tractor or driving to West Bank. Trailer transportation is assumed to be about 2 days at maximum.



Source: JICA Survey Team

Figure 2-4 Equipment Transportation Plan

(5) Bidding Package of the Project

The bidding package will be one including the whole equipment with 1 lot considering the following conditions:

- The restriction to import to Gaza is getting more stringent recently. Multiple packages or lots in bidding will increase procedure and risk of stagnation.
- One package or lot will be simpler and smoother in procedure involving MoLG and JICA.
- It will be better to manage and coordinate custom clearance and transportation of various kind of equipment to each JSC by one supplier.

2-2-4-3 Scope of Works

The scopes of works of the Japanese and Palestine sides are as described in “Obligations of the Recipient Country” mentioned in 2-3 of Chapter 2.

2-2-4-4 Consultant Supervision

The consultant shall implement design, bidding support and procurement supervision in compliance with the scheme of the grant aid of the Government of Japan. The consultant shall dispatch engineers specialized in various stages, such as inspection of completed equipment and handing-over, in accordance with the progress of the procedure. The issues requiring special attention in the consultant supervision are described below.

(1) Monitoring of Progress

The consultant will supervise that the supplier shall complete the work by the day stipulated in the contract and monitor the progress of the project. When delay in the progress of work is found, the consultant will report the anticipated delay to JICA, draw attention of the supplier to the possible delay and request submission of a plan of countermeasures and their implementation.

(2) Quality and Quantity Control

The consultant will inspect the equipment to be procured for whether or not it complies with the quality and quantities stipulated in the contract documents using the following methods:

i) Comparison with the shop drawings and specifications of the equipment
ii) Shop inspection or verification of the commissioned shop inspection results
iii) Checking of initial operation guidance and O/M guidance of the supplier

If the verification and comparison revealed a possibility that the manufactured equipment may not comply with the quality or quantity standards, the consultant will request the supplier to correct, replace or repair it.

(3) Basic Policy for Consultant Supervision

A large quantity of vehicles will be procured from countries other than Japan or Palestine. Therefore, the consultant will consider the period for the transportation and the permissions/licenses to be required. The consultant will also inspect the equipment, which are to be procured from various places, for whether or not they comply with the required specifications.

(4) Supervision in Gaza Strip

Supervision by local staff or agents of the consultants or the supplier and issuance of taking-over certificate in the West Bank in accordance with the report from South Gaza JSC and North Gaza JSC will be examined in case that Japanese consultant and supplier would not enter Gaza Strip.

2-2-4-5 Quality Control Plan

The quality control shall be implemented simultaneously with the consultant supervision mentioned above. The consultant shall verify whether or not the manufactured and delivered equipment satisfy the qualities and specifications required in the contract documents.

(1) Schedule Management

The consultant will confirm the progress status from the report of the supplier and issue a warning of compliance with the schedule as necessary. Procurement schedule management will be as follows.

- Considering the period required for the grant aid system and the period necessary for the production of the equipment, guideline procurement schedule will be prepared. The schedule will be presented in the bid documents. The consultant will check that the schedule submitted by the supplier in bidding be adequate or not.
- The consultant will compare the actual progress reported by the supplier and the original schedule.
- A consultant will warn and advise the supplier to take countermeasures to catch up the original schedule in case of delay.

(2) Quality Management

Basically quality of equipment should be secured in the production factory by the manufacturer. Quality management of the consultant will be as follows.

- Specifications based on the basic design shall be stipulated in bid documents.
- The consultant will check that the equipment proposed by the supplier satisfy the specifications stipulated by the bid documents in bidding.
- The consultant will confirm the details to the supplier if necessary.
- The consultant will confirm the quality of the equipment before pre-shipping inspection and the inspection at factory production. The consultant will instruct the supplier to remedy if necessary.

2-2-4-6 Procurement Plan

The country to be procured and the country of origin to be kept are shown as follows.

Table 2-19 Country of Origin of the Equipment to be Procured

No.	Item	Country of Origin		
		Japan	Palestine	Third Country
1-1	Small Compactor			○
1-2	Medium Compactor			○
1-3	Large Compactor			○
2-1	Dump Truck			○
2-2	Landfill Compactor			○
2-3	Backhoe Loader			○
1-4	Container		○	

Source: JICA Survey Team

2-2-4-7 Operation Guidance Plan

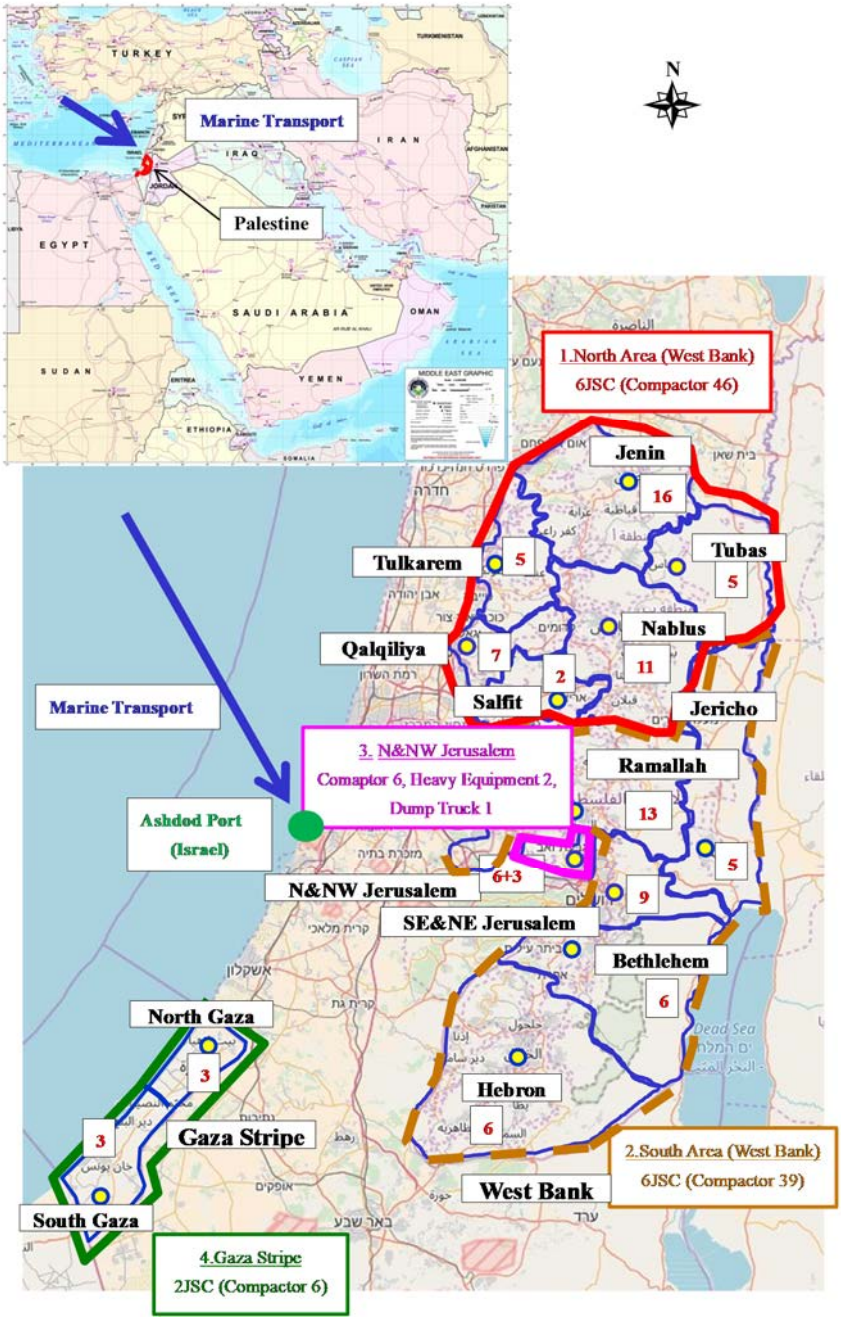
(1) Initial Operation Guidance Plan

Explanation and technical guidance on operation and maintenance of the equipment will be made when the equipment will be handed over. Initial operation guidance by the supplier is planned be carried out in 4 areas considering efficiency.

Table 2-20 Plan for Initial Operation Guidance and Operation/Maintenance Guidance

Area	Target JSC	Target Equipment	Location
1. North Area (West Bank)	6JSC	Compactor 46 Units	Jenin JSC
2. South Area (West Bank)	5JSC	Compactor 39 Units	Bethlehem JSC
3. N&NW Jerusalem Area (West Bank)	1JSC	Compactor 6 Units Heavy Equipment 2 Units Dump Truck 1 Unit	N&NW Jerusalem JSC
4. Gaza Strip	2JSC	Compactor 6 Units	South Gaza JSC

Source: JICA Survey Team



Source: JICA Survey Team

Figure 2-5 Location Plan for Initial Operation Guidance and Operation/Maintenance Guidance

2-2-4-8 Soft Component Plan

(1) Background

Proper and steady O/M system with appropriate organization, manpower, technique and financial management is indispensable in order to operate the vehicles and equipment provided properly in long term. Without such a system, the vehicles and equipment would stop its operation in a short time, before the expected lifetime. Many JSCs were organized not long before having limited manpower and financial capacity only to operate the existing equipment. Therefore, following technical assistance in this project, or "soft-component," is planned to support to build JSC's suitable O/M system.

(2) Objectives

The objectives of the project is that the JSCs for solid waste management provide solid waste

management services to citizens for sound environment and healthy life.

Based on this objectives, the objective of the soft component is set to secure sustainable outcome of the project realizing efficient collection-transportation-disposal services of wastes through the support for smooth introduction and proper operation and maintenance of the project equipment over a long time.

(3) Expected Outcomes

The expected outcomes of the soft component is improvement of operation/maintenance capacity of JSCs for the project equipment, increase of amount of waste properly managed and reduction of the cost for collection and operation/maintenance. In addition, safety and sanitation in operation of collection and workshop will be secured.

The outcomes will be described in detail as follows:

Strengthening Technical O/M System
- Support for Preventive Maintenance
- Support for Repair Management System
- Support for Spare Parts Management System
- Support for Vehicle Operation Plan

(4) Methods to Verify the Achievement of the Outcomes

The methods to verify the achievement of the outcomes are shown in the following table.

Table 2-21 Methods to Verify Achievement of Outcomes

	Item	Outcome	Index	Measurement
Strengthening Technical O/M System				
1	Support for Preventive Maintenance	Daily inspection and periodical inspection will be improved and implemented thoroughly.	・ Instruction paper for preventive maintenance will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
2	Support for Repair Management System	Repair management system will be improved with guideline.	・ Instruction paper for improved repair management system will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
3	Support for Spare Parts Management System	Spare parts and consumables management system will be improved.	・ Instruction paper for improved spare parts and consumables management system will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
4	Support for Operation Safety and Sanitation	Collection will be carried out safely and sanitary with instruction and education on operation safety and sanitation.	・ Instruction paper for operation safety and sanitation will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar

Source: JICA Survey Team

(5) Products of the Soft Component

The consultants of the Soft Component shall submit the products mentioned in the table below to the implementing organizations and JICA.

Table 2-22 List of Products

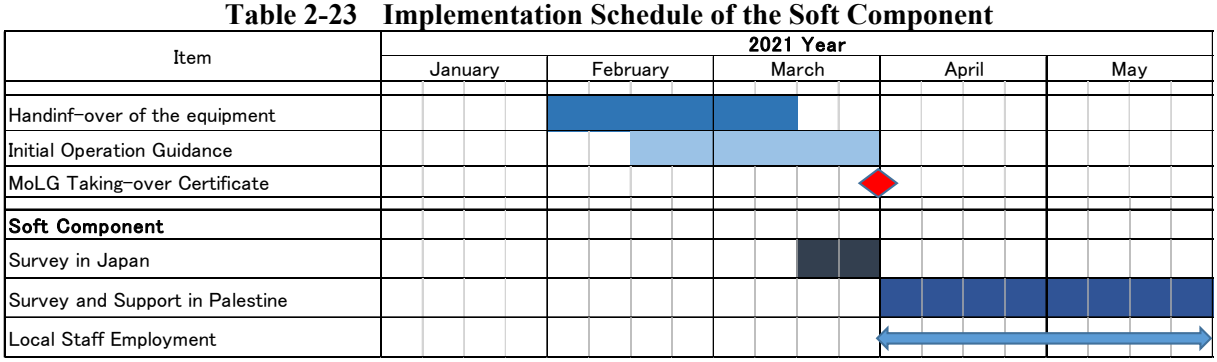
Activity	Item	Products
Support Activity	Overall	Soft Component Completion Report
	Support for Preventive Maintenance	Instruction paper for preventive maintenance
	Support for Repair Management System	Instruction paper for improved repair management system
	Support for Spare Parts Management System	Instruction paper for improved spare parts and consumables management system
	Support for Operation Safety and Sanitation	Instruction paper for operation safety and sanitation planning

Source: JICA Survey Team

(6) Implementation Schedule of the Soft Component

Table 2-23 shows the implementation schedule of the Soft Component. In the first filed survey, assistance shall be provided for strengthening institutional O/M system leading to sustainable O/M and Strengthening technical O/M system to all JSCs after handing-over of the equipment. In the end of the first field survey, the seminar will be held for explanation and discussion on the improvement for O/M system. Assistance for trial improvement for all JSCs will be carried out by local assistants for one month. In the second work, the results of the trial will be reviewed and the problems will be analyzed. Based on the monitoring, proposed by-laws, instruction papers and guidelines will be rectified and finalized. In the end of the second survey, the seminar will be held for explanation and discussion on the sustainable O/M system.

Table 2-23 Implementation Schedule of the Soft Component

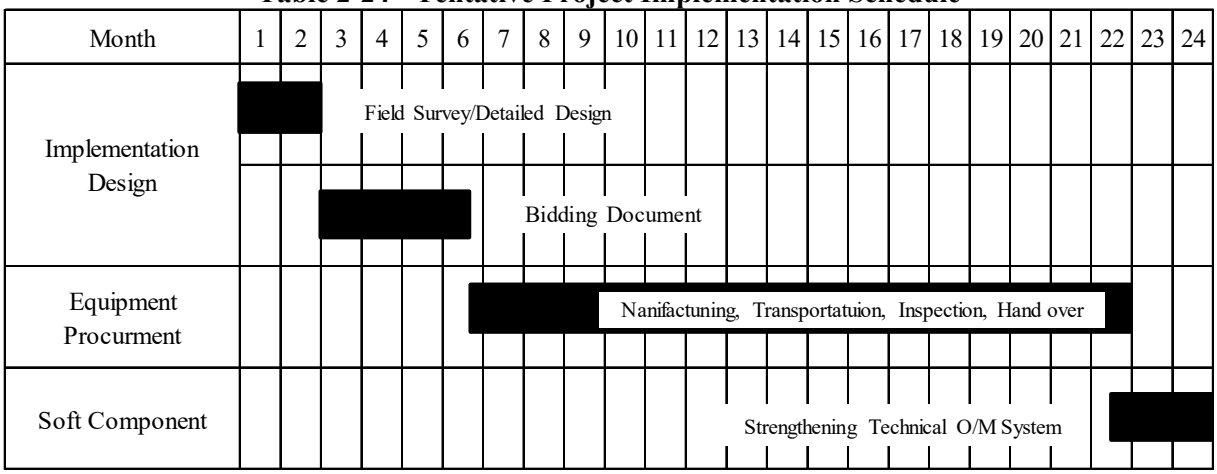


Source: JICA Survey Team

2-2-4-9 Tentative Project Implementation Schedule

The tentative project implementation schedule is shown in the following table.

Table 2-24 Tentative Project Implementation Schedule



Source: JICA Survey Team

2-3 Obligations of the Recipient Country

2-3-1 Major Undertakings to be taken by Each Side

Major undertakings to be taken by each side are shown in the following table.

Table 2-25 Major Undertakings to be Taken by Each Side

No.	Items	Japan	Palestine
1	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine transportation of the Products from Japan or place of product to the recipient country	●	
	2) Internal transportation from the port of disembarkation to the project site	●	
2	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be borne by the Authority without using the Grant		●
3	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To ensure that the products be maintained and used properly and effectively for the implementation of the Project		●
5	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
6	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A (Banking Arrangement)		
	1) Advising commission of A/P (Authorization to Pay)		●
	2) Payment commission		●

(B/A : Banking Arrangement, A/P : Authorization to pay)
Source: JICA Survey Team

2-3-2 Major Undertakings to be taken by Palestinian Side

Major undertakings to be takin by Palestinian side is described in Annex-3 of the Minutes of Meeting signed on 22 November 2019 by both sides. The contents are as follows:

(1) Procedure for Banking Arrangement and Authorization to Pay

Palestine side should take necessary procedures for issuance of A/P (Authorization to Pay) required for payments to the Japanese Consultant and Supplier, and to bear the following commissions to a bank in Japan for the banking services based upon the banking arrangement at the time of commencement of the project (Around May 2019).

- Advising commission of A/P
- Payment commission

(2) Tax and Custom Duty Exemption of the Equipment

Palestine side shall be responsible for tax and custom duty exemption.

(3) Allocation of Necessary Budget and Manpower for Operation of the Equipment

Palestine side should secure and allocate necessary budget, manpower, space for their proper operation, and maintenance of the equipment without delay.

The vehicles and equipment of the project shall be operated and maintained properly in full use for a long term.

(4) Support for Procedure for Import and Delivery of the Equipment to Gaza Strip

Palestine side shall take necessary actions for import and delivery of the equipment to Gaza Strip, such

as coordination with COGAT of Israel.

(5) Provision of Proper Parking Spaces for Equipment

Palestine side shall secure (construct or allocate) parking spaces of the equipment in each JSC for proper O/M.

(6) Provision and Maintenance of Necessary Waste Containers and Materials not Covered by the Project

Palestine side shall prepare necessary quantity of waste containers and materials not covered by the project.

(7) Provision of Parking Space for the Equipment

Palestine side shall prepare or allocate proper parking spaces for the project equipment.

(8) Expansion and Improvement of Final Disposal Sites

Palestine side shall expand and improve the existing final disposal sites and develop new controlled dump sites.

(9) Submission of Project Monitoring Report and Project Completion Report to JICA

Palestine side shall submit the project monitoring report and the project completion report to JICA according to the prescription of the Minutes of Discussions.

(10) Following JICA Bidding Procedure Guidelines

Palestine side shall follow the bidding procedure guidelines.

2-4 Project Operation Plan

2-4-1 Equipment for Waste Collection

2-4-1-1 Operation Plan

This project will procure compactor for Waste collection. Compactors are used in Palestine and its percentage around 80 % in all the waste collection vehicle. So utilization and allocation of compactors are available in Palestine.

Improvement and strengthening of the O/M system will be supported by the soft component.

2-4-2 Maintenance Plan

In most JSC, drivers and mechanics of JSC repair small breakdown by themselves. Most JSCs do not have their workshop (maintenance factory) and they have to outsource heavy repair to private companies or LGU.

2-4-3 Equipment for Final Disposal

2-4-3-1 Operation Plan

Equipment for final disposal will be procured to Beit-anan controlled dump site of N&NW Jerusalem JSC. The plan for the operation of the Beit-anan site has been prepared by the N&NW Jerusalem JSC.

The main work of the disposal site is loading management and landfilling work.

2-4-3-2 Maintenance Plan

Landfill compactor, backhoe loader and dump truck are equipment generally used in disposal sites. At first N&NW Jerusalem JSC plans to outsource maintenance to the private sector. The cost will be covered in the collected service charges.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost Borne by the Japanese Side

This part is closed due to the confidentiality for one year until final verification of the contract of the supplier.

(2) Cost Borne by the Palestine Side

Procurement of bank commissions: approx. 0.02 million yen (approx. 60 Thousand NIS)

(3) Estimation Conditions

i) Time of estimation: May 2018
ii) Foreign exchange rates: 1US$=108.12 JPY
1NIS=30.64 JPY
1EUEO=133.59 JPY
iii) Implementation period: The periods for the bid and procurement are shown in the execution schedule.
iv) Miscellaneous matter: The costs are to be estimated in accordance with the provisions of the grant aid program of the Government of Japan.

2-5-2 Operation and Maintenance Cost

(1) Equipment for Waste Collection

Each JSC has to secure operation and maintenance budget according to number of existing vehicle and new vehicle from grant aid project. New vehicle from Grant Aid project will have economical fuel consumption and low maintenance cost.

Operation and maintenance cost in N&NW Jerusalem, SE&NE Jerusalem, Qalqiliya, Tubas JSCs are estimated with the condition of 100% waste collection coverage area.

Operation and Maintenance Cost will increase in Nablus, Tubas, Hebron JSC, because of increase of number of waste collection vehicle. Operation and maintenance cost of Nablus JSC in 2022 will increase more than 3 times compared to that in 2017. But tipping fee from LGU will be increased, Nablus JSC will secure the budget.

The total O/M cost for 14 JSCs is estimated as 22 million USD in 2017 and 23 million USD million in 2022 as the effect of fuel and repair cost reduction by introduction of the project equipment.

(2) Equipment for Final Disposal

Operation and maintenance cost in N&NW Jerusalem for Equipment for final disposal is shown Table 5-1 with the condition shown below.

Equipment : Landfill Compactor(1 unit), Backhoe Loader (1 unit), Dump Truck (1 unit)
Worker/Guard : 1 person
Operator : 1 person
Operation time : 6 hours/day

Table 2-26 Operation and Maintenance Cost in N&NW Jerusalem JSC (Final Disposal)

Unit: USD/year

Item	O/M Cost (2018 year)	O/M Cost (2022 year)
Salary	34,007	34,007
O&M	5,668	5,668
Fuel	132,626	132,626
Other	166,633*	91,818
Total	338,933	264,118

Source: JICA Survey Team

CHAPTER 3 PROJECT EVALUATION

3-1 Preconditions

A precondition for the implementation of this Project is that the Palestine side shall carry out in full its obligations, including procedures required for tax exemption and customs clearance, payment of bank commissions and insure of operation maintenance and landfill site

3-2 Necessary Inputs by the Recipient Country

The Palestine side must take measures to satisfy the following conditions in order for the outcomes of the Project to be realized and maintained.

(1) Equipment is appropriately dispatched and operated.
(2) The maintenance capability of JSC is improved, thorough regular inspection and management of replacement parts are carried out.
(3) The strategy showing the framework of sustainable waste management will be revised and the final disposal site will be expanded.

3-3 Important Assumptions

The important assumptions for the implementation of this Project are as follows.

(1) There should be no major policy change in Palestine's waste management administration. The system by JSC will be continued on the operation, collection and transportation of final disposal sites and transfer station.
(2) The security is in a safe state.
(3) Large-scale natural disasters do not occur.

3-4 Project Evaluation

3-4-1 Relevance

(1) Beneficiaries of the Project

The number of direct beneficiaries of this Project are 3.3 million, 1.9 million people in Palestine.

(2) Urgency

In Palestine, the amount of waste discharged is increasing, but collection and disposal has not been implemented and the living environment is getting worse. The collection rate for the amount of generated waste is only around 62%, and there are also uncollected areas. Despite this situation, collecting and transporting equipment is becoming obsolete, and urgent improvement by this project implementation is required.

(3) Project Contributing to the Waste National Strategy

Strategic goal 3 of the waste national strategy (2017-2022) formulated in 2010 is "effective and safe waste management service (implementation)". This project contributes to the achievement of the above items by procuring equipment necessary for collection, transportation and disposal.

(4) Consistency with the Assistance Policies and Strategies of the Government of Japan

As the 2016-to-priority areas of assistance in the Palestine country assistance strategy (medium target), "(1) consumer of stability", "(2) administrative capacity building" are shown.

This project improves the hygiene environment, improves waste management capacity and service of the administration, and it is consistent with Japan's ODA policies and policies.

3-4-2 Effectiveness

3-4-2-1 Quantitative Effects

Table 3-1 shows the indicators of the quantitative effects expected from this Project together with the

current (standard) values and the target values of the indicators after completion of the Project.

Table 3-1 Quantitative Effects Expected from the Implementation of this Project

Indicator	Baseline (2016) (Actual)	Target (2024) (Three years after project completion)
Amount of wastes collected by JSC (t/day)	1,609	1,952

Source: JICA Survey Team

3-4-2-2 Qualitative Effects

The qualitative effects described below can be expected from the implementation of this Project.

(1) Improvement of living environment and natural environment decreasing open waste burning
(2) Improvement of administrative services

[Annex]

Annex-1 Members List of the Survey Team

Annex-1: Members List of the Survey Team

Members List of the Survey Team (First Field Survey)

	Name	Assignment	Organization
1	Daisuke IIJIMA	Leader	Environmental Management Group, Environmental Management Team 2, JICA
2	Takaaki MURATA	Planning management	Environmental Management Group, Environmental Management Team 2, JICA
3	Naoyuki MINAMI	Chief consultant / Waste management plan 1 / Collection and transportation plan 1	Yachiyo Engineering Co., Ltd.
4	Akio ISHII	Deputy chief consultant / Waste management planning 2 / Collection and transportation plan 2 / Equipment plan 1 (collection, transportation and transfer station)	Yachiyo Engineering Co., Ltd.
5	Atsushi KATO	Equipment plan 2 (Final disposal site)	Yachiyo Engineering Co., Ltd.
6	Yuriko KUDO	Organization and institution / Legal system, Waste management policy and plan / Operation and maintenance plan	Yachiyo Engineering Co., Ltd.
7	Akinori SEINO	Procurement plan / Cost estimate / Equipment trade	Yachiyo Engineering Co., Ltd.

Members List of the Survey Team (Secondary Field Survey)

	Name	Assignment	Organization
1	Sei KONDO	Leader	Environmental Management Group, Environmental Management Team 2, JICA
2	Keigo TSUSHIMA	Cooperation planning	Environmental Management Group, Environmental Management Team 2, JICA
3	Naoyuki MINAMI	Chief consultant / Waste management plan 1 / Collection and transportation plan 1	Yachiyo Engineering Co., Ltd.
4	Atsushi KATO	Equipment plan 2 (Final disposal site)	Yachiyo Engineering Co., Ltd.
5	Yuriko KUDO	Organization and institution / Legal system, Waste management policy and plan / Operation and maintenance plan	Yachiyo Engineering Co., Ltd.
6	Akinori SEINO	Procurement plan / Cost estimate / Equipment trade	Yachiyo Engineering Co., Ltd.

Annex-2 Survey Schedule

Annex-2: Survey Schedule

First Field Survey Schedule

			JICA		Consultant				
			Daisuke IIJIMA	Takaaki MURATA	Naoyuki MINAMI	Akio ISHII	Atsushi KATO	Yuriko KUDO	Akinori SEINO
1	23-Mar-18	Fri	Departure Narita → Via Hong Kong						
2	24-Mar-18	Sat	Arrival Ramallah, Visits to JICA Office						
3	25-Mar-18	Sun	Discussion on JICA Palestine Office, Courtesy call MoLG (Minister, Vice Minister), Discussion on the Inception Report Meeting, Discussion on presentation the All JSC (West Bank, Gaza Strip)						
4	26-Mar-18	Mon	Field inspection of Almenia landfill site, Field survey existing equipment, Seminar JICA Expert Team (Mr. Tojo and Mr. Yoshida)						
5	27-Mar-18	Tue	Meeting on the JICA, Discussion on draft minutes, JICA Expert Team survey result report by Mr. Tojo						
6	28-Mar-18	Wed	Meeting on the JICA, Discussion on draft minutes, JICA Expert Team survey result report by Mr. Yoshida						
7	29-Mar-18	Thu	Signing of the minutes, Analysis, planning, adjustment survey						
8	30-Mar-18	Fri			Organize the data				
9	31-Mar-18	Sat			Organize the data				
10	01-Apr-18	Sun			Interview Tubas JSC, Related donor survey				
11	02-Apr-18	Mon			Interview NE&SE Jerusalem JSC, Interview Gaza, Related donor survey				
12	03-Apr-18	Tue			Interview Jericho JSC, Inspection on Dump site MoLG, Related donor survey				
13	04-Apr-18	Wed			Interview Nablus JSC, Study of heavy equipment and collection equipment, Related donor survey				
14	05-Apr-18	Thu			Interview N&NW Jerusalem JSC, Study of heavy equipment and collection equipment, Related donor survey				
15	06-Apr-18	Fri			Organize the data				
16	07-Apr-18	Sat			Organize the data				
17	08-Apr-18	Sun			Interview Qalqiliya JSC, Study of heavy equipment and collection equipment, Related donor survey				
18	09-Apr-18	Mon			Discussion on MoLG, Interview Ramallah JSC, Procurement conditions survey				
19	10-Apr-18	Tue			Discussion on the COGAT	Departure Ramallah	Study of heavy equipment and collection equipment, Interview Kfw		Discussion on the COGAT
20	11-Apr-18	Wed			Waste Management / Component	Arrival Narita	Survey for selection of equipment	Maintenance Management, Soft component	Waste Management / Procurement conditions
21	12-Apr-18	Thu			Interview Bethlehem JSC		Interview Bethlehem JSC		
22	13-Apr-18	Fri			Interview World Bank		Interview World Bank		
23	14-Apr-18	Sat			Organize the data		Organize the data		
24	15-Apr-18	Sun			Interview Hebron JSC		Interview Hebron JSC		
25	16-Apr-18	Mon			Interview Salfit JSC		Interview Salfit JSC	Maintenance management, Soft component	Interview Salfit JSC
26	17-Apr-18	Tue			Interview Jenin JSC		Interview Jenin JSC	Maintenance management, Soft component	Interview Jenin JSC
27	18-Apr-18	Wed			Interview Tulkarm JSC		Interview Tulkarm JSC	Maintenance management, Soft component	Waste Management / Procurement conditions
28	19-Apr-18	Thu			Discussion on the MoLG, Inspection Ramallah open dump site		Discussion on the MoLG, Inspection Ramallah open dump site		
29	20-Apr-18	Fri	Prophet's Ascension		Organize the data		Organize the data		
30	21-Apr-18	Sat			Organize the data		Organize the data		

			JICA		Consultant				
			Daisuke IIJIMA	Takaaki MURATA	Naoyuki MINAMI	Akio ISHII	Atsushi KATO	Yuriko KUDO	Akinori SEINO
31	22-Apr-18	Sun			Interview financial dept. MoLG, Preparation of the report		Survey for selection of equipment	Maintenance management plan	Interview financial dept. MoLG, Preparation of the report
32	23-Apr-18	Mon			Discussion on the MoLG		Discussion on the MoLG		
33	24-Apr-18	Tue			Preparation of the report, Inspection Ramallah open dump site		Preparation of the report, Survey for selection of equipment	Preparation of the report, Maintenance management, Soft component	Preparation of the report, Procurement conditions
34	25-Apr-18	Wed			Preparation of the report, Discussion on the UNOPS		Preparation of the report		Preparation of the report, Discussion on the UNOPS
35	26-Apr-18	Thu			Discussion on the MoLG		Discussion on the MoLG		
36	27-Apr-18	Fri			Preparation of the report		Preparation of the report		
37	28-Apr-18	Sat			Preparation of the report		Preparation of the report		
38	29-Apr-18	Sun			Preparation of the report		Preparation of the report		
39	30-Apr-18	Mon			Discussion on the MoLG		Discussion on the MoLG		
40	01-May-18	Tue			Preparation of the report		Preparation of the report		
41	02-May-18	Wed			Departure Ramallah		Departure Ramallah		
42	03-May-18	Thu			Arrival Narita		Arrival Narita		

Secondary Field Survey Schedule

			JICA		Consultant			
			Sei KONDO	Keigo TSUSHIMA	Naoyuki MINAMI	Atsushi KATO	Yuriko KUDO	Akinori SEINO
1	15-Nov-18	Thu	Departure Maputo → Via Instable	Departure Narita → Via Instable	Departure Narita → Via Hong Kong			
2	16-Nov-18	Fri	Arrival Ramallah, Meeting on the JICA					
3	17-Nov-18	Sat	Discussion on JICA Palestine Office, Field inspection of Tubas transfer station site, Zahret Al Finjan landfill site					
4	18-Nov-18	Sun	Discussion on JICA Palestine Office, Courtesy call MoLG (Minister, Vice Minister), Discussion on the Draft Final Report Meeting					
5	19-Nov-18	Mon	Discussion on draft minutes, Field inspection of Beit-anan controlled dump site					
6	20-Nov-18	Tue	Preparation of the report					
7	21-Nov-18	Wed	Discussion on the COGAT	Discussion on the COGAT	Discussion on the COGAT	Preparation of the report, specification of equipment	Preparation of the report, Maintenance management, Soft component	Discussion on the COGAT
8	22-Nov-18	Thu	Signing of the minutes, Discussion on JICA Palestine Office, Departure Ramallah		Signing of the minutes, Discussion on JICA Palestine Office			
9	23-Nov-18	Fri	Arrival Narita		Departure Ramallah			
10	24-Nov-18	Sat			Arrival Narita			

Annex-3 List of Parties Concerned in the Recipient Country

Annex-3: List of Parties Concerned in the Recipient Country

List of Parties Concerned in the Recipient Country

Agency and Position	Name
Ministry of Local Government (MoLG)	
Minister Deputy Minister Acting General Director, Department of Joint Service Councils JSCs Department	Mr. Husein A. Al-A'raj Mr. Mohammed H. A. Aljabarin Mr. Suleiman Abu Muferreh Mr. Ziad Tawafsheh
Tubas JSC	
Executive Manager	Eng. Basel Bani Odah
Hebron JSC	
Executive Director	Eng. Abdullhay Arafa
NE&SE Jerusalem JSC	
Executive Director	Mr. Saed Rabee
Jericho JSC	
Executive Director	Mr. Abdel-Jabbar Abu Halawa
Nablus JSC	
Executive Director	Dr. Nidal Manour
N&NW Jerusalem JSC	
Executive Director	Eng. Mostafa S. Hameed
Qalgiliya JSC	
Executive Director	Eng. Ateid Afaneh
Bethlehem JSC	
Executive Director	Eng. Iyad Aburdeineh
Salfit JSC	
Mayer, Salfit Municipality Executive Director	Mr. Abed Al Kareem Zubaidi Mr. Eyad Yacoub Yaqob
Jenin JCspd	
Technical Manager	Mr. Mohammad Al Sa'di
Ramallah JSC	
Executive Director Chairman, Board of Directors Mayor , Beit-liqiya Municipality	Eng. Husain Abuoun Eng. Munif Treish Mr. Abud Assi

Agency and Position	Name
Technical Operation Manager	Mr. Said Alhudairi
Tulkarem JSC	
Executive Director	Mr. Aktham Badran
Kreditanstalt für Wiederaufbau (KfW)	
Deputy Director, KfW Office Al Bireh / Ramallah	Mr. Waddah Hamadalla
United Nations Offices for Project Services (UNOPS)	
Director	Mr. Tokumitsu Kobayashi
World Bank (WB)	
Program Leader: Infrastructure and Local Services	Mr. Bjorn Pilipp
Coordinator of Government Activities in the Territories (COGAT)	
Foreign Relations Branch, COGAT - Ministry of Defense	Lt.Col. Yoav BISTRISKY
EREZ (Israeli Coordination and Liaison Administration to the Gaza Strip) Foreign Relations & International Organizations Department	
Deputy Head of Department Head of Goods Coordination Section Head of Gaza Reconstruction Mechanism	Lt. Yonatan Wegier Lt. Itamar Kohn Lt. Adi Shapira Lt. Zoe Avisar
JICA Palestine Office	
Chief Representative Senior Representative Senior Representative Project Formulation Advisor	Yuko MITSUI Shinichi NOGUCHI Ritsuko SAKAMOTO Mariko CHIBA

Annex-4 Minutes of Discussion (M/D)

(First Field Survey Minutes of Discussion（M/D） 29th March, 2018)

(Secondary Field Survey Minutes of Discussion（M/D） 22th November, 2018)

Minutes of Discussions
on the Preparatory Survey for the Project for
Improving Solid Waste Management in Palestine

Based on the several preliminary discussions between the Palestinian Authority (hereinafter referred to as "PA") and the Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for Improving Solid Waste Management (hereinafter referred to as "the Project") to the PA. The Team held a series of discussions with the officials of the PA and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Ramallah, 29th March, 2018

Mr. Daisuke Iijima
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Dr. Hussein A. Al-A'raj
Minister
Ministry of Local Government,
Palestine

ATTACHMENT

1. Objective of the Project

   The objective of the Project is to expand the area and type of waste collection service in Palestine and stop usingrandom-dump sites by providing the waste collection vehicles and the heavy machineriesto Joint Service Councils (JSCs) in the West Bank and Gaza Strip in Palestine, especially Nablus, Tubas, Qalqilya and two Jerusalem JSCs, thereby contributing to improve living environmentof resident area, to protect natural environment and to enhancelocal governmental services for local communities through cooperation between local governments units.

2. Title of the Preparatory Survey

   The PA side suggested changing the title of the Preparatory Survey from"the Preparatory Survey for the Project for Improving Solid Waste Management" to "the Preparatory Survey for the Project for Improvement of Collection and Transfer Systems for Solid Waste Management".

   Japanese side will study the appropriateness of this suggestion.

3. Project site

   Both sides confirmed that the sites of the Projectareinthe West Bank and Gaza Strip in Palestine, especially Nablus, Tubas, Qalqilya and 2 Jerusalem JSCs for first priority and other sevenJSCs in the West Bank and twoJSCs in the Gaza Strip for second priority which are shown in Annex 1.

4. Responsible authority for the Project

   Both sides confirmed the authorities responsible for the Project are as follows:

   The Ministry of Local Government (hereinafter referred to as "MoLG") will be the executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authoritiesto ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time.

5. Items requested by the PA

   5-1. As a result of discussions, both sides confirmed that the items requested bythe PAare as follows:

   - Equipment for waste collection and transportation system

- Heavy machineriestostop usingrandom-dumpsites and to operate landfill sites

5-2. JICA will assess the feasibility of the above requested items through the survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

5-3. The PAshall submit an official request to the Government of Japan through a diplomatic channel before 1stMay, 2018.

6. Procedures and Basic Principles of Japanese Grant

6-1. The PAside agreed that the procedures and basic principles of Japanese Grant as described in Annex 2, Annex 3 and Annex 4shall be applied to the Project. As for the monitoring of the implementation of the Project, JICA requiresthe PAside to submit the Project Monitoring Report,the form of which is attached as Annex 5.

6-2. The PAside agreedto take the necessary measures, as described in Annex 6, for smooth implementation of the Project. The contents of the Annex 6 will be elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.
The contents of Annex 6 will be updated as the Preparatory Survey progresses, and eventually, will be used as anattachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey inPalestineuntil 1st May, 2018.

7-2. An official request from the PA to the Government of Japan will be submitted before1stMay, 2018.

7-3. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to the PA in order to explain its contents around the middle of November, 2018.

7-4. If the contents of the draft Preparatory Survey Reportare accepted and the undertakings for the Project are fully agreed by the PA side, JICA will finalizethe Preparatory Survey Report and send it to the PA around February, 2019.

7-5. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The PA side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social

Considerations (April, 2010).

8-2. The Project is categorized as "C"from the following considerations:

Not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

9. Other Relevant Issues

9-1. Inception Report

The contents of Inception Report that the Team explained was understood and accepted in principle by the PA.

9-2. Arrangements for the Survey

As a response to the request by the Team, the PA agreed to provide the Team with the following items in cooperation with other relevant organizations:

(1) To provide an appropriate office space for the Team;

(2) To provide the Team with relevant data, information and materials necessary for the execution of the project;

(3) To prepare answers for questionnaires presented by the Team in English;

(4) To assign full-time counterparts for the Team activity during their stay in Palestine, to play the following roles as a coordinator:

1) To make appointments, set up meetings with authorities, departments and all other organizations, and firms whatever the Team intends to visit;

2) To attend meetings and site visits with the Team, and to make any arrangements on accommodation, a working room, adequate transportation, security, obtaining the permissions,etc., if required; and

3) To assist and advise the Team for data and information gathering.

(5) To secure permission to take photographs, and to enter into a certain property for the survey if necessary; and

(6) To make arrangements to allow the Team to bring back to Japan any necessary data, maps and materials related to the survey.

9-3. Tax Exemption

Although general undertakings of both sides are shown in Annex 6, the Team emphasized the responsibilities of the PA to execute following matters andthe PA agreed to it.

- Both sides confirmed that import tax, customs duties, internal taxes and other

fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services will be exempted. The PA will take necessary measures for tax exemption, if any.

9-4. Safety and Security

The PA agreed to take measures to secure the safety of the members of the Team over the survey period.

9-5. Careful Handling of the Survey Reports

The Team explained that certain information in both the draft and the final reports of the Survey should be dealt with confidentially until the tender is closed when the Project proceeds to actual implementation stage, since disclosure of the information would affect fairness of tender procedure. The PA understood the sensitivity in dealing with the Survey reports and agreed on careful handling of the reports for achieving fair tendering.

9-6. Future prospect on final landfill in West bank

Currently, waste generated in the West Bank is discharged at only two sanitary landfills, which are approaching to the end of their lifetime, and the construction plan of additional one sanitary landfill, namely Ramoun landfill, is suspended because of the decision of the Israeli supreme court. On the other, with the equipment to be provided by the grant aid, it is expected that the amount of waste transported to two sanitary landfills in the West Bank will increase.

Therefore, the Team requested MoLG to solve this issue and to enable Ramoun landfill site in use as soon as possiblein accordance with National Strategy for Solid Waste Management (2017-2022). The Team also requested MoLG to create alternative plan on final landfill after the grant aid is realized and submit to the team by 1st May, 2018, and MoLG agreed it.

9-7. Financialproposal for each JSC operation after the Grant Aidis provided

The Team emphasized that financialproposal for operationneeds to be prepared by each JSC with support of MoLG to ensure future sustainability of JSCs. This proposal needs to be submitted to the Team by 1st May, 2018. MoLG agreed it.

9-8. Proper maintenance for equipment

JICA requested that equipment to be provided need to be maintained in proper manner with roofed parking lot. MoLG and JSCs agreed that proper maintenance plan including construction or allocation of roofed parking lot would be considered when necessary as one of the criteria of prioritization for the Grant Aid.

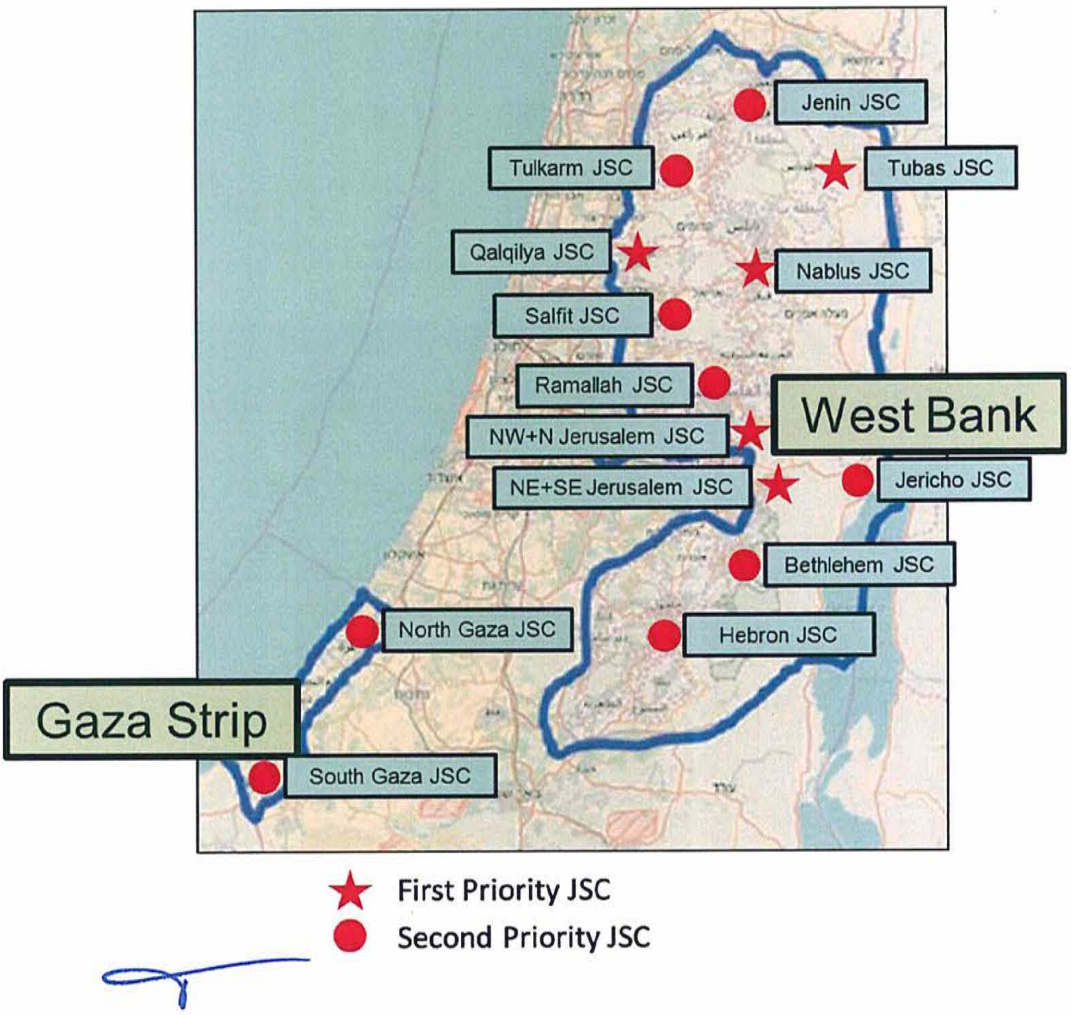
9-9. Arrangement of the grant aid for Gaza JSCs

Providing grant aid for Gaza JSCs will be considered in the survey. Along with its needs and sustainability for equipment, feasibility of delivery to Gaza strip would also be important factor to be surveyed. JICA and MoLG will cooperate and coordinate with Israel government (COGAT: Coordinator of Government Activities in the Territories) on the manner of equipment delivery to Gaza Strip,for the smooth implementation of the Project.

Annex 1 Project Site
Annex 2Japanese Grant
Annex 3 Flow Chart of Japanese Grant Procedure
Annex 4 Financial Flow of Japanese Grant
Annex 5 Project Monitoring Report (template)
Annex 6Major Undertakings to be taken by the PA

Annex 1

Project Site



JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

3. Basic Principles of Project Grants

(1) Implementation Stage

1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of

the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of

construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

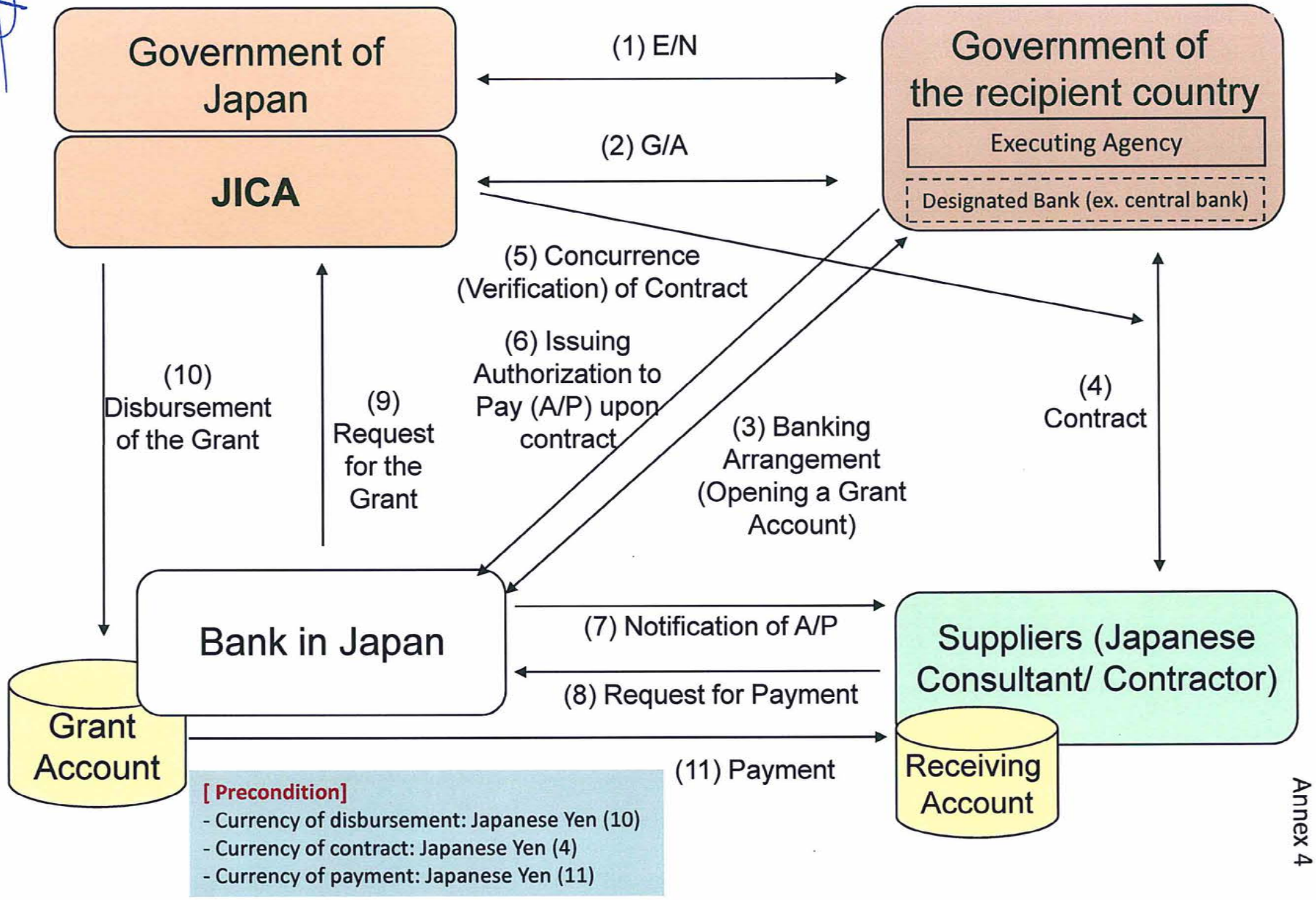
Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)



Project Monitoring Report
on
Project Name
Grant Agreement No.XXXXXXX

20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
ExecutingAgency	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Line Ministry	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of ():

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitativeindicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of SpecificObligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1)Date of estimation:
2)Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (NIS)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1)Date of estimation:
2)Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost,and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original*(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based onAttachment 5(in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5(in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

-Plan forO&M(number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original*(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&Mcost and actual budget allocation for O&M

Original*(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measurescorresponding to the potential risks

Assessment of Potential Risks (*at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency,the term to monitor the indicators stipulated in 1-3.

5-4 Indicators

Please describe the following;

1) Cost recovery(Expenditure / Revenue)
2) Amount of collection (ton/day)
3) Served population and coverage of LGUs (percentage / numbers)
4) Improved amount of random-dumpsite and landfill site (ton)

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/ Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)

Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

-
-
-

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

		Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost		(A/D%)	(B/D%)	(C/D%)	
	Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
	others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost		(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost		(A/D%)	(B/D%)	(C/D%)	
Total		(A/D%)	(B/D%)	(C/D%)	

Annex 6

Major Undertakings to be taken by the PA

1. Specific obligations of the PAwhich will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To open bank account (B/A)	within 1 month after the signing of the G/A	MoLG	To open bank account (B/A)	
2	To issue Authorization to pay (A/P) to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract(s)	MoLG		
3	To approve IEE/EIA(Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation.	N/A	N/A		
4	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report (if necessary).	till land acquisition and resettlement complete	MoLG		
5	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding document(s)	MoLG		

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank)for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	MoLG		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A				
3	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MoLG		
4	2) Payment commission for A/P	every payment	MoLG		
5	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the country of the Recipient	during the Project	MoLG		
6	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	MoLG		
7	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted.	during the Project	MoLG		
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MoLG		
9	To submit the Project Monitoring Report and the Project Completion Report to JICA	during the Project	MoLG		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To implementEnvironmental Management Plan (EMP) and Environmental Monitoring Plan (EMOP)	N/A	N/A		
2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between the PA and JICA.	N/A	N/A		
3	To submit the Project Monitoring Report to JICA	within 3 years after the Project	MoLG		

2. Other obligations of the PA funded with the Grant

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	Preparation of the roofed motor pool for equipment of each JSC (if necessary)	before Tender	
2	Banking commission		
	Total		

*The Amountis provisional. This is subject to the approval of the Government of Japan.

Minutes of Discussions
on
the Preparatory Survey for the Project
for
Improvement of Collection and Transfer Systems for Solid Waste Management
(Explanation on Draft Preparatory Survey Report)

With reference to the Minutes of Discussions signed between Ministry of Local Government (hereinafter referred to as "MoLG") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 29th March, 2018 and in response to the request from the Palestinian Authority (hereinafter referred to as "PA") dated 9th April, 2018, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of Collection and Transfer Systems for Solid Waste Management (hereinafter referred to as "the Project") in Palestine.

As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Ramallah, 22nd November, 2018

Sei KONDO
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Mohammad H. JABARIN
Deputy Minister
Ministry of Local Government
Palestine

ATTACHEMENT

1. Title of the Preparatory Survey
   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for the Improvement of Collection and Transfer Systems for Solid Waste Management".

2. Contents of the Draft Report
   After the explanation of the contents of the Draft Report by the Team, the PA side agreed to its contents.

3. Cost estimate
   Both sides confirmed that the cost estimate shown in Annex 1 including the contingency explained by the Team is provisional and will be examined further by the Government of Japan for its approval. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

4. Confidentiality of the cost estimate and technical specifications
   Both sides confirmed that the cost estimate and technical specifications of the Project should never be disclosed to any third parties until all the contracts under the Project are concluded.

5. Timeline for the project implementation
   The Team explained the expected timeline for the Project implementation to the PA side as shown in Annex 2.

6. Expected outcomes and indicators
   Both sides agreed that key indicators for expected outcomes are as follows. The PA side will be responsible for the achievement of agreed key indicators targeted in year 2024 and shall monitor the progress based on those indicators.

   [Quantitative indicators]

Indicator	Baseline (2016)	Target (2024)
Amount of wastes collected by Joint Service Councils (JSCs) (t/day)	1,609	1,952

   [Qualitative indicators]
   Improvement of living and surrounding environment
   Improvement of services by JSCs

7. Technical assistance ("Soft Component" of the Project)

Considering the sustainable operation and maintenance of the products and services granted through the Project, technical assistance is planned under the Project. The PA side confirmed to deploy necessary numbers of counterparts who are appropriate and competent in terms of its purpose of the technical assistance as described in the Draft Report.

8. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 3. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in 1. of Annex 3, both sides confirmed those shall be clarified in the bid documents by MoLG during the implementation stage of the Project.

The PA side assured to take the necessary measures and coordination including allocation of the necessary budget, which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 3 will be used as an attachment of the Grant Agreement for the Project.

9. Monitoring during the implementation

The Project will be monitored by the MoLG and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 4. The timing of submission of the PMR is described in Annex 3.

10. Project completion

Both sides confirmed that the Project completes when all the equipment procured by the grant are in operation. The completion of the Project will be reported to JICA promptly, but in any event not later than six months after completion of the Project.

11. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability). The result of the evaluation will be publicized. The PA side is required to provide necessary support for the data collection.

12. Items and measures to be considered for the smooth implementation of the Project

Both sides confirmed the items and measures to be considered for the smooth implementation of the Project, as follows:

(1) Allocation of the necessary budget and staff for operation of the equipment

The PA side should secure and allocate the necessary budget, staff, space for

their proper operation, and maintenance of the equipment without delay.

(2) Additional procurement of waste containers for compactor

Although 970 containers for the compactor vehicles (10 containers ($1.1m^3$) for each compactor) will be procured by the Project, if the number of the containers in service is not sufficient, JSCs (PA) have to manage the shortage by themselves.

(3) Procedure for import and delivery of the equipment to Gaza Strip

The PA side shall take necessary actions for import and delivery of the equipment to Gaza Strip, such as coordination with Coordinator of Government Activities in the Territories (COGAT) of Israel.

(4) Proper maintenance for equipment

The PA side shall secure parking spaces of the equipment in each JSC for proper operation and maintenance.

13. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the PA side around June 2019.

14. Environmental and Social Guidelines and Environmental Category

The Team explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as "the Guidelines") is applicable for the Project. The Project is categorized as category "C" because the Project is likely to have minimal adverse impact on the environment under the Guidelines.

15. Other Relevant Issues

15-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

15-2. Procurement of the third country products

Most of the vehicles that are going to be procured for the Project would be manufactured in the third countries, since emission control to exhaust gas from the vehicles has to comply with appropriate EU standards, which vehicles procured in Japan may not meet, and there are few Japanese distributors in terms of these types of vehicles in Palestine.

Annex 1 Project Cost Estimation

Annex 2 Project Implementation Schedule

Annex 3 Major Undertakings to be taken by the Palestinian Authority

Annex 4 Project Monitoring Report (template)

Confidential

Annex 1

(1) Project Cost

Table 1: Cost to be covered by the Japanese side

Item	Project Cost (Million JPY)
Procurement	1,702
Soft component	19
Detailed Design / Procurement Supervision	23
Contingencies	88
Total	1,832

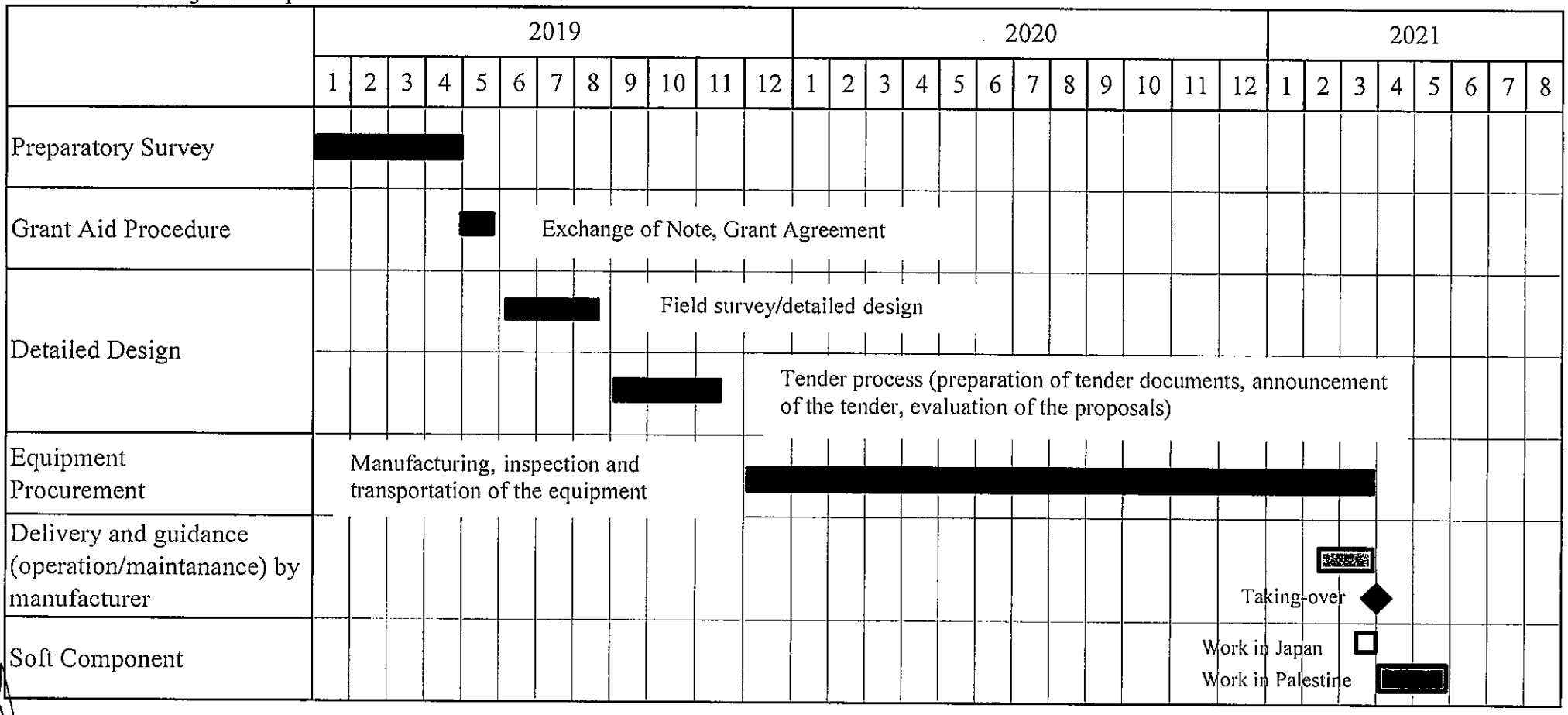
(2) Cost to be covered by the Palestinian side

Table 2: Cost to be covered by the Palestinian side

Item	Content	Cost
Others	To open bank account (B/A)	1.8 Million JPY
	To issue Authorization to pay (A/P)	100 USD

Annex 2

Tentative Project Implementation Schedule



Annex 3

Major Undertakings to be taken by the PA

1. Specific obligations of the PA which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost
1	To open bank account (B/A)	within 1 month after the signing of the G/A	MoLG	1,800,000 Japanese Yen
2	To issue Authorization to pay (A/P) to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract(s)	MoLG	50 USD
3	To approve IEE/EIA(Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation	N/A	N/A	
4	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of the Project Monitoring Report (if necessary)	N/A	N/A	
5	To submit Project Monitoring Report (with the result of Detailed Design)	before preparation of bidding document(s)	MoLG	as necessary

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	MoLG	as necessary
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A			
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MoLG	50 USD
	2) Payment commission for A/P	every payment	MoLG	as necessary
3	To ensure prompt customs clearance and to assist the Supplier(s) with internal transportation in the Palestine	during the Project	MoLG	as necessary
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the Palestine and stay therein for the performance of their work	during the Project	MoLG	as necessary
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Palestine with respect to the purchase of the products and/or the services be exempted	during the Project	MoLG	as necessary
6	To take necessary actions for import and delivery of the equipment to Gaza Strip, such as coordination with Coordinator of Government Activities in the Territories (COGAT) of Israel	during the Project	MoLG	as necessary
7	Securing the parking spaces for the procured vehicle	before the tender	MoLG	as necessary

8	To submit the Project Monitoring Report to JICA after completion of each work under the contract(s), such as shipping, hand over and operational training	within one month after completion of each work	MoLG	as necessary
9	To submit the Project Completion Report to JICA	within six month after completion of the Project	MoLG	as necessary

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost
1	To allocate and to bear cost for maintenance, manpower and fuel required for proper and effective use of equipment provided under the Grant Aid	After completion of the Project	MoLG/ JSCs	as necessary

2. Other obligations of the PA funded with the Grant

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	To conduct the following transportation	during the Project	
	1) Marin (Air) transportation of the products from Japan to the country of the Recipient		
2	To implement detailed design, bidding support and procurement supervision (Consulting Service)		
3	Contingencies		
	Total		1,832

* The Amount is provisional. This is subject to the approval of the Government of Japan.

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Executing Agency	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:
Line Ministry	Person in Charge	(Designation)
	Contacts	Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	**Assessment**
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

5-4 Indicators

Please describe the following;

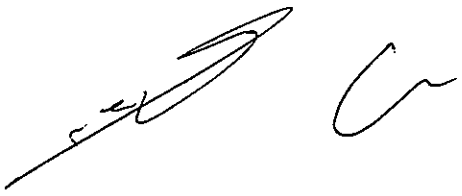
1) Cost recovery(Expenditure / Revenue)
2) Amount of collection (ton/day)
3) Service population
4) Improved amount of random dumpsite and landfill site (ton)

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)



Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
						Price (Decreased) E=C−D	Price (Increased) F=C+D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

-

-

-

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Annex-5 Soft Component (Technical Assistance) Plan

PREPARATORY SURVEY
ON
THE PROJECT
FOR
IMPROVEMENT OF COLLECTION AND TRANSFER SYSTEM S FOR SOLID WASTE MANAGEMENT IN PALESTINE

SOFT COMPONENT PLAN

NOVEMBER 2018

YACHIYO ENGINEERING CO., LTD.

1. Background

National Strategy for Solid Waste Management in Palestine 2017-2022, enacted in 2017, set the target of 100% collection and sanitary landfill by 2022 in conjunction with closing or environmentally improving small dump sites scattered over Palestine, as one of the important policies.

Waste collection service coverage of JSC (Joint Service Council) has not reached 100% mainly due to shortage of collection vehicles and deteriorated old vehicles and equipment give great burden to financial condition of JSCs with increasing huge cost for repair and maintenance. Weak institution of JSCs causes low service operation and satisfaction. In this circumstance, preparation of new collection equipment mainly substitution of the deteriorated vehicles and equipment for final disposal for new controlled dump site is planned in the project.

Without appropriate maintenance for vehicles and equipment, proper operation will lead to hindrance by breakdown or malfunction in several years. Therefore maintenance system for equipment should be strengthened and stabilized in terms of organization, manpower, technique and finance. In addition collection operation with large containers is dangerous, in particular operation of night time and narrow/steep road has causes for serious accidents. In fact, major accidents in collection operation occurred several times in these years. It is anticipated that there were more troubles not reported. So practical education and training for safe operation will be also very important for supervisors and workers. Technical support for the above strengthening of operation and maintenance (O/M) is planned as the soft component.

The conditions and needs for support for O/M of each JSC are shown in the following table:

Table 1-1 Conditions of O/M of each JSC

Priority *	JSC	Number of compactor in 2022	Number of JSC staff and workers	Work shop	Conditions and needs for support
○	Tubas	6	21		Collection service coverage is 100%. Scale is small and cooperation with private workshop and other JSC will be considered. Cost recovery was 94% and improvement should be necessary with support.
○	Nablus	13	38		Population is large. Collection service coverage will be considerably increased from 51%. Present random dump sites are being closed and burden of transportation will increase. It should be required to strengthen management and administration coping with the expansion of the organization. Cost recovery is only 92% and improvement should be necessary with support.
○	Qalqiliya	10	52		The conditions of most vehicles are bad and improvement of maintenance/repair system of vehicles will be necessary. The new vehicles by the project should be operable in the long time with support for strengthening of O/M. There is a plan of cooperation with the workshop of LGU.
○	N&NW Jerusalem	9	31		A new controlled dump site is under construction. O/M of the new equipment for the dump site by the project should be supported. Parking and workshop for the equipment will be required and there is a candidate site near the entrance to the dump site.
○	NE&SE Jerusalem	12	53		Transportation distance for waste are increasing in accordance with closure of random dump sites and improvement of collection operation and O/M of vehicles will be necessary.
	Jenin	19	125	○	The scale is large and it has exclusive workshop. The number of vehicles and work volume is large and support for improvement of O/M will be required.
	Tulkarem	13	56	simple	There is a simplified workshop, where part of repair work is done. Waste collected amount is measured and recorded. Systematic O/M should be required.
	Salfit	6	29		Random dump sites are being closed one by one and transportation distance will be increased to farther landfill site. There is a plan for development of new controlled dump site. Cost recovery was 87% and support for improvement will be necessary.
	Ramallah	30	6		Collection services are carried out by LGUs, which will be commissioned to the JSC gradually. The load of JSC's O/M will increase considerably according to the increase of collection service and support to cope with it will be required.

Priority *	JSC	Number of compactor in 2022	Number of JSC staff and workers	Work shop	Conditions and needs for support
	Jericho	12	35	○	The workshop in collaboration with LGU is in operation and improvement of O/M will be required.
	Bethlehem	11	60	○	The JSC has the exclusive workshop and improvement of its O/M will be required.
	Hebron	31	71		The scale is large. The workshop of LGU is weak and unreliable. Several private workshops are used. Improvement of O/M system should be reconsidered to minimize the cost.
	North Gaza	3	7+		The primary collection with donkey carts will be continued. The JSC is going to start secondary collection service from these gathering points and support for first basic operation will be required.
	South Gaza	12	52	○	There is the workshop of LGU. By cooperation of World Bank, new compactors have been operation from 2018 and strengthening of O/M will be required.

Source : JICA Survey Team

Basically all maintenance works should be operated and managed by each JSC, however small JSC cannot afford to have workshop and are obliged to outsource maintenance/repairs to private company or should make cooperation with LGU workshop. Some LGUs do not have good capacity for equipment maintenance and cooperation will be difficult. At least, preventive maintenance (daily inspection and periodical maintenance) should be carried out by itself. The conditions for outsourcing should be reasonable.

The types of maintenance/repair system of JSC is shown below.

Table 1-2 Types of Maintenance/Repair System

Case	Daily Inspection	Periodical Maintenance	Slight Repair	Major Repair
1	Direct	Direct	Direct	Direct
2	Direct	Direct (using workshop of LGU)	Contract (using workshop and equipment of LGU)	Contract (using workshop and equipment of LGU)
3	Direct	Direct	Direct	Contract (to private workshop)
4	Direct	Direct	Direct	Contract (to newly established communal workshop by small LGUs)
5	Direct	Contract (to private workshop)	Contract (to private workshop)	Contract (to private workshop)
6	Direct	Direct	Contract (to private workshop)	Contract (to private workshop)
7	Outsourcing	Contract (to private workshop)	Contract (to private workshop)	Contract (to private workshop)

Source : JICA Survey Team

2. Objectives

The objectives of the project is that the JSCs for solid waste management provide solid waste management services to citizens for sound environment and healthy life.

Based on this objectives, the objective of the soft component is set to secure sustainable outcome of the project realizing efficient collection-transportation-disposal services of wastes through the support for smooth introduction and proper operation and maintenance of the project equipment over a long time.

3. Expected Outcomes

The expected outcomes of the soft component is improvement of operation/maintenance capacity of JSCs for the project equipment, and increase of amount of waste properly managed and operation/maintenance. In addition, safety and sanitation in operation of collection and workshop will be secured.

4. Methods to Verify Achievement of Outcomes

The outcomes will be described in detail as follows:

Strengthening Technical O/M System

- Support for Preventive Maintenance
- Support for Repair Management System
- Support for Spare Parts Management System
- Support for Operation Safety and Sanitation

The methods to verify the achievement of the outcomes are shown in the following table.

Table 4-1 Methods to Verify Achievement of Outcomes

	Item	Outcome	Index	Measurement
Strengthening Technical O/M System				
1	Support for Preventive Maintenance	Daily inspection and periodical inspection will be improved and implemented thoroughly.	・ Instruction paper for preventive maintenance will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
2	Support for Repair Management System	Repair management system will be improved with guideline.	・ Instruction paper for improved repair management system will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
3	Support for Spare Parts Management System	Spare parts and consumables management system will be improved.	・ Instruction paper for improved spare parts and consumables management system will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar
4	Support for Operation Safety and Sanitation	Collection will be carried out safely and sanitary with instruction and education on operation safety and sanitation.	・ Instruction paper for operation safety and sanitation will be prepared. ・ Seminar will be held for understanding and consensus.	・ Instruction paper (for 5 JSCs) ・ Record of seminar

Source : JICA Survey Team

5. Activities of Soft Component

Initial operation guidance will be carried out by manufacturer of the equipment. The soft component (technical assistance) of the consultant will consist of mainly as follows:

1) Improvement of preventive maintenance:
Preventative maintenance, which includes daily start-up and closing inspections, and periodical checkup and maintenance, is implemented thoroughly in JSCs as the first principle. The soft component program support JSCs to build such a maintenance system with inspection items and outsourcing criteria, based on the concept of "preventative maintenance."

2) Repair Management System:
Repair works should be judged from slight to major properly and slight repair will be done by JSC and major repair will be outsourced to private workshop with appropriate condition and cost.

3) Spare Parts Management System:
Spare parts and consumables should be properly controlled with recording, storage and usage efficiently and effectively.

4) Operation Safety and Sanitation:
Collection works of compactors and crane trucks include dangerous activities. The works shall be

operated safely and sanitary with proper instruction and education to drivers and workers.

The contents of support activities are shown in the following table.

Table 5-1 Contents of Activities

Item		Contents
Support for improvement of technical O/M	Support for Preventive Maintenance	Present conditions, problem analysis, discussions (visiting priority 5 JSCs, communication with other 9 JSCs), revision of instruction papers, advices for financial improvement, partial trial of suggested improvement, analysis of the results, instruction to the local assistant for contents and method of the jobs.
	Support for Repair Management System	
	Support for Spare Parts Management System	
	Support for Vehicle Operation Plan	
	Support for Operation Safety and Sanitation	
Trial for Improvement of O/M		OJT to the technical staff of JSC by the local assistant.
Holding seminar		Seminar for all JSCs (Operation safety and sanitation, preventive maintenance, management of spare parts and consumables, improvement of O/M system, improvement of accounting of O/M etc.).

Source : JICA Survey Team

The resources for the Support Activity in the Soft Component are as follows:

Job description: Consultant to support for improvement of technical O/M.
Quantity of work: 2.50 man-months (Preparatory work in Japan: 0.5 man-months, work in Palestine: 2.0 man-months).
Time of dispatch: After the handover of the equipment.

6. Implementation Schedule of the Soft Component

Table 7-1 shows the implementation schedule of the Soft Component. In the first filed survey, assistance shall be provided for strengthening institutional O/M system leading to sustainable O/M and Strengthening technical O/M system to all JSCs after handing-over of the equipment. In the end of the first field survey, the seminar will be held for explanation and discussion on the improvement for O/M system. Assistance for trial improvement for all JSCs will be carried out by local assistants for one month. In the second work, the results of the trial will be reviewed and the problems will be analyzed. Based on the monitoring, proposed by-laws, instruction papers and guidelines will be rectified and finalized. In the end of the second survey, the seminar will be held for explanation and discussion on the sustainable O/M system.

Table 6-1 Implementation Schedule of the Soft Component

Item	2021 Year				
	January	February	March	April	May
Handinf-over of the equipment					
Initial Operation Guidance					
MoLG Taking-over Certificate					
Soft Component					
Survey in Japan					
Survey and Support in Palestine					
Local Staff Employment					

Source : JICA Survey Team

7. Products of the Soft Component

The consultants of the Soft Component shall submit the products mentioned in the table below to the implementing organizations and JICA.

Table 7-1 List of Products

Support	Item	Products
Support Activity	Overall	Soft Component Completion Report
	Support for Preventive Maintenance	Instruction paper for preventive maintenance
	Support for Repair Management System	Instruction paper for improved repair management system
	Support for Spare Parts Management System	Instruction paper for improved spare parts and consumables management system
	Support for Operation Safety and Sanitation	Instruction paper for operation safety and sanitation planning

Source : JICA Survey Team

8. Obligation of Palestine

The responsible organization MoLG will appoint head of counterpart (General Director) for overall management of the soft component with assisting staff. The JSCs as the implementing organization will assign directors and engineers for collection and maintenance of equipment for improvement of O/M system with the consultants. 2 JSCs of Gaza will participate by Internet.

(1) Feasibility
The needs for the soft component is high. In view of the result of the Technical Assistance Project Phase-2, assignment and participation of the counterpart will be carried out with no problem.

(2) Obstacles and countermeasures if any
The effort to improve/change the basic system will be required. The large JSCs with engineers will cope with easily, while the small JSCs will be able to manage with concurrent posts.

(3) Measures to be taken sustainably for the achievement of the objective of the Soft Component
It shall be required by Palestinian side to implement the improvement for O/M continuously after completion of the soft component sustainably.

Annex-6 Data Book on Solid Waste Management of JSCs in the West Bank (2017) (Updated 2018)

No.	Item	JSC														
		N&NW Jer.	NE&SE Jer.	Qalqeliya	Nablus	Tubas	Jenin	Tulkarem	Salfit	Jericho	Ramallah	Bethlehem	Hebron	North Gaza	South Gaza	14 JSC
1	**Service percentage**															
1.1	No. of target LGU	16	12	34	57	9	93	31	19	17	68	36	26	8	17	443
1.2	No. of served LGU	16	12	33	33	12 (9+3)	99 (91+8)	23	20 (19+1)	20 (14+6)	35	30	16	0	7	356
1.3	Service coverage in terms of LGU No. (%)	100%	100%	97%	58%	133%	106%	74%	105%	118%	51%	83%	62%	0%	41%	80%
1.4	No. of population in the governorates (or JSC areas in Jerusalem) in 2016 (PCBS)	63,008	98,589	113,574	389,328	66,854	318,958	185,314	72,279	53,562	357,968	221,802	729,193	1,022,331	858,803	4,551,563
1.5	No. of target population (Actual)	52,684	184,371	110,113	331,506	59,256	331,722	153,938	75,740	46,527	337,172	205,572	710,064	918,780	664,052	4,181,497
1.6	No. of served population (Actual)	52,684	183,560	110,113	196,162	59,256	298,785	114,474	75,740	46,527	134,869	151,693	486,610	0	350,411	2,260,884
1.7	Service percentage in terms of population No.	100%	99.6%	100%	59%	100%	90%	74%	100%	100%	40%	74%	69%	0%	53%	54%
2	**Collected Quantities**															
2.1	Annual generated quantities by target population (ton/year)	17,880	43,800	31,025	148,190	14,600	96,083	61,354	24,000	22,305	127,750	65,700	181,457	401,135	184,325	1,419,604
2.2	Annual collected quantities by JSC (ton/year)	17,880	43,800	31,025	53,436	14,600	93,797	31,755	24,000	14,600	30,295	54,750	127,057	0	61,685	598,680
2.3	Waste collection %	100%	100%	100%	36%	100%	98%	52%	100%	65%	24%	83%	70%	0%	33%	42%
2.4	Daily collected quantities (ton/day)	57	120	109	146	40	257	87	70	40	83	150	348	0	169	1,676
2.5	Daily collected waste per capita (kg/day/capita)	1.08	0.65	0.99	0.75	0.68	0.86	0.76	0.92	0.86	0.62	0.99	0.72	N/A	0.48	0.74
3	**Financial Information**															
3.1	Revenue in 2017 (NIS)	1,277,275	5,918,400	4,978,620	3,788,191	2,158,227	17,698,609	5,572,841	1,482,452	2,571,175	7,560,000	6,605,849	13,638,618	No Service	3,850,758	77,101,015
3.2	Expenditure in 2017 (NIS)	1,210,627	5,875,300	4,896,408	4,124,741	2,299,667	18,436,051	5,143,098	1,703,968	2,334,027	7,449,848	5,978,323	13,500,041	No Service	3,949,419	76,901,518
3.3	Cost Recovery (%)	105.5%	100.7%	101.7%	91.8%	93.8%	96.0%	108.4%	87.0%	110.2%	101.5%	110.5%	101.0%	No Service	97.5%	100.3%
3.4	Monthly JSC Tariff applied on LGUs (NIS)	The collection fee will be based on population No.	137 NIS/ton	3.7 NIS/capita	125 NIS/ton	143 NIS/ton	170 NIS/ton	133-173 NIS/ton	10 NIS/HH	Jericho M.: 65,000 NIS (fixed), Villages: 22-32 NIS/HH	No Tariff System (insurance cost only)	120 NIS/ton	105 NIS/ton	No Service	10.8 NIS/ton (disposal only), 44.8 NIS/ton (collection & disposal)	
3.5	Monthly collection Fee from people to LGU (NIS/HH/month)	15-25	15-20	20	15	17-22	15 -18	15 -17	12 - 15	17 - 22	10 - 15	15 - 30	16 - 25	5 - 13	5 - 13	
4	**Transfer Station**															
4.1	JSC's Transfer Stations * ( ) indicates # of TS by LGUs or Private	0	1 (1)	1	0 (1)	1	1	1	0	0	0 (2)	0	0 (2)	0 (1)	0 (1)	4
4.2	Quantity of transferred wastes by JSC (t/d)	0	120	85	146	40	50	126	0	0	0	0	145	N/A	0	321
4.3	% of transferred quantity	0%	100%	78%	100%	100%	19%	145%	0%	0%	0%	0%	42%	0%	0%	19%
4.4	Transferring Distance (km)	N/A	25 - 50	80	40	35	35	35	N/A	N/A	N/A	N/A	25 - 35	N/A	N/A	25-80
5	**Disposal System**															
5.1.1	Sanitary Landfill used by JSC	N/A	Al-menya	Zahret-al-finjan	Zahret-al-finjan	Zahret-al-finjan	Zahret-al-finjan	Zahret-al-finjan	N/A	Jericho	N/A	Al-menya	Al-menya	N/A	Deir-al-balah, Al Fukhary (short-term cell)	
5.1.2	Waste transferred to sanitary landfill (t/d)	0	120	109	143	40	257	87	0	40	0	150	348	N/A	169	
5.1.3	% of waste transferred to sanitary landfill	0%	100%	100%	98%	100%	100%	100%	0%	100%	0%	100%	100%	N/A	100%	
5.2.1	Dump sites used by JSC	Random dump sites	N/A	N/A	N/A	N/A	N/A	N/A	Random Dumpsties in LGUs	N/A	Random dump sties in LGUs, and Beit-anan dump site	N/A	N/A	Johr-al-deek controlled dump site	N/A	
5.2.2	Waste disposed in dumpsites (t/d)	57	0	0	0	0	0	0	70	0	83	0	0	0	0	
5.2.3	% of waste disposed in dumpsites	100%	0%	0%	0%	0%	0%	0%	100%	0%	100%	0%	0%	0%	0%	
5.3.1	Recycled Waste (t/d)	0	0	0	3	0	8	2	0	0	0	0	0	0	0	
5.3.2	% of recycled waste	0%	0%	0%	2%	0%	3%	2%	0%	0%	0%	0%	0%	0%	0%	
6	**SWM Facilities**															
6.1	Garage	Private (driver's house)	LGUs	JSC & LGUs	Nablus Municipality	Private (driver's house)	JSC & LGUs	JSC & LGUs	LGUs	JSC & Jericho Municipality	LGUs	JSC	LGUs	Gaza Municipality	JSC	
6.2	Workshop	Private	Private	Private	Private	Private	Private	Private	Private	Jericho Municipality	Private	JSC	Private	Gaza Municipality	JSC	
6.3	Office	Hosted by Beit-anan Municipality	Rented	Rented	Rented	Rented	Owned	Owned	Rent	Rented	Rented	Owned	Rented	Owned	Owned	
6.4	Total Staff No.	33	53	52	38	21	140	53	29	39	6	60	71	7	62	
6.4.1	Administrative Staff	4	2	6	5	3	15	5	4	8	6	6	10	7	11	
6.4.2	Drivers of Collection Vehicles	9	17	12	9	5	34	11	8	9	0	16	20	0	16	
6.4.3	Collection Workers	18	34	34	22	12	76	24	17	16	0	33	41	0	16	
6.4.4	Mechanical Engineers or Technicians	0	0	0	2	0	2	3	0	0	0	5	0	0	15	
6.4.5	Others	2	0	0	0	1	13	10	0	6	0	0	0	0	4	

Annex-7 Calculation of the Number of Compactors

Calculation of the Number of Compactors by All JSC (2018-09-12)

	First Priority					Second Priority									
Planned collection amont in targeted 2022 year															
	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Tulkarm	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	South Gaza	North Gaza	Total
Target Population in 2022	58,374	204,283	126,630	362,137	70,989	170,563	85,738	54,344	237,641	846,396	381,480	393,817	795,534	1,117,236	4,905,163
Served Population in 2022	58,374	203,384	126,630	253,496	70,989	126,837	85,738	54,344	175,357	580,039	343,603	361,449	419,792	279,309	3,139,341
Service Percentage in 2022 (Service Population/Target Population*100%)	100%	100%	100%	70%	100%	74%	100%	100%	74%	69%	90%	92%	53%	25%	64%
Waste Generation amount in 2022	63	133	126	177	48	97	80	47	174	418	297	409	205	57	2,332
Unit generatoin rate in 2022 (kg/capita/day)	1.08	0.66	0.99	0.70	0.68	0.76	0.93	0.86	0.99	0.72	0.86	1.13	0.49	0.58	0.74
No. of need vehicles in targeted 2022 year	6	14	13	18	5	10	8	5	18	43	30	42	21	17	249
No. of Existing vehicles in 2016															
	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Tulkarm	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	South Gaza	North Gaza	Total
Compactor	10	17	12	5	4	15	8	13	18	25	32	38	7	8	212
Others(Dump Tractor, etc)	0	0	0	0	0	1	0	3	1	2	1	0	16	6	30
Total	10	17	12	5	4	16	8	16	19	27	33	38	23	14	242
Capacity of existing vechicles in 2016	70	89	99	76	41	154	103	77	172	371	133	354	166	81	1,986
No. of Existing vehicles in 2022															
	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Tulkarm	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	South Gaza	North Gaza	Total
Compactor	3	3	3	2	1	8	3	6	4	23	3	17	7	0	83
Others(Dump Tractor, etc)	0	0	0	0	0	0	1	1	1	2	0	0	0	0	5
Sub-Total	3	3	3	2	1	8	4	7	5	25	3	17	7	0	88
Capacity of existing vechicles in 2022	17	14	15	11	6	40	20	25	40	176	9	72	71	0	516
No. of new vehicles in targeted 2022 year															
	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Tulkarm	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	South Gaza	North Gaza	Total
Compactor	**6**	**9**	**7**	**11**	**5**	**5**	**2**	**5**	**6**	**6**	**16**	**13**	**3**	**3**	**97**
Others(Dump Tractor, etc)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Sub-Total	**6**	**9**	**7**	**11**	**5**	**5**	**2**	**5**	**6**	**6**	**16**	**13**	**3**	**3**	**97**
Capacity of New vechicles in 2022	42	99	113	152	36	62	38	24	114	116	279	247	57	57	1,436
Total of vechicles in 2022	**9**	**12**	**10**	**13**	**6**	13	6	12	11	31	19	30	10	3	185
Capicty Total of vechicles in 2022	59	113	128	163	42	102	58	49	154	292	288	319	128	57	1,952

Replacements	**6**	**9**	**7**	**3**	**3**	**5**	**2**	**5**	**6**	**2**	**16**	**13**	**3**	**3**	**83**
Expantions	**0**	**0**	**0**	**8**	**2**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**14**
Total	**6**	**9**	**7**	**11**	**5**	**5**	**2**	**5**	**6**	**6**	**16**	**13**	**3**	**3**	**97**

	N&NW Jerusalem	NE&SE Jerusalem	Qalqiliya	Nablus	Tubas	Tulkarm	Salfit	Jericho	Bethlehem	Hebron	Jenin	Ramallah	South Gaza	North Gaza	Total
Compactor 21m3	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**10**
Compactor 13m3	**3**	**3**	**3**	**8**	**2**	**4**	**2**	**2**	**6**	**4**	**9**	**13**	**3**	**3**	**65**
Compactor 8m3	**3**	**5**	**3**	**1**	**3**	**0**	**0**	**3**	**0**	**0**	**4**	**0**	**0**	**0**	**22**
Sub-total	**6**	**9**	**7**	**11**	**5**	**5**	**2**	**5**	**6**	**6**	**16**	**13**	**3**	**3**	**97**

N&NW Jerusalem JSC

N&NW Jerusalem Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	70	17	42	59	10	3	6
Others(Dump Tract	0	0	0	0	0	0	0
total	70	17	42	59	10	3	6

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
	1	Compactor	Volvo	2011	8	4	5	100%	0.9	0.86	0.625	3.9	15.6	4	11	50%	0.9	0.86	0.625	1.9	7.6
Replace	1	Compactor	Volvo	1999	8	2	17	50%	0.9	0.86	0.625	1.9	3.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2005	12	1	11	50%	0.9	0.86	0.625	2.9	2.9	1	17	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	12	1	7	100%	0.9	0.86	0.625	5.8	5.8	1	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	12	3	17	50%	0.9	0.86	0.625	2.9	8.7	3	23	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2011	12	2	5	100%	0.9	0.86	0.625	5.8	11.6	2	11	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Volvo	2016	13	1	0	100%	0.9	0.86	0.625	6.3	6.3	1	6	50%	0.9	0.86	0.625	3.1	3.1
Replace	1	Compactor	Nissan	1999	8	3	17	50%	0.9	0.86	0.625	1.9	5.7	3	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Nissan	1999	8	2	17	50%	0.9	0.86	0.625	1.9	3.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	8	3	16	50%	0.9	0.86	0.625	1.9	5.7	3	22	0%	0.9	0.86	0.625	0	0
													70								17

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
												42

NE&SE Jerusalem JSC

NE&SE Jerusalem Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	89	14	99	113	17	3	9
Others(Dump Tract	0	0	0	0	0	0	0
total	89	14	99	113	17	3	9

Existing vehicles

	Vehicle Type					In target 2016 year									In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Replace	1	Compactor	Volvo	2001	6	2	15	50%	0.9	0.86	0.625	1.5	3	2	21	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2010	8	2	6	100%	0.9	0.86	0.625	3.9	7.8	2	12	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	8	2	17	50%	0.9	0.86	0.625	1.9	3.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	8	2	17	50%	0.9	0.86	0.625	1.9	3.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Man	2006	18	2	10	50%	0.9	0.86	0.625	4.4	8.8	2	16	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2014	8	3	2	100%	0.9	0.86	0.625	3.9	11.7	3	8	50%	0.9	0.86	0.625	1.9	5.7
Not replaced	1	Compactor	Volvo	2009	6	2	7	100%	0.9	0.86	0.625	2.9	5.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	5	2	17	50%	0.9	0.86	0.625	1.2	2.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2005	4	2	11	50%	0.9	0.86	0.625	1	2	2	17	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2012	10	2	4	100%	0.9	0.86	0.625	4.8	9.6	2	10	50%	0.9	0.86	0.625	2.4	4.8
Not replaced	1	Compactor	Volvo	2009	6	2	7	100%	0.9	0.86	0.625	2.9	5.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	6	2	7	100%	0.9	0.86	0.625	2.9	5.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	isuzu	2003	5	2	13	50%	0.9	0.86	0.625	1.2	2.4	2	19	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2014	7	2	2	100%	0.9	0.86	0.625	3.4	6.8	2	8	50%	0.9	0.86	0.625	1.7	3.4
Replace	1	Compactor	isuzu	1999	5	2	17	50%	0.9	0.86	0.625	1.2	2.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	isuzu	2000	2	2	16	50%	0.9	0.86	0.625	0.5	1	2	22	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	6	2	7	100%	0.9	0.86	0.625	2.9	5.8	2	13	0%	0.9	0.86	0.625	0	0
													89								14

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
												99

Qalqiliya JSC

Qalqiliya Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	99	15	113	128	12	3	7
Others(Dump Tract	0	0	0	0	0	0	0
total	99	15	113	128	12	3	7

Existing vehicles

	Vehicle Type					In target 2016 year								In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Not replaced	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	man	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	1999	12	2	17	50%	0.9	0.86	0.625	2.9	5.8	2	23	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2011	12	2	5	100%	0.9	0.86	0.625	5.8	11.6	2	11	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Volvo	2011	12	2	5	100%	0.9	0.86	0.625	5.8	11.6	2	11	50%	0.9	0.86	0.625	2.9	5.8
Replace	1	Compactor	Volvo	1993	8	2	23	0%	0.9	0.86	0.625	0	0	2	29	0%	0.9	0.86	0.625	0	0
	1	Compactor	volvo	2011	8	2	5	100%	0.9	0.86	0.625	3.9	7.8	2	11	50%	0.9	0.86	0.625	1.9	3.8
Replace	1	Compactor	iveco	1999	12	2	17	50%	0.9	0.86	0.625	2.9	5.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Daf	2008	18	2	8	100%	0.9	0.86	0.625	8.7	17.4	2	14	0%	0.9	0.86	0.625	0	0
													99								15

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
					3							113

Nablus JSC

Nablus Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	76	11	152	163	5	2	11
Others(Dump Tract	0	0	0	0	0	0	0
total	76	11	152	163	5	2	11

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Replace	1	Compactor	Iveco	2009	12	4	7	100%	0.9	0.86	0.625	5.8	23.2	4	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	4	7	100%	0.9	0.86	0.625	5.8	23.2	4	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	1999	8	3	17	50%	0.9	0.86	0.625	1.9	5.7	3	23	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2011	8	3	5	100%	0.9	0.86	0.625	3.9	11.7	3	11	50%	0.9	0.86	0.625	1.9	5.7
	1	Compactor	Volvo	2011	8	3	5	100%	0.9	0.86	0.625	3.9	11.7	3	11	50%	0.9	0.86	0.625	1.9	5.7
													76								11

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
												152

Tubas JSC

Tubas Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	41	6	36	42	4	1	5
Others(Dump Tract	0	0	0	0	0	0	0
total	41	6	36	42	4	1	5

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Replace	1	Compactor	Volvo	1999	12	3	17	50%	0.9	0.86	0.625	2.9	8.7	3	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	8	3	17	50%	0.9	0.86	0.625	1.9	5.7	3	23	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2012	8	3	4	100%	0.9	0.86	0.625	3.9	11.7	3	10	50%	0.9	0.86	0.625	1.9	5.7
Replace	1	Compactor	Isuzu	2000	4	3	16	50%	0.9	0.86	0.625	1	3	3	22	0%	0.9	0.86	0.625	0	0
	1	Compactor	jericho	2009	8	3	7	100%	0.9	0.86	0.625	3.9	11.7								
													41								6

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
1	Compactor	Volvo	**2021**	8	**2**	1	100%	0.9	0.86	0.625	3.9	8
												36

Tulkarem JSC

Tulkarem Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	147	40	62	102	15	8	5
Others(Dump Tract	7	0	0	0	1	0	0
total	154	40	62	102	16	8	5

Existing vehicles

	Vehicle Type		In target 2016 year										In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Not replaced	1	Compactor	Volvo	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2009	5	2	7	100%	0.9	0.86	0.625	2.4	4.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Others(Dump Tractor)	Volvo	2009	18	2	7	100%	0.9	0.86	0.25	3.5	7	2	13	0%	0.9	0.86	0.25	0	0
	1	Compactor	Volvo	2015	13	2	1	100%	0.9	0.86	0.625	6.3	12.6	2	7	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2015	13	2	1	100%	0.9	0.86	0.625	6.3	12.6	2	7	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2016	5	2	0	100%	0.9	0.86	0.625	2.4	4.8	2	6	50%	0.9	0.86	0.625	1.2	2.4
	1	Compactor	Volvo	2016	5	2	0	100%	0.9	0.86	0.625	2.4	4.8	2	6	50%	0.9	0.86	0.625	1.2	2.4
	1	Compactor	Iveco	2016	12	2	0	100%	0.9	0.86	0.625	5.8	11.6	2	6	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Iveco	2016	12	2	0	100%	0.9	0.86	0.625	5.8	11.6	2	6	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Iveco	2016	12	2	0	100%	0.9	0.86	0.625	5.8	11.6	2	6	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Iveco	2016	12	2	0	100%	0.9	0.86	0.625	5.8	11.6	2	6	50%	0.9	0.86	0.625	2.9	5.8
													154								40

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**1**	1	100%	0.9	0.86	0.625	10.2	10
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
1	Compactor	Volvo	**2021**	13	**2**	1	100%	0.9	0.86	0.625	6.3	13
												62

Salfit JSC

Salfit Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	103	20	38	58	8	3	2
Others(Dump Tract	0	0	0	0	0	1	0
total	103	20	38	58	8	4	2

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	12	3	7	100%	0.9	0.86	0.625	5.8	17.4	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2016	9	3	0	100%	0.9	0.86	0.625	4.4	13.2	3	6	50%	0.9	0.86	0.625	2.2	6.6
	1	Compactor	Volvo	2016	9	2	0	100%	0.9	0.86	0.625	4.4	8.8	2	6	50%	0.9	0.86	0.625	2.2	4.4
	1	Compactor	Volvo	2016	18	2	0	100%	0.9	0.86	0.625	8.7	17.4	2	6	50%	0.9	0.86	0.625	4.4	8.8
													103								20

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												38

Jericho JSC

Jericho Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	64	23	24	47	13	6	5
Others(Dump Tract	13	2	0	2	3	1	0
total	77	25	24	49	16	7	5

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
	1	Compactor	Volvo	2016	13	2	0	100%	0.9	0.86	0.625	6.3	12.6	2	6	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2016	13	2	0	100%	0.9	0.86	0.625	6.3	12.6	2	6	50%	0.9	0.86	0.625	3.1	6.2
Not replaced	1	Compactor	Volvo	2009	12	1	7	100%	0.9	0.86	0.625	5.8	5.8	1	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	12	1	7	100%	0.9	0.86	0.625	5.8	5.8	1	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2009	12	1	7	100%	0.9	0.86	0.625	5.8	5.8	1	13	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2016	8	2	0	100%	0.9	0.86	0.625	3.9	7.8	2	6	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2016	8	2	0	100%	0.9	0.86	0.625	3.9	7.8	2	6	50%	0.9	0.86	0.625	1.9	3.8
Replace	1	Compactor	Volvo	2009	8	0	7	100%	0.9	0.86	0.625	3.9	0	0	13	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2015	6	1	1	100%	0.9	0.86	0.625	2.9	2.9	1	7	50%	0.9	0.86	0.625	1.5	1.5
	1	Compactor	Volvo	2015	6	1	1	100%	0.9	0.86	0.625	2.9	2.9	1	7	50%	0.9	0.86	0.625	1.5	1.5
Replace	1	Compactor	Volvo	1999	5	0	17	50%	0.9	0.86	0.625	1.2	0	0	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	5	0	17	50%	0.9	0.86	0.625	1.2	0	0	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	5	0	17	50%	0.9	0.86	0.625	1.2	0	0	23	0%	0.9	0.86	0.625	0	0
	1	Others(Dump Tractor)	Dump	2016	16	1	0	100%	0.9	0.86	0.25	3.1	3.1	1	6	50%	0.9	0.86	0.25	1.5	1.5
Not replaced	1	Others(Dump Tractor)	Dump	2010	16	1	6	100%	0.9	0.86	0.25	3.1	3.1	1	12	0%	0.9	0.86	0.25	0	0
Not replaced	1	Others(Dump Tractor)	Grapple	2009	18	2	7	100%	0.9	0.86	0.25	3.5	7	2	13	0%	0.9	0.86	0.25	0	0
													77								25

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	13	**1**	1	100%	0.9	0.86	0.625	6.3	6
1	Compactor	Volvo	**2021**	8	**1**	1	100%	0.9	0.86	0.625	3.9	4
1	Compactor	Volvo	**2021**	8	**1**	1	100%	0.9	0.86	0.625	3.9	4
1	Compactor	Volvo	**2021**	8	**1**	1	100%	0.9	0.86	0.625	3.9	4
												24

Bethlehem JSC

Bethlehem Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	168	38	114	152	18	4	6
Others(Dump Tract	4	2	0	2	1	1	0
total	172	40	114	154	19	5	6

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Not replaced	1	Compactor	Volvo	2009	5	2	7	100%	0.9	0.86	0.625	2.4	4.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	2	7	100%	0.9	0.86	0.625	2.4	4.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	8	3	7	100%	0.9	0.86	0.625	3.9	11.7	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	1	7	100%	0.9	0.86	0.625	5.8	5.8	1	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	0	7	0%	0.9	0.86	0.625	0	0	0	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	0	7	0%	0.9	0.86	0.625	0	0	0	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	0	7	0%	0.9	0.86	0.625	0	0	0	13	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2015	16	2	1	100%	0.9	0.86	0.625	7.7	15.4	2	7	50%	0.9	0.86	0.625	3.9	7.8
	1	Compactor	Volvo	2015	20	2	1	100%	0.9	0.86	0.625	9.7	19.4	2	7	50%	0.9	0.86	0.625	4.8	9.6
	1	Compactor	Volvo	2015	21	2	1	100%	0.9	0.86	0.625	10.2	20.4	2	7	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2015	21	2	1	100%	0.9	0.86	0.625	10.2	20.4	2	7	50%	0.9	0.86	0.625	5.1	10.2
	1	Others(Dump Tractor)	Volvo	2015	10	2	1	100%	0.9	0.86	0.25	1.9	3.8	2	7	50%	0.9	0.86	0.25	1	2
													171								40

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												114

Hebron JSC

Hebron Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	353	166	116	282	25	23	6
Others(Dump Tract	18	10	0	10	2	2	0
total	371	176	116	292	27	25	6

Existing vehicles

	Vehicle Type		In target 2016 year										In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Replace	1	Compactor	Volvo	2009	8	2	7	100%	0.9	0.86	0.625	3.9	7.8	2	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	2009	12	2	7	100%	0.9	0.86	0.625	5.8	11.6	2	13	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2011	8	2	5	100%	0.9	0.86	0.625	3.9	7.8	2	11	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2011	8	2	5	100%	0.9	0.86	0.625	3.9	7.8	2	11	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2011	8	2	5	100%	0.9	0.86	0.625	3.9	7.8	2	11	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2011	13	2	5	100%	0.9	0.86	0.625	6.3	12.6	2	11	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Iveco	2012	13	2	4	100%	0.9	0.86	0.625	6.3	12.6	2	10	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Iveco	2013	21	2	3	100%	0.9	0.86	0.625	10.2	20.4	2	9	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Iveco	2013	21	2	3	100%	0.9	0.86	0.625	10.2	20.4	2	9	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2011	21	2	5	100%	0.9	0.86	0.625	10.2	20.4	2	11	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2011	21	2	5	100%	0.9	0.86	0.625	10.2	20.4	2	11	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2011	21	2	5	100%	0.9	0.86	0.625	10.2	20.4	2	11	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2011	21	2	5	100%	0.9	0.86	0.625	10.2	20.4	2	11	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2015	8	2	1	100%	0.9	0.86	0.625	3.9	7.8	2	7	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2015	13	2	1	100%	0.9	0.86	0.625	6.3	12.6	2	7	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2015	13	2	1	100%	0.9	0.86	0.625	6.3	12.6	2	7	50%	0.9	0.86	0.625	3.1	6.2
	1	Compactor	Volvo	2015	21	2	1	100%	0.9	0.86	0.625	10.2	20.4	2	7	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2015	21	2	1	100%	0.9	0.86	0.625	10.2	20.4	2	7	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Volvo	2015	21	2	1	100%	0.9	0.86	0.625	10.2	20.4	2	7	50%	0.9	0.86	0.625	5.1	10.2
	1	Others(Dump Tractor)	Volvo	2015	12	4	1	100%	0.9	0.86	0.25	2.3	9.2	4	7	50%	0.9	0.86	0.25	1.2	4.8
	1	Others(Dump Tractor)	Volvo	2011	12	4	5	100%	0.9	0.86	0.25	2.3	9.2	4	11	50%	0.9	0.86	0.25	1.2	4.8
	1	Compactor	Volvo	2015	6	2	1	100%	0.9	0.86	0.625	2.9	5.8	2	7	50%	0.9	0.86	0.625	1.5	3
													372								175

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												116

Jenin JSC

Jenin Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	131	9	279	288	32	3	16
Others(Dump Tract	2	0	0	0	1	0	0
total	133	9	279	288	33	3	16

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
	1	Compactor	Volvo	2011	12	1	5	100%	0.9	0.86	0.625	5.8	5.8	1	11	50%	0.9	0.86	0.625	2.9	2.9
	1	Compactor	Iveco	2011	12	1	5	100%	0.9	0.86	0.625	5.8	5.8	1	11	50%	0.9	0.86	0.625	2.9	2.9
	1	Compactor	Volvo	2011	12	1	5	100%	0.9	0.86	0.625	5.8	5.8	1	11	50%	0.9	0.86	0.625	2.9	2.9
Not replaced	1	Compactor	Volvo	2010	8	2	6	100%	0.9	0.86	0.625	3.9	7.8	2	12	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	5	3	7	100%	0.9	0.86	0.625	2.4	7.2	3	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2009	5	2	7	100%	0.9	0.86	0.625	2.4	4.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2008	18	1	8	100%	0.9	0.86	0.625	8.7	8.7	1	14	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2008	18	1	8	100%	0.9	0.86	0.625	8.7	8.7	1	14	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Man	2005	19	1	11	50%	0.9	0.86	0.625	4.6	4.6	1	17	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2004	12	1	12	50%	0.9	0.86	0.625	2.9	2.9	1	18	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2004	12	1	12	50%	0.9	0.86	0.625	2.9	2.9	1	18	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2004	12	1	12	50%	0.9	0.86	0.625	2.9	2.9	1	18	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Iveco	2004	12	1	12	50%	0.9	0.86	0.625	2.9	2.9	1	18	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Man	2002	19	0	14	0%	0.9	0.86	0.625	0	0	0	20	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	5	2	16	50%	0.9	0.86	0.625	1.2	2.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Daf	2000	5	0	16	0%	0.9	0.86	0.625	0	0	0	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	9	2	17	50%	0.9	0.86	0.625	2.2	4.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	9	2	17	50%	0.9	0.86	0.625	2.2	4.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	9	2	17	50%	0.9	0.86	0.625	2.2	4.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	9	2	17	50%	0.9	0.86	0.625	2.2	4.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	1999	9	2	17	50%	0.9	0.86	0.625	2.2	4.4	2	23	0%	0.9	0.86	0.625	0	0
Not replaced	1	Others(Dump Tractor)	Volvo	2004	25	1	12	50%	0.9	0.86	0.25	2.4	2.4	1	18	0%	0.9	0.86	0.25	0	0
													134								9

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	21	**2**	1	100%	0.9	0.86	0.625	10.2	20
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
1	Compactor	Volvo	**2021**	8	**3**	1	100%	0.9	0.86	0.625	3.9	12
												279

Ramallah JSC

Ramallah Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	354	72	247	319	38	17	13
Others(Dump Tract	0	0	0	0	0	0	0
total	354	72	247	319	38	17	13

Existing vehicles

	Vehicle Type		In target 2016 year											In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
JSC	1	Compactor	Volvo	2012	13	1	4	100%	0.9	0.86	0.625	6.3	6.3	1	10	50%	0.9	0.86	0.625	3.1	3.1
	1	Compactor	Volvo	2012	13	1	4	100%	0.9	0.86	0.625	6.3	6.3	1	10	50%	0.9	0.86	0.625	3.1	3.1
	1	Compactor	Volvo	2012	13	1	4	100%	0.9	0.86	0.625	6.3	6.3	1	10	50%	0.9	0.86	0.625	3.1	3.1
	1	Compactor	Volvo	2012	8	2	4	100%	0.9	0.86	0.625	3.9	7.8	2	10	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2012	8	3	4	100%	0.9	0.86	0.625	3.9	11.7	3	10	50%	0.9	0.86	0.625	1.9	5.7
	1	Compactor	Volvo	2012	8	3	4	100%	0.9	0.86	0.625	3.9	11.7	3	10	50%	0.9	0.86	0.625	1.9	5.7
	1	Compactor	Volvo	2012	8	3	4	100%	0.9	0.86	0.625	3.9	11.7	3	10	50%	0.9	0.86	0.625	1.9	5.7
	1	Compactor	Volvo	2012	8	2	4	100%	0.9	0.86	0.625	3.9	7.8	2	10	50%	0.9	0.86	0.625	1.9	3.8
	1	Compactor	Volvo	2012	8	1	4	100%	0.9	0.86	0.625	3.9	3.9	1	10	50%	0.9	0.86	0.625	1.9	1.9
	1	Compactor	Volvo	2012	8	1	4	100%	0.9	0.86	0.625	3.9	3.9	1	10	50%	0.9	0.86	0.625	1.9	1.9
Replace	1	Compactor	Volvo	2009	8	1	7	100%	0.9	0.86	0.625	3.9	3.9	1	13	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Merc	1996	13	2	20	0%	0.9	0.86	0.625	0	0	2	26	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	1999	13	2	17	50%	0.9	0.86	0.625	3.1	6.2	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	1999	10	2	17	50%	0.9	0.86	0.625	2.4	4.8	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Iveco	1999	7	2	17	50%	0.9	0.86	0.625	1.7	3.4	2	23	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	3	2	16	50%	0.9	0.86	0.625	0.7	1.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2000	8	2	16	50%	0.9	0.86	0.625	1.9	3.8	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	3	2	16	50%	0.9	0.86	0.625	0.7	1.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Isuzu	2000	3	2	16	50%	0.9	0.86	0.625	0.7	1.4	2	22	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2005	19	2	11	50%	0.9	0.86	0.625	4.6	9.2	2	17	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2005	11	2	11	50%	0.9	0.86	0.625	2.7	5.4	2	17	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2007	19	2	9	100%	0.9	0.86	0.625	9.2	18.4	2	15	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Volvo	2007	19	2	9	100%	0.9	0.86	0.625	9.2	18.4	2	15	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	15	2	7	100%	0.9	0.86	0.625	7.3	14.6	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Man	2009	19	2	7	100%	0.9	0.86	0.625	9.2	18.4	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	19	2	7	100%	0.9	0.86	0.625	9.2	18.4	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2009	9	2	7	100%	0.9	0.86	0.625	4.4	8.8	2	13	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2010	19	2	6	100%	0.9	0.86	0.625	9.2	18.4	2	12	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2010	19	2	6	100%	0.9	0.86	0.625	9.2	18.4	2	12	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2010	15	2	6	100%	0.9	0.86	0.625	7.3	14.6	2	12	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Volvo	2010	19	2	6	100%	0.9	0.86	0.625	9.2	18.4	2	12	0%	0.9	0.86	0.625	0	0
	1	Compactor	Volvo	2011	9	2	5	100%	0.9	0.86	0.625	4.4	8.8	2	11	50%	0.9	0.86	0.625	2.2	4.4
	1	Compactor	Volvo	2011	9	2	5	100%	0.9	0.86	0.625	4.4	8.8	2	11	50%	0.9	0.86	0.625	2.2	4.4
	1	Compactor	Volvo	2014	4	2	2	100%	0.9	0.86	0.625	1.9	3.8	2	8	50%	0.9	0.86	0.625	1	2
	1	Compactor	Volvo	2014	12	2	2	100%	0.9	0.86	0.625	5.8	11.6	2	8	50%	0.9	0.86	0.625	2.9	5.8
	1	Compactor	Volvo	2014	15	2	2	100%	0.9	0.86	0.625	7.3	14.6	2	8	50%	0.9	0.86	0.625	3.6	7.2
	1	Compactor	Volvo	2015	9	2	1	100%	0.9	0.86	0.625	4.4	8.8	2	7	50%	0.9	0.86	0.625	2.2	4.4
	1	Compactor	Volvo	2016	13	2	0	100%	0.9	0.86	0.625	6.3	12.6	2	6	50%	0.9	0.86	0.625	3.1	6.2
													354								72

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												247

South Gaza JSC

South Gaza Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	143	71	57	128	7	7	3
Others(Dump Tract	23	0	0	0	16	0	0
total	166	71	57	128	23	7	3

Existing vehicles

	Vehicle Type					In target 2016 year								In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	19	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	12	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	12	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	12	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tipper Craane	1995	12	2	21	0%	0.9	0.86	0.25	0	0	2	27	0%	0.9	0.86	0.25	0	0
Replace	2	Others(Dump Tractor)	Tipper Craane	2008	20	2	8	100%	0.9	0.86	0.25	3.9	7.8	2	14	0%	0.9	0.86	0.25	0	0
Replace	2	Others(Dump Tractor)	Tipper Craane	2008	20	2	8	100%	0.9	0.86	0.25	3.9	7.8	2	14	0%	0.9	0.86	0.25	0	0
Replace	2	Others(Dump Tractor)	Tipper Craane	2008	20	2	8	100%	0.9	0.86	0.25	3.9	7.8	2	14	0%	0.9	0.86	0.25	0	0
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor		2016	21	2	0	100%	0.9	0.86	0.625	10.2	20.4	2	6	50%	0.9	0.86	0.625	5.1	10.2
	1	Compactor	Medical	2011	0	2	5	100%	0.9	0.86	0.625	0	0	2	11	50%	0.9	0.86	0.625	0	0
	1	Compactor	Medical	2011	0	2	5	100%	0.9	0.86	0.625	0	0	2	11	50%	0.9	0.86	0.625	0	0
													166								71

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												57

North Gaza JSC

North Gaza Locality

Items	Exist. Vechiler Capa of Target 2016 Year	Exist. Vechiler Capa of Target 2022 Year	New Vehiler Capa of Target 2022 year	Total	No. of Exist. Vechiler in 2016	No. of exist. Vechiler in 2022	No. of New Vechiler in 2022
Compactor	69	0	57	57	8	0	3
Others(Dump Tract	12	0	0	0	6	0	0
total	81	0	57	57	14	0	3

Existing vehicles

	Vehicle Type					In target 2016 year								In target 2022 year							
	Type1	Type2	Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2016	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip)	Daily Work Capacity (t/day)
Not replaced	1	Compactor	Tipper Craane	1995	16	2	21	0%	0.9	0.86	0.625	0	0	2	27	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Tipper Craane	1995	16	2	21	0%	0.9	0.86	0.625	0	0	2	27	0%	0.9	0.86	0.625	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	1992	6	2	24	0%	0.9	0.86	0.25	0	0	2	30	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	1992	6	2	24	0%	0.9	0.86	0.25	0	0	2	30	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	1992	6	2	24	0%	0.9	0.86	0.25	0	0	2	30	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	1992	6	2	24	0%	0.9	0.86	0.25	0	0	2	30	0%	0.9	0.86	0.25	0	0
Replace	1	Compactor	Tipper Craane	2008	16	2	8	100%	0.9	0.86	0.625	7.7	15.4	2	14	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Tipper Craane	2008	16	2	8	100%	0.9	0.86	0.625	7.7	15.4	2	14	0%	0.9	0.86	0.625	0	0
Replace	1	Compactor	Tipper Craane	2008	16	2	8	100%	0.9	0.86	0.625	7.7	15.4	2	14	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor	Tipper Craane	2008	16	2	8	100%	0.9	0.86	0.625	7.7	15.4	2	14	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor		1992	15	2	24	0%	0.9	0.86	0.625	0	0	2	30	0%	0.9	0.86	0.625	0	0
Not replaced	1	Compactor		2001	15	2	15	50%	0.9	0.86	0.625	3.6	7.2	2	21	0%	0.9	0.86	0.625	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	2008	16	2	8	100%	0.9	0.86	0.25	3.1	6.2	2	14	0%	0.9	0.86	0.25	0	0
Not replaced	2	Others(Dump Tractor)	Tractor	2008	16	2	8	100%	0.9	0.86	0.25	3.1	6.2	2	14	0%	0.9	0.86	0.25	0	0
													81								0

New vehicle

Vehicle Type		Manufacturer	Purchase year	Capacity (m^3)	trip/day	Vehicle age in 2022	Effective Rate	Loading Rate	Operation Rate	Unit Loaded Weight after Loading (t/m3)	Average Collection Amount (t/trip/unit)	Daily Work Capacity (t/day)
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
1	Compactor	Volvo	**2021**	13	**3**	1	100%	0.9	0.86	0.625	6.3	19
												57

Annex-8 Letter on commitment to the implement procedures necessary for VAT and customs exemption of the Ministry of Finance and Planning

Palestinian National Authority
Ministry of Finance and Planning
Office of the Minister

السلطة الوطنية الفلسطينية
وزارة المالية والتخطيط
مكتب الوزير

No. : MOF /M.O.L.G/4625/2018 ..... : الرقم

Date :..26/12/2018..... ..... : التاريخ

His Excellency Dr. Hussein Al-Araj
Minister of Local Government

Re: Request for VAT and Customs exemption for the "Project for Improvement of Collection and Transfer Systems for Solid Waste Management"

Dear Dr. Hussein Al-Araj,

Referring to your request letter about VAT and customs exemption for the project "Improvement of Collection and Transfer Systems for Solid Waste Management" we hereby confirm, as will be written in Exchange of Notes, which is a legal document of an international agreement between the Government of Palestine and the Government of Japan, the Palestinian Government and through the Ministry of Finance and Planning shall take the necessary procedures to ensure that VAT and customs will be exempted for all works implemented in Palestine for the above mentioned project which will start by 2019.

Sincerely,

Shukry Bishara
Minister of Finance and Planning

A.Z

Ramallah Tel: 00970-2-2978846/7/8 Fax: 00970-2-2978845 P.O. Box 795 Ramallah E-mail: minister@pmof.ps