DATA COLLECTION SURVEY ON WASTE MANAGEMENT IN NORTHERN REGION ACCEPTING SYRIAN REFUGEES IN THE HASHEMITE KINGDOM OF JORDAN

FINAL REPORT

APRIL 2016

Japan International Cooperation Agency (JICA)

Kokusai Kogyo Co., Ltd.

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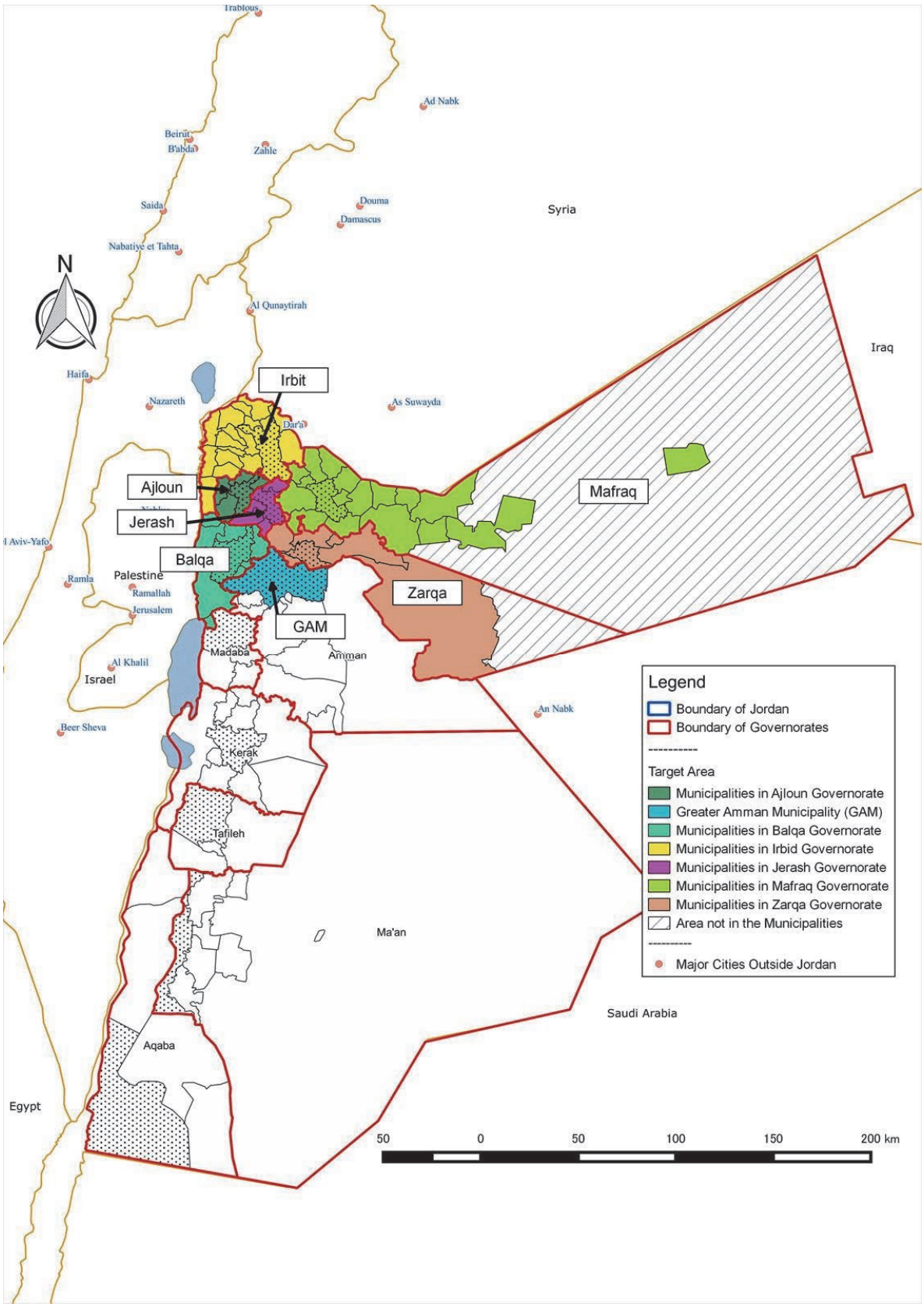


Map of Survey Area

Photos of Survey Area

Landscape of GAM

Street View in Greater Mafraq Municipality

Togbul T/S (Greater Irbid Municipality)

Russaifa T/S (Russaifa Municipality)

Unofficial Dump Site (Azraq Municipality)

Al-Duleil D/S (in Zarqa Governorate)

Weighbridge at Al Ekaider D/S

Disposal Cell in Al Ekaider D/S

Treatment Pond for Zibar (Wastewater from Olive Oil Factory) in Al Ekaider D/S

Disposal Cell in Ghabawi Landfill

Gas Extraction Well in Ghabawi Landfill

Leachate Circulation System in Ghabawi Landfill

Landfill Gas Flaring Facility in Ghabawi Landfill

Cleansing around the Waste Containers in Palestine Camp

Waste Collection in Palestine Camp

Abbreviations

AFD	Agence Française de Développement
CVDB	Cities and Villages Development Bank
DPA	Department of Palestinian Affairs
D/S	Disposal Site
EBRD	European Bank for Reconstruction and Development
EEA	European Environmental Agency
EIA	Environmental Impact Assessment
ESSRP	Emergency Services and Social Resilience Project
EU	European Union
F/S	Feasibility Study
GAM	Greater Amman Municipality
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HDI	Human Development Index
IEE	Initial Environmental Examination
ISWA	International Solid Waste Association
JCP	Jordan Competitiveness Program
JD	Jordan Dinar
JICA	Japan International Cooperation Agency
JRP	Jordan Response Plan
JRPSC	Jordan Response Platform for the Syria Crisis
JSC	Joint Services Council
KfW	Kreditanstalt für Wiederaufbau
MBT	Mechanical Biological Treatment
MOA	Ministry of Agriculture
MOE	Ministry of Environment
MOEMR	Ministry of Energy and Mineral Resources
MOH	Ministry of Health
MOI	Ministry of Interior
MOMA	Ministry of Municipal Affairs
MOPIC	Ministry of Planning and International Cooperation
M/P	Master Plan
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
NS (NSWMS)	National Solid Waste Management Improvement Strategy
RDF	Refuse Derived Fuel
RLDP	Regional and Local Development Project
SWM	Solid Waste Management
T/S	Transfer Station
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
USAID	United States Agency for International Development
WB	World Bank
WtE	Waste to Energy
3Rs	Reduce, Reuse and Recycle

Chapter 1 Background and Outline of the Survey

1.1 Background

Jordan has been experiencing a huge influx of Syrian refugees since March 2011. It is reported that the number of refugees in Jordan registered at UNHCR has reached as many as 620,000. Jordan now has received the third largest number of Syrian refugees following Turkey and Lebanon.

About 80% of those refugees have been residing in the Jordan community, out of the refugee camps. The capital area of Amman and the northern region close to the Syrian border such as Irbid and Mafraq Governorates are the main areas hosting such city-dwelling refugees. The rate of refugees in the Governorates of Amman, Irbid and Mafraq to the total Syrian refugees in the country is 27.4%, 23.3% and 12.4%, respectively.

The abrupt population increase has been making it difficult for the local governments to maintain their social services such as education and medical care. The municipal services of solid waste management (SWM) is not an exception, as the waste amount is overwhelming the service capacity, possibly causing improper waste dumps and open burning and resulting in environmental degradation and insanitary living conditions.

To combat the situation, the Jordan Government developed the Jordan Response Plan based on the needs and vulnerability assessment under the stress of Syrian refugee influx, where the aforementioned SWM issues are also addressed. Several international assistance programs have been carried out by various donor agencies, but the needs for improvement are still strong and persistent.

Meanwhile, JICA has a country analysis paper for Jordan. It states that one of the development concerns of Jordan is the promotion of regional stability and proposes cooperation programs including the “Support Program of Communities Hosting Syrian Refugees”.

In this context, JICA sent a survey team to Jordan to collect the data regarding the condition of SWM in the region hosting the Syrian refugees and the information of other donors’ assistance in the sector, and to propose possible project plans.

1.2 Objectives

This survey aimed at the following objectives:

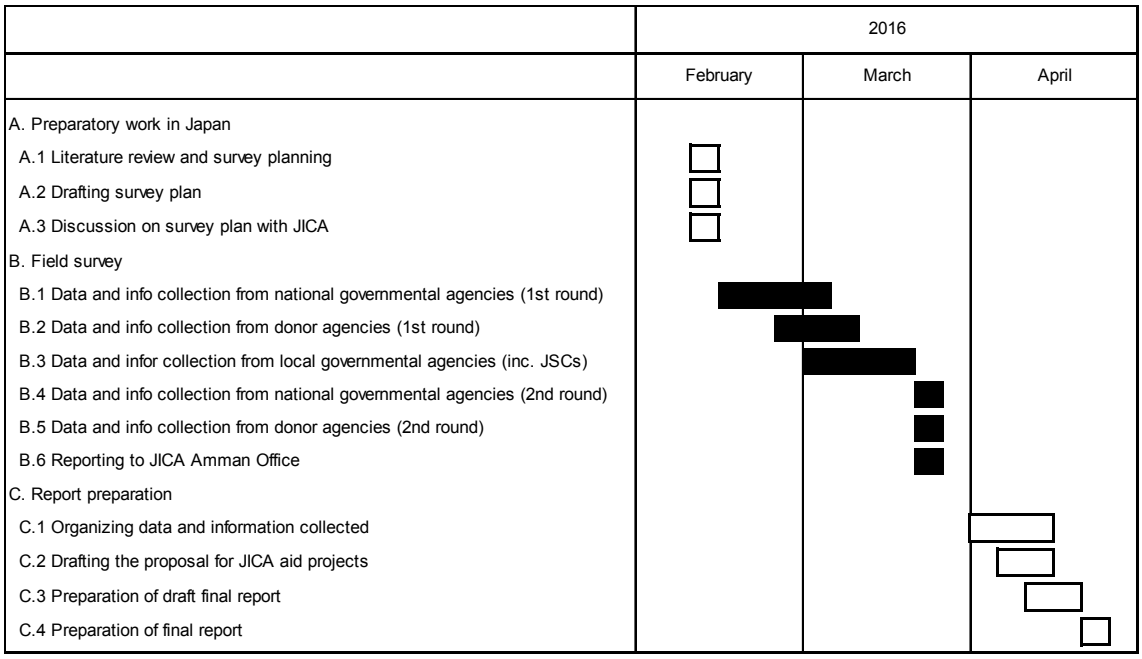
- To collect data and information regarding the status of waste management and the actual or planned activities by international/bilateral donor agencies in this sector in the Greater Amman Municipality (GAM) and the six governorates of Irbid, Mafraq, Ajloun, Zarqa, Balqa, and Jerash, which are the major areas accepting the Syrian refugees.
- To propose the possible project plans for the improvement of SWM in the survey area.

1.3 Schedule and Survey Members

1.3.1 Schedule

The survey started in the middle of February 2016 and ended upon the submission of the final output on April 28, 2016. The schedule is outlined as below.

Table 1-1. Survey Schedule



1.3.2 Survey Members

The survey team is composed of the following members.

Table 1-2. Survey Members

Name	Assignment	Company
Mr. Susumu Shimura	Survey Team Leader, Solid Waste Management Planning	Kokusai Kogyo Co., Ltd.
Mr. Junji Anai	Waste Treatment Facility and Equipment	Kokusai Kogyo Co., Ltd.
Mr. Burneebaatar Gantumur	Economic and Financial Analysis, Institutional Analysis	Kokusai Kogyo Co., Ltd.
Ms. Noriko Otsuki	Analysis of Relevant Projects	Kokusai Kogyo Co., Ltd.

1.4 Survey Area

The survey area covers one city and six governorates, which have 63 municipalities in total. They are listed in Table 1-3.

At the commencement of the survey, Balqa and Jerash Governorates were not included in the survey area. Later, it was found that a list of facilities and equipment requested by MOMA (Ministry of Municipal Affairs) to JICA included some of those for Balqa and Jerash Governorates, and JICA decided to include those governorates into the survey area. Further, JICA also included

the Palestine refugee camps into the survey scope, being aware of the fact that it is a heavy burden for UNRWA (United Nations Relief and Works Agency for Palestine Refugees in the Near East), who operates the camps for Palestine refugees, to manage waste from their camps.

The Arabic name of places of Jordan is written in various spellings in different documents and there seem to be no specific spelling patterns. Therefore, this report follows the rules below.

1. The English spellings of the municipalities shown at https://en.wikipedia.org/wiki/Jordanian_local_elections,_2007 are adopted (see Table 1-3)
2. Municipalities starting with "Greater" are regarded as "city". For example, the "Greater Irbid Municipality" is expressed as Irbid City. As for the Greater Amman Municipality, it is abbreviated to GAM.
3. Other municipalities are written as name plus municipality (e.g. Ramtha Municipality).
4. The names of facilities such as disposal sites and transfer stations are taken from the National Solid Waste Management Strategy (NSWMS).

Table 1-3. Municipalities in the Survey Area

Amman Governorate		Mafraq Governorate		Irbid Governorate	
1	Greater Amman	1	Greater Mafraq	1	Greater Irbid
		2	Manshiet Bani Hasan	2	West Irbid
Ajloun Governarate		3	Erehaab	3	Ramtha
1	Greater Ajloun	4	Bal'ama	4	Sahil Houran
2	Kafrangeh	5	Za-atari wa Al Manshieh	5	Khalid Bin Al Walid
3	Junaid	6	Housha	6	Yarmouk
4	Shafa	7	Baslieh	7	Kaffarat
5	Oyoon	8	Sarhan	8	Sho'la
		9	Khaldieh	9	Saroo
Zarqa Governorate		10	Prince Hussein Bin Abdulla	10	Mo'az Bin Jabal
1	Greater Zarqa	11	Umm Al Jimaal	11	Tabaket Fahil
2	Russaifa	12	Sabha Wa Dafyaneh	12	Sharhabil Bin Hasna
3	Baireen	13	Umm al Gtain Wa Al Mkaifteh	13	Mazaar
4	Hashimyah	14	Dair Al Kahif	14	Taibah
5	Dhlail	15	Salhieh Wa Nayfeh	15	Wastyyeh
6	Hallabat	16	Bani Hashim	16	Deir Abi Said
7	Azraq	17	Safawi	17	Rabyet El Koora
		18	Rwaished	18	Barkash
Jerash Governorate		Balqa Governorate			
1	Greater Jerash	1	Greater Salt	6	Central Shuna
2	Me'raad	2	Ain Al Basha	7	Fuhais
3	Bab Amman	3	Al Aarda	8	Mahis
4	Nasim	4	Dair Alla	9	Swaimah
5	Burma	5	M'aadi		

The locations of municipalities in governorates, excluding GAM, are shown in figures from Figure 1-1 to Figure 1-6.

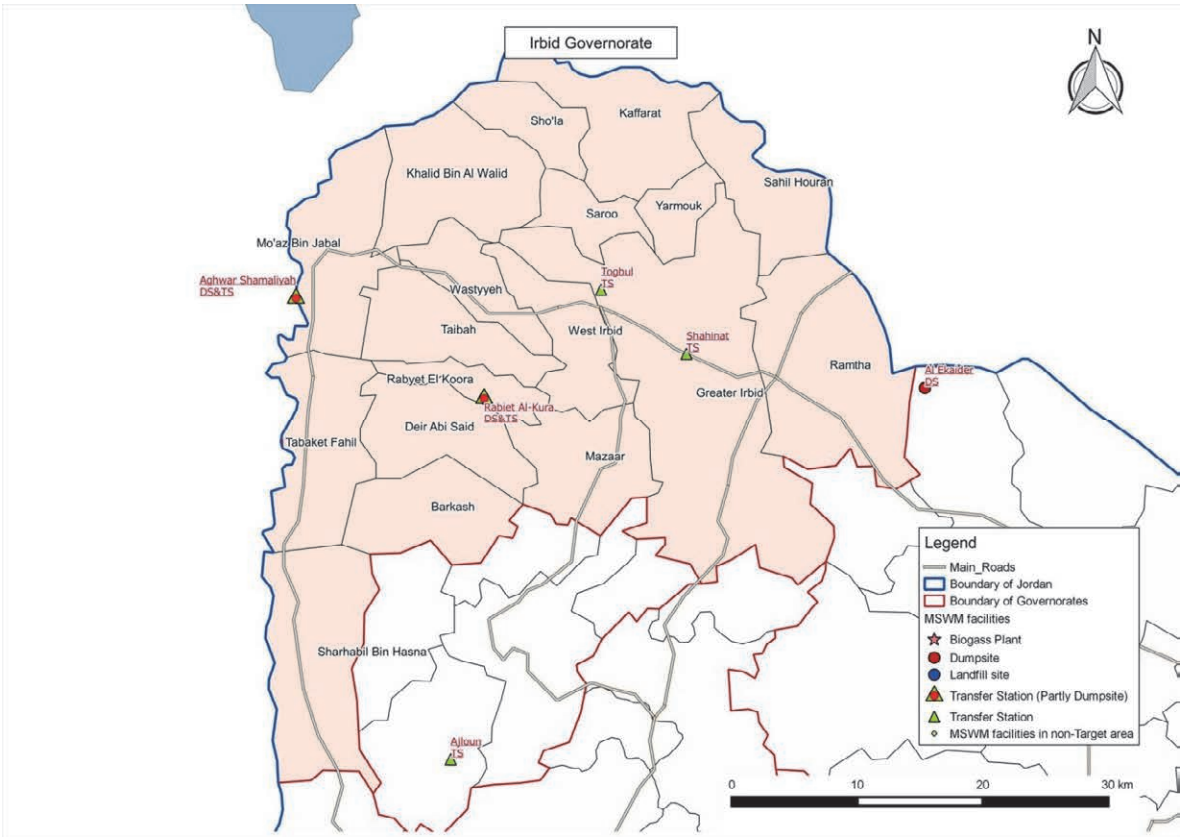


Figure 1-1. Municipalities in Irbid Governorate

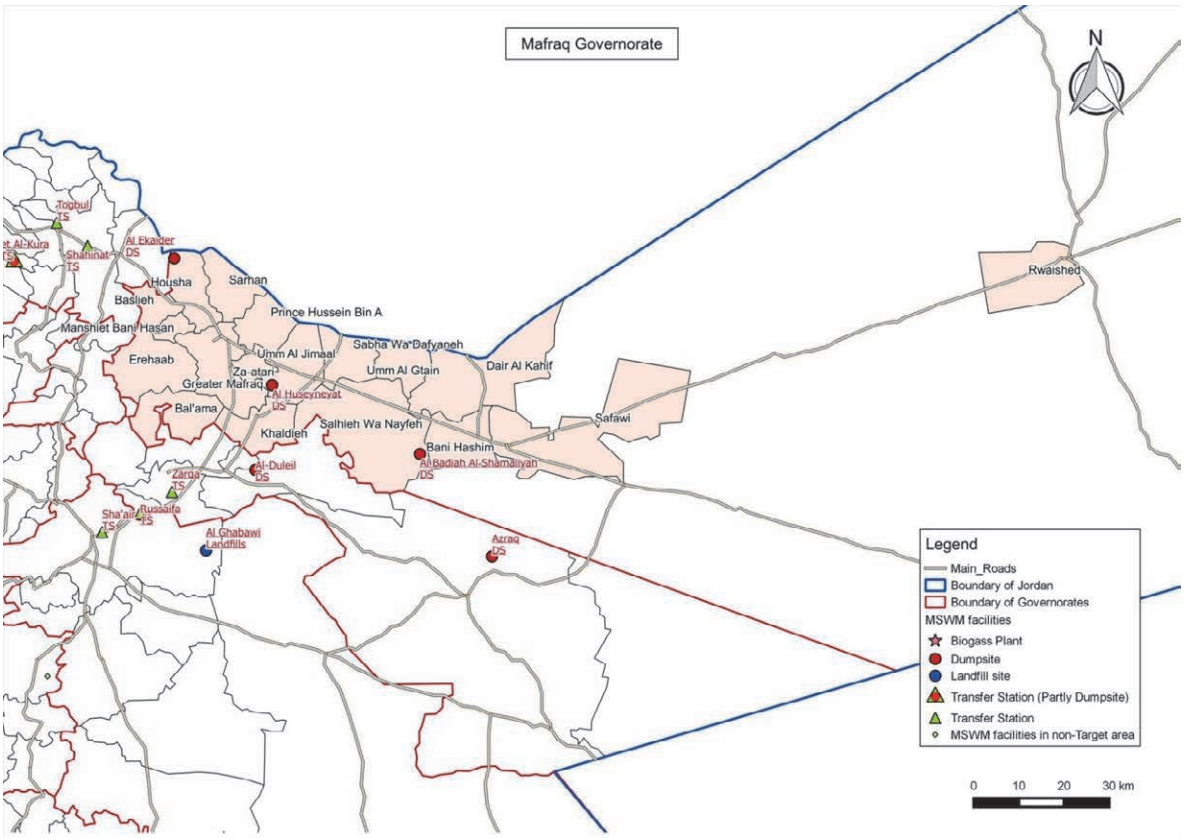


Figure 1-2. Municipalities in Mafraq Governorate

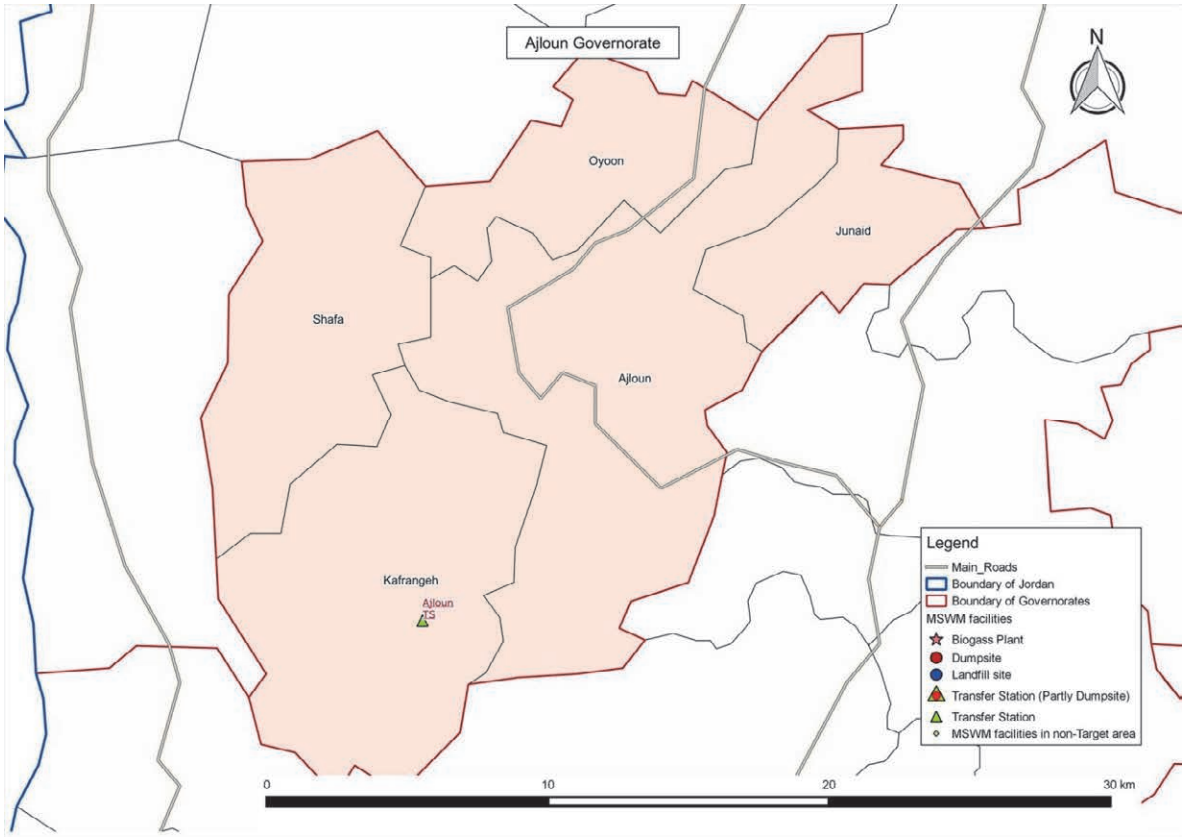


Figure 1-3. Municipalities in Ajloun Governorate

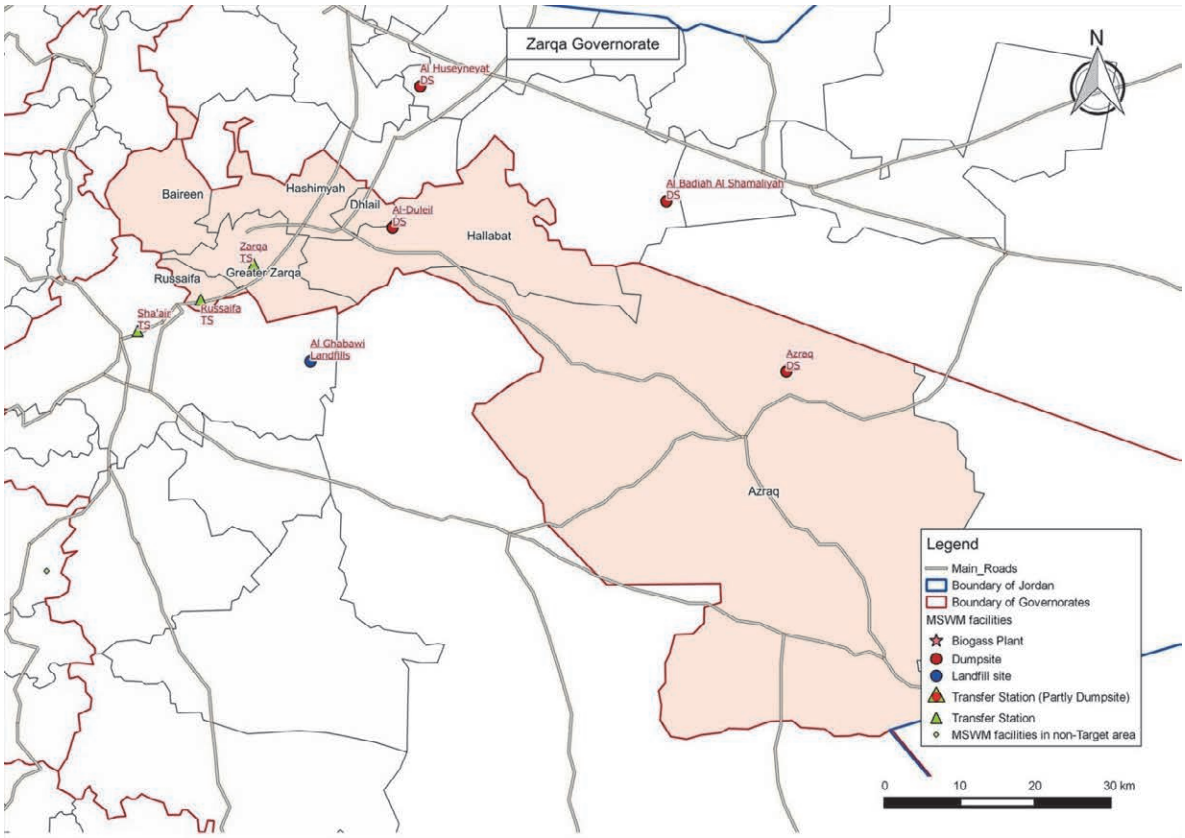


Figure 1-4. Municipalities in Zarqa Governorate

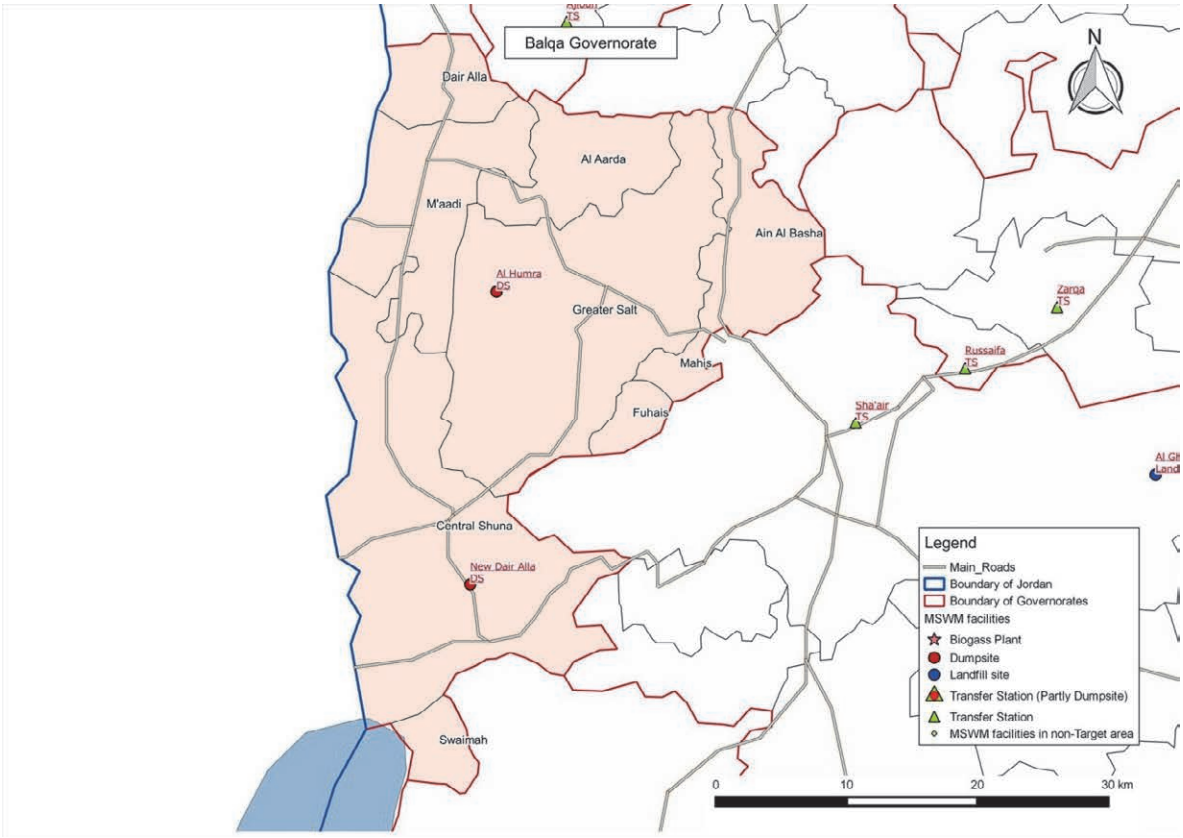


Figure 1-5. Municipalities in Balqa Governorate

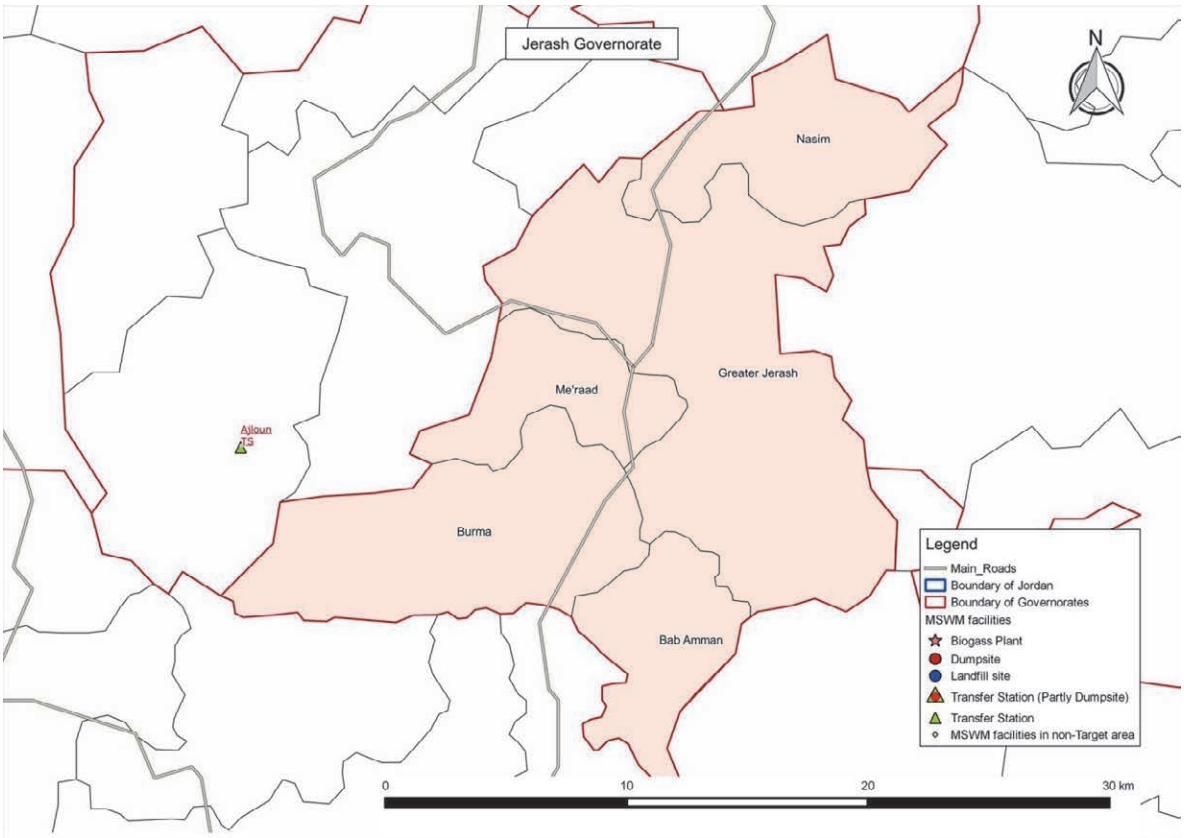


Figure 1-6. Municipalities in Jerash Governorate

In the SWM sector, the major role of the municipalities is waste collection. Most municipalities are small in size and the facilities such as final disposal sites and transfer stations are operated by Joint Services Councils (JSCs), which serve several municipalities. The service area of nine JSCs in the survey area is shown in Figure 1-7.

There are 12 waste disposal sites (D/S) in the survey area. The location of ten (of the twelve) D/S – including one sanitary landfill and eight transfer stations – which the survey team were able to determine, is shown in Figure 1-7. Among these, Zarqa D/S is used by the Azraq Municipality of Zarqa Governorate, but it is an unofficial site. The other two D/S, not shown on the map due to a lack of information on their exact location, are Swaimah D/S and Rwaished D/S. The former is used only by the Swaimah Municipality at the south end of Balqa Governorate, and the latter only by the Rwaished Municipality in the east of Mafraq Governorate. Both are unofficial.

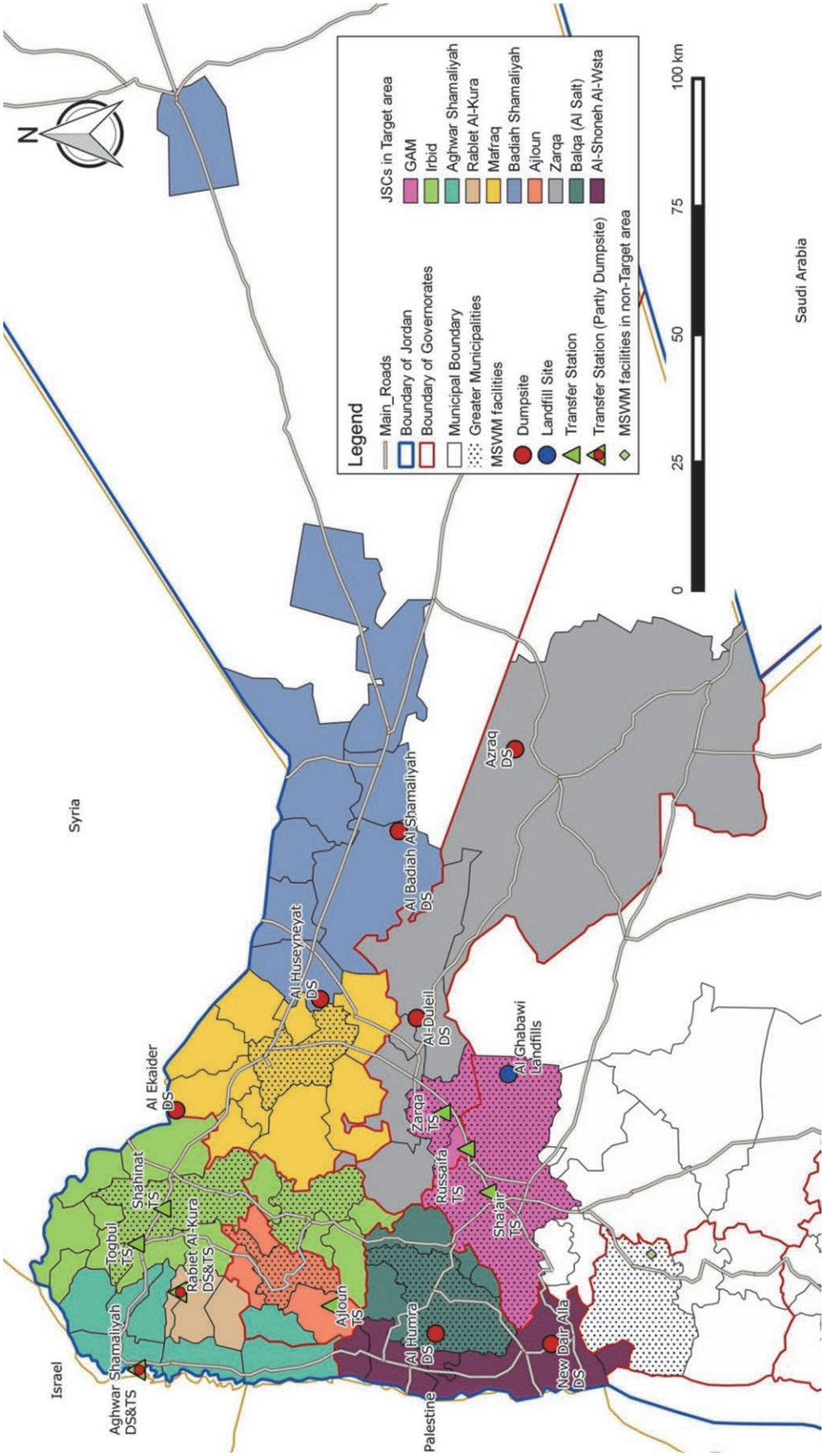


Figure 1-7. JSC Service Area and SWM Facilities

1.5 Interviews with Relevant Organizations and Site Visits to SWM Facilities

The team visited various organizations and SWM facilities from February 14 to March 24 as shown in the next table. The organizations included national and local agencies in the SWM sector in the target area and international and bilateral aid agencies involved in the sector.

Table 1-4. Interview and Site Visits during the Survey

Places of Visit	Date	Details*
National Agencies		
MOPIC (Ministry of Planning and International Cooperation)	Feb 14, Mar 15	Confirmed the JRP (Jordan Response Plan for the Syrian Crisis 2016-18) final report. Discussed the possibilities of loan assistance for the implementation of NSWMS.
MOMA (Ministry of Municipal Affairs)	Feb 14, 23, Mar 2, 7, 14, 20, 21	Discussed the list of equipment unofficially requested to JICA in August 2015.The listed equipment was divided into two, one being the list for JICA specifically for the survey area and the other being the list for the Japanese embassy. Requested MOMA's assistance in arranging meetings and visits to local agencies, JSCs and SWM facilities.
MOE (Ministry of Environment)	Feb 15, 28, Mar 9	Discussed MOE's jurisdiction, hazardous waste management, EIA and NSWMS.
MOH (Ministry of Health)	Not visited	The person introduced by MOE was not available. According to MOE, MOH controls the medical waste management within the medical institutions, while MOE controls the waste outside the medical institutions.
MOA (Ministry of Agriculture)	Not Visited	The person introduced by MOE was not available. According to MOE, MOA does not control agricultural waste.
MOEMR (Ministry of Energy and Mineral Resources)	Feb 15	Discussed the use of waste as energy source (WtE) and the national policy regarding WtE.
City and Village Development Bank (CVDB)	Feb 16, Mar 2	Discussed the jurisdiction of CVDB and its activities with particular focus on assistance and financial support of CVDB and MOMA to the municipalities and JSCs.
Local Agencies and JSCs		
GAM	Feb 16, 18, 24	• Visited Sha'air Transfer Station (T/S), whose facilities and functions will be applied to the new T/S planned by UNDP. • Visited WtE project, using landfill gas at the ex-disposal site. • Visited the landfill gas utilization project assisted by WB and EBRD at Ghabawi Landfill. • Discussed the SWM condition and assistance needs of GAM.
Jerash T/S (proposed site)	Feb 17	Visited the proposed site for Jerash T/S, equipment for which has been requested to JICA by MOMA and UNDP. Also held discussions with the technical staff of Jerash City.
Al Azraq D/S (proposed site)	Feb 25	Visited the proposed site for Al Azraq D/S, whose development has been requested to JICA by MOMA. Visited Al Azraq Municipality and observed its unofficial dump site.
Al Huseyneyat D/S and Mafraq JSC	Feb 28	Visited Al Huseyneyat D/S, whose new disposal cell was requested to JICA by MOMA. Acquired the data of Mafraq JSC.
West Irbid T/S (proposed site) and Irbid JSC	Feb 29	Visited the proposed site for West Irbid T/S, whose development has been requested to JICA by MOMA. Also discussions were held with Irbid JSC were carried out. Visited Togbul T/S, operated by Irbid City.
Al-Kura T/S・and D/S, and Rabiet Al-Kura JSC	Feb 29	Visited Al-Kura T/S, whose equipment has been requested to JICA by MOMA. Visited Al-Kura JSC. Also observed the waste dump beside the T/S.
Aghwar T/S・and D/S and Aghwar Shamaliyah JSC	Feb 29	Visited Aghwar T/S, whose equipment has been requested to JICA by MOMA. Visited Aghwar Shamaliyah JSC. Also observed the waste dump beside the T/S.
Ain Al Basha T/S (proposed site)	Mar 1	Visited the proposed site for Ain Al Basha T/S, whose development has been requested to JICA by MOMA.
Ajloun T/S and Ajloun JSC	Mar 1	Visited Ajloun T/S, whose equipment has been requested to JICA by MOMA. Also held discussions with Ajloun JSC.
Northern UNRWA camps	Mar 3	Visited three UNRWA camps in the north (Jerash, Souf and Husn) and observed the SWM conditions; also acquired information of Irbid and

		Baqa camps.
Al-Duleil D/S and Zarqa JSC	Mar 6	Visited Al-Duleil D/S, whose equipment has been requested to JICA by MOMA. Also discussions held with Zarqa JSC.
Al Badiah Al Shamaliayah D/S and Badiah Shamaliyah JSC	Mar 9	Visited Al Badiah Al Shamaliayah D/S, whose equipment has been requested to JICA by MOMA. Also discussions held with Badiah Shamaliyah JSC.
Al Ekaider D/S and Irbid JSC	Mar 10	Visited Al Ekaider D/S, whose equipment has been requested to JICA by MOMA. Also discussions held with Irbid JSC.
Greater Salt Municipality	Mar 10, 17	Studied the SWM condition in Salt City and visited the Mayor, where the needs for assistance were discussed. The SWM condition in the candidate area of World Heritage was studied on the request of the Mayor.
Greater Ajloun Municipality	Mar 13	Studied the SWM condition in Ajloun City and discussed the needs for assistance.
Greater Zarqa Municipality	Mar 14	Studied the SWM condition in Zarqa City and discussed the needs for assistance. Visited the Ghabawi Zarqa T/S, operated by the private contractor of Zarqa City.
Greater Mafraq Municipality	Mar 15	Studied the SWM conditions in Marfaq City; visited the mayor and discussed the needs for assistance.
Russaifa T/S	Mar 15	Visited Russaifa T/S operated by the Russaifa Municipality. Equipment for this T/S is not in the MOMA's request.
Greater Irbid Municipality	Mar 16	Studied the SWM condition in Irbid City; visited the mayor and discussed the needs for assistance. Visited the Shahinat T/S operated by Irbid City.
Greater Jerash Municipality	Mar 16	Studied the SWM condition in Jerash City and discussed the needs for assistance.
Humra D/S and JSC Balqa Governorate	Mar 17	Visited Humra D/S, whose equipment has been requested to JICA by MOMA. Also held discussions with Balqa JSC.
Za'artari Syrian Refugee Camp	Mar 24	Visited Za'artari Syrian Camp and studied its SWM conditions. Also held discussions with the UNHCR staff managing the camp.
International Agencies		
World Bank (WB/LDK)	Feb 22, 23, Mar 2	Requested information regarding the P5.1, P5.2 and P5.3 in Annex 1 and the planned activities. A list of equipment procured in Emergency Services and Social Resilience Project (ESSRP) was acquired.
UNDP (United Nations Development Programme)	Feb 15, Mar 1	Requested information regarding the P2.1 to P2.6 in Annex 1 and the planned activities.
European Union	Feb 23	Requested information regarding the P3.1, P3.2 and P3.3 in Annex 1 and the planned activities.
EBRD (European Bank for Reconstruction and Development)	Feb 21	Requested information regarding the P6.1 to P6.5 in Annex 1 and the planned activities.
KfW (Kreditanstalt für Wiederaufbau)	Feb 25	Requested information regarding the P10.1 and P10.2 in Annex 1 and the planned activities.
GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit)	Feb 18, 25	Requested information regarding the P7.1 to P7.5 in Annex 1 and the planned activities.
USAID (United States Agency for International Development)	Feb 29, Mar 20	Requested information regarding the P8.1 to P8.7 in Annex 1 and the planned activities. A list of equipment procured in the Community Engagement Program (CEP) for last two years was acquired.
Jordan Competitiveness Program (JCP/USAID)	Mar 2	Requested information regarding the P8.6 and 8.7 in Annex 1.
AFD (Agence Française de Développement)	Feb 23	Requested information regarding the P9.1 in Annex 1 and about the planned activities.
UNRWA	Feb 24, Mar 3	Following the meeting on February 24, visit to three camps in the north area.

* Actions in the "Details" section are those of the survey team (unless otherwise stated)

Chapter 2 General Conditions of SWM of the Country and Issues for Improvement

2.1 National Policies and Plans

2.1.1 Governmental Plans for Short and Medium Terms

In the National Agenda for Sustainable Development (2006-2015), the Jordan government recognized the SWM sector as one of the priority areas and established the following four targets:

1. To improve the financial status, technical capacity and human resources, strengthen the capability of relevant institutions and extend the SWM services.
2. To promote the treatment and disposal of waste for environmental conservation.
3. To minimize waste generation.
4. To maximize environmentally sound reuse and recycling of waste.

Following the National Agenda, the Jordan government issued the Jordan National Vision and Strategy 2025, which declares government policies of different sectors for the coming 10 years. In regard to the environmental sector, the following scenarios and performance indicators of SWM are presented.

Table 2-1. Scenarios and Indicators for SWM from the Jordan National Vision and Strategy 2025

Scenarios	Indicators	2017	2021	2025
・ Safe disposal of solid waste ・ System development of waste reuse and recycling ・ Integrated management of hazardous waste ・ Investment and job creation in SWM sector ・ Private sector participation in SWM sector	Rate of solid waste disposed in landfills (without treatment and reuse/recycling)	80%	75%	60%
	Rate of solid waste treated and reused	20%	25%	40%
	Rate of hazardous industrial waste treated	50%	70%	80%
	Rate of infectious/hazardous medical waste treated	70%	75%	80%

Source: Jordan National Vision and Strategy 2025

As for the first three years of this 10-year planning period, the government also published the Executive Development Plan 2016-2018. It lists a number of projects including the following to respond to the target indicators.

Table 2-2. SWM Projects listed in the Executive Development Plan 2016-2018

Name of Project	Responsible Agency	Total Investment (thousand JD)	Investment during 2016-18	Financial Source
Material and energy recovery at Al Ekaider D/S	MOE	15,000	0	Private
Medical waste project	tbc	10,000	0	Private
Treatment and management of industrial and hazardous waste in Swaqa	tbc	38,000	0	Private
Collection and safe disposal of dry batteries	tbc	0	200	Private
SWM improvement in the Greater Ajloun Municipality	MOE	447	447	General budget
Survey on the Chemical and Hazardous Wastes,	MOE	75	75	General

and the leachate produced from landfills				budget
Efficiency improvement of Solid Waste Recycling	MOE	15	15	General budget
Improved management of waste and landfills	MOE	60	60	General budget
Developing a System for Collection and Management of Computers and Electronic and Electric Wastes	MOE	15	15	General budget

Source: Executive Development Plan 2016-2018

2.1.2 National Solid Waste Management Strategy

(1) Background

The National Solid Waste Management Strategy (NSWMS) was developed in the Regional and Local Development Project (2007-2015)[1] financed by the World Bank and AFD with a Greek company, LDK Consultants, and a Jordanian partner MOSTAQBAL consultants, entrusted by MOMA and CVDB.

(2) Vision

In NSWMS, the Jordan government declares its intention to shift from an old, inefficient, costly and environmentally unstable municipal solid waste management system towards a modern and integrated one that will be based on the 3Rs approach (Reduce, Reuse and Recycle). The hierarchy of integrated SWM is then defined as in the figure below.

Figure 2-1. Municipal SWM Priorities (Hierarchy of Management Practices)

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

(3) Planning Conditions

1) Area of the Plan

[1]The overall objective of RLDP is to improve the financial transfer system from the nation to the local authorities and to optimize the expenditure for public services by the municipalities. The need for a development of the National Solid Waste Management Strategy derived from the observation in the project that a large share of the municipal budget was spent on SWM activities. The total project cost (by WB and AFD) is about US$ 50 million.

The NSWMS divides the country into the following three regions. The underlines show the present survey area.

- **Northern Region**: Irbid, Ajloun, Jerash and Mafraq Governorates
- **Central Region**: Amman (including GAM), Balqa, Madaba and Zarqa Governorates
- **Southern Region**: Karak, Tafilah, Aqaba and Ma'an Governorates

2) Planning Period

The NSWMS has the following three target periods.

- **Short-term period**: 2015 - 2019 (5-years duration)
- **Mid-term period**: 2020 - 2024 (5-years duration)
- **Long-term period**: 2025 - 2034 (10-years duration)

3) Targets of Planning Periods

The following targets were set for each planning period.

- **Short-term actions**: focus on resolving the extreme problems of today and preparatory actions for the next period.
- **Mid-term actions**: supplement the short-term ones and evolve towards set targets for materials or other (e.g. energy) recovery.
- **Long-term actions**: focus on achieving a state-of-the-art level of MSWM and bring Jordan in-line with the European and International state.

(4) Targets and Strategies

The NSWMS shows the quantitative targets for Jordan as below.

Table 2-3. Targets of SWM

	Subject	Targets		
		Short-term (2015-2019)	Mid-term (2020-2024)	Long-term (2025-2034)
1	Catering to the emergency needs for MSWM due to the refugees' influx	✓	✓(if the situation continues)	✓(if the situation continues)
2	Coverage of MSW street-cleansing and collection services		100% by 2024	100%
3	Set-up of separate collection systems for recyclables (at least paper, metal, plastic and glass)			✓ (by 2034)
4	Preparing for re-use and recycling of MSW materials (at least paper, metal, plastic and glass)			50% by weight by 2034
5	Cease operations of uncontrolled or unlicensed disposal sites	50% by 2019	100% by 2024	
6	Reduction of biowaste ending-up at landfills			75% by weight by 2034 (according to 2024 amount)
7	Recovery of packaging waste (including reuse, materials' recovery and energy recovery)			25% by 2034
8	Recycling of packaging waste			15% by 2034

Source: NSWMS

NSWMS further states the following strategies after analysing several management options in order to achieve the aforementioned targets.

1. Expansion of street-cleaning and collection services to the entire country population;
2. Set-up of separate collection system(s) for recyclables;
3. Set-up of separate collection system(s) for biowaste;
4. Upgrade of existing or establishment of new transfer stations;
5. Establishment of "clean" Material Recovery Facilities (MRFs) for pre-segregated recyclables;
6. Establishment of composting units for pre-segregated biowaste;
7. Establishment of Mechanical Biological Treatment (MBT) facilities for mixed MSW, which will consist of a combination of:
   a. "Dirty" MRFs with parallel production of Refuse Derived Fuel (RDF); and
   b. Anaerobic digestion units.
8. Dumpsite Rehabilitation; and
9. Establishment of sanitary landfills (for non-hazardous MSW), including landfill gas utilization where financially viable.

(5) Status of Implementation

1) Implementation, Coordination and Monitoring Organization

In the NSWMS, the establishment of an inter-municipal organization is proposed to coordinate different governmental agencies. Accordingly, there is a Steering Committee for NSWMS chaired by the Minister of MOMA with members from MOEMR, MOE, MOPIC, Ministry of Water and Irrigation and MOMA. Also, a Technical Committee for NSWMS has been established to monitor its implementation status. The Technical Committee is chaired by the head of Local Council Department, MOMA, and consists of members from MOE, MOPIC and MOMA and the representatives of the JSCs.

2) SWM Master Plans

NSWMS addresses several issues for the improvement of SWM in the country (see 2.2.6). One of the issues is the Issue 11 "Studies are required to fulfil the actions/measures". In response to this and to explore the content of NSWMS more practically, the Regional SWM Master Plans will be developed by GIZ for the northern region and by EU for the central region by June 2016. Both plans are under preparation by LDK consultants, who also developed the NSWMS. The EU and AFD are proposing the assistance of 160 million Euro based on the master plans for the northern and central regions.

2.1.3 JRP2016-18 (Jordan Response Plan for the Syria Crisis 2016-2018)

(1) Outline

JRP2016-18 is a program to request international assistance to combat the Syrian refugee crises without compromising the national development of Jordan. In other words, it is a proposal of priority activities to the international community for the betterment of both Syrian refugees and Jordan people, communities and society hosting the refugees. It is a three-year rolling plan, which will be reviewed and updated every year. It was developed to be consistent with the aforementioned Executive Development Plan 2016-2018 and also the Governorate Development plan 2016-2018.

The donors which are going to take part in JRP implementation are requested to register their

assistant programs at Humanitarian Relief Coordination Unit (HRCU) of MOPIC.

(2) SWM Projects in JRP

In the formulation of JRP2016-18, 11 task forces worked on the project development of 11 sectors. There are two projects which deal with SWM issues and are planned in the current survey area. They are outlined below. At present, UNDP is assisting the development of their detailed plans, based on which MOPIC will seek donor assistance.

Table 2-4. Projects related to SWM in the Survey Area Listed in JRP2016-2019

Sector	Pro. #	Objectives	Total Cost
Environment	RES 2.1	Improve integrated management and minimization of medical waste (MW) in a participatory, sustainable and cost effective manner	US$ 2,500,000

Output		Location
1	Existing MW management practices and policies in Jordan assessed, documented with recommendations for immediate and efficient actions	To be determined from Northern area.
2	Capacities for minimization, collection, transfer and treatment technology of MW improved	
3	Local MW management plans and guidelines produced and piloted	

Sector	Pro. #	Objectives	Total Cost
Local Governance and Municipal Service	RES 1.2	Improved service delivery in SWM based on participatory planning, equipment & technological enhancement	US$ 83,394,000

Output		Location
1	Selected needed equipment and containers purchased.	Municipalities of Jarash, Madaba, Al Zarqa, Al Kerak, Sahab, Naoor, Al Jeza, Ain El Basha, Hosban, Om Al Basateen, Al Mowagar, Al Azraq*
2	Capacity building programmes developed and delivered for the following: optimized collection and routing; treatment options› design; operations and maintenance; Joint Services SW management, standards, and legislations.	Irbid,Ramtha, and Mafraq JSC
3	New SW treatment and volume reduction cells at the landfills and treatment plants including: transfer stations; community composting; digesters and recycling plants designed and constructed.	-New sanitary landfill cells at 4 locations: Irbid (33 municipalities using Al Ekaider Landfill), Madaba, Zarqa, and Balqa -New transfer stations including recycling facilities: West Irbid, Mafraq, Balqa, and Ajloun -New Digester units: Irbid, Balqa, and Ajloun -New composting facility including recycling plants: Khaldieh municipality
4	Waste segregation pilots at the household levels in municipalities are introduced	Details unknown.
5	Impact study of SW on other services such as aquifers in the northern governorates conducted	Irbid and Mafraq

Source: JRP2016-2018 and its Annex, Interview with MOMA and UNDP and information from MOMA

* Underlined place names are in the current survey area.

2.2 Current Conditions of SWM and Issues for Improvement

2.2.1 Administrative System of SWM

With many organizations involved, the administration system of SWM in Jordan is complex and certain roles and responsibilities are not clearly defined. However, it may be broadly shared by MOMA and MOE as follows:

- MOMA's SWM administration through either one of its executive arms: the municipalities or the JSCs.[2]
- MOE's environmental management administration (since its establishment in 2003).

The current administrative system of SWM is illustrated in the figure below. MOE formulated a new Environmental Protection Law and is waiting for its enactment. MOE expects that the administration system and roles of concerned organizations will be clear after its enactment.

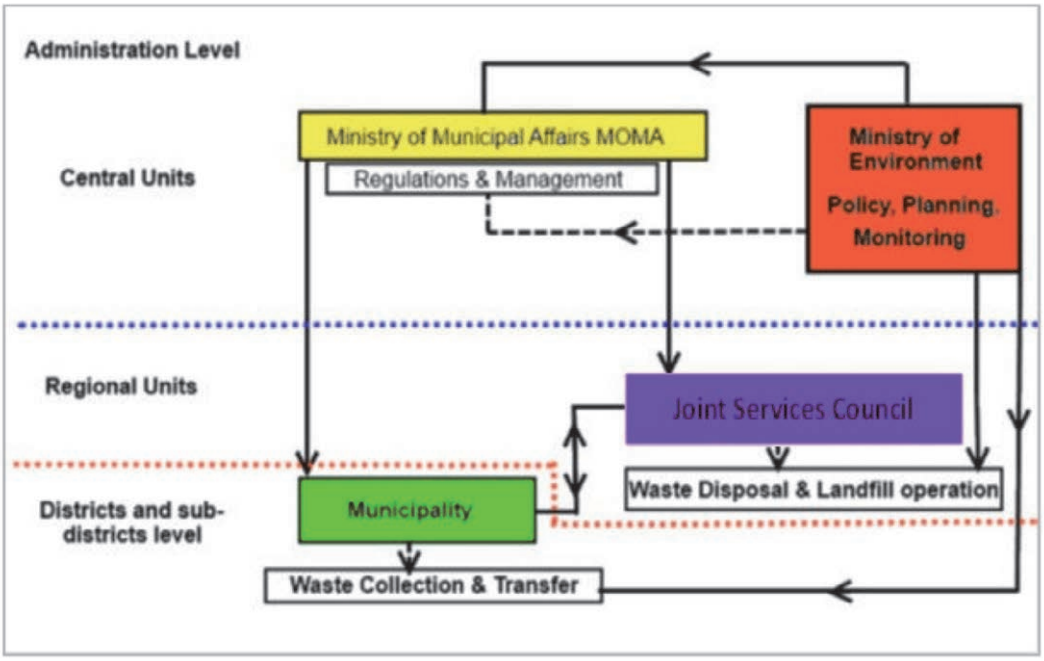


Figure 2-2. Summary of Administrative System of SWM

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

The jurisdiction of organization concerned in SWM is as shown in the table below.

Table 2-5. Jurisdiction on SWM

Organization	Responsible Aspects
MOE	• Sets waste management policy; • Regulates waste management sector; and • Monitors and enforces compliance.

[2] GAM, the Aqaba Special Economic Zone and the Petra Development and Tourism Region are exceptional and not under MOMA.

MOMA	• Supervises municipal functions and service delivery; and • Regulates MSW management
GAM	• Regulates and operates MSW management system in Amman; and • Regulates construction and demolition (C&D) waste permits and final disposal.
Municipality	• Operates MSW management system in a municipality.
JSC	• Operates MSW transfer station and final disposal site
MOH	• Regulates medical waste management
MOA	• Regulates agriculture waste management
MOEMR	• Regulates renewable energy market

Source: Country Report on the Solid Waste Management in Jordan, April 2014, SWEEPNET, GIZ

2.2.2 Legal System

(1) Legal System

The Jordanian legal system is based on legal hierarchy. It is the Parliament that reviews, approves, and produces "Laws". Then the Council of Ministers is sufficient to review and produce "Regulations" stemming from any specific law. Each Ministry may also produce so-called "Instructions" to specify the procedures and mechanisms for the implementation of the laws or regulations.

The legislation of SWM is broadly categorized into that related to MOMA, MOE and other governmental organizations.

(2) Legislation related to MOMA

The legislation related to MOMA is as follows:

- **Municipalities Law No. 41 of 2015**: Sets municipal responsibilities including municipal cleaning, waste collection, and disposal
- **Joint services council regulation No. 75/2009**: Sets the JSCs' responsibility for the construction and operation of landfills/dumpsites.
- **Supplies, Purchases, and Civil Works for Municipalities Regulation No. 70/2009**: Controls all supplies, purchases, and civil works performed by Municipalities as part of MoMA services and daily activities. By this regulation JSCs are obligated to obtain the approval of the Minister of Municipal Affairs for any direct purchase that exceeds JD 300 especially for maintenance and daily activities.
- **Regulation for the Prevention of Health Nuisances No. 8/2014**: Prohibits any person, entity, or activity from causing any nuisance to anybody or from damaging public health. Such nuisances may include bad odours, noise, waste (solid waste, effluents), or any other practice deemed harmful to public health or sanity. It states waste collection fee as well as penalty of violators, etc.

(3) Legislation related to MOE

- **Environment Protection Law No. 52 of 2006**: Sets the direct responsibilities for the Ministry of Environment and overarching principles for environmental protection. At present, revised law is under discussion in the parliament.

- **Solid waste management regulation No. 27 of 2005**: Defines solid and semi-solid materials, to be treated or disposed of, resulting from any activity and not included in the definition of harmful and hazardous waste defined by "Management, Transportation and Handling of Harmful and Hazardous Substances Regulation No. 24/2005". Demands general requirements in terms of manpower, equipment, monitoring, container management, separation of hazardous wastes, documentation, and final treatment or disposal control for every party that generates and/or manages solid waste. According to the hearing from MOE, the regulation has been revised as a Law and is waiting for the discussion in the parliament.
- **Management, Transportation and Handling of Harmful and Hazardous Substances Regulation No. 24/2005**: Defines harmful and hazardous substances and waste. Instructs method of their treatment and disposal.
- **Waste oil handling and management instructions of 2003**: Licensing requirements and documentation for generators, transporters, and treatment of waste oil. Technical requirements for generators, transporters, and treatment of waste oil in terms of storage, spill management, emergency, fuel specs, etc.
- **Hazardous waste handling and management instructions of 2003**: Licensing requirements and documentation for generators, transporters, and treatment/disposal of hazardous waste. Technical requirements of hazardous waste for central storage, wrapping, transport, treatment, disposal, emergency, empty containers, etc.
- **Organic compost (animal and plant origin) storage, production, trading, and use instructions of 2009**: Licensing requirements for compost plants and trading. Technical requirements including location for composting, storage, processing, etc.

(4) Legislation related to organizations other than MOMA and MOE

- **Medical waste management instructions No. 1/2001**: Sets the technical definitions and classification for medical waste, technical requirements for segregation, central storage, transport, and treatment/disposal technologies.
- **Nuisance prevention and waste collection fees for the Greater Amman Municipality No. 83 of 2009**: Sets the different types of nuisances and municipal control measures, including the municipal responsibilities for waste collection, transport, treatment, and disposal, and the attached fee system.
- **Buildings and zoning regulation in the City of Amman No. 67 of 1979 and amendments (latest No. 21 of 2005)**: Sets permit requirements for excavations and renovations to control illegal dumping of construction and demolition waste.
- **Agriculture Law No. 44/2002 and amendment No. 22/2005**: Sets the mandate for agriculture waste management.
- **Renewable Energy and Energy Efficiency Law No. 13 of 2012**: Promotes development of renewable energy projects including Waste to Energy (WtE) projects which include landfill gas and bio-gas utilization.

2.2.3 Current Technical System

(1) Municipal Solid Waste (MSW)

For the formulation of the NSWMS, the current municipal solid waste management (MSWM) was

analyzed using a wide variety of data and set as a baseline profile of 20-year strategy. Since this baseline profile set by the NSWMS is considered as the most appropriate information to describe the current MSWM system, some key data are extracted from the NSWMS as below.

1) Generation and Discharge

The NSWMS sets MSW generation as shown in the table below. According to the table, total MSW generation of the country is 2.7 million tons per year.

Table 2-6. MSW Generation

Items	Quantity
Population (2014)	6,675,279
• Urban Population	82.6 %
• Rural Population	17.4 %
Refugees (2014)	990,790
• Registered Population Refugees in UNRWA Camps	36.8 %
• Non-Palestinian Refugees registered with UNHCR	63.2 %
Seasonal Population(Lodgers per Year in 2011)	3,685,348
Per Capita MSW Generation	
• Urban Area (Residential in 2015)	1.01 kg/person/day
• Rural Area (Residential in 2015)	0.88 kg/ person/day
• Refugees (in camps of ›5,000 refugees)	0.64 kg/ person/day
• Refugees (in camps of ‹5,000 refugees)	0.52 kg/ person/day
• Tourists	1.20 kg/ person/day
MSW Generation (2014)	2,655,977 tons/year

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

Waste composition is set as shown in the table below according to the urban population rate in the governorate.

Table 2-7. Waste Composition of MSW

Urban/Total Population / Material	0%-50%	50%-75%	75%-100%
Biowaste	65%	57%	50%
Paper & cardboard	9%	13%	15%
Plastics	9%	13%	15%
Metals	2%	3%	4%
Glass	2%	3%	4%
Cloth	3%	1%	1%
Wood & yard waste	5%	2%	1%
Others	5%	8%	10%
Application to Governorates	Mafraq, Karak	Jerash, Madaba, Balqa, Ma'an, Tafilah	Amman, Irbid, Ajloun, Zarqa, Aqaba

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

2) Collection and Transportation

Municipal solid waste is collected by each municipality. Most municipalities collect MSW from 1.1 m3 public containers installed in every corner of the municipality. The municipalities collect waste several times per week and, in the core urban area, several times per day. After collected, waste is brought to a transfer station in some municipalities and further transported to the disposal sites. Although some of the greater municipalities operate their transfer stations, other T/Ss are operated by JSC.

The NSWMS sets the current practice of MSWM from collection to final disposal as shown in the table below and estimates the collection coverage rate at 90 %.

Table 2-8. Current MSWM (2014)

Items	Quantity
Collection Coverage Rate of MSW	
• Urban Area	90 %
• Rural Urea	70 %
Separation of Recyclables at Generation	‹ 1%
Final Destination of MSW	
• Composted	0.0 %
• Digested	0.2 %
• Recycled	7.0 %
• Incinerated	0.0 %
• Landfilled	53.0 %
• Openly Dumped	39.8 %

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

3) Treatment and Recycling

As shown in Table 2-8, the treatment and recycling rates are 0.2 % and 7.0% respectively. Most of the recycling activities are conducted informally by waste pickers.

The NSWMS shows the number of current treatment, recycling and disposal facilities in the table below.

Table 2-9. Current Treatment, Recycling and Disposal Facilities (2014)

Items	Operational	Under Construction	Planned
Transfer Stations	14	-	1
“Clean” MRFs (waste separated at generation)	1	-	1
“Dirty” MRFs (waste not separated at generation)	0	1	-
Anaerobic Digestion Plants	1	-	-
Sanitary Landfill	1	-	-
Dumpsites	17	-	-

Source: Development of a National Strategy to improve the Municipal Solid Waste Management Sector in the Hashemite Kingdom of Jordan

4) Final Disposal

As shown in Table 2-9, there are 18 final disposal sites as of 2014. Except for one sanitary landfill (Ghabawi Disposal Site operated by GAM), all 17 are dumpsites and operated by the JSC of each area.

(2) Solid Waste other than MSW

Solid waste other than MSW is essentially managed based on the principle that the discharger is responsible. However, since most of the municipalities apply the public container collection system as described above a lot of solid waste other than MSW are collected and disposed of together with MSW.

There are a lot of livestock farms in the rural areas like Mafraq Governorate, etc. The treatment and disposal of dead animals is one of the most critical issues in MSWM. According to the interview study at MOE, the monitoring of treatment and disposal of dead animals are the responsible matters of MOA, but it may not be well managed. As for medical waste, its management in medical institutions is the responsibility of the MOH and the management of medical waste once discharged from medical institutions is the responsibility of MOE. According to the interview at MOE, there are some cases where infectious medical waste is discharged together with general waste. Major hospitals and Clean City Co., Ltd have incinerators for medical waste incineration. Some medical waste is transported and disposed of at the Swaqa hazardous waste disposal site.

The management of hazardous waste employs a manifest system. It is disposed of at Swaqa hazardous waste disposal site. The facility is operated by MOE. Waste is, however, simply dumped without any treatment.

2.2.4 Finance

(1) Municipality

Main services conducted by municipalities are waste collection and road sweeping, and the expenditure for the services accounts for more than 20% of the total expenditure of municipalities. Some of the greater municipalities operate transfer stations. In addition, GAM operates a landfill.

The municipalities collect waste collection fee as a financial source for waste collection and road sweeping services. The municipality that operates a transfer station and/or a disposal site, it sets the tipping fee for the use of the facility. Total incomes from waste management services, however, could cover only a small part of SWM expenditures. Most of its expenditure, therefore, is covered by general municipal budget.

(2) JSC

JSCs operate transfer stations and final disposal sites under the control of MOMA in accordance with the “Joint services council regulation No. 75/2009”. The Department of Local Councils of MOMA is responsible for the support and control of JSCs.

JSCs set and collect tipping fees from the municipalities and private companies for the use of transfer stations and the disposal sites operated by them. In addition, JSCs collect permission fees for the collection of recyclables at the transfer stations and the disposal sites from waste pickers and

private companies that organize them. The amount of fees collected, however, is small. Consequently, facility operation largely depends on the budget allocated by MOMA. Total amount of budget allocated by MOMA to all the JSCs in 2015 was JD 10 million.

2.2.5 EIA System

As mentioned above the revised Environment Protection Law is under discussion by the parliament and after its enactment, MOE will revise the regulations and instructions under the current law including the regulation of EIA. The current Environmental Impact Assessment Regulations of 2005 (By-law No.37 of 2005) consists of 21 Articles and 5 Annexes.

Projects are divided into the ones that require the environmental permit and the others that do not. The projects requiring the environmental permit includes those specified in Annex 2 or Annex 3 and the projects which are considered by MOE to possibly have significant impacts due to the nature of the project and/or their location. In order to receive the environmental permit an Environmental Impact Assessment (EIA) or an Initial Environmental Evaluation (IEE) shall be conducted. Projects listed in Annex 2 require EIA and those in Annex 3 require IEE.

According to a MOE officer in charge of EIA, although EIA is not clearly required for the project of disposal site construction, MOE will ask for EIA. As for the transfer station, MOE will decide EIA or IEE based on the location and size of the facility. In the case of construction of new cells within the existing disposal site, neither EIA nor IEE is required.

2.2.6 Issues for Improvement in SWM Sector

As shown in the NSWMS, the issues of SWM sector in the country are as follows:

Issue 1. Serving the emergency MSWM needs of Jordanian societies due to the refugees' influx from the neighbouring countries.
Issue 2. Provision of MSWM services to the entire (100%) permanent and temporary population of Jordan.
Issue 3. Improvement of MSWM in local, regional and national levels
Issue 4. Avoidance of co-management of MSW with hazardous or special streams currently ending up in the city containers
Issue 5. Mitigation of informal waste-picking of MSW through integration of informal sector into the MSWM system
Issue 6. Improvement of cost recovery of the MSWM system in Jordan, including the establishment of partnerships between the public and the private sectors
Issue 7. Improvement of the institutional set-up of local, regional and national authorities in relation with MSWM
Issue 8. Motivation of the public to participate in safe MSWM practices by increasing public awareness and education in MSWM related issues
Issue 9. Improvement of monitoring mechanisms for MSWM in terms of operational and environmental performance
Issue 10. Updating the MSWM related legislative framework in Jordan
Issue 11. Required studies to fulfil the actions/measures

2.2.7 Assistance Projects by Donors

(1) Project Outline

Assistant projects by donor agencies are summarized in Annex 1.

(2) Assistance Projects by Subject

1) Assistance for Policies and Up-stream Plans

a. Formulation and Promotion of Jordan Response Plan

JRP, explained in Section 2.1.3, was formulated as an output of coordination among the Jordan government, agencies under the United Nations, other donor agencies and NGOs at the Jordan Response Platform for Syria Crisis (JRPSC), established by MOPIC in 2014. The Secretariat of JRPSC which gives operational support for JRPSC is financially assisted by UNDP, UNWOMEN, UNFPA, OCHA, UNICEF, UNESCO, ILO, UN RC/HC Office, UNOPS and WHO.

According to UNDP, which assists MOE, responsible for the environment sector of JRP, a study to investigate the status of medical waste management and to prepare a detailed plan of the medical waste project (Environment RES 2.1) will be complete at the end of March 2016. Based on this detailed plan, MOPIC will invite an assistance proposal from donors. JRP has another medical waste project (Environment RES 2.2) that aims at the improvement of Swaqa hazardous waste disposal site (outside of the current survey area, in a desert area near the border of Amman and Maa'n Governorates) and it will be possible, depending on the strategy of the donor, to carry out both projects together.

The SWM project of the local governance and municipal service sector (RES 1.2) already has its specific plan developed by UNDP and is seeking donor assistance.

b. Formulation of NSWMS

As mentioned earlier, the NSWMS was developed in the Regional and Local Development Project funded by WB and AFD.

The NSWMS shows short-term, medium-term and long-term plans for the north, south and central regions, but those are still no more than a concept. For its materialization, the master plan of the central region has been developed with EU's finance (due the end of April 2016) and that of the north region by GIZ funding (due June 2016). With these regional plans, project plans such as location and necessary investment scales will become apparent.

AFD has a plan to send (an) expert(s) to MOMA from June 2016 for NSWMS facilitation and personnel selection is to take place.

EU's consultant has been carrying out a study to specify EU's financial contribution to NSWMS implementation until April 2016. The assistance will range from 40 to 60 million Euro at the time of the interview. According to the document prepared by EU and AFD dated on March 15, 2016, 160 million Euro of assistance (100 million grant by EU and 60 million loan by AFD) has been proposed for a package of such components as budget support, infrastructure development, equipment procurement, capacity development and support for waste pickers.

c. Development of National SWM Database

This is the assistance by European Environment Agency to MOE and MOPIC's Department of Statistics. According to the project paper[3], waste will be defined and categorized with codes, and the registration of SWM facilities and SWM information sharing will become available on the internet. Data publication on the internet was planned to be at Jordan Environmental Information System (http://www.jeis.gov.jo/) in December 2015, but it is still under construction.

d. Preparation of By-Law of Waste Electric and Electronic Waste Management

This is the assistance by UNDP to MOE. The By-Law is under the review and UNDP expects its issuance in April 2016.

2) Assistance for Regional SWM Projects

As mentioned earlier, the NSWMS was developed in the WB's Regional and Local Development Project, and prior to its development, a base line study was carried out to understand the overall condition of SWM of the whole country. Aiming at the capacity development of the municipalities, training programs were provided for various municipal affairs including SWM. Equipment for SWM was also procured for some municipalities.

The next assistance from the WB, Emergency Services and Social Resilience Project, was grant assistance for the municipalities seriously influenced by the Syrian refugee influx in order to strengthen their capacity of service provision. It is also financially supported by the governments of the UK, Netherlands, Sweden and Denmark. Based on the proposals from the municipalities, such projects as road development, drainage improvement, and the construction of community halls and IT centers have been carried out. Some projects are for SWM improvement by technical and equipment support. It has supported 20 municipalities in total during these three years with 2016 being the last year, and it may be extended another year according to the person in charge at WB.

Jordan Competitive Program, financed by USAID, aims at investment promotion, job creation and export promotion. As part of its programs, it has been assisting the SWM expert training program operated by Jordan Green Building Council. Adapting the training program developed by ISWA (International Solid Waste Association), the council is to be a Center of Excellence in the country for SWM experts. The trainees are from the governmental organizations and the private sectors.

USAID is also planning to carry out so called Municipalities Support Project (CITIES), where SWM improvement will be one of the components of activities.

3) Assistance for GAM

WB's Amman Solid Waste Management and Carbon Finance (2008-2014) aimed at the improvement of SWM in GAM. Its achievements include the construction of sanitary landfill cells at Ghabawi disposal site and the development of a monitoring and evaluation system. It also planned to carry out landfill gas collection and power generation, but only the gas collection facility was completed within the project period.

The power generation component has been taken over by EBRD's GAM Solid Waste Project (2015-), although the power generation facility is not yet installed.

[3] European Environment Agency, InSEIS Jordan Technical Assistance action 2 (TA2), Development of a waste management information system with integrated possibilities for adjusting it to a specific IT-supported system corresponding to the country's needs, Mission Report, April. 2015

GAM itself has been calling for bids of Design-Build-Operate-Transfer (DBOT) on material and/or energy recovery since March 2015. The contract is expected to be concluded in April 2016. The content of the project is subject to the project proposal, which may include such activities as the recovery of valuable items from waste, production of Refuse Derived Fuel (RDF) and/or methane gas generation. USAID assisted GAM with the preparation of tender documents and EBRD intends to financially support the awarded company to run the project.

EBRD also has a plan to renovate GAM's Shaair transfer station using its loan (US$ 5-15 million) and EU's grant (US$ 5 million).

KfW committed in 2014 to provide EUR 25 million of loans and EUR 2 million of grants for SWM in GAM. The project will include such activities as collection and transfer system improvement, introduction of intermediate treatment (composting, material recovery, RDF, etc.) and/or training, and KfW's consultant team started a study to define the project scope.

4) Assistance for Irbid Governorate

a. SWM in General

UNDP's project, Mitigating the Impact of the Syrian Refugee Crisis on Jordanian Vulnerable Host Communities (2013-2015), was carried out in Irbid and Mafraq Governorates. It aimed to produce five outputs, one of which was to improve the delivery of municipal and social services including waste management. In this light, the Japanese government provided financial assistance and provided waste collection vehicles. The project also carried out Solid Waste Value Chain Analysis (2015) and proposed some approaches towards material recycling.

EU developed SWM master plans for the Greater Irbid Municipality and the Ramtha Municipality in 2014. Based on those plans, GIZ has been carrying out Support to solid waste management in Jordanian communities hosting Syrian refugees (2015-2017) with finance from EU and providing training to the two municipal personnel in such subjects as SWM in general, budgeting and plan formulation.

GIZ has also been implementing "Support to solid waste management in refugee hosting communities (2014-2017)" with finance from BMZ. It mainly places focus on the improvement of operation and maintenance functions of waste collection vehicle depo, optimization of collection routes and collection points and facilitation of communication between the communities and the waste collection authority.

Further, GIZ started "Waste to Positive Energy Project" financed by BMZ, aiming at job creation in the SWM sector in the West Irbid Municipality. The project will be extended to the Ramtha Municipality.

USAID funded Jordan Competitiveness Program commenced a study in February 2016 in the Greater Irbid Municipality for investment promotion in SWM. It will identify potential businesses for investment that will be put out to tender by the municipality and EBRD expects investment opportunity from the study.

In the Community Engagement Project of USAID, waste collection vehicles were provided to some of the municipalities in Irbid Governorates.

b. Assistance for Al Ekaider D/S

EU carried out a feasibility study in 2012 for the comprehensive rehabilitation of Al Ekaider D/S. Its rehabilitation plan, requiring about as much as EUR 50 million in total, has not been implemented. As emergency rehabilitation, as explained later, does not practically solve the problem, the F/S is under review with a concept of WtE to respond to the request from the Jordan government. On the completion of the updated F/S, EU considers providing EUR 20 million of grants, expecting finance contribution from other donors.

USAID developed an emergency rehabilitation plan for Al Ekaider D/S in its Water Resources and Environmental Conservation Project. Based on this plan, one disposal cell is going to be constructed as part of GIZ's project "Support to solid waste management in Jordanian communities hosting Syrian refugees (2015-2017)" and another cell by UNDP's "Improving Solid Waste Management and Income Creation in Host Communities- Rehabilitation of Alakedir Landfill (2014-2017)", which also includes the development of buildings and capacity building for Irbid JSC.

5) Assistance for Mafraq Governorate

As mentioned earlier, UNDP's project, Mitigating the impact of the Syrian refugee crisis on Jordanian vulnerable host communities (2013-2015), was carried out in Irbid and Mafraq Governorates. It aimed to produce five outputs, one of which was to improve the delivery of municipal and social services including waste management. In this light, the Japanese government provided financial assistance and provided waste collection vehicles. The project also carried out Solid Waste Value Chain Analysis (2015) and proposed some approaches towards material recycling.

EU developed a SWM master plan for Greater Mafraq Municipality in 2014. Based on those plans, GIZ has been carrying out Support to solid waste management in Jordanian communities hosting Syrian refugees (2015-2017) with finance from EU. Not only in the Greater Irbid Municipality and in the Ramtha Municipality as mentioned earlier, but also in the Greater Mafraq Municipality the project provides training to the two municipal personnel in such subjects as SWM in general, budgeting and plan formulation. GIZ will also procure a landfill compactor for Marfaq.

GIZ has also been implementing "Support to solid waste management in refugee hosting communities (2014-2017)" with finance from BMZ. The activities which were started in the Greater Irbid Municipality will be expanded to the Greater Mafraq Municipality.

Further, GIZ started "Waste to Positive Energy Project" financed by BMZ, aiming at job creation in the SWM sector in the West Irbid Municipality. The project will be extended to the Greater Mafraq Municipality.

In the Community Engagement Project of USAID, waste collection vehicles were provided to some of the municipalities in Mafraq Governorates.

6) Assistance for Zarqa Governorate

EBRD plans to carry out Solid Waste Management Project in the Greater Zarqa Municipality. Its content is under discussion with relevant parties.

7) Assistance for Jerash Governorate

The aforementioned project "Improving Solid Waste Management and Income Creation in Host Communities- Rehabilitation of Alakedir Landfill (2014-2017)" of UNDP has a component to develop Jerash transfer station and a tender for its EIA study is going to be put out. As the finance for the transfer station seems insufficient, other donor's contribution is expected.

8) Assistance for Ajloun and Balqa Governorates

Under the RLDP and ESSRP of WB, some municipalities were provided with SWM equipment.

9) Other Assistance Plans

USAID is examining the content of a new SWM project, which is expected to start in spring 2017.

KfW was committed in December 2015 to EUR 15 million of grant and its consultant team is carrying out a study to define the project scope.

Chapter 3 Current Condition of SWM and Issues for Improvement in the Survey Area

3.1 Discussion with MOMA

3.1.1 Amendment of the List of Request

MOMA made a request to JICA for grant aid assistance in the form of a list of facilities and equipment needed for SWM in August 2015. The survey team has discussed the points below with MOMA with the aim to examine its content and adequacy.

1. The list did not state where the facilities would be implemented and where the equipment would be sent. The team asked for the information of their location at the first meeting on February 14.
2. The revised list was submitted on February 21, which included the location information. It was found that the destination of facilities and equipment was country wide including not only the survey area but also other areas. The revised list also included the construction of final disposal sites at a cost of about US$ 25 million, which was not in the list of August 2015.
3. In the second meeting on February 23, the team requested i) to exclude any items for the municipalities or JSCs outside of the survey area, and ii) to specify the items requested for the Japanese embassy, because it was too late for JICA to disburse its budget of FY 2015. However, the Japanese embassy could respond urgently to the request.
4. MOMA excluded the items for the area outside of the survey area and submitted the new list on March 14. The list also included snow removal dozers and trucks with salt spreaders to maintain waste management operation during the snowy season. The total estimated cost of the revised list including the cost of construction of transfer stations and their equipment was US$ 66,626,649. The list is shown in Annex 2. MOMA stated that the list does not include the request for the Japanese embassy (Annex 3), which had already been submitted through MOPIC.
5. The team recognized that the list was finally completed and received it.

3.1.2 Priorities of MOMA

The survey team paid a courtesy call to the Minister of MOMA on March 21. The following expectations were addressed by the Minister to JICA.

- Financial assistance: This is the assistance to overcome the financial shortage for the promotion of NSWMS. Specifically, assistance for the facilities and equipment is anticipated. The priority should be given to i) development of transfer stations and ii) improvement and new development of final disposal sites.
- Assistance for soft components: This is the assistance for the training to strengthen the SWM capacity of municipalities and to raise the awareness of citizens.

- The south part of the county does not receive much assistance from donor agencies, although it has also received refugees. The conditions of the disposal sites of Karak (in the south) and Madaba (in the central area) are particularly serious and strongly require assistance for improvement.

3.2 Field Survey

3.2.1 Planning of the Survey

(1) Survey Planning Policy

In the survey area, there are a large number of organizations and facilities subject to the survey including the municipalities, JSCs, disposal sites, transfer stations, and the refugee camps, although the field survey period is limited. Therefore, the field survey schedule was planned according to the following policies:

1. To understand the current conditions of SWM in the survey area as holistically as possible.
2. To collect enough information from the field survey to draw a flow of waste from all the 63 municipalities.
3. To study all the facilities for waste treatment and/or disposal excluding those used exclusively by small municipalities.
4. To understand the background and adequacy of the list of equipment and facilities requested by MOMA to JICA.
5. To study UNRWA camps in the survey area, as UNRWA approached JICA for the assistance of SWM equipment to be used in their Palestine camps.
6. To study SWM conditions of the Syrian camps by visiting a typical one.

(2) Selection of the Organizations and Facilities to be Visited

Based on the abovementioned polices, the following organizations and facilities were included in the survey plan.

Table 3-1. Organizations and Facilities to be Visited

Categories	Organizations and Facilities	
Municipalities (those called "Greater Municipalities)	1. GAM 2. Irbid City 3. Mafraq City 4. Ajloun City 5. Zarqa City 6. Salt City 7 Jerash City	
JSC	1. Irbid JSC 2. Aghwar Shamaliyah JSC 3. Rabiet Al-Kura JSC 4. Mafreq JSC 5. Badiah Shamaliyah JSC 6. Ajloun JSC 7. Zarqa JSC 8. Balqa JSC	
SWM Facilities	Operator	Facilities

(including proposed sites for new facilities)	GAM	1. Sha'air T/S 2. Ghabawi existing sanitary landfill 3. Russaifa ex-D/S, Landfill gas power generation facility
	Irbid City	1. Togbul T/S 2. Shahinat T/S
	Irbid Jerash JSC	1. Al Ekaider existing D/S 2. Jerash T/S (planned site)
	Aghwar Shamaliyah JSC	1. Aghwar Shamaliyah T/S 2. Aghwar Shamaliyah existing D/S
	Rabiet Al-Kura JSC	1. Rabiet Al-Kura T/S 2. Rabiet Al-Kura existing D/S
	Mafreq JSC	1. Al Huseyneyat existing D/S
	Badiah Shamaliyah JSC	1. Al Badiah Al Shamaliyah existing D/S
	Ajloun JSC	1. Ajloun T/S
	Zarqa JSC	1. Al Dulail eixisting D/S 2. Al Azraq new D/S (planned site)
	Zarqa City	1. Zarqa T/S
	Russaifa Municipality	1. Russaifa T/S
	Azraq Municipality	1. Azraq D/S
	Balqa JSC	1. Humra existing D/S 2. Ain Al Basha T/S (planned site)
Refugee Camps	Type of Camp	Name of Camp
	UNRWA Palestine Camps	1. Jerash Palestine Camp 2. Souf Palestine Camp 3. Husn Palestine Camp
	UNHCR Syrian Camps	1. Za'atari Syrian Camp

3.2.2 Result of the Field Survey

(1) SWM by GAM

The condition of SWM of GAM was studied through the field visit, interviews with the city officers and document review. It is summarized in Table 3-2. The following should be noted in considering assistance for GAM.

- The previous assistance by Japan to GAM, such as equipment procurement for the landfill, is highly valued.
- GAM operates its waste collection service using 270 collection vehicles and 3,632 workers. Its SWM service revenue amounts to JD 1.67 million (e.g. waste collection fee, licence fee, etc.).
- It has WtE facility at ex-disposal site. Its present landfill is the only sanitary landfill in the country and GAM also facilitates the large scale WtE project with the assistance of WB and EBRD.
- Its Shaair T/S is planned to be improved by EU's grant at US$ 5 million and EBRD's loan at US$ 5-15 million.
- KfW is committed to provide 25 million in Euro loan (at 2-2.5 % interest) and 2 million in Euro grant for GAM in 2014. The detailed component of the assistance (location and

activities, necessity of EIA studied, marketability of RDF, etc.) is under investigation by a consultant from March 2016.

- GAM mobilized a fund from a commercial bank to procure waste vehicles to respond to the population increase.
- GAM expects JICA not only to procure the facility and equipment but also to carry out other activities such as waste collection improvement, staff training and public awareness raising.

(2) SWM by Municipalities other than GAM

The team studied SWM conditions of six cities selected from 62 municipalities excluding GAM. Those are the cities regarded as a governorate center. The result of the survey is summarized in Table together with that of GAM. The details of the survey output are presented in Annex 4.

Table 3-2. SWM by Seven Cities

Note: Number of population in italic is provided by MOMA and UNHCR (2014)

Name of Municipality Items	1. Greater Amman Municipality (GAM)	2. Greater Irbid Municipality (GIM)	3. Greater Mafraq Municipality (GMM)	4. Greater Ajloun Municipality (GAjM)	5. Greater Zarqa Municipality (GZM)	6. Greater Salt Municipality (GSM)	7. Greater Jerash Municipality (GJM)
General							
G1. Population	*2,528,500*	523,352 (*525,823*)	*73,751*	*52,706*	*514,649*	*128,987*	*76,110*
G2. Population of Registered Syrian Refugees	*142,360*	98,700 (*80,710*)	*32,579*	*4,049*	*18,557*	*5,341*	*3,897*
G3. Number of Departments:	18	16	18	6	25	8	18
G4. Number of staff:	18,000	3,884	568	375	4,500	800	1,200
G5. Name of Responsible Department of MSWM:	Waste Operation Department	Health and Environmental Affairs Department	Health and Environmental Affairs Department	Health Section, Dept. of Environment and Gardening	No specific department. 11 districts provide services	Cleansing Division of Service Department	General Service Department
G6. Number of staff of Responsible Department for MSWM:	5,735	1,045	272	90 Parmanent + Temporary	1,165	208	300
G7. Annual Revenue of Municipality (Thous. JD):	360,000	39,600	4,065	3,247 (2014)	30,000 (2015)	NA	13,000 (Planned budget 2015) 5,500 (actual revenue 2015)
G9. Annual Expenditure of Municipality (Thous. JD):	408,000	31,200	3,939	3,335 (2014)		NA	
G10. Annual Budget of MSWM Dept (Thous. JD):	27,303	2,500	208 (revenue =waste collectionfee)	427	9,691	NA	8,000
G11. Annual Expenditure of MSWM Dept (Thous. JD):	27,303	5,152	1,647	427	8,000	NA	3,000
G12. Existence of MSWM Master Plan and Its Year of Development:	Yes, 2012	Yes, 2014	Yes, 2014	No	Yes, 2014	No	No
MSWM							
M1. Generation	2,448 ton/day (3,000 ton/day in 2030)	376 ton/day (506 ton/day in 2034)	90 ton/day (118 ton/day in 2034)	105 ton/day (2014)	400 ton/day	200 ton/day	110 ton/day
M2. Discharge and Storage System	1.1 m^3 Public Container	1.1 m^3 Public Container	1.1 m^3 Public Container	1.1 m^3 Public Container	1.1 m^3 Public Container	1.1 m^3 Public Container (for accessible area)	1.1 m^3 Public Container
M3. Waste Collection System	- Collection coverage: 90% - Separate collection is not introduced - Collection frequency: 2 or 3 times a day for primary streets and commercial centers, and Every two days for agricultural and remote area - 3 shift service: A= 6:30 to 14:30 (75-80% of services); B=14:30 to 22:30 (10-20% of service commercial areas in all dustricts); and C=22:30 to 6:30 (5-10% of service) - 270 units in total (143 compactor trucks) - 1,971 collection workers including drivers	- Collection coverage: 100% (area wise) - Separate collection is not introduced. - Compactor truck (8-12t): 29; Compactor truck (12t): 15; Tipper: 5; Skip loader: 3 with 43 container (4m3); Open truck: 10; Small dump truck: 14; M-workshop: 1; Trailer truck (for TS): 3 units + 4 containers (50m3) - 161 collection workers	- Service coverage is considered to be low - Separate collection is not introduced -Central: Once a day, Suburbs: 3 times a day - Compactor truck: 13; M-workshop: 1; Tipper: 6; Wheel loader: 4; Pickup truck: 3 - 36 collection workers	- 100% collection in urban area - No separate collection	- Service coverage rate: not known. - Service is provided 1 to 3 times/day, - 610 workers	- Service coverage: more than 95% - service frequency: Once a day - Door to door collection using donkeys in the steep area - 24 compactor trucks, and 11 small dump trucks - 147 workers (including street sweepers)	- 100% is covered (area base) - No separate collection - Downtown: 3 times/day, Other area: Once/day - 250 workers (including street sweepers)

Name of Municipality Items	1. Greater Amman Municipality (GAM)	2. Greater Irbid Municipality (GIM)	3. Greater Mafraq Municipality (GMM)	4. Greater Ajloun Municipality (GAjM)	5. Greater Zarqa Municipality (GZM)	6. Greater Salt Municipality (GSM)	7. Greater Jerash Municipality (GJM)
M4. Waste Transfer System	- Al Sha'air TS - Mechanical transfer system and direct loading system - Operation by transferring Station division - 2,356 ton/day of transferred waste in 2014 - 99 workers - 8 units of 50m3 trailer truck, 9 unit of 30m3 open type trailer trucks, 35 m3 closed type container -roll on roll off trucks	- Operates 2 TS (Togbul and Al Shahinat) - Mechanical transfer system (Al Shahinat TS's hopper has not been functional) - Operation by TS Section of Vehicles Dept. - 18 workers	- GMM transports the waste colllected to Al Husaineyat DS directly.	- Transport the waste to Ajloun TS operated by JSC	- Collected waste is mostly transferred at Zarqa TS and transported to Ghabawi DS - Direct loading of the waste by using wheel loader - TS is operated by contractor - Compaction device of TS is not working. - No facility to prevent waste from scattering by wind.	Direct haulage to Al Humra DS	All the waste colleted is transported directly to Al Ekaider DS.
M5. Vehicle Maintenance:	- 1 workshop at TS - Mobile workshop: 1 units - 61 engineers	- 1 workshop - Operation through workshops and the Maintenance Section of Vehicles Department - 59 workers	- 1 municipal workshop - Operated by the Maintenance and Repair Dept.	- No workshop	- 1 municipal workshop - 200~250 workers	- 1 municipal workshop - 17 mechanics - 200,000 JD/year	- 1 municipal workshop - 29 workers
M6. Street Sweeping and Public Area Cleaning System	- Manual and mechanical sweeping - 3,186 sweepers - Primary street	- Manual and mechanical sweeping - Only one sweeping vehicle but damaged - 736 sweepers	- Manual sweeping - 119 sweepers	- Manual sweeping - No sweeping machine	- Manual sweeping - 300 sweepers	- Manual sweeping - All roads are cleaned by two sifts (day and night) - 90 sweepers	- Manual sweeping - 250 workers
M7. Waste Treatment System	- One MRF but not operated	None	None	None	None	None	None
M8.Final Disposal System	- Ghabawi disposal site - Sanitary landfill - 3,000 ton/day - Operated by Waste Operation Dept. - 22 landfill equipment and 2 internal road maintenance equipment - 72 workers	- Al Ekaider DS operated by Irbid JSC - Tipping fee is 120,000JD/year, but GIM does not pay, because half of the land of Al Ekaider DS (around 50 ha) is owned by GIM.	- Al Husaineyat DS operated by Mafraq JSC - 90 ton/day - Tipping fee is 1,000JD/year but GMM does not pay.	- Al Ekaider DS operated by JSC	- Ghabawi D/S operated by GAM - tipping fee is 2.0 JD/ton	- Al Humra DS operated by Balqa JSC - GSM does not pay tipping fee	- Al Ekaider DS operated by JSC - Tipping fee is 12,000 JD/year but not paid
M9. Waste Collection Fee	- 20 JD/electricity meter/year + 0.005JD/KWh (for >200 KWh per month) - Business: 24 JD/electricity meter/year + additional fee (10 to 1,500 JD/year depending on the contract)	- 24 JD/electricity meter/year, - Business: 24JD/Electricity meter/year + additional fee (10 - 1,500JD depending on contract)	- Collected amount of waste collection fee is 207,278JD/year	- Household: 24JD/electricity meter/year - Business: 40 to 80 JD/electricity meter/year	- Household: 2JD/electricity meter/year - Business: minimum 2 JD/electricity meter/month	NA	- Household: 2 JD/electricity meter/month - Business: 5 JD/electricity meter/month

Name of Municipality Items	1. Greater Amman Municipality (GAM)	2. Greater Irbid Municipality (GIM)	3. Greater Mafraq Municipality (GMM)	4. Greater Ajloun Municipality (GAjM)	5. Greater Zarqa Municipality (GZM)	6. Greater Salt Municipality (GSM)	7. Greater Jerash Municipality (GJM)
M10. Main Issues	- Awareness of users regarding SWM is very low - Maintenence capacity of landfill equipment is weak - Capacity of existing fleet for transporting the mass quantities of waste from TS to Ghabawi DS is not enough - Construction debris damages the compaction devices. - Public waste containers are frequently damaged - The locations of waste containers in the street seem to be a problem - Difficult to find the site for additional TS	- As number of refugees increased drastically, the waste generation amount increased by 30%. (220,000 - 500,000 refugees unofficial data) - Humanintarian aid (food supplies, etc.) for refugees are contributing to the increase of packaging waste. - Public sanitation in the city was affected due to the increase of refugees who discharge waste illegally or out side the waste containers. - Due to the increase of waste, number of trips to transport the waste have increased considerably rusulting in enormous waste collection cost. - Waste scattering around public waste containers by waste pickers - Waste collection vehicles are not sufficient. - Resident's waste discharge manner is not favorable. - The waste transfer capacity is not sufficient. At least 2 more new transfer stations are necessary for GIM.	- Tensions in the host communities are gradually increasing resulting because of the factors such as cultural difference between the refugees and host Jordanians, low education of refugees and disobediences of waste discharge manners by the refugees. - The cost of various municipal services, such as education, public sanitation, medical services, electricity, water supply and waste collection and water supply have increased drastically due to the huge influx of Syrian refugees. Especially waste collection and water supply services are in the most serious conditions.	- Increase of waste due to influx of Syrian refugees - Waste collection capacity is not sufficient for the increased waste amount. (lack of equipment and labor) - Waste littering around waste containers and illegal dumping due to lack of awareness - Low utilization rate of collection vehicles - Municipal own financial source is limited.	- The influx of Syrian refugees resulted in the increase of the municipal expenses. Especially, the drastic increase in waste generation amount resulted in the increase of waste collection expenses. - Unemployment and poverty have increased. - Tensions have been increasing between local Jordanians and the Syrian refugees, especially due to unemployment of youth. - Residents' discharge manner is not favorable. - The quality of containers is not sufficient - Residents' discharge manner is not sufficient and collection frequency is too high.	- The number of collection workers are not sufficient. - Many areas in the city are mountanious and inaccessible for waste collection vehicles. - As the access road to Al Humra DS is steep, the breaks of collection trucks need to be repaired frequently. - Lack of maintenance capacity of hydraulic cylinders, and the adecuated repair for these is conducted in Amman.	- Unplanned expansion of municipal service area due to settlement of refugees. - The municipal capacity has not been sufficient for the increased needs for service. - Waste generation amount doubled since the influx of refugees. - As number of trips to transport the waste to Al Ekaider DS, which is located at a distance of 90km, have increased considerably, the waste collection and transportation costs also have increased.
Other Waste Management than MSW							
O1. Medical Waste Management	- GAM does not collect medical infectious waste.	- GIM does not collect medical infectious waste.	- GMM does not collect medical infectious waste.	- General waste collected by GAjM - Infectious/hazardous waste by private contractor	- GZM is responsible for collection of only general waste generated by medical organization.	- GSM does not collect medical infectious waste.	- GJM does not collect medical infectious medical waste.
O2. Industrial Waste Management	- GAM is responsible for collection only general industrial waste.	- GIM does not collect industrial hazardous waste. - General industricl waste is collected from public containers along with domestic waste.	- GMM does not collect industrial hazardous waste. - General industrial waste is collected from public containers mixed with domestic waste.	- General waste collected by GAjM - Hazardous waste managed by each industry	- GZM is responsible for collection only general industrial waste.	- GSM does not collect industrial hazardous waste.	- GJM does not collect industrial hazardous waste.
O3. Agriculture Waste	- Agricultural waste is collected from public containers mixed with domestic waste.	- Agricultural waste is collected from public containers along with domestic waste.	- Agricultural waste is collected from public containers mixed with domestic waste.	- Agriculture waste discharged into the public containers collected by GAjM	- Agricultural waste is discharged into public container mixed with domestic waste.	- Agricultural waste is collected from public containers mixed with domestic waste.	- GLM collects agricultural waste from public container mixed with domestic waste.
O4. Construction Waste	NA	NA	NA	- Managed by waste generators	NA	- Cleansing Division provides collection service separately from other MSW.	- GLM does not collect construction waste.

Source: Survey team based on the interview with each city, answers to the questionnaires and document review

(3) SWM by JSC

Eight JSCs excluding GAM and Al Shoneh Al Wsta JSC were visited to understand the status of their SWM. The results are summarized in Table 3-3. See Annex 5 for further details.

Table 3-3. SWM by JSCs

Summary of Joint Service Counciles

Note: Number of population in italic is estimated based on the data provided by MOMA and UNHCR (2014)

No	Name of JSC / Items	Irbid JSC	Aghwar Shamaliyah JSC	Rabiet Al-Kura JSC	Mafraq JSC	Badiah Shamaliyah JSC	Ajloun JSC	Zarqa JSC	Balqa JSC
	General:								
G1	Year of establishment	1980	1992	N.A.	1/1/1986	1996	1992	1988	1989
G2	Number of Municipalities covered by JSC	27	7	3	11	7	6	5	5
G3	Population of Municipalities covered by JSC	*1,268,506*	*247,902*	*126,638*	*241,862*	*83,767*	*189,496*	*130,981*	*256,444*
G4	Number of employees	190~200	60	18	119	33	50	136	N.A.
G5	Service field: Transfer station-TS, Landfill-LF	LF	TS LF	TS	LF	LF	TS Slaughter house	LF	LF
G6	Annual budget (million JD)	N.A.	0.50	0.39	1.27	0.26	0.36	0.70	N.A.
G7	Annual expenditure (million JD)	N.A.	0.50	0.39	1.16	0.26	0.36	0.80	N.A.
G8	Main Financial sources: MOMA, Municipality or CVDB	-MOMA subsidies -Tipping fee from businesses -Other revenues	-MOMA subsidies, -Recycling	MOMA subsidies	-MOMA subsidies, -Tipping fee from municipalities, -Tipping fee from businesses	-MOMA subsidies, -Tipping fee from municipalities, -Tipping fee from businesses	-MOMA subsidies, -Slaughter house revenue	-MOMA subsidies, -Tipping fee from businesses	-MOMA subsidies, -Tipping fee from municipalities, -Tipping fee from businesses
	Transfer Station (TS):								
T1	Existence of TS: Yes or No	No	Yes	Yes	No	No	Yes	No	No
T2	Name of TS		Aghwar District	Rabiet Al-Kura TS			Ajloun Governorate TS		
T3	Transfer system Direct, mechanical, others		Mechanical compaction type	Mechanical compaction type			Mechanical compaction type		
T4	Type and number of transfer vehicles		Truck tractor: 1 unit Trailer (50m3): 2 units	Truck tractor: 1 unit Trailer (50m3): 2 units			Truck tractor: 2 unit Trailer (50m3): 2 units Wheel loader: 1 unit Pickup truck: 1 unit		
T5	Amount of waste transferred		30.0 ton/day	90.0 ton/day			160.0 ton/day		
T6	Number of workers		7	18			19		
T7	Annual expenditure for transfer operation		N.A.	N.A.			104,982 JD/year		
T8	Tipping fee		None	None			None		

	Final Disposal Site:								
L1	Existence of Disposal Site: Yes or No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
L2	Name and location of the site	Al Ekaider disposal site 1980 opened	Aghwar District	Rabiet Al-Kura	Al Hoseyneyat Disposal Site	Badiah Shamaliyah disposal site, 2002 start operation		Al Duleil disposal site	Al Humra disposal site
L3	Area of the site	88.0 ha	8.0 ha	3.2 ha	37.8 ha	36.0 ha		27.0 ha	25.0 ha
L4	Owner of the site	JSC: 38ha GIM: 50ha	JSC	JSC	JSC	JSC		JSC	JSC
L5	Covered population	*1,268,506*	N.A.	250,000	Muni: 312,000 Syrian: 180,000	Muni: 75,000 Syruan: 30,000		220,000	
L6	Amount of waste disposed	**1,000 - 1,200 tons/day**	90 - 120 tons/day	120.0 tons/day	250.0 tons/day	200 - 250 tons/day		300.0 tons/day	250 - 350 tons/day
L7	Types and number of landfill equipment: (The figures in brackets are the numbers of equipment out of order.)	Bulldozer: 5 Dump truck: 7 Wheel loader: 9 Tractor with spray: 2 Water truck: 2 Bus (29p): 1	Bulldozer: 1 Wheel loader: 3 (2)	Wheel loader: 1	Bulldozer: 2 Excavator: 1 Wheel loader: 4 Dump truck: 2 Water truck: 1 Tractor: 1 Bus (24 sheets): 1	Wheel loader: 4 (1) Dump truck: 1 Water tanker: 1 Tractor with spray: 2 Pickup truck: 3		Bulldozer: 2 (1) Wheel loader: 4 (2) Dump truck: 2 Tractor with spray: 1 Pickup truck: 1	Bulldozer: 2 (1) Wheel loader: 5 (3) Dump truck: 4 (1) Crawler loader: 1 Water tanker: 1 Tractor with spray: 2 Bus (13 sheets): 1 Pickup truck: 1
L8	Number of workers	70	32	same as TS	33	17		25	35
L9	Annual budget and expenditure	N.A.	incl. TS	same as TS	N.A.	Incl. in the JSC		585,000 JD/year	N.A.
L10	Tipping fee (JD/ton)	2.75 JD/ton	None	None	5.0 JD/ton	6,000 - 10,000 JD/year		15.0 JD/ton for private 30 JD/ton for bulky	N.A.

Source: Survey team based on the interview with each city, answers to the questionnaires and document review

(4) SWM in Refugee Camps

The location of the UNRWA's Palestine refugee camps and the UNHCR's Syrian refugee camps is shown in the figure below together with the location of the SWM facilities.

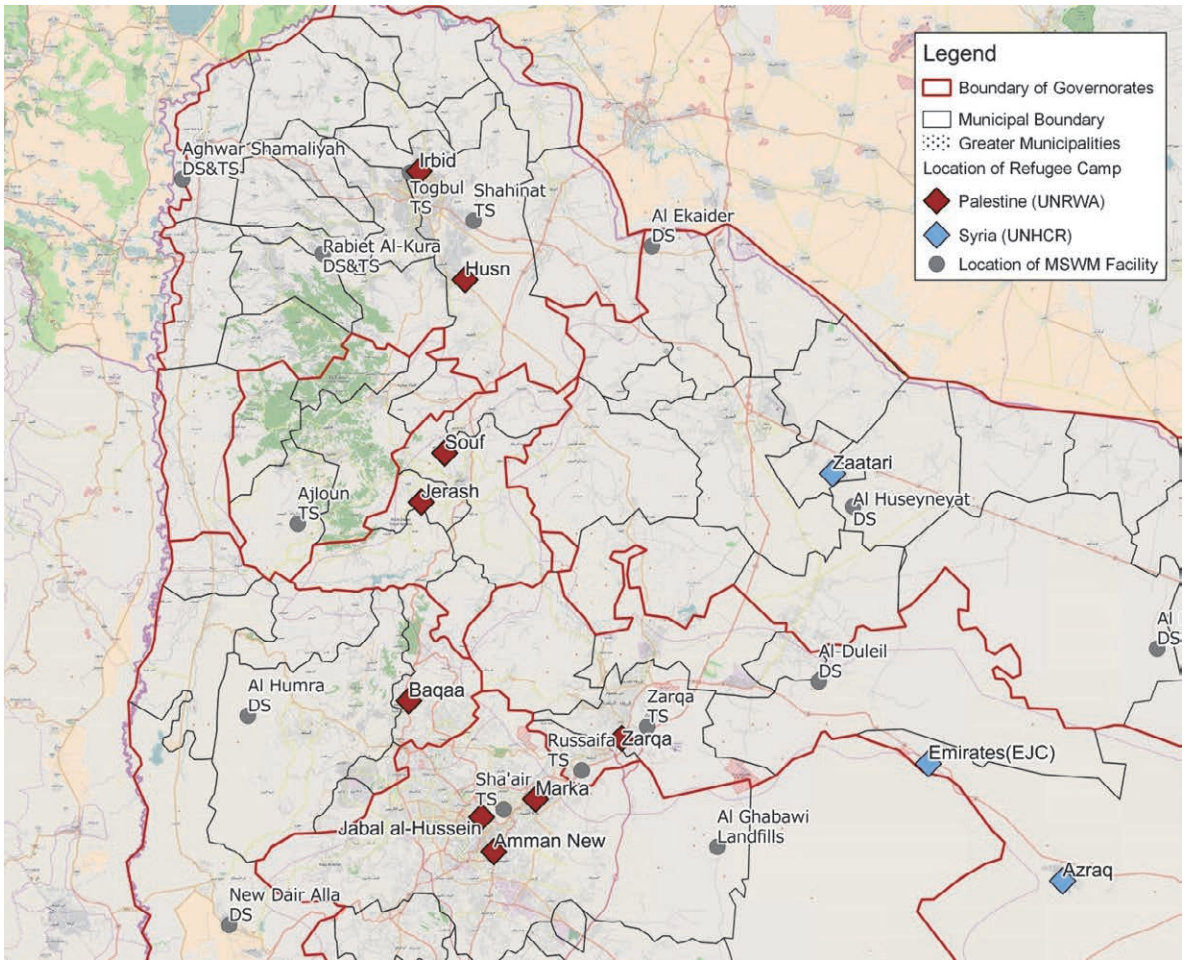


Figure 3-1. Location of Refugee Camps in the Survey Area

1) Palestine Refugee Camps

There are 10 Palestine Camps in Jordan. Among them, two camps called Amman New Camp and Jabal Hussein Camp in GAM are served by GAM for waste collection, and UNRWA manages waste in other camps. In case of Baqa'a camp, which has the largest refugee population, UNRWA entrusts waste collection and transportation service to a public company.

The collection system using 1.1 m3 containers is widespread in the country. In the Palestine camps; however, the roads are generally too narrow to place such waste containers along the roads except for some areas in Husm Camp and Jabal Hussein Camp. Therefore, a primary collection system is employed; waste is first collected by the collection workers using handcarts and brought to a so-called "collection point" where a larger container is placed at some distance from the dwelling area. In Jerash Camp, the primary collection is carried out using two pick-up trucks which were modified so as to be used as dump trucks with a capacity of 2 m3.

The containers at the collection points have a capacity of 4 m^3 and 10 m^3. Waste in the 4 m^3

containers is transferred to large compactor trucks and brought to final disposal. Irbid, Husn, Souf and Jerash Camps use three large compactor trucks together. The containers with a capacity of 10 m^3 are used in Amman New and Habal Hussain Camps and are transported to final disposal by skip load trucks without waste transfer.

The long distance waste transportation to the final disposal sites is a common issue for all the camps. It is apparent particularly for all the camps except for camps in GAM and Irbid Camp, as waste has to be transported to the final disposal sites by the waste collection vehicles, resulting in low collection efficiency and heavy financial strain. The development of a waste transferring system is highly demanded by UNRWA.

Table 3-4. SWM in Palestine Refugee Camps (December 2015)

Camp	Staff			Wheel Barrows/ Hand Carts	Collection Points	Containers			Vehicles				Refuse Removal
	Worker	Driver	Foreman			1m³	4m³	10 m³	Mini Tipper	Small Comp.	Large Comp.	Skip Lifter	
Marka	49	4	3	44	11	0	21	0	0	3	2	0	UNRWA
Zarqa	9	2	1	7	0	0	0	0	0	2	0	0	UNRWA
Irbid	18	1.5	2	18	5	0	10	0	0	1	0.75	0	UNRWA
Husn	22	1.5	2	24	10	32	12	0	0	1	0.75	0	UNRWA
Souf	16	0.5	2	17	7	0	8	0	0	0	0.75	0	UNRWA
Jarash	21	2.5	2	22	6	0	10	0	2	0	0.75	0	UNRWA
Amman New Camp	38	0	3	38	5	0	0	7	0	1	0	2	GAM
Talbieh	9	1	1	9	1	0	0	0	0	1	0	0	UNRWA
Jabal Hussein	26	0	2	26	6	14	0	2	0	1	1	1	GAM
Baqa'a	92	2	5	95	14	0	35	0	0	2	4	0	Contractor
Total	300	15	23	300	65	46	96	9	2	12	10	3	

Source: UNRWA

Among the camps from which waste is directly transported to the disposal sites, the following three camps will benefit from the construction of Jerash T/S and Ain Al Basha T/S, both of which are proposed by MOMA. Using these transfer stations will greatly save the transportation cost as waste transportation distance is shortened by 40 to 50 km.

Table 3-5. Comparison of Waste Transportation Distance from Three Palestine Camps

Name of Camps	Waste generation*1		Distance to disposal Site*2		Distance to proposed TS*2	
	(ton/year)	(ton/day)	Name	(km)	Name	(km)
Souf	2,786	7.6	Al Ekader DS	46.8	Jerash TS	7.8
Jarash	3,458	9.5	Al Ekader DS	54.5	Jerash TS	3.6
Baqa'a	26,286	72.0	Ghabawi DS	53.8	Ain Al Basha TS	4.8

*1: UNRWA's data

*2: Estimated by the survey tem from satellite photos

2) Syrian Refugee Camps

In Jordan, there are three Syrian refugee camps. One is Za'atari Camp (79,000 people in March 2016) in Mafraq Governorate and the other two are Azraq Camp (32,000 people in March 2016)

and Emirati Camp (6,440 people in March 2016) in Zarqa Governorate.

In Za'atari Camp, UNHCR entrusts waste management to UNICEF, which in turn outsources waste collection and transportation to a private company. Once collected, waste is transferred to a large vehicle in the camp and hauled to the Huseineyat D/S, which is three kilometers to the east of the camp. The survey team does not have information about SWM of Azraq Camp or Emirati Camp, but according to the Azraq Municipality, waste from Azraq camp is disposed of at Azraq D/S, operated by the Azraq Municipality.

The management of waste generated at the Syrian camps is borne by UNHCR. On the other hand, waste from Syrian refugees living outside of camps are collected by the municipalities and disposed of at the disposal sites of the JSCs. Therefore, the increased fiscal load for waste management necessarily rests on the municipalities. It can be observed occasionally that waste that cannot be collected with the existing collection capacity is left scattered along streets.

3.3 Current Conditions of Waste Management Sector

3.3.1 Municipal Solid Waste Management

(1) Waste Flow of Municipal Solid Waste

The current conditions of MSWM in 63 municipalities of the survey area, which consists of GAM and six governorates, were understood through the field surveys and compiled in a waste flow diagram shown in the table below. The data applied in the waste flow construction are as follows:

- Jordanian population data provided by CVDB (2014 data)
- Data of Syrian refugees provided by MOMA (UNHCR 2014 data)
- MSW generation rate in 2015: National Strategy of SWM (Urban area= 1.01kg/person/day, Rural area = 0.88kg/person/day)
- MSW generation rate of urban area was applied to the greater municipalities while that for rural area was used for other municipalities.
- Waste collection rate was assumed to be 80%.
- Values in brackets in the boxes of transfer stations (T/S) and disposal sites (D/S) are the data obtained through interview surveys.
- Waste amounts written in italic fonts are the values estimated by the survey team.

Waste from the Palestinian and Syrian refugee camps is managed by UNRWA and UNHCR and is not included in waste flow.

Table 3-6: The waste flow of MSW in the Study Area

Governorate	Municipality	① Population J	② Population-S	③ Waste generation	④ Waste collection	(J): Jordanian (S): Syrian	Transportation (TS or Direct haulage)		Disposal amount (ton/day)	
Irbid	Khalid Bin Al Walid	22,979	1,098	21	17		Aghwar Al Sharmaliyah TS (90km, 2 trips, In=120~150ton/day, Out=30ton/day)	133 ton/day	Aghwar DS	133 ton/day
Irbid	Mo'az Bin Jabal	37,290	433	33	26					
Irbid	Sharhabil Bin Hasna	53,974	77	47	38					
Irbid	Tabaket Fahil	27,471	0	24	19	225,767 (J)				
Irbid	Taibah	45,111	3,340	43	34	7,202 (S)		30 ton/day		
Irbid	Wastyyeh	38,942	2,254	36	29				Al Ekaider DS (1000~1200t/day)	1,099 ton/day
Irbid	Barkash	56,530	1,790	52	42		Rabiet Al Kura TS (90km, 2 trips)	57 ton/day		
Irbid	Deir Abi Said	35,996	3,203	35	28	126,638 (J)				
Irbid	Rabyet El Koora	34,112	1,145	31	25	6,138 (S)	40% is dumped to the own site =	38 ton/day		
Ajloun	Greater Ajloun	52,706	4,049	57	46					
Ajloun	Junaid	23,923	3,402	24	19		Ajloun TS (50km, 2 x 2 trips=4 trips, In=160ton/day)	120 ton/day		
Ajloun	Kafrangeh	35,050	1,727	33	26	153,500 (J)				
Ajloun	Oyoon	19,686	531	17	14	10,103 (S)				
Ajloun	Shafa	22,135	394	19	15					
Irbid	Greater Irbid	525,823	80,710	602	482	25%	Togbul TS (Out=20~30% of collected w aste)	120 ton/day		
						5%	Shahinat TS	24 ton/day		
						70%	Direct haulage	337 ton/day		
Irbid	Ramtha	98,396	22,072	106	85					
Irbid	Sahil Houran	41,284	0	36	29					
Irbid	West Irbid	56,680	4,416	54	43					
Irbid	Yarmouk	17,695	1,194	17	14	288,606 (J)	Direct haulage	225 ton/day		
Irbid	Kaffarat	29,305	1,546	27	22	30,369 (S)				
Irbid	Mazaar	17,445	0	15	12					
Irbid	Saroo	16,039	572	15	12					
Irbid	Sho'la	11,762	569	11	9					
Jerash	Bab Amman	15,350	464	14	11					
Jerash	Burma	14,169	25	12	10					
Jerash	Greater Jerash	76,110	3,897	80	64	167,858 (J)	Direct haulage	134 ton/day		
Jerash	Me'raad	39,238	4,818	39	31	11,042 (S)				
Jerash	Nasim	22,991	1,838	22	18					
Mafraq	Housha	16,538	3,078	18	14		Direct haulage	14 ton/day		
Mafraq	Bani Hashim	11,142	6	10	8					
Mafraq	Dair Al Kahif	9,560	27	8	6					
Mafraq	Safawi	4,769	1,695	5	4					
Mafraq	Salhieh Wa Nayfeh	14,463	248	13	10	83,767 (J)	Direct haulage	62 ton/day	Al Badiah Al Shamaliyah DS (200~250ton/day)	62 ton/day
Mafraq	Umm Al Jimaal	19,863	1,235	18	14	6,245 (S)				
Mafraq	Sabha Wa Dafyaneh	12,710	3,034	14	11					
Mafraq	Umm al Gtain Wa Al Mkaifteh	11,260	0	10	8					
Mafraq	Bal'ama	24,980	0	22	18					
Mafraq	Baslieh	5,090	90	4	3					
Mafraq	Erehaab	25,236	0	22	18					
Mafraq	Greater Mafraq	73,751	32,579	103	82					
Mafraq	Khaldieh	26,920	2,438	26	21	209,289 (J)	Direct haulage	189 ton/day	Al Huseyneyat DS (300ton/day)	189 ton/day
Mafraq	Manshiet Bani Hasan	9,075	1,812	10	8	47,441 (S)				
Mafraq	Prince Hussein Bin Abdulla	13,072	1,171	13	10					
Mafraq	Sarhan	21,010	5,167	23	18					
Mafraq	Za-atari wa Al Manshieh	10,155	4,184	13	10					
Zarqa	Baireen	15,480	363	14	11					
Zarqa	Dhlail	35,955	3,885	35	28	119,251 (J)	Direct haulage	90 ton/day	Al Duleil DS (300~500ton/day)	90 ton/day
Zarqa	Hallabat	7,586	377	7	6	9,151 (S)				
Zarqa	Hashimyah	60,230	4,526	57	46					
Zarqa	Greater Zarqa	514,649	18,557	536	429		Zarqa TS	429 ton/day		
Zarqa	Russaifa	296,192	8,698	269	215		Russaifa TS	151 ton/day	Al Ghabawi DS	644 ton/day
							Direct haulage	65 ton/day		
Balqa	Ain Al Basha	85,784	7,776	82	66					
Balqa	Al Aarda	12,893	119	11	9					
Balqa	Fuhais	15,030	266	13	10	256,444 (J)	Direct haulage	203 ton/day	Al Humra DS (250~300ton/day)	203 ton/day
Balqa	Greater Salt	128,987	5,341	135	108	14,140 (S)				
Balqa	Mahis	13,750	638	13	10					
Balqa	Central Shuna	45,251	1,497	41	33					
Balqa	M'aadi	15,224	141	13	10	105,261 (J)	Direct haulage	76 ton/day	New Dair Alla DS	76 ton/day
Balqa	Dair Alla	44,786	1,945	41	33	3,583 (S)				
Zarqa	Azraq	11,730	1,609	11	9		Direct haulage	9 ton/day	Azraq DS (unofficial site)	9 ton/day
Mafraq	Rwaished	2,648	912	3	2		Direct haulage	2 ton/day	Own DS	2 ton/day
Balqa	Swaimah	4,789	0	4	3		Direct haulage	3 ton/day	Own DS	3 ton/day
	Total	3,108,750	258,978	3,139	2,511					2,511 ton/day

Transfer haulage = 931 ton/day (JSC=207 ton/day, Municipality=724 ton/day)
Direct haulage = 1,581 ton/day
Total = 2,511 ton/day

Greater Amman Municipality (GAM)

Governorate	Municipality	① Population J	② Population-S	③ Waste generation	④ Waste collection	(J): Jordanian (S): Syrian	Transportation (TS or Direct haulage)		Disposal amount (ton/day)	
Amman	Greater Amman Municipality	2,302,014	142,360	2,450	1,960		Sha'air TS	1,960 ton/day	Ghabawi DS (2,500 ton/day)	1,960 ton/day
Total of the Target Area		5,410,764	401,338	5,589	4,471					4,471 ton/day

Table 3-7: The waste flow in the Palestinian refugee camps located in the Study Area

Camp	Location	Total Population*		Waste generation	Transportation (TS or Direct haulage)	Final Disposal
		Family	Person	ton/day		
Irbid	Irbid	6,188	27,698	8.8	Togbul TS (GIM)	Al Ekaider DS
Husn	Irbid	45,831	24,900	11.8		Al Ekaider DS
Souf	Jerash	4,691	19,950	7.6		Al Ekaider DS
Jarash	Jerash	6,064	31,000	9.5		Al Ekaider DS
Marka	Zarqa	15,400	75,000	30.5		Ghabawi DS (GAM)
Zarqa	Zarqa	3,961	20,038	6.8		Ghabawi DS (GAM)
ANC	GAM	11,878	55,582	35.0		Ghabawi DS (GAM)
Talbieh	Amman Gov.	2,010	7,500	3.8		Ghabawi DS (GAM)
Jabal Hussein	GAM	7,201	31,771	16.6		Ghabawi DS (GAM)
Baqa'a	Balqa	25,701	118,944	72.0		Ghabawi DS (GAM)
Total		128,925	412,383	202.4		

* Based on camp services officers records. (December 2015)

Source: Materials provided by the UNRWA Amman Office and results of interview surveys conducted by the Study Team *(GIM: Greater Irbid Municipality)

Table 3-8: The waste flow in the Syrian refugee camps located in the Study Area

Syrian Camp	Population	Waste generation	Transportation (TS or direct haurage)	Final Disposal
	person	ton/day		
Za'atari	79,000	69.5	TS in Camp	Husaineyat DS
Zarqa	32,000	28.2		Azraq DS (unofficial)
Emirati	6,440	5.7		(No Information)

Note: Disposal site of waste from Zarqa Camp is based on the information from Azraq Municipality.

Waste generation rate= 0.88 kg/perspn/day

Source: Results of the interview survey conducted at Za'atari refugee camp

(2) Waste Generation and Discharging

1) Generation Amount and Waste Composition

The waste generation amount and composition data are presented in the NSWMS (Table 2-7). Although EU prepared local SWM master plans for the Greater Irbid Municipality, the Greater Mafraq Municipality and the New Al Ramtha Municipality in 2014, these plans did not present any information about waste generation and composition of the respective municipalities. GAM has waste composition data of the years 2010 and 2011 and this data is close to the data for urban areas indicated in the NSWMS.

2) Waste Discharging

Regarding the waste discharging system, most of the target municipalities use steel containers with a capacity of 1.1 m^3. There are also places in the municipalities where plastic dust boxes with a capacity of up to 240 litres are used due to the lack of spaces for placing the 1.1 m^3 containers.

None of the municipalities have introduced separate discharging systems.

(3) Collection and Transportation

1) Waste Collection

The municipalities are responsible for the provision of waste collection services in their jurisdiction. In most cases, waste is collected from 1.1 m^3public containers with compactor trucks usually equipped with loading arms for the containers.

Separate collection has not been introduced in any of the municipalities.

As the collection of construction waste with compactor trucks damages their hydraulic cylinders, the Greater Salt Municipality organizes primary collections using small-scale dump trucks and reloads the waste from the small trucks onto large-scale dump trucks at their simple transfer points in order to prevent damage to the of hydraulic cylinders.

2) Transportation

As no intermediate treatment facilities exist in the target municipalities (63 municipalities), all the collected waste is transported to 12 disposal sites (three of them are unofficial dumpsites) either directly or through the transfer stations.

Detailed information about waste transfer and direct transportation of waste collected in the 63 municipalities is compiled in Table 3-6[4] and summarized in the figure below.

[4] As locations of Swaimah DS (used only by Swaimah municipality of Balqa governorate) and Rwaished DS (used only by Rwaished municipality of Mafraq governorate) were not identified, the figure did not include these disposal sites.

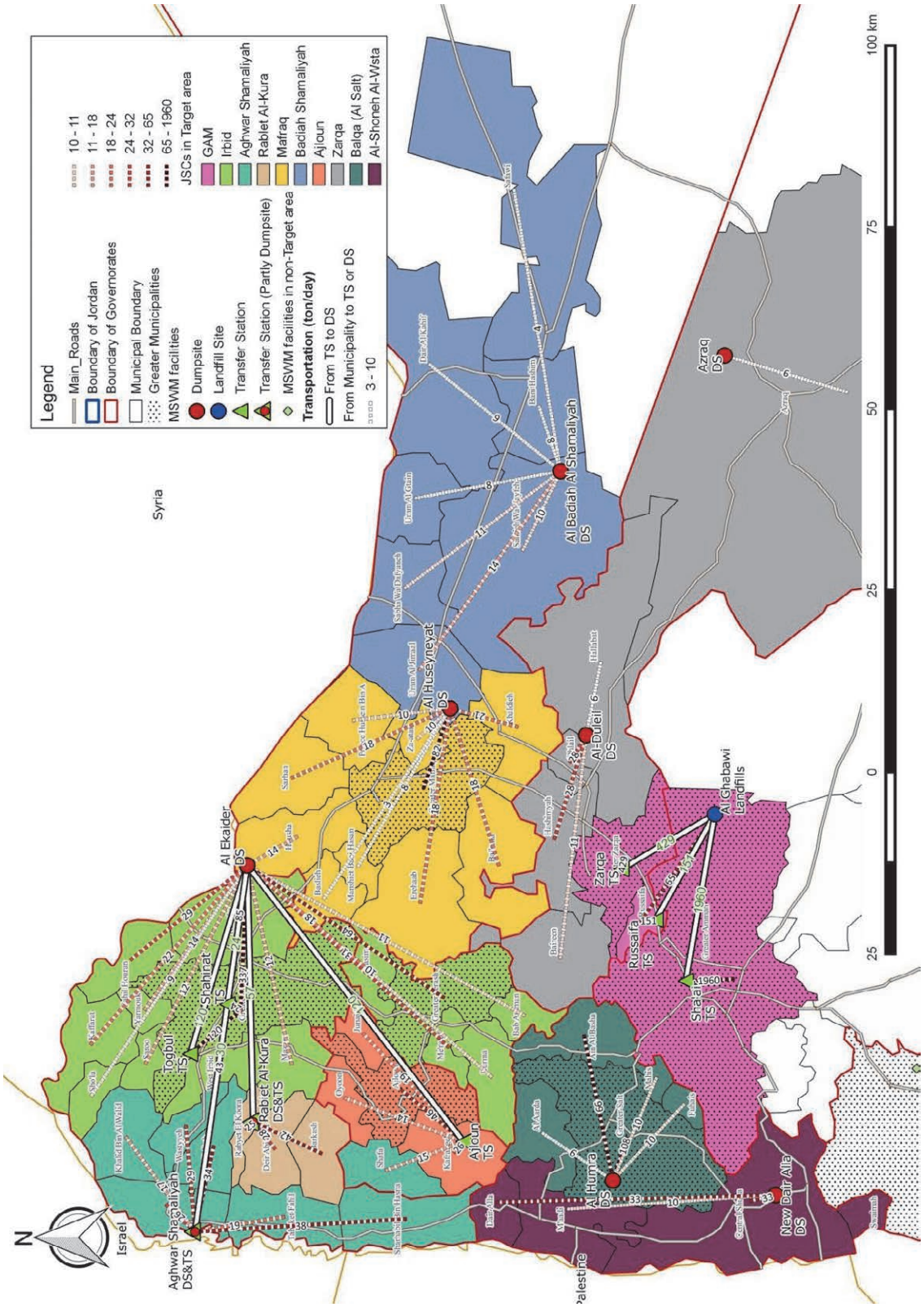


Figure 3-2: The current conditions of waste transfer and direct transportation in the Study Area

(4) Waste Treatment and Recycling

As mentioned above, intermediate treatment facilities for MSW do not exist in the survey area. As an exception, a material recovery facility (MRF) was constructed at Ghabawi Landfill of GAM in 2005 to promote waste recycling in the city. However, the MRF has not commenced operations yet.

Waste recycling in Jordan is conducted in a way of collecting recyclables based on the market principles. The JSCs receive permission fees from waste pickers or private companies for segregation of recyclables at their SWM facilities. Similarly, the company that constructed the MRF at Ghabawi Landfill will have to pay 5% of its generated profits from facility operation to GAM according to their contract. As for GAM, it is obliged to provide the MRF with mixed waste collected in the city.

(5) Final Disposal

All waste collected in the survey area is disposed at 12 final disposal sites presented in the table below.

Table 3-9: Final disposal sites in the Survey Area

Disposal sites	Number of user municipalities	Disposal amount*1 (ton/day)	Landfill level*2
1. Al Ghabawi	3	1,960 (2,500)	Level 4
2. Al Ekaider	29	1,099 (1,000 – 1,200)	Level 2
3. Aghwar Shamaliyah	6*3	133*4	Level 1.5
4. Rabiet Al-Kura	3*3	38*4	Open dump
5. Al Huseyneyat	9	189 (300)	Level 2
6. Al Badiah Al Shamaliyah	7	62 (200 – 250)	Level 1.5
7. Al-Duleil	4	90 (300-500)	Level 1.5
8. Al Humra	5	203 (250-300)	Open dump
9. New Dair Alla	3	76	Unknown
10. Azraq*5	1	9	Open dump
11. Rwashed dump site*5	1	2	Unknown
12. Swaimah dumpsite*5	1	3	Unknown

(Note) 1: The disposal amounts were calculated from the population data and waste generation rate using the method presented in the section (1) of 3.3.13.3.1 of this report. The values in the brackets are the data provided by site operators.
2: Soil coverage is conducted every day under “Level 2” and irregularly under “Level 1”. Under “Level 4”, the site has a leachate collection facility and leachate is treated.
3: As the two disposal sites were decided to be closed, waste from nine municipalities using the sites is supposed to be transported to Al Ekaider DS. However, part of the waste is still disposed at the current sites due to the insufficient transporting capacities. As waste from these nine municipalities is partly disposed at Aghwar Shamaliyarh or Rabiet Al-Kura and partly at Al Ekaider DS, the total number of user municipalities in the table exceeds 63.
4: Estimation by the survey team based on the consideration of current transporting capacity.
5: Unofficial disposal sites.

3.3.2 Other Waste Management

(1) Industrial Waste

During the field surveys conducted in seven municipalities (GAM, the Greater Irbid Municipality,

the Greater Mafraq Municipality, the Greater Ajloun Municipality, the Greater Zarqa Municipality, the Greater Salt Municipality and the Greater Jerash Municipality), it was identified that non-hazardous industrial waste is collected from public containers by the municipalities and disposed at final disposal sites operated by the JSCs. Businesses discharging large amounts of non-hazardous industrial waste transport their waste by themselves directly to disposal sites and pay tipping fees (as for Al Ekaider DS, the tipping fee is 2.75 JD/ton) to the JSCs.

As for hazardous industrial waste, generators are obliged to treat and dispose of it by themselves; and therefore, municipalities are not involved in the treatment and disposal of hazardous industrial waste.

(2) Medical Waste

According to the results of the field surveys, general waste discharged by medical organizations is collected by the target municipalities together with MSW and disposed at the final disposal sites.

Infectious and hazardous medical waste is treated and disposed of by the respective generators without the involvement of the municipalities.

(3) Agricultural Waste

As the field surveys revealed, agricultural waste is discharged into the public containers, collected by municipalities and disposed of at the final disposal sites operated by the JSCs. However, waste that should not be discharged into the public containers such as those from chicken farms and olive oil production is transported by the respective generators directly to the disposal sites. Tipping fees are charged to this type of waste at the disposal sites.

(4) Construction Waste

According to the results of the field surveys, residents who renovate their houses usually discharge construction waste into the public containers. Such waste is collected by the municipalities and disposed of at the final disposal sites of the JSCs. As for the construction waste generated from construction activities, the respective construction companies are obliged to treat and dispose of the waste by themselves.

3.3.3 Institutional System

(1) Waste Management Organizations

In the survey area, the municipalities are responsible for the provision of waste collection services while the SWM facilities such as the transfer stations and the final disposal sites are operated by the JSCs of respective governorates in most cases. However, there are occasions that municipalities operate the SWM facilities in addition to collection services (Table 3-10).

Table 3-10: SWM scope of the target municipalities

Municipalities	SWM scope
GAM	Waste collection, transfer station and disposal site
Greater Zarqa Municipality	Waste collection and transfer station
Greater Irbid Municipality	Waste collection and transfer station

Municipalities	SWM scope
Azraq Municipality	Waste collection and disposal site
Rwashed Municipality	Waste collection and disposal site
Swaimah Municipality	Waste collection and disposal site
Other 57 Municipalities	Waste collection

(2) Legal System

The Municipalities Law authorizes the municipalities to establish and enforce municipal regulations necessary for their local governance. However, the target municipalities, excluding GAM, have not enacted any municipal regulations in the field of waste management. As for GAM, it established a municipal regulation on construction waste; "The buildings and zoning regulation in the City of Amman No. 67/1979" [5].

(3) Financial System

1) Municipalities

a. Revenues from Waste Management Activities

a.1 Waste Collection Fee

The majority of the municipalities covered by the field surveys set waste collection fee at 2 JD/month for the households. As for the organizations and business entities, the amount of the waste collection fee differs depending on their types.

In order to ensure effective fee collection, all the municipalities set the amount of waste collection fee for each electricity meter and have the fees collected by the electricity companies. The electricity companies collect waste fees from the households and other electricity users together with electricity payments and deduct the electricity payment billed to the municipalities from the total of collected waste collection fees. The difference between the municipal electricity payment and the collected waste collection fees is transacted between the municipalities and the electricity companies. Therefore, there are occasions that the electricity companies do not transfer collected fees to the municipalities if the municipal electricity payment exceeds the total amount of collected waste collection fees.

The waste collection fees set by the target municipalities are shown in the table below:

Table 3-11: Waste collection fees in the target municipalities

No	Municipalities	Waste collection fee	Annual collection amount (2015)
1	GAM	• Household: 20 JD/electric meter/year +α (α=0.005 JD per 1 kWh of consumed electricity exceeded 200 kWh/month. Average electricity consumption=160 kWh/month). • Others: 4 JD/electric meter/year +α (α=10 to 1,500 JD/year depending on contracts). In addition, GAM spends part of Professional License Fee to be collected from businesses for SWM. It also collects Professional Solid Waste Fee from businesses. The	JD 18,260,000

[5] Country Report on the Solid Waste Management in Jordan, April 2014, SWEEPNET, GIZ

No	Municipalities	Waste collection fee	Annual collection amount (2015)
		amounts of both fees differ depending on types of businesses.	
2	Greater Irbid Municipality	• Household: 24 JD/electric meter/year • Others: 24 JD/electric meter/year +α (α=10 to 1,500 JD/year)	JD 2,500,000
3	Greater Mafraq Municipality	• The fees could not be confirmed.	JD 207,278
4	Greater Ajloun Municipality	• Household: 24 JD/electric meter/year • Others: 40 to 80 JD/electric meter/year	JD 264,000
5	Greater Zarqa Municipality	• Household: 24 JD/electric meter/year • Others: 24 JD/electric meter/year (minimum tariff)	JD 1,600,000
6	Greater Jerash Municipality	• Household: 24 JD/electric meter/year • Others: 60 JD/electric meter/year	JD 70,000

Source: Questionnaire survey conducted by the survey team in the target municipalities

Although data of collected fees were obtained during the study (presented above), it was also identified that some municipalities (e.g. the Greater Mafraq Municipality) recognize revenues of waste collection fees only when the electricity companies transfer remaining amounts of waste collection fees after deducting municipal electricity payments from the total fees paid by waste generation sources. In such cases, the amount transferred by the electricity companies will be recorded as the total collected fees in accounting records. It should be noted that the data of "collected amounts of waste collecting fees" of municipalities is not necessarily the same with the total amounts of fees collected by the electricity companies.

As the waste collection fees are collected with the electricity payments, the fee collection rate (the rate of actually collected fees to the amount of total fees that should be collected) is considered to be high. However, the amount of total fees that should be collected could not be calculated due to the reasons below and therefore, the fee collection rate could not be ascertained.

- As there are many cases where several households share one electricity meter, the number of households does not match the number of electricity meters. Therefore, the number of electricity meters should be known in estimating the fees that should be collected from households. However, the data of electricity meters could not be obtained during the field surveys.
- Waste collection fees set for organizations and business entities vary greatly depending on types of activities and business. In order to calculate the amount of fees that should be collected from organizations and business entities, information on the number of organizations/businesses of each fee level was necessary. However, this data was not obtained during the field surveys.

a.2 Other Revenues

Among the municipalities that operate the transfer stations and/or the disposal sites (GAM, the Greater Irbid Municipality, the Greater Zarqa Municipality and the Russaifa Municipality), only GAM sets a tipping fee at the Ghabawi Landfill for waste brought directly by waste generators. The

tipping fee at the Ghabawi DS was 2.5 JD/ton at the time of the field survey.

b. SWM Expenses

Based on the public accounting system in Jordan, the municipalities record expenses by each type of expense, not by activities and operational units. Since the identification of SWM expenses from the financial statements of the target municipalities was not possible, the data obtained during the interview surveys were used in relevant estimations.

According to the estimations, unit costs of SWM activities in the target municipalities vary from 25 JD/ton to 50 JD/ton. The minimum and the maximum values for the unit cost are observed in the Greater Ajloun Municipality and the Greater Mafraq Municipalities, respectively. Both of the municipalities transport their waste to the transfer stations or the disposal sites located in neighboring municipalities, but the difference in the unit cost is large.

Although the Greater Irbid Municipality and the Greater Zarqa Municipality operate the transfer stations, the values for the unit cost for both municipalities were estimated at around 38 JD/ton, not as high as that of the Greater Mafraq Municipality.

As factors influencing this variety of expenses could not be identified during this survey, further analyses are necessary on every aspect of SWM expenses including the types of expenses, cost calculation methods and the efficiency of SWM activities.

c. Financial Conditions of Municipalities Covered by the Field Surveys

Financial indicators of the target municipalities of the field surveys are compiled in Table 3-12 while the comparison of financial conditions across the municipalities is presented in Table 3-13 (also refer to Annex 6 for the Income Statements of these municipalities provided by MOMA).

According to Table 3-13, total municipal expenditures and SWM expenses for a citizen vary greatly across the municipalities from 40 to 160 JD/person/year and 8.5 to 24 JD/person/year, respectively. The average value of the total municipal expenditure per citizen was 120 JD/person/year while that of SWM expenses per citizen was estimated at 10 JD/person/year (if GAM, which shows the biggest figures, is excluded the average values will be 50 JD/person/year and 11 JD/person/year respectively).

As for the municipalities that are under MOMA's jurisdiction (those other than GAM), subsidies from the central government account for 40 to 88% of the total municipal revenues (50% on average); and thus, it was concluded that the municipalities are highly dependent on the subsidies from the central government.

The SWM expenses occupy 7 to 39% of the total municipal expenditures. Although the share was 9% on average, it will increase to 23% if GAM is excluded. Therefore, SWM activities including street cleansing and waste collection services can be considered one of the major services that municipalities provide.

On the other hand, the amounts of collected waste collection fees show a range from 2 to 84% of

total SWM expenses differing greatly across the municipalities. On average, the rate of collected fees against the SWM expenses equals 52% (37% if GAM is excluded). Observing the municipalities separately, the biggest value for the rate is presented by the Greater Irbid Municipality with its 84% while that of GAM was estimated at 58% (61% when the collected tipping fees at Ghabawi Landfill are included) placing the municipality in second place. If these municipalities are excluded, the rate of collected fees against the SWM expenses will be 2% to 21% for the other municipalities and the average will drop to 13%.

As mentioned in the previous section, there are municipalities that record the amount transferred by electricity companies as the fee collection revenue; and therefore, there is a possibility that the amount of collected fees recorded are less than the total amounts of actually collected fees. Even taking into account such revenue recognition, however, it can still be considered that the amounts of collected fees remain smaller in comparison with municipal SWM expenses. It implicates that a considerable portion of SWM expenses are not covered by the revenues of waste collection fees but financed by the municipal general budget.

Table 3-12: Financial indicators of 7 municipalities covered by the field surveys

No	SWM Indicators	Greater Amman Municipality	Greater Irbid Municipality	Greater Mafraq Municipality	Greater Ajloun Municipality	Greater Zarqa Municipality	Greater Salt Municipality	Greater Jerash Municipality
1	Population	2,528,500	606,533	106,330	56,755	533,206	134,328	80,007
2	Amounts of Waste (ton/day):							
	Generation amount	2,554	602	103	57	536	135	80
	Collection amount	2,298	376	90	46	429	200	110
3	Number of Staffs (person):							
	Total Municipal Staffs	18,000	3,884	586	375	4,500	800	1,200
	Total SWM Staffs	5,735	1,045	272	90	1,165	208	300
4	Municipal Finance:							
	Year of data	2009	2014	2014	2014	2014	2014	2014
	Actual Revenues (JD/year):							
	Receipts from MOMA		15,845,280.91	3,039,754.38	2,844,307.39	12,723,573.74	4,370,959.31	3,699,242.55
	Municipal Revenues	360,000,000.00	23,766,439.10	2,298,379.42	402,975.36	11,588,969.87	3,659,493.21	2,526,534.45
	Total Revenues	**360,000,000.00**	**39,611,720.01**	**5,338,133.81**	**3,247,282.75**	**24,312,543.62**	**8,030,452.52**	**6,225,777.00**
	Actual Expenditures (JD/year):							
	Recurrent Expenditures		25,248,543.24	3,740,632.14	2,935,214.52	20,295,761.30	5,061,578.90	4,264,872.75
	Capital Expenditures		5,986,237.66	528,295.13	414,907.21	2,304,840.28	1,424,676.22	1,528,223.46
	Total Expenditures	**408,000,000.00**	**31,234,780.90**	**4,268,927.27**	**3,350,121.73**	**22,600,601.57**	**6,486,255.12**	**5,793,096.20**
5	MSWM Finance:							
	Year of data	2009	2014	2014	2014	2014	N.A.	2014
	SWM Annual Expenses (JD/year)							
	Salaries		3,528,600.00	963,000.00	292,000.00		N.A.	1,800,000.00
	Fuel and Lubricants				80,000.00		N.A.	
	Maintenance				55,000.00		N.A.	
	Other Operational Expenses		1,623,185.00	684,355.00			N.A.	1,200,000.00
	Total SWM Expenses (JD/year)	**27,303,000.00**	**5,151,785.00**	**1,647,355.00**	**428,918.38**	**6,026,827.09**		**1,931,032.07**
	Financial sources of MSWM:							
	Municipal Budget	10,570,339.00	826,191.63	1,620,223.00	392,841.88	5,194,469.89		1,530,798.41
	Collected Waste Collection Fee	15,950,283.00	4,325,593.37	27,132.00	36,076.50	832,357.20	667,729.58	400,233.66
	Collected Tipping Fee (Ghabawi DS)	782,378.00						

Source: (1) Population: GAM→GAM (2013); Others→Jordanians : CVDG (2014) and Syrians: UNHCR (2014); (2) Generation amount: "National Strategy to Improve the MSWM Sector in the Hashimite Kingdom of Jordan" (1.01 kg/person/day), 2015; (3) Collection amount: Greater Zarqa and Greater Ajloun→Estimation with the assumption: Collection rate=80%; Others→Results of the questionnaire survey conducted by the Study Team; (4) Revenues, expenditures and collected fees: GAM→GAM, "Strategic Plan for Improving Amman MSWM System", 2014; Others→Financial statements of municipalities in 2014 provided by MOMA; (5) SWM expenditures: Results of questionnaire survey conducted by the Study Team.

Note: The collected fees are the data of 2014 and provided by MOMA with the income statements of the municipalities. Therefore, the values differ with those of Table 3-11, which belong to 2015 and obtained during the interview surveys. Considering the reliability, the 2014 data were adopted for the table. The statements of 2015 were not obtained during the survey since they had been under preparation.

Table 3-13: Comparison of financial conditions of 7 municipalities covered by the field surveys

No	Indicators of Comparison	Greater Amman Municipality	Greater Irbid Municipality	Greater Mafraq Municipality	Greater Ajloun Municipality	Greater Zarqa Municipality	Greater Salt Municipality	Greater Jerash Municipality	Averages (GAM Included)	Averages (GAM Excluded)
1	Staffing:									
	SWM Staffs / Municipal Staff (%)	31.9%	26.9%	46.4%	24.0%	25.9%	26.0%	25.0%	30.0%	27.1%
2	Expenses per Citizen:									
	Municipal Expense / Population (JD/person/year)	161.36	51.50	40.15	59.03	42.39	48.29	72.41	119.07	48.60
	SWM Expense / Population (JD/person/year)	10.80	8.49	15.49	7.56	11.30	0.00	24.14	10.50	10.01
3	Municipal Finance:									
	Revenue Formation:									
	MOMA Subsidies / Total Revenues (%)	0.0%	40.0%	56.9%	87.6%	52.3%	54.4%	59.4%	9.5%	49.0%
	Own Revenues / Total Revenues (%)	100.0%	60.0%	43.1%	12.4%	47.7%	45.6%	40.6%	90.5%	51.0%
	Cost Structure:									
	Recurrent Expenditures / Total Expenditure (%)	0.0%	80.8%	87.6%	87.6%	89.8%	78.0%	73.6%	12.8%	83.5%
	Capital Expenditures / Total Expenditure (%)	100.0%	19.2%	12.4%	12.4%	10.2%	22.0%	26.4%	87.2%	16.5%
4	SWM Finance:									
	SWM expense / Total Expense (%)	7.0%	16.0%	39.0%	13.0%	27.0%		33.0%	9.0%	23.0%
	Collected Waste Collection Fees / SWM Expense (%)	58.0%	84.0%	2.0%	8.0%	14.0%		21.0%	52.0%	37.0%
	Collected Tipping Fees / SWM Expense (%)	3.0%							2.0%	
	Unit Cost of SWM (JD/ton)	32.55	37.54	50.15	25.77	38.51		48.10	32.80	39.61

2) JSC

Financial indicators of the eight JSCs visited by the survey team and comparison of the financial conditions of the seven JSCs whose data are well available are presented in Table 3-16 and Table 3-17, respectively (also refer to Annex 6 for Income Statements of the JSCs provided by MOMA).

a. Personnel

According to Table 3-17, the number of employees working at the SWM facilities, such as the transfer stations and the disposal sites, accounts for 28 to 65% of total employees of the JSCs with the percentage varying significantly across the JSCs. In general, the share of employees working at the SWM facilities is small (34% on average). The main reason for the small share of SWM employees is that JSCs also conduct services other than SWM activities such as the operation of slaughter houses.

b. Revenues

b.1 Fiscal Transfer from MOMA

Budget transferred by MOMA to the JSCs accounts for 70 to 80% of total revenues of the JSCs (the average was 85%); and therefore, the share of other revenues in the total is extremely low (the average of the seven JSCs was 15% only).

Although the amounts of revenues, expenses and profits/losses of the JSCs per unit waste received at the SWM facilities differ across the JSCs, the average values for the indicators were estimated as 5.6 JD/ton, 5.7 JD/ton and -0.1 JD/ton from the data of the seven JSCs. Although the JSCs are facing losses per each ton of the received waste, the losses are also covered by the budget from MOMA.

b.2 Tipping Fees of SWM Facilities

The JSCs set tipping fees to the municipalities and private companies for treating and disposing of their waste at the transfer stations and the disposal sites operated by the JSCs. According to the results of the field surveys, the total amounts of tipping fees collected by the seven JSCs accounted for less than 9% of the total revenues of the respective JSCs in 2014. This is because the municipalities, which transport the majority of waste into the SWM facilities, do not pay their fees.

The payments of tipping fees by the municipalities in 2014 are presented in the table below. The total amount of tipping fees paid by the municipalities did not exceed even 0.2% of the total revenues of the JSCs in 2014.

Table 3-14: Tipping fees set by the JSCs of the Study Area and the annual collection amounts

	JSC	Facility		Tipping Fee			
		Type	Name	Target	Unit Fee		Collected Fee in 2014 (JD)
1	Irbid JSC	Disposal site	Al Ekaider DS	Municipality	1,000	JD/Mun/year	0.0
				Direct Transport	5	JD/ton	297,644.7

	JSC	Facility		Tipping Fee			
		Type	Name	Target	Unit Fee		Collected Fee in 2014 (JD)
2	Aghwar Shamaliyah JSC	Transfer Station	Aghwar Shamaliyah T/S (Also uses as dumpsite)	Municipality	25,800	JD/all Mun/year	0.0
3	Rabiet Al-Kura JSC	Transfer Station	Rabiet Al-Kura T/S (Also uses as dumpsite)	Municipality	0	JD/Mun/year	0.0
4	Mafraq JSC	Disposal site	Al Huseyneyat DS	Municipality	1,000	JD/Mun/year	2,500.0
				Direct Transport	5	JD/ton	5,049.0
5	Badiah Shamaliyah JSC	Disposal site	Badiah Shamaliyah DS	Municipality	1,000	JD/Mun/year	2,000.0
				Direct Transport	6~10,000	JD/contract/year	0.0
6	Ajloun JSC	Transfer Station	Ajloun Governorate T/S	Municipality	26,926	JD/all Mun/year	0.0
7	Zarqa JSC	Disposal site	Duleil DS	Municipality	116,100	JD/all Mun/year	0.0
				Direct (with contract)	10~1,000	JD/contract/year	117,054.0
				Direct (without contract)	15	JD/ton/year	
8	Balqa JSC	Disposal site	Al Humra DS	Municipality	66,000	JD/all Mun/year	5,000.0
				Direct Transport	N.A		24,817.0

Source: (1) Unit fee: Results of questionnaire surveys conducted by the Study Team
(2) The amounts of collected fees in 2014: Income statements of the JSCs provided by MOMA

b.3 Other Revenues

Other revenue sources for the JSCs are paid rents for their assets lent to others, revenues from other operations such as slaughter houses (in some JSCs) and interest revenues for their deposits at banks. As for the seven JSCs, the share of these revenues was estimated at 6% of the total of JSC revenues.

In addition, the field surveys revealed that many JSCs charge waste pickers (or private companies organizing waste pickers) permission fees for the segregation of waste at their transfer stations and disposal sites. However, actual payment of these fees was not identified during the survey due to the unique book keeping practices employed by the JSCs.

The table below presents the permission fees set by some of the JSCs in the survey area for waste segregation at their facilities.

Table 3-15: Permission fees set by JSCs for Waste Segregation at their Facilities

No	JSC	Facility Name	Waste Pickers at the Facility (person)	Recyclable Segregation License Fee Set by JSC (JD/year)
1	Irbid JSC	Al Ekaider DS	40~50	76000
2	Zarqa JCS	Duleil DS	22	25000
3	Badiah Shamaliyah JSC	Badiah Shamaliyah DS	4	5000
4	Aghwar Shamaliyah JSC	Aghwar Shamaliyah T/S	N.A	10000

Source: Results of questionnaire surveys conducted by the Study Team

c. Expenses

Due to small amounts of capital expenditures, all expenses of the JSCs mostly consist of recurrent expenses. According to the results of interview surveys conducted in the survey area, investment expenditures of all the local government organizations are restricted by a Cabinet decision.

Among the total expenses of the JSCs, salary expenses occupy the biggest share. According to the data obtained during the study, the shares of recurrent and capital expenditures in the total expenses of the seven JSCs in 2014 were 97% and 3%, respectively.

Considering the types of expenses, the salary expenses occupied 68% in the total expenses of the JSCs. All the other expenses, including maintenance costs of equipment and operational expenses of SWM facilities, accounted for 29% of the total.

Table 3-16: Financial indicators of the JSCs located in the Study Area

No	Indicators	Irbid JSC	Aghwar Shamaliyah JSC	Rabiet Al-Kura JSC	Mafraq JSC	Badiah Shamaliyah JSC	Ajloun JSC	Zarqa JSC	Balqa JSC
1	Facility of Operation:								
	Transfer Station	No	Yes	Yes	No	No	Yes	No	No
	Disposal Site Operation	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
2	Name of Facility:								
	Transfer Station (T/S)		Aghwar T/S	Rabiet Al-Kura T/S			Ajloun T/S		
	Disposal Site (DS)	Al Ekaider DS	Dumpsite at the T/S	Dumpsite at the T/S	Al Hoseyneyat	Badiah Shamaliyah		Duleil DS	Al Humra DS
3	Amount of Treated Waste (ton/day):								
	Transfer Station		30[注1]	90[注1]			160		
	Disposal Site	1,100	105[注1]	30[注1]	250	225		300	300
	Total	**1,100**	**135**	**120**	**250**	**225**	**160**	**300**	**300**
4	Number of Employees (person):								
	Total Staff	180	60	N.A.	119	33	50	136	N.A.
	Staffs of SWM Facilities	65	39	18	33	17	19	25	35
	Transfer Station		7	18			19		N.A.
	Landfill	65	32		33	17		25	35
5	JSC Finance:								
	Target Year	2014	2014	2015	2014	2014	2014	2014	2014
	Revenue (JD/year):								
	Subsidies from MOMA	1,088,790.00	456,277.19	387,250.00	663,655.00	105,125.00	364,750.49	673,282.00	946,963.00
	Operational Revenues	435,581.97	8,716.06		7,549.00	2,000.00	1,616.00	117,054.00	29,817.00
	Non-operational Revenues	42,207.76	0.00		112,691.00	0.00	45.00	0.00	3,000.00
	Total Revenues	**1,566,579.73**	**464,993.25**	**387250.00**	**783,895.00**	**107,125.00**	**366,411.49**	**790,336.00**	**979,780.00**
	Expenses (JD/year):								
	Salaries	878,492.17	318,342.00		598,659.00	70,430.00	233,684.99	565,446.00	836,875.00
	Other Recurrent Expenses	560,334.33	200,500.66		176,733.00	32,673.18	104,026.48	216,352.00	185,216.00
	Capital Expenditures	98,095.94	34,300.67		1,723.00	4,500.00	20,579.64	4,477.00	3,716.00
	Total Expenses	**1,536,922.44**	**553,143.33**	**387,250.00**	**777,115.00**	**107,603.18**	**358,291.11**	**786,275.00**	**1,025,807.00**
	Protits/Losses	**29,657.29**	**- 88,150.08**	**0.00**	**6,780.00**	**- 478.18**	**8,120.38**	**4,061.00**	**46,027.00**

Source: (1) Financial data: Rabiet Al-Kura JSC→Results of questionnaire survey, Other JSCs→MOMA; (2) Other data: Results of questionnaire survey *1-Estimation by the Study Team

Table 3-17: Comparison of financial conditions of 7 JSCs located in the Study Area

No	Indicators of Comparison	Irbid JSC	Aghwar Shamaliyah JSC	Mafraq JSC	Badiah Shamaliyah JSC	Ajloun JSC	Zarqa JSC	Balqa JSC	Total of 7 JSC
1	Staffing:								
	SWM Facility Staff / Total Staff (%)	36.1%	65.0%	27.7%	51.5%	38.0%	18.4%	N.A.	34.3%
2	Revenue Formation:								
	MOMA Subsidies / Total Revenues (%)	69.5%	98.1%	84.7%	98.1%	99.5%	85.2%	96.7%	85.0%
	Other Revenues / Total Revenues (%)	30.5%	1.9%	15.3%	1.9%	0.5%	14.8%	3.3%	15.0%
3	Cost Structure:								
	Total Recurrent Expense / Total Expense (%)	93.6%	93.8%	99.8%	95.8%	94.3%	99.4%	99.6%	96.7%
	Capital Expenditures / Total Expenses (%)	6.4%	6.2%	0.2%	4.2%	5.7%	0.6%	0.4%	3.3%
4	Financial Indicators per unit waste:								
	Average Revenue (JD/ton)	3.90	9.44	8.59	1.30	6.27	7.22	8.95	5.61
	Unit Cost (JD/ton)	3.83	11.23	8.52	1.31	6.14	7.18	9.37	5.71
	Margin per Ton (JD/ton)	0.07	- 1.79	0.07	- 0.01	0.14	0.04	- 0.42	- 0.10

3.4 Issues for Improvement

3.4.1 Municipal Solid Waste Management

(1) Waste Discharging

The municipalities in the survey area use steel containers with a capacity of 1.1 m^3 for the public to discharge municipal solid waste. This discharge method is utilizing public waste containers is usually associated with the following problems:

1. Residents are allowed to discharge their waste anytime 24 hours a day. Therefore, if the collection service is not sufficient, waste can be easily scattered outside the public waste containers, deteriorating the environment and public sanitation of the surrounding areas.
2. It is difficult to prevent undesignated waste (such as industrial and construction waste) from being discharged to the public containers.
3. In towns with narrow streets such as Palestinian refugee camps, places where waste containers can be placed are very limited due to a lack of sufficient spaces. In such cases, primary collections should be arranged for delivering waste from generation sources to the public containers.
4. If waste recycling and intermediate treatment are to be promoted, the container collection system will hinder the introduction of separate collection, which is necessary for recycling. It has not been considered as a problem at present without intermediate treatment facilities.

In some of the Palestinian refugee camps, the placement of public containers (with a capacity of 4 m3) has become difficult because of the strong opposition by residents who live near those containers. The reason for the opposition was considered to be a lack of space and dense buildings along the narrow streets of the camps. Therefore, it is necessary to replace the container collection system with a curbside collection system.

(2) Collection

Based on the information provided by UNRWA and the results of field surveys conducted in three refugee camps, it was concluded that the waste collection rate in urban areas including the refugee camps is almost 100% since most of the waste being generated in these areas is collected.

As international organizations and donors have supported the procurement of collection vehicles, waste collection capacities of the municipalities has improved greatly. However, the fleets of waste collection vehicles of the municipalities consist of those produced by different manufacturers in different countries since most of them were provided under the aid programs of various donors. Due to the variety in vehicles, the municipalities have been facing difficulties in the establishment of vehicle maintenance systems including spare parts procurement.

Currently, the waste collected in the survey area is transported to 12 final disposal sites either directly or through the transfer stations. Among them, seven are located relatively near to the residential areas. However, of these seven, three of them (Azraq, Rwashed, and Swaimah) are unofficial and used only by municipalities where these are located. Another two sites (Aghwar Shamaliyah and Rabiet Al-Kura) are used despite a closure order due to insufficient waste transfer capacities. And the other two sites (Al Humra, and New Dair Alla) are also requested to be closed

by the Jordan Valley Authority.

Therefore, all the municipalities in the survey area have to use the remaining five sites out of the 12 disposal sites (Al Ghabawi, Al Ekaider, Al Huseyneyat, Al Badiah Al Shamaliyah, and Al Dueil) located in semi-deserts remote from the residential areas.

As a result, the municipalities without nearby transfer stations have to make 50-100 km round trips to haul waste to the disposal sites at a distance. These long transporting distances result in the following problems:

1. The number of trips to be conducted by a collection vehicles will be limited due to extended time required for one trip (collection=>transportation=>unloading at disposal sites=>return to the waste collection area).
2. If the municipalities extend the utilization time of the vehicles in order to increase the number of trips, heavy work-loads will cause frequent breakdowns.
3. Finally, long distance haulage will increase fuel consumption and labour costs. Increased collection costs will add pressure on the financial conditions of the municipalities.

Therefore, **the existence of transfer stations is one of the essential needs** of remote municipalities to increase efficiency of vehicle utilization and reduce waste collection and transportation expenses.

As the municipalities apply a mixed collection system, a system that collects unseparated waste discharged into the public waste containers, the transition to a separate collection system will be difficult.

(3) Waste Transfer and Intermediate Haulage

Issues identified through the field surveys conducted at the existing transfer stations located in the survey area were compiled in the table below. Although some of the transfer stations operate properly, the overall capacity of waste transfer and intermediate haulage in the survey area is not sufficient.

Table 3-18: Issues of existing transfer stations

Transfer stations	Operating organizations	Issues
Sha'air TS	GAM	• As waste mixed with construction debris breaks compaction devices, transfer of this waste from collection trucks to large-scale trucks is conducted directly; and thus, waste scatters during the transfer process resulting in bad odors. • Transfer and intermediate haulage capacity is not sufficient.
Togbul TS	Greater Irbid Municipality	• Together with Shahinat TS located in the municipality, the transfer capacity is not sufficient. As a result, some municipalities transport their waste directly to Al Ekaider DS.
Shahinat TS	Greater Irbid Municipality	• As the compaction device was broken, waste is dumped openly from collection trucks and reloaded onto large-scale trucks with wheel loaders. Waste scattered during the process results in bad odor. • Capacity of intermediate haulage is not sufficient.
Aghwar Al Sharmaliyah TS	Aghwar Al Sharmaliyah JSC	• The station used to be a disposal site. Due to the decision of closure, the site is being used as a transfer station. However, part of the waste brought to the station is disposed of at the facility due to its insufficient capacity of intermediate haulage.
Rabiet Al-Kura TS	Rabiet Al-Kura JSC	• Like Aghwar Al Sharmaliyah TS, the transfer station used to be a disposal site. Due to the insufficient haulage capacity, part of the waste is still disposed of at the facility.

		• In winters, snow removal equipment is necessary for maintaining the accessibility of collection trucks to the station.
Ajloun TS	Ajloun JSC	• Haulage capacity is not sufficient. • As it has only 1 hopper, operation is highly dependent on its functionality. • In winters, snow removal equipment is necessary.
Zarqa TS	Greater Zarqa Municipality	• As the compaction device was broken, waste is dumped openly from collection trucks and reloaded onto large-scale trucks with wheel loaders. Waste scattered during the process results in bad odor.
Russaifa TS	Russaifa Municipality	• As the compaction device was broken, waste is dumped openly from collection trucks and reloaded onto large-scale trucks with wheel loaders. Waste scattered during the process results in bad odor.

Source: Prepared by the Study Team based on the information obtained during the field surveys.

Jordan Valley Authority requested the closure of six disposal sites (Aghwar Shamaliyah, Rabiet Al-Kura, Al Humra, New Dair Alla, Rwashed, and Swaimah) that are located in Jordan Valley. If those disposal sites were closed, the municipalities using these sites would have to transport their waste to the disposal sites located far from the municipalities (from 50 to 100 km for round trip). When considering the current collection and transportation capacities of these municipalities, the site closure, without constructing transfer stations, will have a huge impact on those municipalities.

Regarding the construction of transfer stations, careful procedures should be followed due to expected opposition by local residents against the construction of transfer stations. In the case of GAM, it had to cancel its construction plan of two new transfer stations due to opposition by local residents.

It is necessary to construct transfer stations as early as possible, but careful considerations of socio-economic impacts are requisite before proceeding.

(4) Waste Recycling and Intermediate Treatment

There are no intermediate treatment facilities in the survey area. Although a MRF was constructed at Ghabawi Landfill in GAM, the facility has never been operated since its construction (for almost 10 years).

As the promotion of waste recycling might contribute to alleviation of social problems resulting from the influx of refugees by such means as creating jobs etc., many donor organizations are considering recycling promotion. The promotion of recycling; however, will be difficult, if it does not take place at waste generation sources, due to the following factors:

1. Unlike industrial waste, municipal waste contains various items and substances in it. Therefore, a waste sorting systems is essential when promoting off-site recycling (waste recycling at places other than generation sources).
2. The construction and operation of sorting facilities requires a lot of funds. In order to reduce these costs, recyclables should be separated at generation sources and discharged separately. Separate collection systems should be planned and introduced taking separated waste into consideration.
3. The current container collection system is designated for collecting the mixture of waste discharged into public containers; and therefore, it will require considerable costs to transit to a separate discharge and collection system. The method for financing these costs will be a major

issue.

4. GAM and the private company that constructed the MRF have been in dispute for 10 years. Considering this fact, it can be concluded that the municipalities do not have intention to bear the cost burden necessary for introduction of new systems.
5. Finally, the establishment of a separate discharge and collection system requires sufficient understanding and active participation of local residents. Judging from the current conditions of waste in public containers, municipalities have to implement extended public education and awareness raising activities in order to obtain public support.

(5) Final Disposal

As mentioned above, the number of disposal sites will decrease. Besides this, the following problems found at the JSC disposal sites should be addressed:

1. The JSCs do not have landfill plans that are necessary for implementing the proper operation of disposal sites. Drawings showing landfill plans were not observed at any disposal sites other than Al Ekaider DS.
2. The utilization of heavy equipment for landfill operations is not appropriate. For instance, most of the disposal sites use wheel loaders for waste pushing and compaction instead of bulldozers or for soil excavation instead of excavators. However, wheel loaders are appropriate for loading soil onto dump trucks. Though this kind of wheel loader utilization pattern can be the result of a lack of bulldozers or excavators, it can also result from a lack of knowledge about landfill operations.
3. In addition to the above, the efficiency of operation was extremely low and equipment was not maintained properly due to the insufficient knowledge of operators about proper utilization and maintenance of heavy equipment.
4. At some of the disposal sites, incoming waste was not registered.
5. Landfill gas and leachate control was not implemented.

The problems mentioned above will not be solved by the construction of new landfill cells or the provision of landfill equipment that MOMA requested. In fact, the director of Al Huseyneyat DS, which was the only disposal site where reasonable operations were implemented in comparison with those covered by the field surveys, requested not only the construction of a new landfill cell, but also soft assistance, such as training of employees and instruction about landfill operations.

3.4.2 Other Waste Management

(1) Industrial Waste

The present survey was not able to identify problems related with industrial waste other than textile waste that was discharged from an industrial zone in Irbid governorate and transported to Al Ekaider DS. As for the textile waste, it causes the frequent breakdowns of bulldozers by being caught in its tracks (endelles belts) during waste pushing and compaction operations.

In order to address the problem, Irbid JSC, which operates Al Ekaider DS, requested the construction of a textile incinerator to JICA through MOMA. In relation with this request, the following survey should be conducted:

1. According to the information obtained through the field surveys, the daily amount of textile waste being transported to Al Ekaider DS was 20 to 25 tons/day (24 containers/day; container capacity-5 m^3). If the generation amount of textile waste reaches this level, it is reasonable to incinerate waste in the industrial zone, the generation source. The treatment and disposal of industrial waste is the responsibility of respective generators. The reason for the necessity of using the incinerator at the DS should be clarified.
2. In case that the textile waste is incinerated at Al Ekaider DS, it is necessary to confirm if Irbid JSC is able to operate and maintain the incinerator.
3. Presently, Al Ekaider DS has been charging textile waste generators JD 2.75 for each ton of incoming textile waste. However, it is necessary to confirm if this fee is sufficient for the operation and maintenance of the incinerator. In case that it is not sufficient, sources for financing the difference between the fee revenue and the expected operational expenses should be identified.
4. The possibilities of recycling textile waste should be surveyed.

(2) Medical Waste

As for medical waste, no problems were identified during the survey. However, the following items should be verified.

1. Actual conditions of separation of infectious and hazardous medical waste at medical organizations should be surveyed in order to identify possible mixtures of this type of waste with general medical waste that is collected by the municipalities; and
2. Possible disposal of infectious and hazardous medical waste at final disposal sites should be identified.

(3) Agricultural Waste

The following issues were identified during the field surveys. However, these should be verified through a detailed survey.

1. Waste generated at animal breeding facilities such as poultry farms is disposed of at the final disposal sites. The possibility to treat and dispose this type of waste at generation sources should be surveyed.
2. According to the information obtained during the surveys, carcasses of animals are disposed at specified places of final disposal sites. It is necessary to verify if this waste is treated properly (in such ways as disinfection) before the disposal.
3. In Al Ekaider DS, liquid waste generated during olive oil production is disposed of and it causes bad odor. A method for treating this type of waste should be examined.

(4) Construction Waste

The construction waste related issues found during the field surveys are as follows. However, detailed surveys are necessary to verify the issues.

1. Construction waste discharged from large-scale construction works is collected and disposed of separately by the respective generators. However, construction waste generated during house renovation by residents is discharged into the public containers designated for municipal solid

waste. Therefore, the latter is being collected by the municipalities together with each municipal solid waste and disposed of at final disposal sites.

2. As construction waste contains a lot of debris, the collection of this type of waste together with municipal waste results in serious damages to hydraulic cylinders or compaction parts of waste collection trucks (compactor trucks) and compaction devices of the transfer stations.
3. The damages of hydraulic cylinders and compaction parts have been one of the major problems of municipalities and transfer stations. In order to prevent the problems at the transfer station in GAM, waste that contains construction waste is transferred directly from collection trucks to haulage trucks, but this direct transfer processes causes a problem of waste scattering.
4. Also, the Greater Salt Municipality collects construction waste separately with small scale dump trucks apart from municipal solid waste. To prevent the damage to hydraulic cylinders, the introduction of independent management of construction waste containing debris as operated in Greater Salt Municipality is worth considering.

3.4.3 Institutional System

(1) Enactment of SWM Regulations at Municipal Level

The waste collection rate in the seven municipalities covered by the field surveys is almost 100%. The collection frequency is normally once a day, but it can be three times per day depending on collection areas. In addition, road cleaning services are also conducted frequently.

Despite these efforts by the municipalities, waste scattering was a common problem for most of the municipalities, causing a deterioration in the landscape and urban environment. To solve the problem, each municipality needs to conduct such measures as mentioned below:

1. In compliance with the Municipalities Law No. 13/20111 and its amendments (latest NO. 7/2012), the municipalities need to establish and enforce regulations of waste management based on their conditions and to monitor waste management performance.
2. The regulations should include waste discharging rules and penal provisions for violations of the regulation.
3. Following the enforcement of the regulations, public education and awareness raising activities about waste discharging rules should be organized for the general public and business entities.

(2) Establishment of Construction Waste Control Rule

As mentioned above, construction waste has been one of the causes for damages of compactor trucks owned by the municipalities. At the same time, construction waste also causes breakdowns of the hydraulic systems at the transfer stations. In order to prevent these breakdowns, the municipalities should enact regulations or ordinances to regulate construction waste depending on their conditions referring to the experience of GAM, which has already established a regulation on construction waste (Buildings and Zoning Regulation in the City of Amman No. 67/1979 and its amendments (the latest: No. 21/2005)).

(3) Improvement of SWM Financial System

The necessary improvements found in the current SWM financial system are as follows:

1. For the improvement of municipal SWM finance and for the verification of the necessity for transfer stations, the unit costs of SWM activities (waste collection, transportation and final disposal) should be calculated for each ton of waste dealt with. By calculating the current unit costs, expected cost reduction after constructing and utilizing new transfer stations will become clear, which then contributes to a better understanding of relevant parties about the necessities of transfer stations.
2. To calculate the unit costs, it is necessary to improve the current accounting system and clarify all expenses of SWM activities. Moreover, the municipalities need to verify actual collected amounts of waste collection fees in their accounting by registering all relevant information such as municipal electricity consumption; municipal electricity payments; total collected waste collection fees by the electricity companies – as the fee collection is outsourced to the electricity companies currently and the collected fees are used to offset the electricity payments of the municipalities – and the actual transferred amount by the electricity companies to the municipalities.
3. If unit costs are calculated, it is also possible to set tipping fees of the SWM facilities (transfer stations and disposal sites) at a fair level through discussions among relevant parties.
4. Although the JSCs have set tipping fees at their transfer stations and disposal sites, most of them are not able to collect the fees. Therefore, relevant parties should discuss the causes and identify necessary solutions.
5. The tipping fees should be set based on actual expenses of treatment and disposal operations.

As described above, the clarification of actual conditions of SWM finance is essential to establish a sustainable SWM system.

Chapter 4 Proposed Project Plans

The survey team proposes project plans shown in the next table.

Table 4-1. Proposed Project Plans

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
1. Equipment procurement to improve existing transfer stations (T/Ss) • High	**Background:** Its necessity was validated during the survey. **Objectives:** To enhance the capacity of waste transfer of the existing T/Ss, to reduce the cost for waste collection and transportation by municipalities remote from waste disposal sites (D/Ss), to reduce the necessary number of waste collection vehicles and to cease waste dumping at D/Ss which should have stopped operations. **C/Ps:** MOMA, JSCs and municipalities operating the concerned T/Ss and municipalities which bring waste to the concerned T/Ss.	**Activities:** Procurement of static compaction systems, refuse transfer semi trailers (rear loading, 50m3), truck tractors, and snow removers. **Expected outputs:** 1. Increase of waste transferred and decrease of waste directly transported to the D/Ss 2. Cost reduction for waste collection and transportation by the municipalities and refugee camps which use the T/Ss and reduction of the necessary number of waste collection vehicles. 3. Prevention of inappropriate waste dumping **Project duration:** 1 year	T/Ss operated by JSCs: • Ajloun T/S in Ajloun Governorate • Al-Kura T/S and Aghwar T/S in Irbid Governorate T/Ss operated by Municipalities: • Togbul T/S and Al Shahinat T/S of Greater Irbid Municipality • Zarqa T/S of Greater Zarqa Zarqa Municipality • Russaifa T/S of Russaifa Municipality (can be replaced with the enlarged Zarqa T/S)	According to the list of MOMA's request: • US$ 1,373,240 for equipment for T/Ss • US$ 2,252,818 for other related equipment	• This is one of the priorities of NSWMS. • EU and AFD have proposed to MOMA an assistance amounting to EUR 160 million for the implementation of NSWMS (National SWM Strategy). Its components are not fixed yet, but prior arrangement will be needed.
2. F/S for the construction of new T/Ss. • High	**Background:** Its necessity was validated during the survey. **Objectives:** To investigate the demand for the new T/Ss and to verify their construction. **C/Ps:** MOMA, JSCs that will operate the concerned T/Ss and municipalities which will bring waste to the concerned T/Ss.	**Activities:** Formulation of basic plans of T/S construction, implementation of IEE (or EIA) and, in some situations, elaboration of detailed designs. **Expected outputs:** 1. Clarification of necessity of the T/Ss based on cost-benefit analysis. 2. Consensus building among relevant authorities and neighboring communities based on the result of F/S. **Project duration:** 1.5 years	• West Irbid T/S in Irbid Governorate • Ain Al-Basha T/S in Balqa Governorate • If it is necessary, T/Ss other than the above will be included.	No information	• This is one of the priorities of NSWMS. • EU and AFD have proposed to MOMA an assistance amounting to EUR 160 million for the implementation of NSWMS. Its components are not fixed yet, but prior arrangement will be needed.

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
3. Construction of new T/Ss • High	**Background:** Its necessity was validated during the survey. **Objectives:** To reduce the cost for waste collection and transportation by municipalities remote from waste disposal sites (D/Ss); to reduce the necessary number of waste collection vehicles; and to cease waste dumping and improper disposal at D/Ss, which it has been determined to stop operations. **C/Ps:** MOMA, JSCs that will operate the concerned T/Ss, and municipalities which will bring waste to the concerned T/Ss.	**Activities:** Construction of access road and T/Ss and procurement of static compaction systems, hook lifters "Roll on roll off tippers" (35 m3), containers and snow removers. **Expected outputs:** 1. Increase of waste transferred and decrease of waste directly transported to the D/Ss 2. Cost reduction for waste collection and transportation by the municipalities and refugee camps which use the T/Ss and reduction of the necessary number of waste collection vehicles. 3. Prevention of inappropriate waste dumping **Project duration:** 2 years	• West Irbid T/S in Irbid Governorate • Ain Al-Basha T/S in Balqa Governorate • If it is necessary, T/Ss other than the above will be included.	According to the list of MOMA's request: • US$ 5,390,000	• This is one of the priorities of NSWMS. • EU and AFD have proposed to MOMA an assistance amounting to EUR 160 million for the implementation of NSWMS. Its components are not fixed yet, but prior arrangement will be needed.
4. Procurement of equipment to improve the existing D/Ss • Relatively high	**Background:** Its necessity was validated during the survey. **Objectives:** To enhance the physical and operational capacity of the existing D/Ss. **C/Ps:** MOMA, JSCs operating the concerned D/Ss.	**Activities:** Procurement of heavy equipment for waste disposal such as bulldozers and tools for their maintenance and repair. **Expected outputs:** 1. Improvement of waste disposal operation in the D/Ss and its surrounding environment, as a result of clear determination of the disposal operation area in each D/S, and prevention of fire and waste scattering by earth covering. 2. Establishment of heavy equipment maintenance system. **Project duration:** 1 year	• Al Ekaider D/S in Irbid Governorate • Al Husaineyat D/S in the middle of Mafraq Governorate. • Al Badia Al Shamiliyah D/S in the east of Mafraq Governorate. • Al Duleil D/S in the center of the eastern part of Zarqa Governorate.	According to the list of MOMA's request: • US$ 4,291,550 for waste disposal equipment • US$ 4,527,114 for other equipment including incinerators.	• This is one of the priorities of NSWMS. • GIZ, UNDP, EBRD and KfW have projects for existing D/Ss. • EU and AFD are proposing assistance.

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
5. Technical assistance for improved operations of the existing D/Ss • High	**Background:** Its necessity was validated through field observation during the survey. **Objectives:** To enhance the capacity of the JSCs for D/S operations through the implementation of pilot projects at a pilot D/S and the dissemination of the lessons learned from pilot projects. **C/Ps:** MOMA and the JSCs of the concerned D/Ss.	**Activities:** Formulation of improvement plans, improvement of disposal operations through implementation of pilot projects (e.g. construction of sanitary disposal cells), and training for dissemination of the lessons learned to other JSCs. **Expected outputs:** 1. Improved operations of D/S operated by the JSC. 2. Establishment of a model of well-operated D/S. 3. Dissemination of operation methodology at the model D/S. **Project duration:** 3 years	Al Husaineyat D/S in the center of Mafraq Governorate is assumed to be the D/S, where a model D/S is developed. Improved methodology for operations will be disseminated to the following D/Ss: • Al Ekaider D/S in Irbid Governorate • Al Badia Al Shamaliyah in the east of Mafraq Governorate • Al Duleil D/S in the center of the eastern part of Zarqa Governorate. • If it is necessary, other D/Ss will be included.	According to the list of MOMA's request: • US$ 5,000,000 for the construction of a sanitary cell	• This is one of the priorities of NSWMS. • GIZ has a plan of equipment procurement. • EU and AFD have proposed to MOMA an assistance amounting to EUR 160 million for the implementation of NSWMS. Its components are not fixed yet, but prior arrangement will be needed.
6. Construction of a new D/S • Middle	**Background:** Its necessity was validated during the survey. **Objectives:** To carry out studies for the construction of Al Azraq D/S requested by MOMA; to construct the D/S; to cease waste dumping at the current unofficial D/S; and to prevent the pollution of groundwater which is the water source of areas including GAM. **C/Ps:** MOMA; JSC which will operate the new D/S; municipalities, which will use the new D/S; and other users.	**Activities:** Implementation of studies at the Al Azraq D/S; F/S; EIA; and D/S constructions, supervision and procurement of heavy equipment; and other items necessary for landfill operations. **Expected outputs:** 1. Termination of current waste disposal at the unofficial D/S 2. Prevention of pollution of groundwater which is the water source of areas including GAM **Project duration:** 4 years	Proposed site for Al Azraq D/S in Zarqa Governorate, approved by D/S Construction Committee.	According to the list of MOMA's request: • US$ 20,000,000	• This is one of the priorities of NSWMS. • EU and AFD have proposed to MOMA an assistance amounting to EUR 160 million for the implementation of NSWMS. Its components are not fixed yet, but prior arrangement will be needed.

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
7. Procurement of equipment to assist waste collection services by municipalities • Low	**Background:** Its necessity was validated during the survey. **Objectives:** To enhance the waste collection capacity of municipalities. **C/Ps:** MOMA and municipalities concerned.	**Activities:** Procurement of waste containers, waste collection vehicles, snow removing dozers and others. **Expected outputs:** 1. Extension of waste collection services. 2. Clean city landscape **Project duration:** 1 year	• 62 municipalities in 6 governorates • Details are shown in the list of MOMA's request.	According to the list of MOMA's request: • US$ 9,619,714 for waste collection equipment + • US$ 11,881,010 for other equipment	• This is one of the priorities of NSWMS. • GIZ, UNDP, EBRD and KfW have partly implemented this. EU and AFD are proposing assistance.
8. Improvement of SWM in Greater Salt Municipality (GSM) • High	**Background:** Its necessity was validated through observation of present SWM conditions of municipalities during the survey. Prevention of waste scattering and exposure around town and preservation of city landscape are common issues of municipalities. It is necessary not only to upgrade municipal capacities but also to establish cooperative relationships with citizens. **Objectives:** To prevent waste from being scattered or exposed around town by enhancing the municipal capacities and establishing cooperative relationships with citizens; to develop a model municipality in GSM where the municipality and citizens are well motivated to preserve the city landscape with the aim of World Heritage registration; and to disseminate lessons learned in GSM to other municipalities. **C/Ps:** MOMA and GSM	**Activities:** Development of waste discharge rules and its publication; improvement of waste discharge behavior, waste discharge containers, waste collection works and public area cleaning; public awareness raising; provision of training; and development of publication tools for the dissemination of achievements to other municipalities. **Expected outputs:** 1. Improvement of city landscape 2. Development of waste discharge rules as a model 3. Establishment of SWM system by a model municipality **Project duration:** 3 years	Model development in GSM and dissemination of achievements to other municipalities in the country.	According to the list of MOMA's request: • US$ 112,676 for waste collection equipment of GSM • US$ 780,634 for other equipment of GSM	• Similar projects have been carried out by such donors as GIZ and USAID in other municipalities in cooperation with NGOs. • Minister of Municipal Affairs requested assistance for municipal capacity development through improved waste discharge and collection system and public awareness raising. • Mayor of GSM also expressed his request for assistance. • Interaction can take place with JICA's on-going project "Sustainable Community Tourism Development Project".

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
9. Enhancement of SWM Capacity in GAM • Low	**Background:** This was requested by GAM during the survey. **Objectives:** To construct SWM facilities and to procure equipment for waste collection, transfer and final disposal. **C/Ps:** GAM	**Activities:** Financial assistance for facility construction and equipment procurement for waste collection, transfer and final disposal. **Expected outputs:** 1. Enhancement of SWM capacity of GAM **Project duration:** 3 years	GAM	No information	• JICA has assisted GAM with its SWM a few times. • WB, EBRD and KfW have projects in GAM. • Prior arrangement will be needed with the project of KfW.
10. 3Rs promotion and waste discharge improvement in GAM • Relatively high	**Background:** This was requested by GAM during the survey. **Objectives:** To preserve city landscape through 3Rs promotion and waste discharge improvement with the citizens' cooperation. **C/Ps:** GAM	**Activities:** 3Rs promotion; improvement of waste discharge and collection system; capacity development of GAM officials; technical assistance for public awareness raising; and implementation of pilot projects. **Expected outputs:** 1. Promotion of 3Rs in GAM 2. Improvement of city landscape through the prevention of waste scattering and exposure **Project duration:** 3 years	GAM	No information	• JICA has assisted GAM with its SWM a few times. • Prior arrangement will be needed with the project of KfW.
11. Procurement of waste collection vehicles for Palestine refugee camps • Relatively high	**Background:** The issue raised by UNRWA was verified during the survey. **Objectives:** To improve the waste collection system in Palestine refugee camps. **C/Ps:** UNRWA	**Activities:** Procurement of waste collection vehicles **Expected outputs:** 1. Improvement of waste collection system in Palestine refugee camps **Project duration:** 1 year	Five Palestine refugee camps located in Irbid, Jerash, and Balqa Governorates	No information	• The opinion of the Jordan government has not been asked yet. • The present activities or plans of other donor agencies are not well known. (GIZ has been engaged in the development of SWM strategies for UNRWA camps (not only those in Jordan).)

Project Title and Degree of Priority	Background, Objectives and Jordan Counterparts (C/Ps)	Project Outline	Location, Area	Estimated Project Cost	Notes
12. Assistance for recycling activities in Syrian refugee camps • High	**Background:** Its necessity was validated through the field observation during the survey. **Objectives:** To promote 3Rs in Syrian refugee camps. **C/Ps**: UNHCR	**Activities:** Procurement of carts, pick-up trucks, shredding machines, bailing machines, and others. **Expected outputs:** 1. Recycling promotion at waste generation sources in Syrian refugee camps. 2. Job creation for Syrian refugees **Project duration:** 3 years	Selected Syrian refugee camp(s).	No information	• The opinion of the Jordan government has not been asked yet. • The present activities or plans of other donor agencies are not well known.

Annexes

Annex 1 Outline of the Projects by Donor Agencies

Annex 2 List of Facilities and Equipment Requested by MOMA to JICA

Annex 3 List of Facilities and Equipment Requested by MOMA to Japanese Embassy

Annex 4 SWM by the Municipalities

Annex 5 SWM by the JSCs

Annex 6 Financial Report of the 6 Municipalities and the JSCs

Annex 1. Outline of the Project by Donor Agencies

No.	Dono and C/P	Projects	Outline	Present Status	GAM	Irbid	Mafraq	Ajloun	Zarqa	Jerash	Balqa	Al Ekaider specific	Ghabawi specific
P1.1	UN/ MOPIC	Jordan Response Plan for the Syria Crisis (JRPSC) 2016-18の作成	This is the government's plan to assist Syrian refugees and strengthen the resilience of the country. Task forces of 11 sectors developed plans of each sector. Task Force 3 (Environment) proposes hazardous waste projects and Task Force 7 (Local Governance and Municipal Services) projects for municipal waste.	Completed. Calling for donors' proposals for assistance.	✓	✓	✓	✓	✓	✓	✓		
P2.1	UNDP/ MOMA	Mitigating the impact of the Syrian refugee crisis on Jordanian vulnerable host communities (2013-2015)	Aiming to contribute to sustaining social and economic stability, the project strengthened the social services and invested in employment creation. Among five outputs expected, Output 3 "Improved delivery of municipal and social services" entailed the activities for SWM. Its achievement included: - Municipalities Needs Assessment Report - SWM plans for selected municipalities - Provision of SWM equipment The Japanese government shared 48.9% of the project cost (US$ 5.75 million).	No specific information was available. A document related to P2.6 states that this project finished in 2018.		✓	✓						
P2.2	UNDP	Solid Waste Value Chain Analysis (2015)	As part of P2.1, a study was carried out to figure out the solutions to strengthen SWM of Iarbid and Mafraq Governorates and to promote job creation and economic stability. The study clarified the real flow of waste trade and proposed some approahces.	Study completed and referred to in the consideration of livelihood development.		✓	✓						
P2.3	UNDP/MOMA	Improving Solid Waste Management and Income Creation in Host Communities- Rehabilitation of Alakedir Landfill (2014-2017)	Its components include: 1. Infrastructure improvement of Al Ekaider D/S (development of existing buildings, road, lighting and buffer zones), 2. Construction of disposal cell, 3. Efficiency improvement of waste collection and transportation by the transfer station, 4. Equipment for Al Ekaider D/S, 5. Livelihood improvement of local communities, 6. capacity development of JSC and landfill staff. The Governemnt of Canada provided US$ 13.5 million.	1. Tender for buildings finished and construction under implementation. Tender prepared for the other activities. 2. EIA revised. the Request for Proposals announced to get an engineering entity for implementation. 3. Tender for EIA under preparation. 4. In process 5. A set of concept notes is being developed. 6. Workshops and a learning visit are planned.								✓	
P2.4	UNDP/MOE	Project document preparation for "Improve integrated management and minimization of medical waste in a participatory, sustainable and cost effective manner"	Jordan Response Plan for the Syria Crisis (JRPSC) 2016-18 has 11 sectors. Among them, this is the project (Res 2.1) of the Environment sector and will include the assessment of current practices of medical waste management, improvement of medical waste management technology, and development of local medical waste management plans. The project document will be used to call for donor assistance.	Project document is to be prepared by the end of March 2016 by UNDP's consultant. The target area is not yet specified.	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		
P2.5	UNDP/MOE	"Facilitate the upgrading of Swaqa dumping site to a state of art facility in line with international standards" のProject Document作成	Jordan Response Plan for the Syria Crisis (JRPSC) 2016-18 has 11 sectors. Among them, this is the project (Res 2.2) of the Environment sector and will improve the Swaqa hazardous waste disposal site. The project document will be used to call for donor assistance.	Project document is to be prepared by the end of March 2016 by UNDP's consultant. The target area is not yet specified.									
P2.6	UNDP/MOMA	Implementation assistance for "Improved service delivery in SWM based on participatory planning, equipment & technological enhancement"	Jordan Response Plan for the Syria Crisis (JRPSC) 2016-18 has 11 sectors. Among them, this is the project (Res 1.2) of the Local Governance and Municipal Service sector and will improve municipal SWM.	Project document prepared. Calling for donor assistance.									
P2.7	UNDP/MOE	Preparation of MOE Regulation of Waste Electric and Electronic Equipment	It aims to prepare the MOE Regulation of Waste Electric and Electronic Equipment.	Under discussion. To be issued in April 2016.	✓	✓	✓	✓	✓	✓	✓		
P3.1	EU/MOMA	Feasibility Study for the Rehabilitation of Al Ekaider Landfill (Mediterranean Hot Sport Investment Programme (MeHSIP) (2010-2012)) and its Review	This is part of Horizon 2020, EU's research and development program. A feasilibity study of the comprehensive rehabilitation of Al Ekaider D/S was carried out. It will be reviewed and updated by GIZ.	Started in April 2016 and due in June 2016. For its implementation, EU considers to provide EUR 20 millilon of Grant and expects more financial input from other donors.								✓	
P3.2	EU/MOMA	Amman Solid Waste Management and Carbon Finance (2008-2014)、Amman Landfill Gas Recovery	This is to formulate the SWM master plan for Greater Irbid Municipality, New Al-Ramtha Municipality, and Greater Mafraq.	Completed. Calling for donors' proposals for assistance.		✓	✓						
P3.3	EU/MOMA	Formulation of Regional SWM Plan for Northern Region	This is to prepare the regional SWM M/P for the central area in order to facilitate the implementation of NSWMS.	In progress. Due in April 2016. (See P7.4 for the northern part)	✓				✓		✓		
P3.4	EU/MOMA	Facilitation of the implementation of NSWMS	EU considers to provide EUR 40-90 million for the implementation of NSWMS. EU also expressed its intention to provide EUR 100 millinon of grant for the implementation of NSWMS together with AFD, which will provide EUR 60 million of soft loan.	A study by consultants is in progress to define the project scope. Due in June 2016.	✓				✓		✓		
P4	EEA/MOE, DoS	Development of a waste management information system with integrated possibilities for adjusting it to a specific IT-supported system corresponding to the country's needs, Assessment Report Feb 2015	European Neighbourhood and Partnership (ENP) Instrument, Towards a Shared Environmental Information System (SEIS), Increased collaboration with EEA and further implementation of SEIS in interested ENP countries (InSEIS), InSEIS Jordan Technical Assistance action 2 (TA2). Aims to develop a database of SWM of the country.	In progress, according to MOE.	✓	✓	✓	✓	✓	✓	✓		
P5.1	WB/MOMA, CVDB	Emergency Services and Social Resilience Project (ESSRP) (2014-2016)	This targets the municipalities in the north with a large influence of Syrian refugee influx. With US$ 65.5 million of grant for three years, it aims to strengthen the sorcial services (including SWM) and to respond to the emergent needs for the improvement of living conditions.	In progress. 2016 is the third year and US$ 20 million will be used to implement projects based on the request from the municipalities. SWM equipment was procured for some of the municipalities. One year extention is planned with additional financial contribution from other donors.		✓	✓	✓	✓	✓	✓		
P5.2	WB/MOMA, CVDB	Regional and Local Development Project (RLDP) (2007-2015)	This is to assist the Jordan fogernment in promoting regionally balanced local development, principally through municipalities and other ancillary support institutions. The observation that a large share of the municipal budget was spent on municipal waste services lead to the development of the national SWM strategy. US$ 50 million in total together with the finance by AFD.	Completed. Calling for donors' proposals for assistance.		✓	✓	✓	✓	✓	✓		
P5.3	WB/GAM	Amman Solid Waste Management and Carbon Finance (2008-2014)、Amman Landfill Gas Recovery	This aimed at the improvement of SWM in Greater Amman Municipality and had components of the review ofmanagement operation, the improvement of landfilling practices, the construction of sanitary disposal cells and leachate circulation facility and the purchase of CER (Certified Emission Reductions) derived from landfill gas power generation.	Completed. The construction of two transfer stations was cencelled as a result of social and environmental assessment. The Emission Reduction Purchase Agreement, signed by the Bank on behalf of the Carbon Fund of Europe, was cancelled in December 2012 once the project could not deliver CER within the required time-frame due to delays in the Design-Built-Operate construction.	✓								✓

No.	Dono and C/P	Projects	Outline	Present Status	GAM	Irbid	Mafraq	Ajloun	Zarqa	Jerash	Balqa	Al Ekaider specific	Ghabawi specific
P6.1	EBRD/GAM	GAM Solid Waste Project (2015-)	It took over the component of landfill gas power generation of the WB project above with US$ 18 million of loan at maximum, US$ 5 million of loan at maximum from Green Energy Special Fund and US$ 10 million from GAM.	In progress. The power generation facility is not yet installed.									✓
P6.2	EBRD/GAM	Greater Amman Municipality (GAM) Waste-to-Energy Project	GAM has announced a request for proposals to Design-Build-Operate-Transfer of a municipal solid waste-to-energy facility. EBRD expects to finance the awarded entity for project execution.	Proposals are to be submitted by March 14, 2016. The project proponent will consider several funding sources including EBRD.									✓
P6.3	EBRD	Zarqa Waste Management	It will aim at the strengthened SWM capacity of Greater Zarqa Municipality. Facility and equipment for waste collection, transportation and treatment (sorting) will be upgraded with EUR 2.5 million of loan from EBRD and EUR 2 million of grant from an international donor.	Under the discussion with relevant parties.					✓				
P6.4	EBRD	Irbid Solid Waste Project	EBRD expects to invest into projects proposed by the SWM study in Greater Irbid Municipality in Jordan Competitiveness Program (P8.6) financed by USAID.	Depends on the result of the study.		✓							
P6.5	EBRD/GAM	Shaair Transfer Station Rehabilitation Project	This is to improve the Shaair transfer station, which is only T/S currently operated by GAM, with US$ 5 million of EU's grant and US$ 5-15 million of EBRD's loan. The loan will be used for the renovation of existing facility, while the grant for equipment procurement.	In preparation.	✓								
P7.1	GIZ/MOE, MOMA	Support to solid waste management in refugee hosting communities (2014-2017)	This project include such activities as the improvement of operation and maintenance functions of a collection vehicle depo, optimization of collection routes and collection points and facilitation of communication between the communities and the waste collection authority in Greater Irbid Municipality, Greater Mafraq Municipality and Greater Karak Municipality financed by BMZ	Present activitiesa are in Greater Irbid Municipality. To be extended to other two municipalities.		✓	✓						
P7.2	GIZ/MOMA	Support to solid waste management in Jordanian communities hosting Syrian refugees (2015-2017)	The project is for Greater Irbid Municipality, Greater Mafraq Municipality and Ramtha Municipality and has the following three components 1. Construction of one disposal cell in the Al Ekaider D/S, 2. provision of equipment such as waste containers and cleansing tools, 3. trainings of the subjects such as SWM in general, budgeting, planning and recycling. Financed by EU.	In progress.		✓	✓						
P7.3	GIZ	Waste to Energy Project (aiming at Livelihood Improvement)	This is to improve the livelihood and to create jobs in the SWM sector in Greater Irbid Municipality, Greater Mafraq Municipality and Ramtha Municipality. A commiitee is to be established with members from the municipality and local social groups. Project concepts are shared at the committee based on the technical input from GIZ and real actions are determined in a participatory manner.	Small pilot activites are on-going in West Irbid.		✓							
P7.4	GIZ/MOMA	Formulation of Regional SWM Plan for Northern Region	A northern region M/P on SWM is to be developd for the facilitation of NSWMS.	It will start in April 2016 by the awarded consultants.(see P3.3 for the M/P of the north.)		✓	✓	✓		✓			
P7.5	GIZ/UNRWA	UNRWA Solid Waste Management Strategy Project (2015-)	This is a regional program (not only in Jordan) to formulate a SWM strategy for the camps operated by UNRWA. Pilot activities are planned to be carried out in four camps in the north (Irbid, Husn, Jerash and Souf).	Pilot projects will start within 2016. Details are not available at GIS in Jordan.		✓	✓						
P8.1	USAID	Emergency Rehabilitation Plan of Al Ekaider Landfill Site	It was a part of Water Resources and Environmental Conservation Project. An emergency rehabilitation plan was made for Al Ekaider D/S.	Completed and folloowed by P2.3 and P7.2.								✓	
P8.2	USAID/GAM	T/A for Waste to Energy Project of GAM	Technical assistance was givent to the preparation of tender documents for GAM to call for DBOT WtE project at Shaair T/S.	Proposals should be submitted by March 14, 2016.	✓								✓
P8.3	USAID	Community Engagement Program (CEP)	This started in 2014 to develop the caapcity of 16 municipalities/20 communities in Irbid, Mafraq and Tafileh Governorates. Implementing agencies include an NGO "Global Communities", Jordanian company Jidara and Jordan River Foundation.	Provision of waste vehicles and containers were executed as part of activities.		✓	✓						
P8.4	USAID	New SWM Project	Its content is being considered, expecting to start in Spring 2017.	In preparation.	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		
P8.5	USAID	Municipalities Support Project (CITIES)	Its details are not available. Assistance for SWM will be part of the project under the objectives of municipality strengthening.	In preparation.	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		
P8.6	USAID(JCP)/Irbid市	Integrated Solid Waste Management Project at Dead Sea Development Zone (DSDZ) and Greater Irbid Municipality (2015-?)	This is to examine the SWM framework in Greater Irbid Municipality (and Dead Sea Development Zone) and to formulate projects for investment promotion. It is under the Jordan Competitiveness Program, financed by USAID.	A contract was signed with a consultant team in February 2016. The proposed projects may be implemented with a finance of EBRD (P6.4).		✓							
P8.7	USAID (JCP)/JGBC	Grant Assistance for Center of Excellence of SWM (2015-2016)	This is to assist Jodan Green Building Council to provide a SWM expert training program based on the know-how of ISWA (International Solid Waste Association) and to serve as a Center of Excellence under the Jordan Competitiveness Program financed by USAID.	27 trainers were trained. Training activities will be futher strengthened by updating the training materials (prepation of Arabic documents, reflection of SWM practics in Jordan specific, etc.).	✓	✓	✓	✓	✓	✓	✓		
P8.8	USAID (JCP)	Assistance for SWM legislation	For the improvement of laws and regulations on SWM.	Still at a concept stage expecting to carry out in 2017.									
P9.1	AFD/MOMA	T/A for the Implementation of National Stragegy to Improve SWM	One or two SWM experts will be sent to MOMA for the facilitation of NSWMS in June 2016.	During the personnel selection.	✓	✓	✓	✓	✓	✓	✓		
P10.1	KfW/GAM	Solid Waste Management Project	In 2014, EUR 25 million of loan and EUR 2 million of grant were committed. The previous fact-finding proposed such projects as collection and transportation improvement, waste treatment including composting, material recovery and/or RDF production, and capacity trainings.	KfW's consultant team started a study to define the project scope in March 2016. There will be a workshop in June 2016 with participation from the Jordan government and relevant donor agencies.	✓								
P10.2	KfW	Solid Waste Management Project	In December 2015, EUR 15 million grant was committed.	Ditto.									

Annex 2-1. List of Facilities and Equipment Requested by MOMA to JICA (Listed by Usage)

List of Equipment & Facilities Requested by MOMA (March 2016)

Usage		Equipment & Facilities	Disposal site Total	Transfer station Total	JSC Total	Municipality Total	Target Area Total	Common	Total	Non-Target Total	Grand Total
Disposal site	Equipment	Landfill Compactor	1	0	0	0	1	0	1	3	4
		Bulldozer	6	0	0	0	6	0	6	4	10
		Excavator	3	0	0	0	3	0	3	4	7
		Wheel Loader	2	4	0	1	7	0	7	8	15
		Bus of Passengers (28 passengers)	0	0	1	0	1	0	1	0	1
		Farm Tractor with Sprinkler	5	1	1	10	17	0	17	13	30
		Tanker (10 m3) for Waste Water	0	0	1	5	6	0	6	5	11
		Tanker (10 m3) for Drinking Water	0	0	0	6	6	0	6	4	10
		Fog machine	0	0	0	0	0	120	120	0	120
		Tipper (10 m3)	0	1	12	7	20	0	20	21	41
Waste collection		Tipper (3 m3)	0	0	0	38	38	0	38	12	50
		Tipper (6 m3)	0	0	0	4	4	0	4	6	10
		Garbage Bin (1100 litre)	0	0	0	0	0	2,500	2,500	0	2,500
		Garbage compactors (10 m3)	0	0	0	29	29	0	29	21	50
		Garbage compactors (8 m3)	0	0	0	16	16	0	16	4	20
		Mini Loader	0	0	0	28	28	0	28	22	50
Monitoring & Maintenance		Pickup	0	0	0	0	0	4	4	0	4
		Snow removal dozer	0	0	12	33	45	0	45	0	45
		Four-wheel drive truck with salt spreader	0	0	12	33	45	0	45	0	45
Transfer station		Refuse Transfer semi Trailer (rear loading) (50 m3)	0	5	0	0	5	0	5	1	6
		Truck Tractor	0	5	0	0	5	0	5	1	6
	Facilities	Construction of Transfer Station	0	2	0	0	2	0	2	0	2
IMT		Textile Incinerator (to be located in Al-ekeder landfill)	1	0	0	0	1	0	1	0	1
New disposal site		Construction of a new sanitary landfill cell at Al-Husaineyat landfill	1	0	0	0	1	0	1	0	1
		Construction of a sanitary landfill in Al-Azraq	1	0	0	0	1	0	1	0	1
Grand Total			20	18	39	210	287	2,624	2,911	129	3,040

Target Area: Irbid Governorate, Mafraq Governorate, Ajloun Governorate, Zarqa Governorate, Jerash Governorate, Balqa Governorate
ITM: Intermediate Treatment Facility

Annex 2-2. List of Facilities and Equipment Requested by MOMA to JICA (Estimated Cost)

Cost of Equipment & Facilities Requested by MOMA (March 2016)

	Equipment & Facilities	Disposal site Total	Transfer station Total	JSC Total	Municipality Total	Target Area Total	Common Total	**Target Area + Common**	Non-Target Total	Grand Total
Equipment	Landfill Compactor	492,958	0	0	0	492,958	0	**492,958**	1,478,874	1,971,832
	Bulldozer	1,521,126	0	0	0	1,521,126	0	**1,521,126**	1,014,084	2,535,210
	Excavator	929,577	0	0	0	929,577	0	**929,577**	1,239,436	2,169,013
	Wheel Loader	338,028	676,056	0	169,014	1,183,098	0	**1,183,098**	1,352,112	2,535,210
	Bus of Passengers (28 passengers)	0	0	59,155	0	59,155	0	**59,155**	0	59,155
	Farm Tractor with Sprinkler	1,760,565	352,113	352,113	3,521,130	5,985,921	0	**5,985,921**	4,577,469	10,563,390
	Tanker (10 m3) for Waste Water	0	0	91,549	457,745	549,294	0	**549,294**	457,745	1,007,039
	Tanker (10 m3) for Drinking Water	0	0	0	507,042	507,042	0	**507,042**	338,028	845,070
	Fog machine	0	0	0	0	0	507,000	**507,000**	0	507,000
	Tipper (10 m3)	0	105,634	1,267,608	739,438	2,112,680	0	**2,112,680**	2,218,314	4,330,994
	Tipper (3 m3)	0	0	0	1,338,018	1,338,018	0	**1,338,018**	422,532	1,760,550
	Tipper (6 m3)	0	0	0	281,692	281,692	0	**281,692**	422,538	704,230
	Garbage Bin (1100 litre)	0	0	0	0	0	705,000	**705,000**	0	705,000
	Garbage compactors (10 m3)	0	0	0	3,267,604	3,267,604	0	**3,267,604**	2,366,196	5,633,800
	Garbage compactors (8 m3)	0	0	0	1,577,472	1,577,472	0	**1,577,472**	394,368	1,971,840
	Mini Loader	0	0	0	3,154,928	3,154,928	0	**3,154,928**	2,478,872	5,633,800
	Pickup	0	0	0	0	0	140,844	**140,844**	0	140,844
	Snow removal dozer	0	0	1,500,000	4,125,000	5,625,000	0	**5,625,000**	0	5,625,000
	Four-wheel drive truck with salt spreader	0	0	1,200,000	3,300,000	4,500,000	0	**4,500,000**	0	4,500,000
	Refuse Transfer semi Trailer (rear loading) (50 m3)	0	633,805	0	0	633,805	0	**633,805**	126,761	760,566
	Truck Tractor	0	739,435	0	0	739,435	0	**739,435**	147,887	887,322
	Equipment total	**5,042,254**	**2,507,043**	**4,470,425**	**22,439,083**	**34,458,805**	**1,352,844**	**35,811,649**	19,035,216	54,846,865
Facilities	Construction of Transfer Station	0	5,390,000	0	0	5,390,000	0	**5,390,000**	0	5,390,000
	Textile Incinerator (to be located in Al-ekeder landfill)	425,000	0	0	0	425,000	0	**425,000**	0	425,000
	Construction of a new sanitary landfill cell at Al-Husaineyat landfill	5,000,000	0	0	0	5,000,000	0	**5,000,000**	0	5,000,000
	Construction of a sanitary landfill in Al-Azraq	20,000,000	0	0	0	20,000,000	0	**20,000,000**	0	20,000,000
	Facilities Total	**25,425,000**	**5,390,000**	**0**	**0**	**30,815,000**	**0**	**30,815,000**	0	30,815,000
Grand Total		**30,467,254**	**7,897,043**	**4,470,425**	**22,439,083**	**65,273,805**	**1,352,844**	**66,626,649**	19,035,216	85,661,865

Target Area: Irbid Governorate, Mafraq Governorate, Ajloun Governorate, Zarqa Governorate, Jerash Governorate, Balqa Governorate
ITM: Intermediate Treatment Facility

(Cost structure of Transfer Station is shown in Annex 2-4.)

Annex 2-3. List of Facilities and Equipment Requested by MOMA to JICA (for Facilities and JSCs)

No	Place of Distribution	Number of Equipment by Types																	
		Bulldozer	Bus of Passengers (28 passengers)	Construction of a new sanitary landfill cell at Al-Huaineyat landfill	Construction of a sanitary landfill in Al-Azraq	Construction of Transfer Station	Excavator	Farm Tractor with Sprinkler	Garbage compactors (8 m3)	Landfill Compactor	Refuse Transfer semi Trailer (rear loading) (50 m3)	Tanker (10 m3) for Waste Water	Textile Incinerator (to be located in Al-ekeder landfill)	Tipper (10 m3)	Truck Tractor	Wheel Loader	Snow removal dozer	Four-wheel drive truck with salt spreader	Grand Total
(A)	**Target Area**																		
1	**Disposal site**																		
	Al Humra DS	1					1	1								1			4
	New Dair Alla DS	1						1											2
	Al Ekaider DS	1					1			1			1						4
	Al Badiah Al Shamaliyah DS	1						1											2
	Al Huseyneyat DS	1		1				1											3
	Al Duleil DS	1					1	1								1			4
	Azraq DS (To be Constructed)				1														1
	Disposal site Total	**6**	**0**	**1**	**1**	**0**	**3**	**5**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**20**
2	**Transfer station**																		
	Ajloun TS										2				2	1			5
	Ain Al Basha TS (To be constructed)					1													1
	Al Shoneh Al Wsta TS							1								1			2
	Aghwar Al Sharmaliyah TS										1			1	1	1			4
	Rabiet Al Kura TS										2				2	1			5
	West Irbid TS (To be constructed)					1													1
	Transfer station Total	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**5**	**4**	**0**	**0**	**18**
3	**JSC**																		
	Irbid JSC		1									1		2			4	4	12
	Ajloun JSC													2			2	2	6
	Al Kura JSC							1						1					2
	Balqa JSC													2			3	3	8
	Mafraq JSC													2			3	3	8
	Northern Badia JSC													1					1
	Zarqa JSC													2					2
	JSC Total	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**12**	**0**	**0**	**12**	**12**	**39**

Annex 2-3. List of Facilities and Equipment Requested by MOMA to JICA (for the Municipalities (1))

No	Place of Distribution	Farm Tractor with Sprinkler	Garbage compactors (10 m3)	Garbage compactors (8 m3)	Mini Loader	Tanker (10 m3) for Waste Water	Tanker (10 m3) for Drinking Water	Tipper (10 m3)	Tipper (3 m3)	Tipper (6 m3)	Wheel Loader	Snow removal dozer	Four-wheel drive truck with salt spreader	Grand Total
4	**Municipality**													
a.	**Irbid:**													
	Barkash			1					1					2
	Deir Abi Said		1		1									2
	Greater Irbid				1			1				1	1	4
	Kaffarat		1						1					2
	Khalid Bin Al Walid	1	1	1					1					4
	Mazaar				1							2	2	5
	Mo'az Bin Jabal	1	1	1	1	1								5
	Rabyet El Koora			1					1					2
	Ramtha				1									1
	Sahil Houran								1					1
	Saroo		1		1									2
	Sharhabil Bin Hasna	1		1					1					3
	Sho'la		1						1					2
	Tabaket Fahil	1	1	1					1					4
	Taibah		1		1									2
	Wastyyeh		1		1		1			1				4
	West Irbid								1					1
	Yarmouk								1					1
	Irbid Total	4	9	6	8	1	1	1	10	1	0	3	3	47
b.	**Mafraq:**													
	Bal'ama								1			2	2	5
	Bani Hashim								1					1
	Baslieh								1					1
	Dair Al Kahif		1						1					2
	Erehaab								1			2	2	5
	Greater Mafraq				1			1				1	1	4
	Housha								1					1
	Khaldieh		1	1	1				1					4
	Manshiet Bani Hasan		1	1					1					3
	Prince Hussein Bin Abdulla			1					1					2
	Rwaished		1		1		1							3
	Sabha Wa Dafyaneh		1	1	1	1			1					5
	Safawi								1					1
	Salhieh Wa Nayfeh		1											1
	Sarhan								1					1
	Umm al Gtain Wa Al Mkaifteh				1				1					2
	Umm Al Jimaal		1	1					1					3
	Za-atari wa Al Manshieh								1					1
	Mafraq Total	0	7	5	5	1	1	1	15	0	0	5	5	45

Annex 2-3. List of Facilities and Equipment Requested by MOMA to JICA (for the Municipalities (2))

No	Place of Distribution	Farm Tractor with Sprinkler	Garbage compactors (10 m3)	Garbage compactors (8 m3)	Mini Loader	Tanker (10 m3) for Waste Water	Tanker (10 m3) for Drinking Water	Tipper (10 m3)	Tipper (3 m3)	Tipper (6 m3)	Wheel Loader	Snow removal dozer	Four-wheel drive truck with salt spreader	Grand Total
c.	**Ajloun:**													
	Greater Ajloun				1			1				2	2	6
	Junaid		1		1				1			3	3	9
	Kafrangeh		1		1		1					2	2	7
	Oyoon		1		1				1			2	2	7
	Shafa								1			1	1	3
	Ajloun Total	0	3	0	4	0	1	1	3	0	0	10	10	32
d.	**Zarqa:**													
	Azraq	1	1						1					3
	Azraq DS (unofficial site)										1			1
	Baireen		1			1			1					3
	Duleil								1					1
	Greater Zarqa				1			1						2
	Hallabat						1		1					2
	Hashimyah		1		1									2
	Russaifa				1			1						2
	Zarqa Total	1	3	0	3	1	1	2	4	0	1	0	0	16
e.	**Balqa:**													
	Ain Al Basha		1		1					1				3
	Al Aarda	1	1	1					1					4
	Central Shuna	1	1	1	1					1				5
	Dair Alla	1	1	1	1	1				1				6
	Fuhais		1		1							2	2	6
	Greater Salt				1			1				3	3	8
	M'aadi	1		1										2
	Mahis						1		1			1	1	4
	Swaimah	1		1										2
	Balqa Total	5	5	5	5	1	1	1	2	3	0	6	6	40
f.	**Jerash:**													
	Bab Amman		1		1	1			1			1	1	6
	Burma		1		1		1		1			1	1	6
	Greater Jerash				1			1				2	2	6
	Me'raad								1			3	3	7
	Nasim								1			2	2	5
	Jerash Total	0	2	0	3	1	1	1	4	0	0	9	9	30
	Municipality Total	**10**	**29**	**16**	**28**	**5**	**6**	**7**	**38**	**4**	**1**	**33**	**33**	**210**

Annex 2-3. List of Facilities and Equipment Requested by MOMA to JICA
(Items for the Survey Area but not for Specific Municipalities, Items for the Municipalities not in the Survey Area, Number of Items in Ttal)

MOMA's Distribution Plan of the Equipment

No	Place of Distribution	Number of Equipment by Types																									
		Bulldozer	Bus of Passengers (28 passengers)	Construction of a new sanitary landfill cell at Al-Huaineyat landfill	Construction of a sanitary landfill in Al-Azraq	Construction of Transfer Station	Excavator	Farm Tractor with Sprinkler	Fog machine	Garbage Bin (1100 litre)	Garbage compactors (10 m3)	Garbage compactors (8 m3)	Landfill Compactor	Mini Loader	Pickup	Refuse Transfer semi Trailer (rear loading) (50 m3)	Tanker (10 m3) for Waste Water	Tanker (10 m3) for Drinking Water	Textile Incinerator (to be located in Al-ekeder landfill)	Tipper (10 m3)	Tipper (3 m3)	Tipper (6 m3)	Truck Tractor	Wheel Loader	Snow removal dozer	Four-wheel drive truck with salt spreader	Grand Total
(A)	**Target Area**																										
5	**Common**								120	2,500					4												2,624
	Target Area Total	6	1	1	1	2	3	17	120	2,500	29	16	1	28	4	5	6	6	1	20	38	4	5	7	45	45	2,911
(B)	**Non-Target Total**	4	0	0	0	0	4	13	0	0	21	4	3	22	0	1	5	4	0	21	12	6	1	8	0	0	129
	Grand Total	10	1	1	1	2	7	30	120	2,500	50	20	4	50	4	6	11	10	1	41	50	10	6	15	45	45	3,040

Annex 2-4. Cost Structure of Transfer Station

Unit Cost of Transfer Station（Estimated by MOMA in March 2016)

Items	Qty	Unit price	Cost
Pick up 4X4	1	US$25,000	US$25,000
Hook Lifters "Roll on Roll off tipper"	4	US$150,000	US$600,000
Container (35m^3)	8	US$15,000	US$120,000
Static compaction system with PLC and needed equipment "railway conveyors etc."	1	US$450,000	US$450,000
Infrastructure and civil works (For each Transfer Station)	1	US$1,500,000	US$1,500,000
			US$2,695,000

Annex 3. List of Facilities and Equipment Requested by MOMA to Japanese Embassy

The List of Equipment and Facilities Requested by MOMA to the Japanese Embassy (Submitted on March 14, 2016)

	Equipment	Specification	Qty	Unit price	Cost
1	Landfill compactor	not less than 35,000kg	3	$492,958	$1,478,874
2	Bulldozer	not less than 22,000kg	5	$253,521	$1,267,605
3	Wheel Loader	not less than 17,500kg	15	$169,014	$2,535,210
4	Excavator	not less than 30,000kg	3	$309,859	$929,577
5	Tipper	10 m^3, with drive (6 x 4) to proportion work in landfill	25	$105,634	$2,640,850
6	Tanker	1200/ for drinking water transfer	10	$100,000	$1,000,000
7	Pickup truck		2	$25,000	$50,000
8	Garbage compactor truck	18 m^3	1	$125,000	$125,000
9	Hook lifters "Roll on Roll off tipper"		8	$150,000	$1,200,000
10	Container	35 m^3	16	$15,000	$240,000
11	Static compaction system	with PLC and other needed equioment "Railway, conveyors etc."	1	$450,000	$450,000
	Total				$11,917,116

Annex 4. SWM by the Municipalities

SWM in Greater Amman Municipality

Subject	Contents
Municipality and General	Number of Departments: **The Greater Amman Municipality (GAM) consists in the following directorates, departments and sections;** **GAM provides services to the 27 administrative regions.** **1. 18 Directorate**
	Number of staffs: ● **18,000 persons**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **Environmental Directorate**
	Number of staffs of responsible department of MSWM: ● **5,735 persons**
	Budget and expenditure of Municipality in 2010: *Source: Improving Amman SWM System (Date: June 2014, Ref: 1-31-0162)* ● **Actual Revenues: 360,000,000 JD** ● **Actual Expenses: 408,000,000 JD**
	Budget and expenditure of responsible department of MSWM: *Source: Improving Amman SWM System (Date: June 2014, Ref: 1-31-0162)* ● **Actual Revenues: 16,723,661 JD (2009) by garbage fee, etc.** ● **Actual expenditures: 27,303,000 JD (2009)**
	Issues and problems caused by the influx of Syrian refugees: ●
MSWM Plan	Existence of the plan: (Yes) No
	If Yes, when was it formulated? ● 2012
	What organization formulated the plan: ● **Environmental Directorate**
Responsible organization for management of each category of waste	1. Domestic waste: ● **Waste Operation Department**
	2. Medical waste: ●
	3. Industrial waste: ● **General waste: Waste Operation Department** ● **Infectious waste:**
	4. Agricultural waste: ●
	5. Construction waste ●
Waste Generation	1. Population: ● **2,528,500 (2013 source: tender document of WtE)** (2,444,374 (2014 forecasted by Dept. of Statistic)
	2. Future Population (2020): ● **5,025,082 (forecasted by GAM)**
	3. MSW (Waste the municipality responsible for) generation amount in 2013:

	● **2,448 tons/day**
	4. Future MSW generation amount (2030): ● **3,000 ton/day (estimated for the year)**
Discharge and Storage system	1. Rule or method of discharge: ● **Citizens discharge waste to 25,000 containers**
	2. Types of storage containar: ● **Steel containers with a capacity of 1.1 m^3.**
	3. Current issues on discharge and storage system: ●
Collection system	1. Collection service coverage rate: ● **90% (waste collection amount: 2,488 ton/day)**
	2. Application of separate collection: ● **Separate collection is not conducted.**
	3. Collection frequency: ● **2 or 3 times per day for primary streets and commercial centers** ● **Every two days for agricultural and remote area**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **Public container** ● **The MSW collection and cleaning services are organised in 3 shifts, 7 days a week. Information related to distribution of collection shifts has been stated by GAM during the early meetings held in May 2010 with the human resource department and the environmental directorate:** ➢ **Shift A: 6:30 to 14:30, about 75-80% of the service,** ➢ **Shift B: 14:30 to 22:30, about 10-20% of the service, focusing on commercial areas in all districts,** ➢ **Shift C: 22:30-6:30, about 5-10% of the service.**
	5. Number of collection vehicles:
	1. **Compactor truck (16m3): 78 units** 2. **Compactor truck (8m3): 20 units** 3. **Compactor truck (4m3): 45 units** 4. **Hoist truck: 13 units**
	6. Operating organization: ● **Waste Operations Department** ➢ **Waste Treatment Division**
	7. Number of collection workers: ● **1,971 workers (298 foremen, 540 drivers, 1,133 workers).**
	8. Annual expenditure for collection service: ● **20,485,000 DJ (2009)**
	9. Current issues on collection system: ● **Awareness of users with solid waste management is very low.** ● **Containers are frequently damaged.** ● **Positions of containers in the street seem to be a problem.**
Transfer system	1. Number of transfer stations: ● **One**
	2. Location of transfer stations: ● **Al Sha'air TS**

	3. Transfer system: Direct, mechanical, others: ● **Mechanical type** ● **Direct type**
	4. Transfer vehicle: Type and capacity: *(Eatimated number based on the JICA report of gtant aid project in 2004 and improving Amman MSWM system in 2014)* ● **Compaction type (50m3 trailer): 8 units** ● **Tractor head: 8 units** ● **Open type trailer (30m3): 12 units** ● **Trancor head for 30m3 trailer: 9 units** ● **Closed type container (35m3) / roll-on roll-off truck: ? units**
	5. Amount of waste transfered: ● **2,356 ton/day in 2014**
	6. Operating organization: ● **Waste Operation Department, Transferring Stations Division**
	7. Number of workers: ● **99 (2 engineers, 11 Foremen, 42 Drivers, 41 workers, 3 Office employees)**
	8. Annual expenditure for transfer operation: ● **1,406,000 DJ (2009)**
	9. Current issues on transfer system: ● **Construction deblis damages compaction devices.** ● **Capacity of existing fleet for transporting the mass quantities of waste from TS to Ghabawi DS is not enough**
Vehicle maintenance system	1. Number of maintenance shops: ● One in the transfer station
	2. Location of maintenance shops: ● **Al Sha'air**
	3. Operating organization: ● **Maintenence unit, Waste Treatment Division, Waste Operations Department**
	4. Number of workers: ● **?**
	5. Annual expenditure for maintenance shop: ● **?**
	6. Current issues on maintenance system: ● **Lot of aiged vehicles**
Street sweeping and public area cleaning system	1. Method: ● **Manual, mechanical**
	2. Length or area of sweeping service: ● **Primary road**
	3. Number of sweeping vihecles: ●
	4. Operating organization: ● **Waste Treatment Division,**
	5. Number of workers:

	● **3,186**
	6. Annual expenditure for sweeping and cleaning service: ● **Included in the cost of collection service.**
	7. Current issues on sweeping and cleaning system: ●
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **No intermediate treatment (MRF was constructed but not operated yet**
Final disposal system	1. Location of the site(s): ● **Ghabawi DS**
	2. Amount of waste disposed of: ● **3,000 ton/day**
	3. Operating organization: ● **Waste Operaiton Department**
	4. Types and number of landfill equipment (based on the JICA report for grant aid project in 2004): ● **Landfill compactor: 6 units** ● **Bulldozer: 5 units** ● **Dozer shovel: 2 units** ● **Wheel loader: 2 units** ● **Dump truck (12 ton): 7 units** ● **Water tanker (5000l): 1 unit** ● **Motor grador: 1 unit** ● **Road roller with vibrator: 1 unit**
	5. Number of workers: ● **72 person**
	6. Payment or tipping fee: ● **GAM charges large commercial or industrial producers of solid waste for collection and disposal in Ghabawi.** ● **Other municipalities and private companies pay a fee rid of their wastes in Ghabawi disposal site.**
	7. Current issues on final disposal system: ● **The capacity of earth work in the landfill site is not enough** ● **Maintenence capacity of landfill equipment is weak**
Financial system	**1. Annual budget for MSWM: JD**
	2. Annual expenditure for MSWM (2009): **(A) Total: 27,303,000 JD** **(1) SWM operating cost: 22,783,000 JD** **(2) SWM capital cost: 4,520,000 JD**
	3. Financial sources of MSWM (2009): **Total: *27,303,000 JD*** **(1) Municipal budget: *10,570,339 JD* (A)-(6)** **(2) Garbage fee: 13,169,436 JD** **(3) Professional licence fee: 1,964,847 JD** **(4) Professional SW fee: 816,000 JD** **(5) Dumping fee: 782,378 JD** **(6) Total ((2)~(4)): 16,732,661 JD**
	4. Waste collection service fee:

	● **Households: 20 JD/electricity meter/year plus JOD 0.005 per KWh (For >200 KWh per month)** ● **Businesses: 24 JD/electricity meter/year + Additional Fee (Additional fee = 10 to 1,500 JD/year depending on contracts).**
	5. Current issues on financial system: ● **N.A**
Medical waste management	● **GAM does not collect medical infectious waste**
Industrial waste management	● **GAM is responsible for collection only general industrial waste.**
Agricultural waste management	● **Agricultural waste is collected from public containers mixed with domestic waste.**

SWM in Greater Irbid Municipality

Subject	Contents
Municipality and General	Number of Departments: **The Greater Irbid Municipality consists in the following directorates, departments and sections;** **1. IT Department** **2. Department of Finance which includes 5 Sections; Salaries, Budgeting, Expenditures, Licensing and Revenues.** **3. Directorate of Traffic** **4. Directorate of Support** **5. Directorate of Investment** **6. Directorate of Studies** **7. Organizing and Planning Department with 6 Sections; Licensing, Organization, Properties, Drawings, Statistics** **8. Maintenance and Agricultural** **9. Operations and lightning includes Mechanics, cleaning, operation, lightning** **10. Procurement.** **11. Warehouse** **12. Inspection and follow up** **13. Legal Directorate** **14. Internal Auditing** **15. Engineering services, incl. Building section** 16. **Cultural Affairs**
	Number of staffs: ● **3,884 persons**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **Health and Environmental Affairs Department**
	Number of staffs of responsible department of MSWM: ● **1,045 persons**
	Budget and expenditure of Municipality in 2014: ● **Actual Revenues: 39.6 million JD** ● **Actual Expenses: 31.2 million JD**

	Budget and expenditure of responsible department of MSWM in 2014: ● **Actual Revenues: 2,500,000 JD (collected waste fees)** ● **Actual expenditures: 5,151,785 JD (2014)**
	Issues and problems caused by the influx of Syrian refugees: ● **As the number of refugees increased drastically, the waste generation amount increased by 30%. However, the exact number of refugees has not been known. According to the informant, 220,000 to 500,000 refugees were settled in the municipality. In addition, humanitarian aids (food supply etc.) for refugees are contributing to the increase of packaging waste.** ● **Public sanitation in the city was affected due to the increase of refugees who discharge waste illegally or outside containers.** ● **Due to the increase of waste, number of trips increased considerably resulting in huge collection costs.**
MSWM Plan	Existence of the plan: (Yes) No
	If Yes, when was it formulated? ● **May 2014**
	What organization formulated the plan: ● **CCM and Greater Irbid Municipality**
Responsible organization for management of each category of waste	1. Domestic waste: ● **Health and Environmental Affairs Department**
	2. Medical waste: ● **General waste: Health and Environmental Affairs Department** ● **Infectious waste: Data not available.**
	3. Industrial waste: ● **General waste: Health and Environmental Affairs Department** ● **Infectious waste: Data not available.**
	4. Agricultural waste: ● **Health and Environmental Affairs Department**
	5. Construction waste ● **Health and Environmental Affairs Department**
Waste Generation	1. Population in 2013: ● **622,052 (including 98,700 Syrian refugees)**
	2. Future Population (2020): ● **Future population has not forecasted. However, annual population growth was assumed to be 1.5% in the estimation of future generation amount.**
	3. MSW (Waste the municipality responsible for) generation amount in 2013: ● **376 tons/day**
	4. Future MSW generation amount (2020): ● **506 ton/day (estimated for the year 2034)**
Discharge and Storage system	1. Rule or method of discharge: ● **Container collection is applied.**
	2. Types of storage containar: ● **Steel containers with a capacity of 1.1 m3.**
	3. Current issues on discharge and storage system: ● **Illegal dumping by refugees** ● **Waste discharge outside containers**

	● **Waste scattering around public containers by waste pickers.**
Collection system	1. Collection service coverage rate: ● **100% (area-wise)**
	2. Application of separate collection: ● **Separate collection is not conducted.**
	3. Collection frequency: ● **Data not available.**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **4. Public container**
	5. Number of collection vehicles:
	i. **Compactor (8-10 ton): 29 units (as of 2014; 12 was provided by donors)** **ii. Rotary type compactor (12 ton): 15 units (as of 2014)** **iii. Tipper: 5 units (as of 2014)** **iv. Skip loader: 3 units + 43 containers (4 m3)** **v. Open truck: 10 units (as of 2014)** **vi. Small-scale dump truck: 14 units (as of 2014)** **vii. Mobile workshop: 1 unit** **viii. Trailer Truck (for waste transfer): 3 units + 4 trailers (50 m3)**
	6. Operating organization: ● **Supervisors and Collection workers: Health and Environmental Affairs Department** ● **Drivers and Equipment: Mobility and Garage Section of Vehicles Department**
	7. Number of collection workers: ● **161 collection workers.**
	8. Annual expenditure for collection service: ● **Included in the expenses of responsible department of MSWM**
	9. Current issues on collection system: ● **Collection vehicles are not sufficient. Therefore, vehicles become obsolete rapidly due to extensive use of the current vehicles.** ● **Breakdowns of compactor trucks occur frequently as construction waste is also collected by compactor trucks.** ● **Shortage of collection workers.** ● **Residents' waste discharge manner is not sufficient. The biggest problem related with discharge manner is the diffulty when collected waste discharged outside public containers.**
Transfer system	1. Number of transfer stations: ● **2**
	2. Location of transfer stations: ● **Togbul T/S (in the north-western suburb) and Al Shahinat T/S (in the south-eastern suburb)**
	3. Transfer system: Direct, mechanical, others: ● **Mechanical transfer system.** ● **Compaction hopper of Al Shahinat T/S has not been functional. Therefore, wheel loaders and open-top trailers are being used.**

	4. Transfer vehicle: Type and capacity: ● **Trailer trucks. Trailer capacity is 50 m3.**
	5. Amount of waste transfered: ● **Data not available**
	6. Operating organization: ● **Transfer Station Section of Vehicles Department**
	7. Number of workers: ● **18 workers**
	8. Annual expenditure for transfer operation: ● **Data not available.**
	9. Current issues on transfer system: ● **Transfer capacity is not sufficient. In addition to the current stations, at least 2 new transfer stations with similar capacities are necessary for Greater Irbid Municipality.** ● **Al Shahinat T/S has not been used sufficiently. The reason might be the short distance to Al Ekaider DS.**
Vehicle maintenance system	1. Number of maintenance shops: ● **1**
	2. Location of maintenance shops: ● **In the city center**
	3. Operating organization: ● **Workshops and Maintenance Section of Vehicles Department.**
	4. Number of workers: ● **59 workers**
	5. Annual expenditure for maintenance shop: ● **Data not available**
	6. Current issues on maintenance system: ● **Frequent breakdowns of equipment due to the obsoleteness..** ● **Difficulty of procurring cheap and good quality spareparts.** ● **Lack of maintenance ability for new vehicles due to their computerized systems.** ● **Lack of budget and insufficient resources**
Street sweeping and public area cleaning system	1. Method: ● **Mixed (Mannual and Mechanical)**
	2. Length or area of sweeping service: ● **Data not available.**
	3. Number of sweeping vihecles: ● **One obsolete sweeping vehicle is used for street sweeping. The Health and Environmental Affairs Department submitted its request to purchase 2 new sweeping vehicles to the Municipality.**
	4. Operating organization: ● **Health and Environmental Affairs Department**
	5. Number of workers: ● **736 street sweepers**
	6. Annual expenditure for sweeping and cleaning service: ● **Included in the expenses of responsible department of MSWM above**.

	7. Current issues on sweeping and cleaning system: ● **N. A.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **No waste treatment facilities exist in the municipality.**
Final disposal system	1. Location of the site(s): ● **Al Ekaider DS**
	2. Amount of waste disposed of: ● **Refer to the Questionnaire answered by Irbid JSC**
	3. Operating organization: ● **Irbid JSC**
	4. Types and number of landfill equipment (in case your municipality operates the site): ● **Refer to the Questionnaire answered by Irbid JSC**
	5. Number of workers: ● **Refer to the Questionnaire answered by Irbid JSC**
	6. Payment or tipping fee: ● **Although the Municipality has to pay 120,000 JD/year to Al Ekaider DS, it does not pay the fees since half of the Al Ekaider land (around 50 Ha) is owned by Greater Irbid Municipality.**
	7. Current issues on final disposal system: ● **Refer to the Questionnaire answered by Irbid JSC**
Financial system	**1. Annual budget for MSWM: 5,151,785 JD**
	2. Annual expenditure for MSWM: **Total: 5,151,785 JD** **Salaries: 3,528,600 JD** **Other operational costs: 1,623,185 JD**
	3. Financial sources of MSWM: **Total: 5,151,785 JD** **Municipal budget: 2,651,785 JD** **Collection fee: 2,500,000 JD**
	4. Waste collection service fee: ● **Households: 24 JD/electricity meter/year** ● **Businesses: 24 JD/electricity meter/year + Additional Fee (Additional fee = 10 to 1,500 JD/year depending on contracts).**
	5. Current issues on financial system: ● **N. A.**
Medical waste management	● **The municipality does not collect medical infectious waste.**
Industrial waste management	● **The municipality does not collect industrial hazardous waste.** ● **General industrial waste is collected from public containers along with domestic waste. Therefore, detailed information about general industrial waste is not available.**
Agricultural waste management	**As agricultural waste is collected from public containers along with domestic waste, detailed information about agricultural waste is not available.**

SWM in Greater Mafraq Municipality

Subject	Contents
Municipality and General	Number of Departments: **The Greater Mafraq Municipality consists in the following directorates, departments and sections;** **1. IT Department** **2. Department of Finance which includes 5 Sections; Salaries, Budgeting, Expenditures, Licensing and Revenues.** **3. Directorate of Traffic** **4. Directorate of Support** **5. Directorate of Investment** **6. Directorate of Studies** **7. Organising and Planning Department with 6 Sections; Licensing, Organisation, Properties, Drawings, Statistics** **8. Health and Environmental Affairs Department** **9. Monitoring & Evaluation Department** **10. Maintenance and Repair Department** **11. Operations and lightning includes Mechanics, cleaning, operation, lightning Department** **12. Procurement Section** **13. Warehouse Department** 14. **Inspection and follow up Section** 15. **Legal Directorate** **16. Internal Auditing Section** **17. Engineering services, incl. Building section** 18. **Cultural Affairs Department.**
	Number of staffs: ● **586 persons**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **Health and Environmental Affairs Department**
	Number of staffs of responsible department of MSWM: ● **272 persons**
	Budget and expenditure of Municipality in 2014: ● **Actual Revenues: 4,065,423 JD (2014)** ● **Actual Expenditure: 3,938,507 JD (2014)**
	Budget and expenditure of responsible department of MSWM in 2014: ● **Actual revenues: 208,278 JD (collected waste fees in 2014).** ● **Actual expenditures: 1,647,355 JD (2014) with the following breakdowns:** - **Salary: 963,000 JD** - **Operational expenses: 684,355 JD**
	Issues and problems caused by the influx of Syrian refugees: ● **Tensions in the host communities are gradually increasing resulting by factors such as cultural difference between the refugees and host Jordanians, low education of refugees and disobediences of waste discharge manners by the refugees.** ● **The costs of various municipal services such as education, public**

	sanitation, medical services, electricity and water supply, and waste collection services increased drastically due to the huge influx of Syrian refugees. Especially, waste collection and water supply services are in the most serious conditions. The capacity of the municipality has still been insufficient for the total needs of the residents including the refugees as the municipality lacks necessary equipment.
MSWM Plan	Existence of the plan: (Yes) No
	If Yes, when was it formulated?: ● **July 2014**
	What organization formulated the plan: ● **CCM and Greater Mafraq Municipality**
Responsible organization for management of each category of waste	1. Domestic waste: ● **Health and Environmental Affairs Department.**
	2. Medical waste: ● **General waste: Health and Environmental Affairs Department.** ● **Infectious waste: Hospitals and medical organizations**
	3. Industrial waste: ● **General waste: Health and Environmental Affairs Department.** ● **Industrial hazardous waste: Generators**
	4. Agricultural waste: ● **Health and Environmental Affairs Department**
	5. Construction waste ● **Health and Environmental Affairs Department**
Waste Generation	1. Population in 2014: ● **190,000 (Jordanians-90,000; Syrian refugees-100,000 including the unregistered)**
	2. Future Population (2020): ● **Future population has not forecasted. However, annual population growth was assumed to be 1.5% in the estimation of future generation amount.**
	3. MSW (Waste the municipality responsible for) generation amount in 2015: ● **90 ton/day (household-78 ton/day; commercial-12 ton/day)**
	4. Future MSW generation amount (2034): ● **118 ton/day for the year 2034.**
Discharge and Storage system	1. Rule or method of discharge: ● **Container collection is applied. Residents are allowed to discharge their waste to public containers in their convenient time.**
	2. Types of storage containar: ● **Steel container with a capacity of 1.1 m3**
	3. Current issues on discharge and storage system: ● **Discharging waste outside containers and illegal dumping. Considerable amount of household waste dumped illegally was observed elsewhere inside the town during the team visit.**
Collection system	1. Collection service coverage rate: ● **Considered to be relatively low.**
	2. Application of separate collection: ● **Separate collection is not introduced.**
	3. Collection frequency:

	● **Central part of the city: once a day** ● **Suburbs and villages: three times a week**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **4. Public container.**
	5. Number of collection vehicles:
	i. Compactor (? m3): **13 units (as of 2016)** ii. Mobile Workshop: **1 units (as of 2016)** iii. Tipper (?m3): **6 units (brokent-2; 2014)** iv. Wheel loader: **4 units (broken-2; 2014)** v. Pickup truck: **3 units (as of 2014)** vi. Tractor with sprayer: **2 units (as of 2016)**
	6. Operating organization: ● **Health and Environmental Affairs Department**
	7. Number of collection workers: ● **36 collection workers**
	8. Annual expenditure for collection service: ● **Included in the expenses of Health and Environmental Affairs Department**
	9. Current issues on collection system: ● **Collection vehicles are not sufficient.** ● **Shortage of workers due to the trend of Jordanians not to apply for low-paid waste handling jobs.** ● **Lack of containers.** ● **Residents' bad discharge manner and illegal dumping.**
	10. Other ● **MOMA contracted out waste collection services in part of Greater Mafraq Municipality to Al Khabeer Co., Ltd, a private company.** ● **The contract payment is made from MOMA to the company. The amount is 37 JD per ton of waste transported to the disposal site.** ● **The company dispatches 5 compactor trucks daily and each truck conducts 1 trip per day.**
Transfer system	If your municiaplity has some transfer systems (stations), please give us information below. ● **No transfer stations exist in the municipality.**
Vehicle maintenance system	1. Number of maintenance shops: ● **One workshop**
	2. Location of maintenance shops: ● **In the city center**
	3. Operating organization: ● **Maintenance and Repair Department**
	4. Number of workers: ● **Data not available**
	5. Annual expenditure for maintenance shop: ● **Maintenance costs of collection vehicles and spare parts costs are included in the expenses of Health and Environmental Affairs**

	Department ● **Data for workshop management and technical staff-related expenses are not available.**
	6. Current issues on maintenance system: ● **N. A.**
Street sweeping and public area cleaning system	1. Method: ● **Mannual**
	2. Length or area of sweeping service: ● **Data not available**
	3. Number of sweeping vihecles: ● **None**
	4. Operating organization: ● **Health and Environmental Affairs Department**
	5. Number of workers: ● **119 street sweepers**
	6. Annual expenditure for sweeping and cleaning service: ● **Included in the expenses of Health and Environmental Affairs Department**
	7. Current issues on sweeping and cleaning system: ● **Workers are not sufficient as Jordanians do not like jobs related with waste. Therefore, the municipality hires 60 syrian refugees for waste collection and street sweeping.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **The municipality does not operate any treatment facilities.**
Final disposal system	1. Location of the site(s): ● **Al-Husaineyat DS**
	2. Amount of waste disposed of: ● **250 ton/day (90 ton/day of which is from Greater Mafraq Municipality)**
	3. Operating organization: ● **Mafraq JSC**
	4. Types and number of landfill equipment (in case your municipality operates the site): ● **Refer to the Questionnare answered by Mafraq JSC**
	5. Number of workers: ● **Refer to the Questionnare answered by Mafraq JSC**
	6. Payment or tipping fee: ● **1,000 JD/year (but the municipality does not pay the fee)**
	7. Current issues on final disposal system: ● **Refer to the Questionnare answered by Mafraq JSC**
Financial system	1. Annual budget for MSWM (2014): **1,647,355 JD**
	2. Annual expenditure for MSWM (2014): **Total: 1,647,355 JD** **Salaries: 963,000 JD** **Other operational expenses: 684,355 JD**
	3. Financial sources of MSWM (2014): **Total: 1,647,355 JD**

	Municipal budget: 1,440,077 JD **Collection fee: 207,278 JD**
	4. Waste collection service fee: ● **Data not available.**
	5. Current issues on financial system: ● **N.A.**
Medical waste management	● **The municipality does not collect medical infectious waste.**
Industrial waste management	● **The municipality does not collect industrial hazardous waste.** ● **General industrial waste is collected from public containers along with domestic waste. Therefore, detailed information about general industrial waste is not available.**
Agricultural waste management	● **As agricultural waste is collected from public containers along with domestic waste, detailed information about agricultural waste is not available.**

SWM in Greater Ajloun Municipality

Subject	Contents
Municipality and General	Number of Departments: ● **6 departments**
	Number of staffs: ● **375 (permanent)** *Depending on the necessity, the municipality hires temporary workers.*
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **Health Section, Department of Environment and Gardening.**
	Number of staffs of responsible department of MSWM ● **Permanent: 90 + Temporary**
	Budget and expenditure of Municipality in 2015: **The financial statements of 2015 have been under preparation. The information about budget and expenditures of 2014 is as follows.** ● Approved Budget: **4,372,222 JD/year** ● Actual Revenue: **3,247,528 JD/year** ● Actual Expenses: **3,335,138 JD/year**
	Budget and expenditure of responsible department of MSWM in 2015: ● **Due to current accounting system, separating revenues and expenditures of SWM from those of the municipal total was not possible.**
	Issues and problems caused by the influx of Syrian refugees: ● **Due to the influx of Syrian refugees, the waste generation amount increased from 48 ton/day (2009) to 105 ton/day (2014). As most of the refugees live outside refugee camps and settled in the local communities, the municipality is responsible for collection of the increased waste. However, the collection capacity has not been sufficient for collecting the waste due to the lack of equipment and labor.**

MSWM Plan	Existence of the plan: ● **No**
Responsible organization for management of each category of waste	1. Domestic waste: ● **Greater Ajloun Municipality**
	2. Medical waste: ● **For infectious and medical hazardous waste: Private companies based on contracts with the MOH.** ● **For general waste: Greater Ajloun Municipality**
	3. Industrial waste: ● **For industrial hazardous waste the generators shall manage by themselves.** ● **For general industrial waste: Greater Ajloun Municipality**
	4. Agricultural waste: ● **Greater Ajloun Municipality. Agricultural waste is usually mixed with other domestic waste.**
	5. Construction waste ● **Waste generators. The municipality instructs the generators where to dispose the waste and monitors illegal dumping of construction waste.**
Waste Generation	1. Population in 2015: ● **Around 52,000 (2014).** ● **The result of the census-2015 has not been informed to the municipality.**
	2. Future Population (2020): ● **Data not available.**
	3. MSW (Waste the municipality responsible for) generation amount in 2015: ● **105 ton/day (2014).**
	4. Future MSW generation amount (2020): ● **No Plan**
Discharge and Storage system	1. Rule or method of discharge: ● **Majority uses public containers of 1.1 m^3.** ● **In few narrow streets, municipal workers collect waste and bring it to the containers of 1.1 m^3. Hand carts are used in these streets.**
	2. Types of storage containar: ● **1.1 m3 steel containers**
	3. Current issues on discharge and storage system: ● **There are littering around containers and illegal dumping due to lack of awareness.** ● **Public education be conducted.**
Collection system	1. Collection service coverage rate: ● **Urban area: 100% (area-wise)** ● **Rural area: some remote areas below 100% (area-wise).**
	2. Application of separate collection: ● **No separate collection. Waste is mixed in public containers.**
	3. Collection frequency: ● **The central part and commercial areas are collected daily while residential areas are twice or three times a week depending on their locations.**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify)

	● **4 (Public Containers)** ● **7 (Other): Narrow streets are collected by hand carts.**
	5. Number of collection vehicles:
	i. **Compactor (8 m3): 6 units** ii. Compactor (? m3): units iii. Tipper (?m3): units iv. Skipp loader: units v. Others (specify): units
	6. Operating organization: ● **Greater Ajloun Municipality consists of 5 areas and they have own offices.** ● **5 Health Sections of the 5 area offices under Department of Environment and Gardening.**
	7. Number of collection workers: ● **90 persons (as of January 2016) including all staffs for MSWM excluding temporary workers. The number was 105 in 2014.**
	8. Annual expenditure for collection service: ● **Due to current accounting system, separating expenditures of SWM from those of the municipal services was not possible.**
	9. Current issues on collection system: ● **Low utilization rate of collection vehicles. 3 out of 6 compactor trucks are obsolete and break down frequently.**
Transfer system	If your municiaplity has some transfer systems (stations), please give us information below. ● **The municipality does not operate any transfer stations.**
Vehicle maintenance system	If your municiaplity has a vehicle maintenance shop, please give us information below. ● **The municipality does not have any workshop. Vehicles are maintained by a private shop based on a contract.**
Street sweeping and public area cleaning system	1. Method: ● **Mannual**
	2. Length or area of sweeping service: km, m2 ● **Only main streets and commercial areas are being sweeped.**
	3. Number of sweeping vihecles: ● **No specially designed vehicles.**
	4. Operating organization: ● **5 Health Sections of the 5 area offices under Department of Environment and Gardening.**
	5. Number of workers: ● **Included in the 90 workers written in "Collection system". All workers engage in waste collection and street sweeping activities.**
	6. Annual expenditure for sweeping and cleaning service: ● **Due to current accounting system, separating expenditures of SWM**

	from those of the municipal services was not possible.
	7. Current issues on sweeping and cleaning system: ● **Nothing special.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **No treatment facilities exist.**
Final disposal system	1. Location of the site(s): ● **The municipality does not operate a disposal site.**
Financial system	1. Annual budget for MSWM: **427,000 JD**
	2. Annual expenditure for MSWM: Total: **427,000 JD** Saralies: **292,000 JD** Fuel and Lubricant: **80,000 JD** Maintenance: **55,000 JD** Others: JD
	3. Financial sources of MSWM: Total: **427,000 JD** Municipal budget: **163,000 JD** Collection fee: **264,000 JD*** ● ***: The collection fees are collected with electricity payment by the electricity company. The amount of collected fees is 264,000 JD/year. However, the electricity company does not transfer the amount to the municipality. Instead, the electricity company does not send invoices to the municipality for its electricity consumption of it.**
	4. Waste collection service fee: ● **Residents: 24 JD/electric meter/year** ● **Businesses: 40 to 80 JD/electric meter/year**
	5. Current issues on financial system: ● **Municipal own financial source is limited.**
Medical waste management	● **The municipality is responsible for collection of only general waste discharged by medical organizations. Container collection is applied.**
Industrial waste management	● **The municipality is responsible for collection of only general industrial waste. Container collection is applied.**
Agricultural waste management	● **Agricultural waste is discharged into containers mixed with domestic waste. The municipality collects each container and transports to transfer station being operated by Ajloun Governorate JSC.**

SWM in Greater Zarqa Municipality

Subject	Contents
Municipality and	Number of Departments:

General	● **25 departments**
	Number of staffs: ● **Around 4,500 permanent staffs**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **No departments in the municipality are assigned to implementation of SWM. Currently, 11 service districts of the municipality are responsible for waste collection and road sweeping in their respective areas. The service districts were equipped with collection vehicles and tools by the municipality.** ● **However, the Local Development Unit has been planning to development SWM system in Zarqa by expanding activities of the ESSRP, which will be explained in section "Other Information" at the end of this form, gradually to other areas. The department will be named as Department of Cleanliness.**
	Number of staffs of responsible department of MSWM ● **1,165 people are involved in SWM activities:** – **Administration- 100** – **Engineers- 5** – **Area organizers- 10** – **Supervisors - 150** – **Technicians- 150** – **Drivers- 150** – **Collection workers- 300** – **Road sweepers- 300**
	Budget and expenditure of Municipality in 2015: ● **Budget: 30,000,000 JD/year (2015)** ● **Salary expenses account for 80% of the total municipal expenses.**
	Budget and expenditure of responsible department of MSWM in 2015: ● **The annual budget of the municipality is approved by MOMA. The budget plan is prepared for each type of costs, but not for each functional unit of the municipality. Therefore, it is difficult to separate the budget for SWM.** ● **However, actual expenses of SWM activities are estimated to be 9,690,750 JD/year by the Local Development Unit.**
	Issues and problems caused by the influx of Syrian refugees: ● **The influx of Syrian refugees resulted in the increase of the municipal expenses. Especially, drastic increase in waste generation amount resulted in increase of collection expenses.** ● **Unemployment and poverty increased.** ● **Tensions have been increasing between local Jordanians and the Syrian refugees, especially due to unemployment of youth.**
MSWM Plan	Existence of the plan: ● **Yes.**
	If Yes, when was it formulated?: ● **March 2014**
	What organization formulated the plan: ● **LDK Consultants in Association with MOSTAQBAL Engineering and Environmental Consultants**

Responsible organization for management of each category of waste	1. Domestic waste: ● **Zarqa Municipality**
	2. Medical waste: ● **For general medical waste: Zarqa Municipality** ● **For infectious or hazardous medical waste: not known**
	3. Industrial waste: ● **For general industrial waste: Zarqa Municipality** ● **For industrial hazardous waste: Generators themselves. However, the Department of Environment, the MOE's branch at Zarqa Governorate, implements monitoring. As the MOE's capacity is not sufficient for monitoring this type of waste being generated throughout the country, it is planning to transfer the function to municipalities.**
	4. Agricultural waste: ● **Zarqa Municipality. Agricultural waste is usually mixed with other domestic waste.**
	5. Construction waste: ● **Waste generators. The municipality monitors illegal dumping of construction waste.**
Waste Generation	5. Population in 2015: ● **800,000 people (permanent). In addition, floating population is expected to be relatively high.** ● **As the territory of Zarqa municipality is 65 km2, the population density (123/ha) is very high.**
	6. Future Population (2020): ● **Future population has not been forecasted.**
	7. MSW (Waste the municipality responsible for) generation amount in 2015: ● **N.A.**
	8. Future MSW generation amount (2020): ● **Generation amount has not been forecasted.**
Discharge and Storage system	1. Rule or method of discharge: ● **Waste dischargers discharge their waste to public containers. No specific rules are set.**
	2. Types of storage containar: ● **Steel containers with a capacity of 1.1 m3.**
	3. Current issues on discharge and storage system: ● **Residents' discharge manner is not sufficient. Many residents discharge their waste outside public containers.** ● **The quality of containers is not sufficient; and thus, utilization period of the containers are shorter. Although the municipality produces small number of containers at its workshop, the majority of the containers that the municipality uses are made by local entities and relatively cheaper.**
Collection system	9. Collection service coverage rate: ● **Not exactly known. There are some non-collection areas due to the following conditions:** – **Insufficiency of equipment and public containers.** – **Existence of inaccessible areas.**
	10. Application of separate collection:

	● **Separate collection is not introduced.**
	11. Collection frequency: ● **1 to 3 times per day in the areas covered by collection service.** ● **The municipality is planning to reduce the frequency to twice or three times a week in the future.**
	12. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **4 (Public Containers).**
	13. Number of collection vehicles:
	i. Compactor (? M3): units (Data not available) **ii. Compactor (? M3): units (Data not available)** **iii. Tipper (?m3): units (Data not available)** **iv. Skip loader: 2 units** **v. Container (6 m3 for Skip loader): 5 units** **vi. Containers (1,1 m3): 2,000 units**
	14. Operating organization: ● **11 service districts of the municipality.**
	15. Number of collection workers: ● **610 workers (drivers and supervisors are included).**
	16. Annual expenditure for collection service: ● **2,710,125 JD/year.**
	17. Current issues on collection system: ● **Residents' discharge manner is not sufficient and collection frequency is too high.** ● **Insufficiency of equipment. However, 16 trucks and 700 containers will be provided under ESSRP of WB.**
Transfer system	If your municiaplity has some transfer systems (stations), please give us information below. 1. Number of transfer stations: ● **1 transfer station (Ghabawi Zarqa transfer station)**.
	2. Location of transfer stations: ● **At a distance of 5 km in the south from Zarqa municipality.**
	3. Transfer system: Direct, mechanical, others: ● **Direct transfer by using wheel loader. The compaction devices of the station has been broken down.**
	4. Transfer vehicle: Type and capacity: ● **Lardge open top tipper loaded by wheel loader.**
	5. Amount of waste transfered: ● **400 tons/day. Although weighbridge is not installed at the station, the municipality is provided with the waste amount data by the disposal site (Ghabawi) when it sends invoice of tipping fee.**
	6. Operating organization: ● **A private company based on a contract with the municipality.**
	7. Number of workers: ● **Not known.**
	8. Annual expenditure for transfer operation: ● **6,323,625 JD/year (3.5 JD/ton)**

	9. Current issues on transfer system: ● **Compaction device is not working.** ● **No protection facility for waste scattering by wind.**
Vehicle maintenance system	If your municiaplity has a vehicle maintenance shop, please give us information below.
	1. Number of maintenance shops: ● **1 – the municipal workshop.**
	2. Location of maintenance shops: ● **At a distance of 2 km from the city.**
	3. Operating organization: ● **Workshop Department of the municipality.**
	4. Number of workers: ● **200 to 250 persons due to the maintenace of all equipment of the municipality.**
	5. Annual expenditure for maintenance shop: ● **Not known.** ● **Ecpenditure included in SWM expenses.**
	6. Current issues on maintenance system: ● **Large number of employees and their salaries.**
Street sweeping and public area cleaning system	1. Method: ● **Mannual.**
	2. Length or area of sweeping service: ● **N.A.**
	3. Number of sweeping vihecles: ● **Sweeping vehicles are not used.**
	4. Operating organization: ● **Service districts**
	5. Number of workers: ● **300 (only street sweepers).**
	6. Annual expenditure for sweeping and cleaning service: ● **Included in SWM expenses.**
	7. Current issues on sweeping and cleaning system: ● **Parking in the streets make street sweeping works difficult.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **The municipality does not operate any treatment facilities.** ● **The municipality made contract with a private company for waste sorting at the T/S. The company pays 40,000 to 45,000 JD per year to the municipality.**
Final disposal system	● **The municipality does not operate a disposal site. It transports waste to Ghabawi DS of GAM. Tippting fee is 2 JD/ton.**
Financial system	1. Annual budget for MSWM: **8,000,000 JD**
	2. Annual expenditure for MSWM: **Total:** **8,000,000 JD**

	3. Financial sources of MSWM: **Total: 8,000,000 JD** **Municipal budget: 6,400,000 JD** **Collection fee: 1,600,000 JD**
	4. Waste collection service fee: ● **Households: 2 JD/electric meter/month** ● **Business entities: Set differently depending on types of activities and size of business. The minimum tariff is 2 JD/electric meter/month.** ● **Fees are collected by electricity company together with electricity payment. Before transferring the collected fees to the municipality, the electricity company deducts commission (10% of collected fee) for its service and the full payment of the electricity consumed by the municipality.**
	5. Current issues on financial system: ● **Fee collection cost is high (10% of the collected fees).** ● **80% of expenditure is salary.**
Medical waste management	● **The municipality is responsible for collection of only general waste discharged by medical organizations. Container collection is applied.**
Industrial waste management	● **The municipality is responsible for collection of only general industrial waste. Container collection is applied.**
Agricultural waste management	● **Agricultural waste is discharged into containers mixed with domestic waste. The municipality collects each container and transports to transfer station being operated by Ghabawi Zarqa transfer station.**
Other Information	**1. About ESSRP:** ● **The 1st Phase of ESSRP with a budget of 1.6 million USD will be implemented in 4 service districts of the municipality as a pilot with the activities below.** – **Provision of equipment: 16 trucks and 700 containers with a capacity of 1.1 m3;** – **Awareness raising programs including improvement of residents' waste discharge manner;** – **SWM capacity building of staffs of the municipality;** – **Job creation** – **Reduction of collection costs and** – **Cleaning campaigns** ● **All activities of the project were planned based on the actual needs identified in local community and will be implemented with the participation of local residents.** ● **The WB also committed 2 million USD for Zarqa as the budget for the 2nd Phase of the project, according to the informant.** ● **In the second stage the municipality intends to have the Green Stations for promotion of recycling at generation and creation of jobs.** **2. Waste segregation at the transfer station** ● **The municipality selects a company or individuals through tenders for separation of recyclables at the transfer station.** ● **The selected company or individuals pay 40,000 to 45,000 JD/year to the municipality.**

SWM in Greater Salt Municipality

Subject	Contents
Municipality and General	Number of Departments: ● **8 Departments**
	Number of staffs: ● **Around 800 employees**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **Cleaning Division of Services Department**
	Number of staffs of responsible department of MSWM ● **208 employees with following breakdowns:** - **Administration staff 4** - **Mechanics and Electricians 17** - **Drivers 40** - **Workers 147**
	Budget and expenditure of Municipality in 2015: ● **Data could not be obtained due to absence of the accountant.**
	Budget and expenditure of responsible department of MSWM in 2015: ● **Data could not be obtained due to absence of the accountant.**
	Issues and problems caused by the influx of Syrian refugees: ● **Data could not be obtained due to absence of relevant staff.**
MSWM Plan	Existence of the plan: ● **No**
Responsible organization for management of each category of waste	1. Domestic waste: ● **Cleaning Division**
	2. Medical waste: ● **General waste: Cleaning Division.** ● **Infectious waste: Hospitals and medical organizations**
	3. Industrial waste: ● **General industrial waste: Cleaning Division** ● **Hazardous waste: Generators.**
	4. Agricultural waste: ● **Cleaning Division**
	5. Construction waste ● **Cleaning Division provides collection service separately from other MSW.**
Waste Generation	1. Population in 2015: ● **Total population: 225,000 people** ● **Number of refugees: Not known**
	2. Future Population (2020): ● **Future population has not been forecasted.**
	3. MSW (Waste the municipality responsible for) generation amount in 2015: ● **200 ton/day.**
	4. Future MSW generation amount (2020): ● **Future generation amount has not been forecasted.**

Discharge and Storage system	1. Rule or method of discharge: ● **Residents living in high places discharge put their waste outside their houses.** ● **Container collection is applied in accessible areas.**
	2. Types of storage containar: ● **Steel containers with a capacity of 1.1 m3.**
	3. Current issues on discharge and storage system: ● **Information could not be obtained due to absence of relevant staff.**
Collection system	1. Collection service coverage rate: ● **More than 95% (it depends on the area.)**
	2. Application of separate collection: ● **No.**
	3. Collection frequency: ● **Once a day.**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **4. Container collection by collection trucks in accessible areas.** ● **5. Door to door collection by donkeys in inaccessible high areas.**
	5. Number of collection vehicles:
	i. Compactor trucks: **24 units (broken-4)** ii. Small-scale dump truck (2 ton): **11 units** iii. Tipper (?m3): **5 units** iv. Skipp loader: units v. Wheel loader: **7 units (used mainly for construction and other services)** **vi. Autograder: 1 unit (for construction)**
	6. Operating organization: ● **Cleaning Division**
	7. Number of collection workers: ● **147 workers including road sweepers**
	8. Annual expenditure for collection service: ● **Data could not be obtained due to absence of the accountant**
	9. Current issues on collection system: ● **Number of collection workers are not sufficient. According to the informant, the municipality plans to empoy 200 collection workers for Cleaning Division, it has been employing 147 workers presently. 53 posts have been vacant.** ● **Many areas in the city are mountaineous and inaccessible for collection trucks. Donkeys are being used for collection in these areas; and therefore, collection efficiency of donkey collection is expected to be lower.**
Transfer system	If your municipality has some transfer systems (stations), please give us information below. ● **The municipality created a small transfer point near its workshop. Waste collected by donkeys and small-scale dump trucks from inaccessible areas and narrow streets are brought to the transfer point and loaded mannually or by wheel loaders to big capacity compactor trucks.**

Vehicle maintenance system	If your municiaplity has a vehicle maintenance shop, please give us information below.
	1. Number of maintenance shops: ● **1 workshop for all vehicles of the municipality.**
	2. Location of maintenance shops: ● **Inside the city.**
	3. Operating organization: ● **Maintenance Division of Services Department.**
	4. Number of workers: ● **17 mechanics and electricians (Administration staffs are excluded).**
	5. Annual expenditure for maintenance shop: ● **200,000 JD/year (Salary not included)**
	6. Current issues on maintenance system: ● **As the road to Al Humra DS is steep, brakes of collection trucks need to be repaired frequently.** ● **Since the workshop does not possess tools and equipment for repairing hydraulic cylinders of compactor trucks and heavy equipment, this kind of repair is conducted in Amman.**
Street sweeping and public area cleaning system	1. Method: ● **Mannual**
	2. Length or area of sweeping service: ● **All roads are cleaned by two shifts: day shift and night shift.**
	3. Number of sweeping vihecles: ● **None**
	4. Operating organization: **Cleaning Division**
	5. Number of workers: ● **90 workers (out of the 147 workers).**
	6. Annual expenditure for sweeping and cleaning service: ● **Data could not be obtained due to absence of the accountant.**
	7. Current issues on sweeping and cleaning system: ● **Information could not be obtained due to absence of relevant staff.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **No treatment facilities exist.**
Final disposal system	1. Location of the site(s): ● **Al Humra DS (located in the territory of Greater Salt Municipality)**
	2. Amount of waste disposed of: ● **250-300 tons/day (200 ton/day is from Greater Salt Municipality)**
	3. Operating organization: ● **Balqa JSC**
	4. Types and number of landfill equipment (in case your municipality operates the site): ● **Refer to the Questionnaire Answered by Balqa JSC.**
	5. Number of workers: ● **Refer to the Questionnaire Answered by Balqa JSC.**
	6. Payment or tipping fee: ● **The municipality does not pay any tipping fee to the disposal site.**

	7. Current issues on final disposal system: ● **Refer to the Questionnaire Answered by Balqa JSC.**
Financial system	1. Annual budget for MSWM: ● **Data could not be obtained due to absence of the accountant.**
	2. Annual expenditure for MSWM: ● **Data could not be obtained due to absence of the accountant.**
	3. Financial sources of MSWM: ● **Data could not be obtained due to absence of the accountant.**
	4. Waste collection service fee: ● **Data could not be obtained due to absence of the accountant.**
	5. Current issues on financial system: ● **Data could not be obtained due to absence of the accountant.**
Medical waste management	● **The municipality does not collect medical infectious waste. General waste of medical organizations are collected from containers mixed with domestic waste.**
Industrial waste management	● **The municipality does not collect industrial hazardous waste. General industrial waste is collected from containers mixed with domestic waste.**
Agricultural waste management	● **Agricultural waste is collected from public containers mixed with domestic waste.**

SWM of Greater Jerash Municipality

Subject	Contents
Municipality and General	Number of Departments: ● **18 Departments**
	Number of staffs: ● **1,200 employees**
	Name of responsible department of Municipal Solid Waste Management (MSWM): ● **General Service Department**
	Number of staffs of responsible department of MSWM ● **300 employees**
	Budget and expenditure of Municipality in 2015: ● **Budget (plan): 13,000,000 JD (2015)** ● **Actual revenue: 5,500,00 JD (2015)** ● **Expenditure: 9,000,000 JD (2015)**
	Budget and expenditure of responsible department of MSWM in 2015: ● **Expenditure: 3,000,000 JD (2015)** ● **Salary: 150,000 JD/month**
	Issues and problems caused by the influx of Syrian refugees: ● **Unplanned expansion of municipal service areas due to settlement of refugees resulted in drastic increase of service costs. The capacity of municipality has not been sufficient for the increased needs for services. Procurement of additional collection equipment is necessary.**

	● **Waste generation amount doubled since the influx of refugees. As number of trips to be conducted to Al Ekaider DS, which is located at a distance of 90 km, increased considerably, waste collection and transportation costs increased.**
MSWM Plan	Existence of the plan: ● **No**
Responsible organization for management of each category of waste	1. Domestic waste: ● **General Service Department of Greater Jerash Municipality (GSD)**
	2. Medical waste: ● **General waste: GSD.** ● **Infectious waste: Sterilization and incineration at the hospital of Jerash.**
	3. Industrial waste: ● **General industrial waste: GSD** ● **Hazardous waste: Generators.**
	4. Agricultural waste: ● **GSD**
	5. Construction waste ● **GSD**
Waste Generation	1. Population in 2015: ● **Total population: 250,000 people (refugees included)** ● **Number of refugees: 50,000 people**
	2. Future Population (2020): ● **Future population has not been forecasted.**
	3. MSW (Waste the municipality responsible for) generation amount in 2015: ● **110 ton/day.**
	4. Future MSW generation amount (2020): ● **Future generation amount has not been forecasted.**
Discharge and Storage system	1. Rule or method of discharge: ● **Container collection is applied.**
	2. Types of storage containar: ● **Steel containers with a capacity of 1.1 m3.**
	3. Current issues on discharge and storage system: ● **Number of containers is insufficient.**
Collection system	1. Collection service coverage rate: ● **100% (area-wise)**
	2. Application of separate collection: ● **No.**
	3. Collection frequency: ● **Downtown: 3 times/day.** ● **Other areas: Once a day.**
	4. Collection system: 1. Point, 2. Bell, 3. Dust chute, 4. Public container, 5. Door to door, 6. Street, 7. Others (specify) ● **4. Public container.**
	5. Number of collection vehicles:
	i. Compactor (4 ton): **12 units (4 broken)** ii. Compactor (9-10 ton): **4 units** iii. Tipper (?m3): units

	iv. Skipp loader: units v. Wheel loader: **2 units**
	6. Operating organization: ● **GSD**
	7. Number of collection workers: ● **250 workers including road sweepers**
	8. Annual expenditure for collection service: ● **Included in the expenditures of MSWM**
	9. Current issues on collection system: ● **Low collection capacity due to insufficiency of collection vehicles and containers.** ● **Obsoleteness of collection equipment and frequent occurance of breakdowns.** ● **Distant location of the disposal site (Al Ekaider) and non-existence of a T/S.** ● **Accumulation of snow undermines waste collection. Wheel loaders should be procured for snow removal.**
Transfer system	If your municipality has some transfer systems (stations), please give us information below. ● **Currently no T/Ss exist. However, construction of a new T/S in Jerash for the 5 municipalities of the governorate has already been planned. Greater Jerash Municipality will operate the T/S.**
Vehicle maintenance system	If your municiaplity has a vehicle maintenance shop, please give us information below.
	1. Number of maintenance shops: ● **1 (one)**
	2. Location of maintenance shops: ● **At the edge urban area of Greater Jerash Municipality.**
	3. Operating organization: ● **Maintenance unit of Greater Jerash Municipality.**
	4. Number of workers: ● **29 workers (Administration staffs are excluded).**
	5. Annual expenditure for maintenance shop: ● **Data not available**
	6. Current issues on maintenance system: ● **Due to limited time for the meeting, the information was not obtained.**
Street sweeping and public area cleaning system	1. Method: ● **Mannual**
	2. Length or area of sweeping service: ● **Data not available**
	3. Number of sweeping vihecles: ● **None**
	4. Operating organization:
	5. Number of workers: ● **250 workers (Collection workers included).**
	6. Annual expenditure for sweeping and cleaning service: ● **Included in the expenditures of MSWM**

	7. Current issues on sweeping and cleaning system: ● **Nothing special.**
Treatment system	If your municiaplity has some SW treatment facilities, please give us information below. ● **No treatment facilities exist.**
Final disposal system	1. Location of the site(s): ● **The municipality transports waste to Al Ekaider DS.**
	2. Amount of waste disposed of: ● **110 tons/day**
	3. Operating organization: ● **Irbid JSC**
	4. Types and number of landfill equipment (in case your municipality operates the site): ● **Refer to the MM with Irbid JSC.**
	5. Number of workers: ● **Refer to the MM with Irbid JSC.**
	6. Payment or tipping fee: ● **12,000 JD/year. Sometimes, the municipality does not pay the tipping fee.**
	7. Current issues on final disposal system: ● **N.A.**
Financial system	6. Annual budget for MSWM: JD
	7. Annual expenditure for MSWM: **Total: 3,000,000 JD** **Saralies: 1,800,000 JD** **Others: 1,200,000 JD**
	8. Financial sources of MSWM: **Total: 3,000,000 JD** **Municipal budget: 2,930,000 JD** **Collection fee: 70,000 JD**
	9. Waste collection service fee: ● **Households: 2 JD/electric meter/moth** ● **Businesses: 5 JD/electric meter/month** ● **The waste fee is collected by the electricity company. As the Municipality has to pay for electricity used for municipal and public services including street lightening, the electricity company deducts the total amount of the bills from the collected waste fees. In most cases, the municipality does not receive the collected waste fees from the electricity company.**
	10. Current issues on financial system: ● **Nothing special.**
Medical waste management	If your municipality collects medical waste (infectious and hazardous waste) together with the general waste from hospitals and clinics, please answer the following questions: ● **The municipality does not collect medical infectious waste. General waste of medical institutions are collected from containers mixed with**

	domestic waste.
Industrial waste management	If your municipality collects industrial waste from factories, please answer the following questions: ● **The municipality does not collect industrial hazardous waste. General industrial waste is collected from containers mixed with domestic waste.**
Agricultural waste management	If your municipality collects agricultural waste from chicken farms, etc., please answer the following questions: ● **Agricultural waste is collected from public containers mixed with domestic waste. Therefore, collection of detailed information about agricultural waste was not possible.**

Annex 5. SWM by the JSCs

SWM of Irbid JSC

Subject	Questions	Answers
General	1. Name of JSC:	Irbid JSC
	2. Date of establishment:	1980
	3. Municipality and others covered by JSC service :	● **Municipalities:** **A) 14 in Irbid Governorate** – **Greater Irbid** – **Kaffarat** – **Khalid Bin Al Walid (uses Aghwar Shamaliyah DS at the same time)** – **Mazaar** – **Ramtha** – **Sahil Houran** – **Saroo** – **Sharhabil Bin Hasna *(uses Aghwar Shamaliyah DS at the same time)*** – **Sho'la** – **Tabaket Fahil *(uses Aghwar Shamaliyah DS at the same time)*** – **Taibah *(uses Aghwar Shamaliyah DS at the same time)*** – **Wastyyeh *(uses Aghwar Shamaliyah DS at the same time)*** – **West Irbid** – **Yarmouk** **B) 5 in Jerash Governorate** – **Bab Amman** – **Burma** – **Greater Jerash** – **Me'raad** – **Nasim** **C) 5 in Ajloun Governorate** – **Greater Ajloun** – **Junaid** – **Kafrangeh** – **Oyoon** – **Shafa** **D) 3 in Mafraq Governorate** – **Baslieh** – **Housha** – **Sarhan**
	4. Name of JSC head:	**Eng. Qasem Banihani**
	5. Organization chart (Department name):	**JSC consists of following departments:** ● **Administration**

		● **Disposal site** ● **Others**
	6. Number of employees according to the department:	● **Total 180 persons with the following works:** **1. Landfill: 65 persons** **2. Administration: 56 persons** 3. **Work in the municipalities: 55 persons** 4. **On leave: 4 persons**
	● Service field:	● **Landfill operation** ● **Provision of equipment and labour to municipalities during occurrances of emergency during huge snowfall etc.**
	● Annual budget (plan) and Actual revenue:	● **Total : 2,190,200 (2015)**
	● Annual expenditure:	● **Total: 1,808,109 (2015):-** ● **Salaries make 46% of the budget** ● **Fuels and liubricants make 9%...** ● **Maintanace make 11.5%** ● **Other: 33.5%**
	● Financial sources	● **Total JD with the following breakdown:** **1. MOMA: 1,087,092 million JD** **2. Others: (Not specified)**
Transfer station	If your JSC operates transfer stations, please give us information below. ● **The JSC does not operate a transfer station.**	
Treatment system	● **The JSC does not operate any solid waste treatment facilities.** ● **However, a company is contracted with the JCS to segregate recyclables at the landfill site. 40 to 50 waste pickers are currently working on waste segregation. The company pays 76,000 JD/year to the JSC for the permission to segregate recyclables.**	
Treatment system	Your JSC is requesting a textile incinerator. Please give us information below.	
	1. Purpose of incineration	● **To incenerate textile waste.**
	2. Reason why textile incinerator	● **Many textile processing factories located in Al Hasan Industrial zone transports textile waste to Al Ekaider. The daily amount of this waste being received at the DS is around 20 to 25 ton (24 trips with skip loaders). As textile wastes cause frequent breakdowns of heavy equipment, it is impossible to compact by bulldozers. Disposal of textiles without any treatment requires huge space. Therefore, incinerator is necessary.**
	3. Existence of preliminary design, EIA and feasibility study (F/S)	● **None.**
	4. Specification of the incinerator (capacity, type, etc.)	● **None.**

	5. Installation site at the Al Ekaider disposal site	● **Two candidate sites with natural ground inside the Al Ekaider premise were decided. One is near the entrance and the other is near the landfill cell for domestic waste.**
	6. Operator of the incinerator	● **Al Ekaider DS**
	7. Proposed tipping fee of incineration	● **Not decided yet.**
	8. Existence of the operation plan	● **None.**
	9. Involvement of donors	● **None.**
	10. How do you disposed of medical waste?	● **Medical hazardous waste is not received at Al Ekaider DS.**
Final disposal system	If your JSC operates a landfill, please give us information below.	
	1. Name and location of the site:	**Al Ekaider disposal site.**
	2. Area of the site:	**88 ha (880 dunom)**
	3. Owner of the site	**Irbid JSC (around 35 Ha) and Greater Irbid Municipality (around 50 Ha)**
	4. Covered population	● **Municipalities: Not known.** ● **Syrian refugees: Not known.**
	5. Amount of waste disposed of (tons/day):	**1,000 to 1,200 tons/day**
	6. Types and number of landfill equipment:	**Bulldozer: 5 units** **Excavater: 0 unit** **Wheel loader: 9 units** **Dump truck: 7 units** **Water truck: 2 units** **Tractor with sprayer: 2 units** **Passenger bus for 20 persons: 1 unit**
	7. Number of workers:	**65 persons with the following breakdowns:** ● **Operator: 35 persons** ● **Others: 30 persons**
	8. Annual budget and expenditure of the Disposal Site:	**Not Available**
	9. Tipping fee (JD/ton)	● **Municipality: 1JD/year electricity meter subscr[ption.** ● **Solid waste: 4 JD/ton** ● **Elemination: 30 JD/ton** ● **Textile: 2.75 JD/ton valid until 31/9/2016 and then it will be 4 JD/ton** ● **Industrial waste water: 1.25 for each use of the weighing instrument** ● **Diaries: 2 JD/m^3** ● **Slaughterhouses: 4 JD /ton** ● **Zibar of oplives: 330 JD/actual production line.**
	10. Current issues on final disposal system:	Please note: ● **Many of the heavy equipment are**

		obsolete and breakdowns occur frequently. ● **The JCS does not have a workshop (planning to alter its garage into a workshop). No mechanics is being hired. Therefore, maintenance is conducted by external workshops.** ● **Insufficient landfill space. However, 2 landfill cells will be constructed by donors.** ● **The JSC does not possess an excavator; and thus, soil preparation is not efficient.**
Medical waste disposal at the landfill	● **Medical infectious waste is not received.**	
Industrial waste disposal at the landfill	**Following industrial waste has been received:** ● **General industrial waste mixed with domestic waste. Transportation is conducted by municipalities.** ● **Zibar from olive oil factories. Amount is not known. Received in the zibar ponds established in Al Ekaider. No special treatment is conducted. Tipping fee is 2.75 JD/ton.** ● **Textile waste. Amount is 20 to 25 ton/day. This waste is being dumped in a separate place at the landfill area. Tipping fee is 2.75 JD/ton.** ● **Liquid waste that consisted of sludge from factories and waste water from water treatment facilities located near the landfill site. No special treatment is conducted on the sludge. Being stored in liquid ponds established in Al Ekaider separate from those for Zibar. Tipping fee is not known.** ● **Animal waste. Mostly those received from slaughter houses and chicken farms. This type of waste is landfilled with domestic waste. No tipping fee is set for those transported by the municipalities.**	
Agricultural waste disposal at the landfill	● **Agricultural waste is collected by municipalities from public containers together with domestic waste.**	

SWM of Aghwar Shamaliyah JSC

Subject	Questions	Answers
General	1. Name of JSC:	**Aghwar Shamaliyah JSC**
	2. Date of establishment:	**1992**
	3. Municipality and others covered by JSC service :	**Municipalities:** ● **Mo'az Bin Jabal (Irbid Gov., Aghwar District)** ● **Tabaket Fahil (Irbid Gov., Aghwar District)** ● **Sharhabil Bin Hasna (Irbid Gov., Aghwar District)** ● **Khalid Bin Al Walid (Irbid Gov.)** ● **Taibah (Irbid Gov.)** ● **Wastyyeh (Irbid Gov.)** ● **Shafa (Ajloun Gov.)**

	4. Name of JSC head:	**Eng. Muhamad Al Oguili**
	5. Organization chart (Department name):	**JSC has the following departments:** ● **Transportation and Disposal site** ● **Finance** ● **Administration** ● **Service** ● **Maintenance**
	6. Number of employees according to the department:	**Total 60 persons with the following works:** ● **T/S 7 persons** ● **Disposal site: 32 persons** ● **Administration and others: 21 persons**
	● Service field:	● **Operation of T/S** ● **Operation of landfill**
	● Annual budget:	**Total 500,000 JD per year**
	● Annual expenditure:	**Total 500,000 JD per year**
	● Financial sources	**MOMA: 445,000 JD/year** **Municipalities: 45,000 JD/year** **Recovery of recyclables: 10,000 JD/year**
Transfer station	If your JSC operates a transfer station, please give us information below. ● **Yes**	
	1. Number of transfer stations:	**One**
	2. Name of transfer stations:	**Aghwar District T/S**
	3. Transfer system: Direct, mechanical, others:	**Mechanical compaction type**
	4. Transfer vehicle: Type and capacity:	**Track tructor with 50m3 semi-trailer**
	5. Amount of waste transfered (tons/day):	**30 ton/day**
	6. Types and number of transfer vehicles:	● **Truck tructor: 2 units** ● **Refuse transfersemi-trailer (50m3): 1 unit** ● **Tractor for water and insecticide: 2 inits** ● **Water tank truck: 1 unit** ● **Minibus: 1 unit**
	7. Number of workers:	**7 persons**
	8. Annual expenditure for transfer operation:	**100,000 JD/year**
	9. Tipping fee:	**N. A.**
	10. Current issues on transfer station:	● **Shortage of equipment** ● **Number of employees exceeded the necessity.** ● **Lack of maintenance capacity.**
Treatment system	● **None.**	
Final disposal system	If your JSC operates a landfill, please give us information below. **Yes.**	

	1. Name and location of the site:	**Same as T/S**
	2. Area of the site:	**8 ha (80 dunom)**
	3. Owner of the site	**JSC**
	4. Covered population	● **Data not available**
	5. Amount of waste disposed of (tons/day):	**90-120 tons/day**
	6. Types and number of landfill equipment:	**Bulldozer: 1 unit** **Wheel loader: 3 units (2 broken down)**
	7. Number of workers:	**Total 39 persons work in the T/S and dump site**
	8. Annual budget and expenditure:	**Included in the buget and expenditure of the T/S**
	9. Tipping fee (JD/ton)	● **N.A.**
	10. Current issues on final disposal system:	● **N.A.**
Medical waste disposal at the landfill	● **None**	
Industrial waste disposal at the landfill	● **None**	
Agricultural waste disposal at the landfill	● **Agricultural waste is collected from public containers mixed with domestic waste.**	

SWM of Rabiet Al Kura JSC

Subject	Questions	Answers
General	1. Name of JSC:	**Rabiet Al Kura JSC**
	2. Date of establishment:	**N. A.**
	3. Municipality and others covered by JSC service :	**Municipalities:** **A) Deil Abi Said** **B) Rabyet ElKoora** **C) Barkash**
	4. Name of JSC head:	**Eng. Osama Obeidat**
	5. Organization chart (Department name):	**Only operation of Rabiet Al Kura T/S**
	6. Number of employees according to the department:	**Total 18 persons work in the T/S and emergency dump site**
	7. Service field:	**Only operation of Rabiet Al Kura T/S**
	8. Annual budget:	● **Budget (plan): N. A.** ● **Actual Revenue: 387,250 JD (2015)**
	9. Annual expenditure:	● **387,250 JD (2015)**
	10. Financial sources	● **Subsidy from MOMA: 387,250 JD (2015)**
Transfer station	If your JSC operates a transfer station, please give us information below. ● **Yes**	
	1. Number of transfer stations:	● **1**
	2. Location and name of	● **Rabiet Al Kura Transfer Station**

	transfer stations:	**located in Al Kura.** ● **(distance to Al Ekaider DS: 90 km)**
	3. Transfer system: Direct, mechanical, others:	● **Mechanical compaction type**
	4. Transfer vehicle: Type and capacity:	● **Truck tractor with 50m3 semi-trailer**
	5. Amount of waste transfered (tons/day):	● **90 ton/day**
	6. Types and number of transfer vehicles:	● **Truck tractor: 1 unit** ● **Refuse transfer semi-trailer (50m3): 2units**
	7. Number of workers:	● **18 persons**
	8. Annual expenditure for transfer operation:	● **Municipalities: 12,750 JD per year (but not paid)** ● **Direct transport by generators: N. A.**
	9. Tipping fee:	● **None**
	10. Current issues on transfer station:	● **Shortage of equipment** ● **Shortage of workers**
Treatment system	● **No treatment facilities**	
Final disposal system	If your JSC operates a landfill, please give us information below. ● **As all waste (120 ton/day) cannot be transferred due to the lack of transferring capacity of the T/S, the JSC dumps part of received waste at the T/S.**	
	1. Name and location of the site:	● **Same as the T/S**
	2. Area of the site:	● **3.2 ha (32 dunom) including the T/S and the dumpsite**
	3. Owner of the site	● **JSC**
	4. Covered population	● **Around 250,000**
	5. Amount of waste disposed of (tons/day):	● **30 ton/day**
	6. Types and number of landfill equipment:	● **Wheel loader: 1 units**
	7. Number of workers:	**Total 18 persons work in the T/S and emergency dump site**
	8. Annual budget and expenditure:	**Included in the revenues and the expenditures of the T/S**
	9. Tipping fee (JD/ton)	**None**
	10. Current issues on final disposal system:	**Please note:** ● **N.A.**
Medical waste disposal at the landfill	● **Medical infection waste is not received**	
Industrial waste disposal at the landfill	● **Industrial hazardous waste is not received**	
Agricultural waste disposal at the landfill	● **As municipalities bring agricultural waste mixed with domestic waste, impossible to identify.**	

SWM of Mafraq JSC

Subject	Questions	Answers
General	1. Name of JSC	**Mafraq JSC**
	2. Date of establishment:	**1/1/1986**
	3. Municipality and others covered by JSC service :	● **Municipalities:** **A) Greater Mafraq** **B) ManshietBani Hasan** **C) Erehaab** **D) Bal'ama** **E) Za-atariwa Al Manshieh** **F) Baslieh** **G) Sarhan** **H) Khaldieh** **I) Prince Hussein Bin Abdulla** **J) Umm Al Jimaal** **K) SabhaWaDafyaneh** • **Zatri Syrian refugee camp;** • **University of Al Albeut;** • **Military base; and** • **Slauter house.**
	4. Name of JSC head:	**Moh'd Khair Al Shraah**
	5. Organization chart (Department name):	**Attached (in Arabic)**
	6. Number of employees according to the department:	**Total 119 persons with the following works:** • **Landfill: 33 persons** • **Administration: 32 persons** • **Worked in the municipalities:50 persons** • **Non payed leave: 4**
	● Service field:	**Landfill operation,**
	● Annual budget:	**Total budget 2016: 1,270,826 JD's with the following break down:** ● **Salaries & promotions: 736,526 JD's** ● **Others(training, electricity, water, net, mail, office expenditure, insurance, machinery maintenance, pest control, oils and lubricants, & many others): 187,300 JD's** ● **Capital expenditure: 336,000 JD's** ● **Constructions & landfill maintenance: 20,000 JD's**
	● Annual expenditure:	**Annual expenditure in 2015: 1,159,700 JD's with the following break down:** • **Salaries & promotions: 730,900 JD's** • **Others (training, electricity, water, net, mail, office expenditure, insurance, machinery maintenance, pest control, oils and lubricants, & many others): 175,300 JD's** • **Capital expenditure: 203,000 JD's** • **Constructions & landfill maintenance: 50,000**

		JD's
	● Financial sources	**Total 1,270,826 JD with the following breakdown:** • **MOMA: 1,006,471 JD's** • **Others (Landfill use fees by the private sector [farms & factories]) : 239,355 JD's** • **Annual Municipalities contribution: 25,000 JD's**
Transfer station	If your JSCoperatestransfer stations, please give us information below. **No transfer station**	
Treatment system	If your JSC has some SW treatment facilities, please give us information below. **No specific treatment only valuable waste recovery by waste pickers in the dump site.**	
Final disposal system	If your JSCoperates a landfill, please give us information below.	
	1. Name and location of the site:	**Al Hoseyneyat disposal site**
	2. Area of the site:	**37.8 ha**
	3. Owner of the site	**JSC**
	4. Covered population	● **Municipalities: 312,000** ● **Syrian refugees: About 180,000**
	5. Amount of waste disposed of(tons/day):	**250 tons/day**
	6. Types and number of landfill equipment:	**Bulldozer: 2 units** **Excavater: 1 unit** **Wheel loader: 4 units** **Dump truck: 2 units** **Water truck: 1 unit** **Tractor wuth spray: 1 unit** **Passenger bus for 24 persons: 1unit**
	7. Number of workers:	**33 persons**
	8. Annual budget and expenditure:	**Budget: ?? JD** **Total expenditure of ?? JD with the following breakdown:** ● **Salary: ??** ● **Fuel and lubricant: ??** ● **Maintenance of equipment: ??** ● **Others:**
	9. Tipping fee (JD/ton)	• **Municipality: 1,000JD/year but not paid.** • **Other users: 5 JD/ton**
	10. Current issues on final disposal system:	• **Lack of landfill equipment, especially bulldozer and landfill compactor** • **Lanfill cell for sanitary landfill operation** • **Lack of landfill operation plan** • **Weak capability of staff for proper landfill operation**
Medical waste disposal at the landfill	**No medical wastes disposable in the landfill**	
Industrial waste disposal at the landfill	**No industrial wastes disposable in the landfill**	

Agricultural waste disposal at the landfill	**The landfill receive around 60 tons/day of dead animals, poultry farms waste, etc.** **Dumped in a special trenches**

SWM of Badiah Shamaliyah JSC

Subject	Questions	Answers
General	1. Name of JSC:	● **Badiah Shamaliyah JSC**
	2. Date of establishment:	● **1996**
	3. Municipality and others covered by JSC service :	● **Municipalities:** • **Bani Hasim** • **Dair Al Kahif** • **Sabha Wa Dafyaneh** • **Safawi** • **Salhieh Wa Nayfeh,** • **Umm al Gtain Wa Al Mkaifteh** • **Umm Al Jimaal** ● **Others: Direct transports by businesses. However, number of contracted businesses is not known.**
	4. Name of JSC head:	**Mr. Kasim Dardour**
	5. Organization chart (Department name):	● **A steering committee formed by 7 municipalities above.** ● **Director** ● **Administration department** ● **Financial department** ● **Technical department (disposal site included)**
	6. Number of employees according to the department:	● **Total 33 persons with the following works:** **1. Landfill: 17 persons** **2. Administration: 7 persons** **3. Worked in the municipalities: 9 persons**
	7. Service field:	● **Landfill operation**
	8. Annual budget:	● **Annual budget (plan): 478,883 JD** ● **Actual revenue: 260,507 JD**
	9. Annual expenditure:	● **Total 260,507 JD**
	10. Financial sources	● **Total 260,507 JD with the following breakdown:** **1. MOMA: 216,695 JD** **2. Municipalities: 2,000 JD** **3. Collected fees from businesses: 20,000 JD** **4. Others: 21,812 JD**
Transfer station	● **The JSC does not operate any transfer stations.**	
Treatment system	● **None.**	

Final disposal system	If your JSC operates a landfill, please give us information below.	
	1. Name and location of the site:	● **Badiah Shamaliyah disposal site.** ● **Started operation in 2002.**
	2. Area of the site:	● **36 ha (360 dunom)**
	3. Owner of the site	● **The JSC**
	4. Covered population	● **Municipalities: 75,000 people** ● **Syrian refugees: About 30,000 people**
	5. Amount of waste disposed of (tons/day):	● **200 to 250 tons/day** ● **However, the amount is not measured with truckscale.**
	6. Types and number of landfill equipment:	**Bulldozer: 0 unit** **Excavater: 0 unit** **Wheel loader: 4 units (broken-1)** **Dump truck: 1 unit** **Water truck: 1 unit** **Tractor wuth sprayer: 2units (broken-1)** **Pickup truck: 3 units**
	7. Number of workers:	● **17 persons with the following breakdown:** **1. Management: 2** **2. Operator: 12** **3. Technician: 3**
	8. Annual budget and expenditure:	● **Included in the JSC total revenues and expenditures.**
	9. Tipping fee (JD/ton)	● **Municipality: 1,000 JD/year but not paid completely.** ● **Other users: 6,000 to 10,000 JD/year depending on contracts.**
	10. Current issues on final disposal system:	**Please note:** ● **Disposal site is located far from municipalities (35 km from Northern Badiah)** ● **Lack of heavy equipment such as bulldozers and excavators.** ● **Lack of maintence staff such as mechanics. As capable mechnics cannot be found in surrounding municipalities, maintenance is conducted in Amman.**
Medical waste disposal at the landfill	● **Medical infectious waste is not received at the disposal site.**	
Industrial waste disposal at the landfill	● **Industrial hazardous waste is not received at the disposal site.** ● **Industrial general waste and those from slaughter houses and chicken farms are collected from public containers mixed with domestic waste.**	
Agricultural waste disposal at the landfill	● **Agricultural waste is collected from public containers mixed with domestic waste.** ● **As farmers use most of agricultural waste as fodders for animals, the diposal amount is expected to be small.**	

SWM of Ajloun JSC

Subject	Questions	Answers
General	1. Name of JSC:	**Ajloun Governorate JSC**
	2. Date of establishment:	**1992**
	3. Municipality and others covered by JSC service :	**Municipalities:** **A) Deil Abi Said** **B) Ajloun** **C) Kafrangeh** **D) Junaid** **E) Shafa** **F) Oyoon**
	4. Name of JSC head:	**Mr. Issa Mohammad Khasawner**
	5. Organization chart (Department name):	**JSC has the following departments:** • **Administration** • **Finance** • **Transfer Station** • **Slaughter house**
	6. Number of employees according to the department:	**Total 50 persons with the following works:** • **Head 1 person** • **Administration: 7 persons** – **Manager (1 person)** – **Typist (2 persons)** – **Driver (1 person)** – **Security (2 persons)** – **Assistant (1 person).** • **Finance 1 person** • **T/S: 19 persons** • **Slaughter house: 2 persons** • **Working in municipalities: 20 persons**
	● Service field:	• **Operation of T/S** • **Operation of slaughter house:** • **Technical support to municipalities**
	● Annual budget:	**Total 357,175 JD per year**
	● Annual expenditure:	**Total 357,818 JD per year with following breakdown:** ● **Fuel & lubricants: 48,553 JD** ● **Maintenance: 55,000 JD**
	● Financial sources	**Total 357,175 JD per year with following sources:** • **MOMA: 353,376 JD** • **Revenue from slauter house: 3,500 JD** • **Others: 300 JD**
Transfer station	If your JSC operates a transfer station, please give us information below. **Yes**	
	1. Number of transfer stations:	**One**

	2. Location and name of transfer stations:	**Ajloun Governorate T/S**
	3. Transfer system: Direct, mechanical, others:	**Mechanical compaction type**
	4. Transfer vehicle: Type and capacity:	**Track tructor with 50m3 semi-trailer**
	5. Amount of waste transfered (tons/day):	**160 ton/day**
	6. Types and number of transfer vehicles:	● **Truck tructor: 2 units** ● **Refuse transfersemi-trailer (50m3): 2 units** ● **Wheel loader: 1 unit** ● **Pick-up truck: 1 unit**
	7. Number of workers:	● **19 persons**
	8. Annual expenditure for transfer operation:	● **104,982 JD/year (2015)**
	9. Tipping fee:	● **Although the amount of annual contribution to be paid by municipalities is 26,926 JD, municipalities do not pay.** ● **No tipping fee is set since the T/S does not accept waste from private companies.**
	10. Current issues on transfer station:	● **As the T/S is on an elevated location, ascending to the T/S in winters is difficult if it snowed.** ● **Compaction capacity of the T/S is not sufficient.**
Treatment system	● **None.**	
Final disposal system	● **None**	
Medical waste disposal at the landfill	● **None**	
Industrial waste disposal at the landfill	● **None**	
Agricultural waste disposal at the landfill	● **None**	

SWM of Zarqa JSC

Subject	Questions	Answers
General	1. Name of JSC:	**Zarqa Governorate JSC**
	2. Date of establishment:	**1988**
	3. Municipality and others covered by JSC service :	● **Municipalities:** – **Azraq** – **Baireen** – **Duleil** – **Hallabat**

		- **Hashimyah** • **Others** - **Factories in industrial zones** - **Business entities**
	4. Name of JSC head:	**Eng. Ziad Abeluah Al Heyasat**
	5. Organization chart (Department name):	**As shown in below**
	6. Number of employees according to the department:	● **Total 136 persons with the following works:** **1. Landfill: 25 persons** **2. Administration: 19 persons** **3. Worked in the municipalities: 92 persons**
	7. Service field:	**Landfill operation**
	8. Annual budget:	● **Budget: 1,200,000 JD (plan for 2015)** ● **Actual Revenue: 695,000 JD (2015)**
	9. Annual expenditure:	● **JSC total expenses 800,000 JD (2015)**
	10. Financial sources	● **Total 695,000 JD (2015) with the following breakdown:** - **MOMA: 575,000 JD (2015)** - **Collected tipping fee: 120,000 JD (2015)**
Transfer station ● **None**		
Treatment system ● **None.**		
Final disposal system	If your JSC operates a landfill, please give us information below. ● **There is a landfill in Azraq, but it is unofficial. In order to establish an official disposal site the landfill committee consists of MoMA, MoH, MoWI, MoA, MoNR, MoE, Azraq Minicipality and Land Dept identified the site in 2012. It is proposed landfill for JICA assistance.**	
	1. Name and location of the site:	**Duleil disposal site**
	2. Area of the site:	**27 ha (270 dunom)**
	3. Owner of the site	**JSC**
	4. Covered population	● **Municipalities: 220,000** ● **Syrian refugees: Data not available**
	5. Amount of waste disposed of	**300 tons/day**
	6. Types and number of landfill equipment:	• **Bulldozer: 2 units (1 broken)** • **Wheel loader: 4 units (2 broken)** • **Dump truck: 2 units** • **Tractor wuth spray: 1 unit** • **Pick up truck 1 unit**
	7. Number of workers:	**25 persons with the following breakdown:** ● **Management: 2** ● **Operator: 15** ● **Technician: 1** ● **Others (Supervisors and Security guards): 7**
	8. Annual budget and	**Budget: 585,000 JD (2015)**

	expenditure:	**Total expenditure of 585,000 JD (2015) with the following breakdown:** ● **Salary: 150,000 JD** ● **Fuel and lubricant: 100,000 JD** ● **Maintenance of equipment: 30,000 JD** ● **Others: 305,000 JD**
	9. Tipping fee (JD/ton)	• **Municipality: 1,000JD/year but not paid.** • **Other users:** – **Domestic waste from generators with contracts: varies depending on contracts** – **Domestic waste from generators without contract: 15 JD/ton** – **Bulky waste: 30 JD/ton**
	10. Current issues on final disposal system:	**Please note:** • **Landfill operation is not sufficient.** • **No excavator for extraction of soil for soil coverage.** • **No capacity for equipment maintenance.**
Medical waste disposal at the landfill	• **Infectious waste is not received.**	
Industrial waste disposal at the landfill	• **Industrial hazardous waste is not received.**	
Agricultural waste disposal at the landfill	1. Disposal of agriculturall waste: 2. If yes, sources, types and amount of agricultural waste: 3. Disposal methods of agriculturall waste: 4. Tipping fee: 5. Current issues on agricultural waste disposal method	• **Yes.** • **Amount of agricultural waste is impossible to separate from the total waste.** • **Landfilling with domestic waste.** • **10 to 1,000 JD/year depending on contracts** • **Nothing special.**

SWM of Balqa JSC

Subject	Questions	Answers
General	1. Name of JSC:	● **Balqa JSC**
	2. Date of establishment:	● **1989**
	3. Municipality and others covered by JSC service :	● **Municipalities:** **1. Greater Salt Municipality** **2. Ain Al Basha** **3. Al Aarda** **4. Fuhais** **5. Mahis** ● **Others:**

		➢ **2 private companies**
	4. Name of JSC head:	● **Data could not be collected due to absence of JSC administration staffs.**
	5. Organization chart (Department name):	● **Data could not be collected due to absence of JSC administration staffs.**
	6. Number of employees according to the department:	● **Data could not be collected due to absence of JSC administration staffs.**
	7. Service field:	● **Disposal site operation**
	8. Annual budget:	● **Data could not be collected due to absence of JSC administration staffs.**
	9. Annual expenditure:	● **Data could not be collected due to absence of JSC administration staffs.**
	10. Financial sources	● **Data could not be collected due to absence of JSC administration staffs.**
Transfer station	**The JSC does not operate any transfer stations.**	
Treatment system	**None.**	
Final disposal system	If your JSC operates a landfill, please give us information below.	
	1. Name and location of the site:	● **Al Humra disposal site.** ● **Started operation in 1989**
	2. Area of the site:	● **25 ha (250 dunom)**
	3. Owner of the site	● **The JSC**
	4. Covered population	● **Municipalities: Not known.** ● **Syrian refugees: Not known.**
	5. Amount of waste disposed of (tons/day):	● **250 to 350 tons/day** ● **However, the amount is not measured with truckscale.**
	6. Types and number of landfill equipment:	**Bulldozer: 2 unit (broken-1)** **Excavater: 0 unit** **Wheel loader: 5 units (broken-3)** **Dump truck: 4 unit (broken-1)** **Crawler loader: 1 unit** **Water truck: 1 unit** **Tractor wuth sprayer: 2 units** **Bus (13 people): 1 unit** **Pickup truck: 1 unit**
	7. Number of workers:	● **35 persons with the following breakdown:** **1. Management: 3** **2. Operator: 6** **3. Driver: 6** **4. Worker: 20**
	8. Annual budget and expenditure:	● **Data could not be collected due to absence of JSC administration staffs.**
	9. Tipping fee (JD/ton)	● **Data could not be collected due to absence of JSC administration staffs.**
	10. Current issues on final disposal system:	● **Data could not be collected due to absence of JSC administration staffs.**
Medical waste disposal at the landfill	● **Medical infectious waste is not received at the disposal site.** ● **General waste of medical organizations is collected by municipalities from public containers mixed with domestic waste.**	
Industrial waste	● **Industrial hazardous waste is not received.**	

disposal at the landfill	● **Industrial general waste is collected by municipalities from public containers mixed with domestic waste.**
Agricultural waste disposal at the landfill	● **Agricultural waste is collected by municipalities from public containers mixed with domestic waste.**

Annex 6-1. Revenues and Expenditures of the 6 Municipalities (2014) (1)

1) REVENUES AND EXPENDITURES OF GREATER MUNICIPALITIES IN 2014

UNIT: JD

Account No	Items	Greater Irbid	Greater Mafraq	Greater Ajloun	Greater Zarqa	Greater Salt	Greater Jerash
(A)	**REVENUES:**						
A1	Receipts from MOMA:						
1111	Taxes and fees	15,844,280.91	3,039,754.38	2,803,107.39	12,287,744.93	4,122,739.56	3,674,217.55
1311	Aid and grants	1,000.00	0.00	41,200.00	435,828.81	248,219.75	25,025.00
	Total Receipts from MOMA	15,845,280.91	3,039,754.38	2,844,307.39	12,723,573.74	4,370,959.31	3,699,242.55
A2	Municipal Revenues:						
11211	Professions licenses	677,393.09	109,094.50	38,495.66	699,330.70	132,538.75	86,742.42
1212	Buildings and Constructions licenses	6,935,014.88	312,507.54	126,838.14	2,139,360.22	218,628.68	427,899.27
1213	Incomings	844,958.01	230,372.94	28,487.95	1,153,344.75	467,141.68	140,200.71
1214	Fees	5,539,149.02	673,199.20	27,664.63	1,112,001.21	207,846.30	117,358.32
1215	Revenues of waste collection	4,325,593.37	27,132.00	36,076.50	832,357.20	667,729.58	400,233.66
1216	Various revenues	3,386,961.52	752,040.90	34,046.42	3,405,379.95	1,051,007.49	994,559.03
1411	Rents	1,450,943.17	193,903.37	82,949.07	2,164,261.63	816,482.84	329,719.01
1412	Revenues of projects of goods and services production	0.00	0.00	0.00	0.00	0.00	0.00
1511	Interests revenues	0.00	128.96	28,417.00	251.22	14,650.74	29,822.04
1512	Revenues of financial investments	606,426.05	0.00	0.00	82,683.00	83,467.15	0.00
	Total Municipal Revenues	23,766,439.10	2,298,379.42	402,975.36	11,588,969.87	3,659,493.21	2,526,534.45
	Total Revenues	39,611,720.01	5,338,133.81	3,247,282.75	24,312,543.62	8,030,452.52	6,225,777.00
(B)	**EXPENDITURES:**						
B1	Recurrent Expenditures:						
2111	Salaries, wages and allowances	16,170,205.48	3,033,339.61	1,660,979.42	16,850,409.65	3,159,335.93	3,167,808.59
2112	Administrative and general expenses (others)	6,105,493.12	252,368.87	175,545.60	1,289,432.91	1,489,682.53	401,075.39
2113	Rents expenses	302,781.54	26,571.50	31,643.18	86,708.45	47,964.95	75,992.00
2121	Health and environment expenses	155,660.86	193,310.59	8,212.38	463,498.73	17,256.34	15,886.28
2122	Social expenses	37,460.95	4,771.10	12,707.40	24,225.38	14,264.40	29,749.22
2123	Maintenance expenses	1,452,935.22	74,067.99	114,426.39	1,049,355.55	282,115.54	170,726.20
2211	Interests and commissions expenses	1,024,006.07	156,202.48	931,700.16	532,130.63	50,959.21	403,635.07
	Total Recurrent Expenditures	25,248,543.24	3,740,632.14	2,935,214.52	20,295,761.30	5,061,578.90	4,264,872.75
B2	Capital Expenditures:						
2311	Administrative capital expenditures	70,834.63	20,577.96	36,325.50	49,165.89	14,801.00	72,948.72
2312	Service capital expenditures	5,915,403.03	507,717.17	378,581.71	2,255,674.39	1,398,266.62	565,699.44
2313	Investment capital expenditures	0.00	0.00	0.00	0.00	11,608.60	889,575.30
	Total Capital Expenditures	5,986,237.66	528,295.13	414,907.21	2,304,840.28	1,424,676.22	1,528,223.46
	Total Expenditures	31,234,780.90	4,268,927.27	3,350,121.73	22,600,601.57	6,486,255.12	5,793,096.20
(C)	**PROFITS/LOSSES**	8,376,939.11	1,069,206.54	-102,838.98	1,711,942.05	1,544,197.41	432,680.80

Source: Ministry of Municipal Affairs

Annex 6-1. Revenues and Expenditures of the 6 Municipalities (2014) (2)

2) CASH FLOWS OF GREATER MUNICIPALITIES IN 2014

UNIT: JD

No.	Items	Greater Irbid	Greater Mafraq	Greater Ajloun	Greater Zarqa	Greater Salt	Greater Jerash
(A)	Cash Inflows:						
1	Operational Revenues	39,611,720.01	5,338,133.81	3,247,282.75	24,312,543.62	8,030,452.52	6,225,777.00
2	External-source Inflows:						
	Borrowing from Development Bank - interest	0.00	0.00	0.00	897,448.00	10,535.00	440,345.68
	Borrowing from Development Bank - non interest	0.00	0.00	0.00	0.00	0.00	0.00
	Overdraft - Development Bank	0.00	0.00	0.00	0.00	0.00	0.00
	Overdraft- Commercial Banks	0.00	0.00	0.00	0.00	0.00	0.00
	Borrowing from Commercial Banks	0.00	0.00	0.00	0.00	0.00	0.00
	Borrowing from the Arab Towns Organization	0.00	0.00	0.00	0.00	0.00	0.00
	Borrowing from other entities	0.00	0.00	0.00	0.00	0.00	0.00
	Received deposits- Governmental	0.00	0.00	126,603.51	1,469,548.64	13,827.00	249,015.12
	Received deposits- Non-Governmental	5,009,169.84	141,273.76	96,544.45	15,497,874.02	893,488.12	462,140.83
	Received advance	516,968.60	110,701.20	29,808.25	2,750.00	12,892.50	12,050.00
	Total External-source inflows	5,526,138.44	251,974.96	252,956.21	17,867,620.66	930,742.62	1,163,551.63
	Total Inflows	45,137,858.45	5,590,108.76	3,500,238.96	42,180,164.27	8,961,195.14	7,389,328.63
(B)	Cash outflows:						
1	Operational expenses	31,234,780.90	4,268,927.27	3,350,121.73	22,600,601.57	6,486,255.12	5,793,096.20
2	Other outflows						
	Payment of installments of loans of CVDB- interest loans	2,775,355.23	788,208.00	0.00	827,884.00	174,628.14	1,308,032.75
	Payment of installments of loans of CVDB- Non-interest loans	125,833.00	0.00	0.00	0.00	0.00	0.00
	Payment of overdraft - CVDB	0.00	0.00	0.00	0.00	0.00	0.00
	Payment of overdraft - Commercial Banks	0.00	0.00	0.00	0.00	0.00	0.00
	Payment of installments of loans of commercial banks	0.00	0.00	0.00	0.00	0.00	0.00
	Payment of installments of loans of the Arab towns organization	0.00	0.00	0.00	0.00	0.00	0.00
	Payment of installments of loans of other entities	0.00	0.00	0.00	0.00	0.00	0.00
	Payment of governmental deposits - Accrued	0.00	0.00	38,333.34	822,400.70	9,475.00	338,349.07
	Payment of non-governmental deposits - Accrued	5,390,281.39	122,913.35	88,624.74	15,435,784.28	789,617.18	458,408.98
	Paid advances	318,825.60	110,701.20	32,662.70	2,750.00	9,760.00	32,050.00
	Total other outflows	8,610,295.22	1,021,822.55	159,620.78	17,088,818.98	983,480.32	2,136,840.80
	Total Outflows	39,845,076.11	5,290,749.82	3,509,742.50	39,689,420.55	7,469,735.44	7,929,937.00
('C)	Cash balances:						
1	Beginning balance	6,413,786.89	92,680.54	871,737.83	647,094.71	1,715,730.82	540,608.37
2	Ending balance	11,706,569.22	392,039.49	862,234.28	3,137,838.44	3,207,190.53	0.00

Source: Ministry of Municipal Affairs

Annex 6-1. Revenues and Expenditures of the JSCs (2014)

UNIT: JD

No	Items	Irbid JSC	Aghwar Shamaliyah JSC	Mafraq JSC	Badiah Shamaliyah JSC	Ajloun JSC	Zarqa JSC	Balqa JSC
(A)	**REVENUES:**							
A1	Subsidies from MOMA	1088790	456277.19	663655	105125	364750.49	673282	946963
A2	Operational Revenues:							
1	Contributions from Municipalities	**0.00**	**0.00**	**2,500.00**	**2,000.00**	**0.00**	**0.00**	**5,000.00**
2	Other Revenues of Operations:							
	Revenues from SWM operations	297,644.72	0.00	5,049.00	0.00	0.00	117,054.00	24,817.00
	Revenues from other operation (Slaughter House etc)	137,937.25	8,716.06	0.00	0.00	1,616.00	0.00	0.00
	Total of Other Operational Revenues	**435,581.97**	**8,716.06**	**5,049.00**	**0.00**	**1,616.00**	**117,054.00**	**24,817.00**
	Total Operational Revenues	435,581.97	8,716.06	7,549.00	2,000.00	1,616.00	117,054.00	29,817.00
A2	Non-operational Revenues:							
4	Interest Revenues	42,207.76	0.00	0.00	0.00	0.00	0.00	0.00
5	Grants and Donations from External Organizations	0.00	0.00	0.00	0.00	0.00	0.00	3,000.00
6	Other Non-operational Revenues (rent of assets etc)	0.00	0.00	112,691.00	0.00	45.00	0.00	0.00
	Total Non-operational Revenues	42,207.76	0.00	112,691.00	0.00	45.00	0.00	3,000.00
	Total Revenues	1,566,579.73	464,993.25	783,895.00	107,125.00	366,411.49	790,336.00	979,780.00
(B)	**EXPENDITURES:**							
B1	Recurrent Expenditures:							
1	Salaries and allowances	878,492.17	318,342.00	598,659.00	70,430.00	233,684.99	565,446.00	836,875.00
2	Other recurrent expenses	560,334.33	200,500.66	176,733.00	32,673.18	104,026.48	216,352.00	185,216.00
	Total Recurrent Expenditures	1,438,826.50	518,842.66	775,392.00	103,103.18	337,711.47	781,798.00	1,022,091.00
B2	Capital Expenditures							
3	Procurement Costs of Equipment and Tools	29,465.00	1,700.00	1,723.00	1,900.00	625.00	799.00	3,716.00
4	Developmental Expenses:							
	Construction of Facilities	0.00	32,600.67	0.00	2,600.00	19,954.64	3,678.00	0.00
	Other developmental expenses	68,630.94	0.00	0.00	0.00	0.00	0.00	0.00
	Total Developmental Investments	**68,630.94**	**32,600.67**	**0.00**	**2,600.00**	**19,954.64**	**3,678.00**	**0.00**
	Total Capital Expenditures	98,095.94	34,300.67	1,723.00	4,500.00	20,579.64	4,477.00	3,716.00
	Total Expenditures	1,536,922.44	553,143.33	777,115.00	107,603.18	358,291.11	786,275.00	1,025,807.00
(C)	**PROFITS/LOSSES**	29,657.29	-88,150.08	6,780.00	-478.18	8,120.38	4,061.00	-46,027.00

Source: Ministry of Municipal Affairs