

Results of Analyzing the Informal Waste Management Sector in Aqaba and Petra

Impressum

Published by:

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Aqaba, Jordan, May 2023

On behalf of:



of the Federal Republic of Germany

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Background Information

This study has been prepared for the global project "Environmental Protection Worldwide" and is implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH as part of the "Export Initiative Environmental Protection" on behalf of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV).

The project contributes to solving key environmental challenges by developing technical and institutional know-how, transferring knowledge and implementing activities in the partner countries and worldwide. The measures are embedded in the strategies of the partner

countries and support central environmental solutions, such as the circular economy, sustainable consumption and production, and environmentally friendly mobility. Partner countries are Jordan, India, Thailand, Malaysia and Ukraine. Project measures focus on building up technical and institutional know-how as well as laying the foundation for the introduction and use of competitive, sustainable environmental and climate protection technologies "Made in Germany".

In Jordan the projects focuses on introducing an Extended Producer Responsibility (EPR) system for packaging waste.

1- Background

Jordan faces different environmental challenges resulting from unsustainable production and consumption patterns in addition to the increase of waste, the loss of biodiversity, air contamination and deterioration of soil which leads to the pressure on the local environmental systems.

The file of waste management is one of the most important environmental issues that the government pays great attention to especially the Ministry of Environment. Waste is defined as any material that any person has and wants to get rid of or intends to get rid of or must get rid of by the prevailing legislation. The growing amount and complexity of solid waste (SW) generated in Jordan has not been accompanied by adequate sanitation facilities and management programs. Jordan disposed of approximately 2.1 million tons of municipal solid waste (MSW) in its landfills. Future projections show the waste volume increasing by 3-5% annually,

and, as the country continues to urbanize, municipal waste generation will continue to grow from the current rate of 0.9kg per person, per day (MOENV, 2020). The solid waste management sector is considered as one of the most complicated sectors due to the different types of solid waste.

According to the UN Development program in Jordan, Jordan produces 2.2 million tons of municipal solid waste annually which increases by 5% annually where only 7% is recycled or saved by the non-governmental sector. The presence of this huge quantity of waste in addition to 2.5 billion plastic bags (Heinrich Boll Stiftung, 2020) leads to waste management as a national priority in Jordan. A lot of initiatives have been adopted on the national level to raise awareness about the impact of waste and the possibility of finding a solution concerning sustainable change in the production of waste and waste management.

2- An Overview of Informal Waste Management in Petra and Aqaba

Alongside Jordan's formal waste management sector, a dynamic informal sector has built and sustained viable value chains from waste, without support and often in precarious and vulnerable conditions. Informal actors include waste pickers, contractors who engage waste pickers for daily work at dumpsites, itinerant scrap collectors with trollies or trucks, scrap dealerships. Waste pickers, often working alone, salvage recyclable materials, including paper, cardboard, plastic and metal, from municipal waste containers on streets and from dumpsites. They collect, sort and sell this waste to scrap dealers and waste brokers, who sell it for processing and manufacturing in Jordan or for export. Waste pickers play a critical role in retrieving recyclable material from the waste stream and supplying the recycling sector, as well as diverting waste from landfills. Just 7% of the waste in Jordan is recycled; of this, an

estimated 70% is sourced by waste pickers (Taher, et al., 2022).

Aqaba City and Petra area are some of the most important areas in the southern region due to their tourism importance in addition to the numbers of tourists visiting both areas annually in comparison with their populations. However, each of them has its own management system which is different from the other governorates. In 2001 the Aqaba Special Economic Zone was established by a special law and managed by the Aqaba Special Economic Zone Authority. The municipality of Aqaba has been abolished as well as all authorities related to it. In 2009 Petra Tourism and Development Region which is located the in Ma'an governorate was established and was given all responsibilities and authorities.

All activities in both cities are run by the council of commissioners where each of them has been tasked to manage all activities as well as control through the commissions and directorates of each of them. The responsibility of Aqaba and Petra authorities includes the collection and transport of waste. The Joint Services Council supervises the landfill as well as landfilling operations.

2.1. Informal Waste Pickers in Petra Tourism and Development Region Authority

Petra Region Authority is the responsible party for all activities within the region boundaries through the council of commissioners and its different directorates and by the special law of Petra Tourism and Develop-



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Petra Region Authority collects and transports waste from all areas excluding the Archaeological site where waste is collected and transported by a local community named Al Anbat Capital Community which includes a lot of local people members. The transport operation is the same as the Petra region process where all waste is transported to the Basta landfill and landfilled without any processing or making use of useful waste.

Having discussions with local people, and responsible staff in Petra Region authority as well as people working in the landfill concerning the absence of an approach to benefit from the packaging materials with financial value such as cartoons, plastic and metals they referred that to different reasons such as:

ment Region Authority including the management of waste in the areas of the region. Petra Tourism and Development region covers 6 areas which are: Wadi Musa, Taybah, Al Rajif, Delaghah, Um Saihoon and Baidah area.

According to Petra Region Authority site, the population of the region is 31956 inhabitants where 17970 are in Wadi Musa.

The Petra Region Authority through its staff takes over the responsibility of collecting and transporting waste from residential areas and the tourism areas to the landfill in "Bastah" where the waste is landfilled directly without any sorting or processing. All waste transported from the different areas is landfilled.



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- 1 The low number of inhabitants and finally the low quantity of waste collected from the Region's areas.
- 2 Low quantities which result in low returns.
- 3 The nature of the areas and their roughness in Petra Region Authority and the long distances between the areas will increase the cost of waste collection and transport in comparison with the financial returns.
- 4 Feeling shy to work in this field since all the inhabitants are relatives and of tribal background and finally
- 5 It will be difficult to work in a field that may create bullying and shyness.

In general, there are no signs of persons who search in waste containers looking for valuable materials or the pick-ups roaming the markets and collecting the waste or scrap.

During our follow-up and contact with a number of the concerned people and to make sure that the scavengers are present in Wadi Musa or other areas of Petra region Authority, some of the concerned persons stated that some families or groups who move around the Jordanian cities (locally known as Gypsies) are seen in Petra Region Authority areas and usually assuming the profession of beggars. It has been noticed that some of them collect garbage of financial value and take it with them on their way back to central areas, and this explains the presence of some people targeting the waste in the containers or beside them or the house's garbage.

2.2. Informal Waste Pickers Aqaba Special Economic Zone Authority (ASEZA)

The ASEZA area is somehow different from the Petra Area about the geography and topography and the

nature of the area. The inhabitants are about 200.000 which is larger by 4 times of Petra inhabitants. There are two landfills in Aqaba where the first one is located near the Al Ma'mel area and is designated for landfills only and the second one is located at the back road near Aqaba University for Technology on the south beach and is the main landfill of the city and all landfill operations are conducted there by the approved measures.

Aqaba City is different from the Petra area where we find a lot of scraps shops that collect waste of financial value whether directly or dealing with roamers in addition to a lot of people who search the waste containers to collect such waste in addition to the pick-ups roaming the city for the same purpose.



Eng. Samih Abu Amreih

3- Methodology

This research aims to understand the circumstances of the informal sector in both Aqaba and Petra cities as well as the circumstances of the informal people working in solid waste management where their operations are conducted side by side with the waste management sector in the two cities in addition to the work of the private sector if it is available. Moreover, it aims to evaluate the socio-economic situation of the non-official people working in this field as well as the challenges they face in addition to presenting some solutions and recommendations to improve their work environment.

The study and the research started in the middle of March 2023 from Petra City and after several tours which lasted for 3 days in the streets of the city in addition to the contact of a number of persons of Petra inhabitants as well as the visits to more than one of the

organizations we did not find any place for the collection of scraps or any persons searching for scraps or waste of financial value.

In the third week of March 2023, the search and study began in Aqaba city. The efforts are divided on more than one level which include the public sector, private sector and informal sector which covers individuals and shop owners.

The methodology includes a review of the waste management situation in Petra and Aqaba and the present situation of activities related to the collection, transport and landfilling, the main landfills, the sector of the people working in the field of waste management and the non- official workers if available. The methodology also includes field visits for a number of sites as well as

meetings with some official people in addition to the preparation of a questionnaire which was distributed and filled out through personal meetings.

All files, studies and reports concerning the waste management sector in general and the non-official workers in particular have been reached and reviewed in both Petra and Aqaba cities. In addition to that reports issued by ASEZA, UNDP, USAIDS and GIZ have been reviewed.

Informal workers are usually divided in to four major categories:

• Street waste workers: informal workers working independently or individually in the streets and the residential areas, however, most of them do not work on a regular basis due to the economic situation and the prices of the material they used to collect. The type of the material and its financial value control their work and activities and they rely on the saying "the lighter in weight and the higher in price". They have the knowledge of all types of materials and their prices.

They usually work in the residential areas close to where they live or they may move further if they get a lower price or free transportation and they usually sell the materials they have collected to the scrap shops. There are 3 scrap shops in Aqaba and most of the workers sell their materials to those shops. The number of people working in this field is estimated 60-80 people. All people working in this field are males except for two ladies and most of them are Jordanians and one from Bangladesh and one from the sons of Gaza.

The scavengers search in the waste containers usually available in the residential areas which have a lot of activities such as the 3rd, 5th and 8th residential areas, Cornish Street. Due to the high number of visitors and restaurants in the Cornish street we will find a lot of scavengers searching the waste containers for the metal cans. The scavengers are active in the middle of the nights and early in the morning, some of them have salaries from the Ministry of Social Development and some of them are retired people but their salaries do not cover their needs. The monthly profit of scavengers is estimated between 100-200 JD and it depends on the quantity and the value of the collected materials. In general, their financial affairs are very bad. There is a problem related to the control of the prices of packaging materials such as metal cans, plastic and cartoons. The scavengers usually look for the metal cans, plastic materials and cartoons because of their high prices. Through the meetings and the tours, we discovered that some people collect and sell materials of high price but not regularly.



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• The landfill waste workers: After meetings with some of the responsible people and some of the waste collectors and when asking about the landfill workers they all answered that most of the workers are always available in the landfill area and some of them have vehicles (Pick-Up) and some of them stay there for a few days and do not leave the landfill unless they find means of transportation and during the holidays a higher number of workers are available there.

The workers are always granted 30 minutes to sort the waste from each vehicle that comes to the landfill. All workers are males and of Jordanian nationality and the number of workers is 20-25 persons usually, you will find one-third of them at the same time in the landfill area. The monthly income is different and for those who have pick-ups they may gain 350-450 JD excluding fuel prices, and the others may gain 100-150 JD. The ages of the workers vary from 19-61 years and some of them had previous judicial issues.



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• Waste workers own vehicles (usually pick-ups) and they usually work independently or with other persons and they used to collect waste or scraps directly from the containers or from the markets and in front of the houses. Some of the vehicles have loudspeakers calling for scraps. They buy the scraps at very low prices from

the residential areas and all of them are of Jordanian nationality and they are all males except one lady. The number of vehicles in Aqaba city is about 50 where 10 of them are owned by residents of Aqaba and the rest from other governorates. The income of each is 400-450JD excluding the fuel costs.



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• Brokers and scrap traders: The scrap traders are two main sections, the intermediate shops most of them located in the "Al Herafyah" area and most of them have vehicles roaming the residential areas to collect the scrap; There are 4 shops with vehicles in addition to the landfill workers, and there are other 3 small shops inside the city and most of their customers are from the streets workers collecting scraps because they are very close to them. The second section is the scrap main shops located in the "Al Ma'mel" area and

there are 5 shops and they receive the scraps from the smaller shops and they process the scrap such as crushing plastic and pressing cartoons and metal and then sending such scrap to the traders in Amman or exporting it directly from Agaba in case the prices are better. Those traders are all males and of Jordanian nationality and they are about 50 persons working on a full time basis, however; there are some Bangladesh people among them.







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4- The Role of the Private Sector in the Waste Management Sector:

4.1. Petra Region Authority

Petra Region Authority controls, supervises and executes all activities related to the collection and transport of waste to the landfill in "Bastah" and from all areas of the region excluding the Archaeological Park which was entrusted to a local community (A community established in 2012 and having members from all the 6 areas of the region and located in Wadi Musa. The areas are Wadi Musa, Taybah, Al Rajif, Dlaghah, Um the value of world resources to build a more sustain-Sayhoon and Baidah.

4.2. Aqaba Special Economic Zone **Authority- ASEZA:**

There are three private and licensed sector companies:

1. Urbaser Jordan

It is the largest company operating in Aqaba and it covers all areas of the coastal city. The company collects and transports the waste to the landfill.

Urbaser is an international Spanish company pioneering in the field of environmental solutions and it is an international company that focuses on benefiting from able future. It serves more than 70 million people in 19 countries through a net that employs 50000 employees and 150 factories which operate every day to achieve a real circular.

In 2017 /2018 Urbaser and ASEZA made an agreement by which Urbaser will take over the responsibility of the cleaning tender of Aqaba Governorate for 3 years which 2. The Green City Company has been renewed for another 3 years. The company aims to achieve excellence in benefiting from resources of high value to the earth to build a more sustainable future. Through its vision to deliver the best environmental solutions along the value chain for citizens, businesses and society to inspire meaningful transformation every day.

The company is committed to applying the Sustainable Development Goals (SDGs), especially 10: Reduce Inequality, 11: Sustainable Cities and Communities, 12: Responsible Consumption and Production, and 17: Partnership for the Goals.

City, Wadi Rum and other sites run by the private sector excluding the ports, the Industrial zone on the south coast and the Industrial zone north of Aqaba City.

According to the company, the total waste collected daily is 140 - 150 tons from the areas within its responsibility. The company is responsible for the collection and transport of waste, it doesn't do any sorting or processing of the waste. Its mission ends on its arrival at the landfill.

The number of employees is about 350 people of Jordanian and Egyptian nationalities. The number of Jordanians employees is 75 - 80 people which represents 25 -30% and Egyptians employees are about 270 - 275 which The quantity of waste especially from metal cans, plastic represents 70 - 75%. The total number of employees is about 395 - 400 and all of them are covered by social security, medical insurance and life insurance.

The company presently is ready to have a partnership with any other party to establish a special site for waste sorting beside the landfill which is already specified for sorting operations. The company aims to sort at least 85% of the waste. The company states that the cost of the project is about one million dinar and it is ready to provide half of that amount with any other party.

In case the sorting site becomes operational it is expected to employ 12 – 15 full-time employees with all laborer's rights which include social security, medical insurance as well as life insurance.

Green City company for waste management in 2006 (one Amayreh Investment Group companies) as a company specializing in the management and handling of waste through the operations (the capture and sweeping, and the combination and transportation) with the mission to respond to the growing environmental needs through the application of best environmental practices are in conformity with the standards domestic and international. Headquartered in the city of Aqaba, located in all sections of the Department, where the company currently provides the bulk of the services to work recycling, collection and transportation of municipal waste.

The company covers a geographical area including Agaba The company has contracts with a number of tourism hotels as well as ports which include the container terminal and the industrial complex in addition to the industrial area which also includes the vehicle parking areas in addition to other locations. The company operates as an intermediate establishment for the collection, processing and sorting of waste and selling such materials to the scrap shops.

> The company sorts about 60% of the collected waste (around 120 tons monthly) and the rest will be transported by its vehicles to the landfill. The company assures that they can sort 95% of waste in case suitable circumstances are available.

> and cartoon usually increases during the summertime and the weekends. The 3rd and 6th residential areas are the most generating areas for producing waste due to the high density of population.

The company has a number of workers on a fixed basis and sometimes they hire temporary workers.

3. Typical for Waste Oil Treatment Company

The company operates in the field of waste oil treatment.

5- Overview of Waste Workers and the Results

Petra is a small city and it does not represent an as metal cans, plastic, cartoons, metals or destror active market for scraps trading and sorting due to the appliances or any other useful materials such as aforementioned reasons.

bread. The vehicle owners usually sell what they

The scrape sector in Aqaba city is also a moderate sector in comparison with the central and northern governorates. The number of people working in the collection and sorting of waste and scrap which includes non-official workers in addition to the scrap traders and workers is between 200-220 persons and this figure does not include the employees of Urbaser Jordan Company which is in charge of the collection and transport of waste and scrap in Aqaba city.

5.1. Informal Waste Workers:

Informal workers are active in two directions either by using pick-ups or small vehicles roaming between the residential areas and the commercial markets and usually they are active during midday and early evening; they collect the waste of financial value or any waste that can be recycled; the waste usually is left beside the public streets or the minor streets or beside the waste containers; and in the other direction, some of the workers search in the waste containers hoping to find any material of good value such

as metal cans, plastic, cartoons, metals or destroyed appliances or any other useful materials such as bread. The vehicle owners usually sell what they have collected daily or in a few days (in case they have stores) to the broker shops in the "Al Harafyah: area and a few of them send their collected waste to the larger scrap shops in the Al Ma'mel" area. Some of the vehicle owners have small areas where they used to disassemble the destroyed electrical appliances and take out the copper parts and any other material of high value or they process the metal cans by pressing or by hand.

However; the street workers who spend their time on foot are seeking waste of lightweight and high value; the metal cans are the most collected waste in addition to some of the other metals, copper or high-value plastic items. They do not own means of transport; therefore they walk for long distances daily; they also search in the waste containers in the residential areas near their living areas. Most of them sell what they collect directly to the scrap traders especially those located in Aqaba city and rarely do they sell to the shops at Al Harafyah because the prices there are higher than inside the city. No animal-drawn carriages have been seen in Aqaba city.







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The number of vehicles operating in this sector is about 50 where 10 of them are owned by local people of Aqaba and the rest from outside the governorate.

They are all males and of Jordanian nationality except for one lady. The number, of streets workers who do not have cars and spend their day walking on foot, is about 80 people and you do not find all of them in the streets at the same time and most of them are Jordanians and some of them are from Gaza and sometimes there are two ladies.

The workers in the landfill are all Jordanians and they do not exceed 25 people and you don't find all of them on the site at the same time; some of them own vehicles and others use hired vehicles and the rest don't have any vehicles and they hire vehicles when they get a lot of scraps. Most of the workers have families or they support other family members and some of them have previous judicial issues, and some of them leave the site every 4 or 5 days.

6- Challenges and the Socio-economic and Legal Restrictions

6.1. Legal Restrictions:

The informal waste sector is not a licensed sector and working in that sector is questionable. The problems related to this sector should be solved and the legal frame for the sector should be set up in order to guarantee at least some parts of the workers' rights such as medication and the right to live; other legal measures should be addressed to find a way to have those people under the social security umbrella and to find any medical coverage for them and their families.

Aqaba City is different from the rest of the cities since all workers in this sector are Jordanian nationals or from people of Gaza and a small number are from other nationalities. None of the Syrian refugees is working in this sector.

Having interviews with a lot of the street workers it became clear that they understand the legal consequences in case they fell in trouble and they exert their effort to avoid all types of problems and this reality contradicts what was told by some of the official people who said that some of the workers work sometimes in this sector to provide the prices of liquor or banned materials. Honestly, during the interviews with the workers and some of the official people they did not refer to this issue as a general note but they refer to special cases only since most of the workers have families and students to support.

The landfill workers are different some of them have previous security constraints or are ex-prisoners and others have a very bad financial status. Their presence in the landfill is illegal and unsafe at the same time.

Some of the workers create a lot of trouble inside the landfill which is related to their movement and work that hinder the movement of vehicles inside the landfill and which may threaten their safety sometimes.

6.2. Social Restrictions

Most of the workers who have been interviewed indicated that they work in this field due to the bad financial situation and the need to increase their retirement salaries (if there is) and to fulfill the requirement of living. The surprise is that we found some persons whose financial situations are good to work in this field and collect the high value scraps and sell it to the mediators.

During the interviews with the landfill workers they expressed their fears of having some diseases, especially the diseases resulting from the bad smells in addition to the presence of dangerous materials; some of them drink the waters of the used bottles which may have health impacts and which may transfer diseases to them.

During the interviews phase all the informal workers as well as the workers in the scrap shops that there is no negative view against them because of their work in the scrap collection except for minor bullying actions and they don't pay any attention to that and they only focus on their work in order to provide a living.

6.3. Economic Restrictions

The percentage of waste and scrap collected from the landfill especially for those who own vehicles is much better than the percentage of the waste collected from the streets and for the people who don't own vehicles. In addition to that, the fluctuating prices of fuel which is considered high in comparison with prices of the scraps.

The scrap traders who own the large shops, especially in the "Al Ma'mel" Area control the prices where we found the prices are very low regardless of the high prices internationally or even in Amman. The informal workers are obligated to sell for them and sometimes the workers don't collect the plastic and the cartoons due to their the clearance process and the transport fees if they hire low prices.

The prices of packaging and the other collected materials are variable where the prices are increased (for each kilogram) if such material is sold in the "Al Ma'mel" area and this is suitable for those who own the vehicles and in case the quantities are larger.

The street workers target metal cans, high-value plastic and other metals such as copper.

The workers who own the vehicles collect they collect metals, copper, plastic, metal cans, cartoons and any materials of good value.

The landfill workers collect all types of waste and then they sort it and most of them avoid papers and cartoons due to their poor conditions.

The scrap prices in Amman are higher than in Aqaba; some of the waste collectors who own vehicles have thought to sell the waste they collected in Amman, however, they faced a lot of obstacles represented by the Customs procedures as well as paying fees in addition to large trucks.

7- The Economic Aspect:

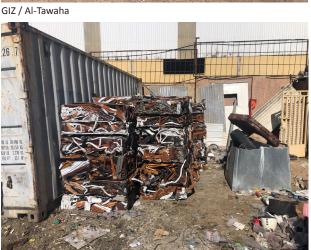
The scrap shops in the "Al Ma'mel" area which are 5 shops own grinders to grind the plastic waste and pressing machines to press the cartoons and the metal waste. This situation leads to the control of the prices.

The following table shows the waste quantity and the expected prices

Material	Price
Metal cans	45-55 piaster/ kilo gram
Plastic	10 piaster/ kilogram
Copper	3.5-4.00 JOD/kilogram
Cartoons	3-5 piaster/ kilogram
Aluminum	70 piaster/ kilogram
Metal	14-20 piaster/ kilogram
(according to each type)	

- The large material such as electrical appliances are sold for 45-50 piaster/kilogram
- The price of a sack of dried bread reaches 3 dinars
- The price of metal cans varies between 40-55 piaster / kilogram
- There are 3 individual parties that collect the cars oil and the fuel oil in addition to a company (Typical for waste Oil Treatment) which receive the oil from the ships. The car's oil is recycled and used as a fuel for boilers. The price of the used car oil reaches US\$ 400/ ton and the used vegetable oil price reaches US\$ 1500
- There are no activities related to the wood waste since there is no grinding machine in Agaba. The wooden pallets are collected only, processed and sold. They buy such pallets for 3 dinars and sell them for 5 dinars.
- Depleted batteries are collected and sold for US\$ 88 per ton.
- · All tiers are collected and cut into pieces and transported to Amman for export.





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According to the results of this study and after the completion of interviews with informal workers in addition to the official and responsible staff as well as the private sector it is clear that the informal waste workers in the Aqaba area face some work circumstances that should be addressed and corrected or to find other suitable solutions related to the skills and productivity as well as the fluctuated income and which is also not enough for the workers in addition to the absence of security within the Jordanian legislative frame. A number of major issues are identified:

- 1 The legal status of the informal waste workers which may be effective in case there are requests to cover them by the social security umbrella or the medical insurance or to provide them by donations.
- 2 Worsen of economic problems related to the low income which is in general not guaranteed and the absence of alternative financial resources in addition to the high level of weakness due to the large size of the families and the high costs of living and the fluctuation of fuel prices for example.

- Administrative issues related to the facilitation of having licenses to transport the waste and scrap to Amman after studying the informal workers' socio economic situation as well as addressing the related decisions with the Department of Customs, ASEZA and the Ministry of Environment in order to exempt such waste and material from the fees besides the facilitation of applying the sustainable and green initiatives in the city of Aqaba in addition to the simplifying the licensing procedures.
- 4 The social issues related to social security and medical insurance or any other type of community support.

8- Conclusions and Recommendations:

- Supporting the sustainable and green initiatives related to the collection and sorting of waste.
- 2 Studying the socio economic situation of the waste informal workers.
- 3 Addressing the problems related to the legal aspect through the study of the legal situation of those workers as well as exempting them from any prosecutions in case they show their interest in this work as well as their stay away from troubles.
- 4 Studying the real economic value of the collected waste
- 5 The credibility of the parties in charge towards the workers in the waste sector as well as the coordination with the different partners and organizations to find suitable solutions for the workers.

- 6 The possibility of providing some equipment which helps the workers in collecting and sorting the waste in a safer way.
- 7 Supporting some projects such as a grinding machine and a presser which will help the informal workers to reshape the collected material and to sell it at a better price.
- 8 Reconsidering the clearance and customs fees for the small traders in order to send their materials to Amman.
- The possibility of supporting part of the projects of recycling or waste sorting which will be operated and managed by the private sector.

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10- Annexes: Questionnaire Form

