

ASSESSMENT FOR THE ENGAGEMENT OF THE INFORMAL SECTOR IN THE SOLID WASTE MANAGEMENT SECTOR IN JORDAN

Technical Working Paper



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LIST OF ABBREVIATIONS

3 Rs	Reduce – Reuse – Recycle
DoS	Department of Statistics
FDS	Final Disposal Sites
GoJ	Government of Jordan
ILO	International Labour Organization
HDPE	High density polyethylene
JCI	Jordan Chamber of Industry
JSC	Joint Services Council
KII	Key Informant Interview
LOPE	Low density polyethylene
MoENV	Ministry of Environment
MoL	Ministry of Labour
MoLA	Ministry of Local Administration
MRF	Materials Recovery Facility
MoSD	Ministry of Social Development
MSWM	Municipal Solid Waste Management
NSWMS	National Municipal Solid Waste Management Strategy
PET	Polyethylene terephthalate
PPE	Personal Protective Equipment
PS	Polystyrene
PVC	Polyvinyl chloride
PwD	People with Disabilities
SSC	Social Security Cooperation
SW	Solid Waste
SWEEP NET	Regional Solid Waste Exchange of Information and Expertise Network
SWM	Solid Waste Management
WEF	World Economic Forum

1 INTRODUCTION

Over the past five years, the solid waste management (SWM) sector in Jordan has undergone institutional and operational changes. Aging and inadequate SWM infrastructure, already under strain from steadily increasing waste generation, came under additional pressure with the influx of Syrian refugees, especially in the northern governorates of Irbid and Mafrq. In response to increased stress on infrastructure, linked to regional instability and demographic pressures, the Government of Jordan (GoJ) developed the National Municipal Solid Waste Management Strategy (NMSWMS) with the assistance of international agencies. The NMSWMS aims to shift SW management to an efficient and economically, socially and environmentally sustainable system, and was approved by the GoJ in September 2015.

The NMSWMS follows the 3Rs approach (reduce, reuse, recycle) and prioritizes reducing the amount of waste sent to Final Disposal Sites (FDS). However, the infrastructure for sorting and recycling is inadequate; many governorates lack any sorting facilities and continue to send waste directly to FDS. This puts informal sector actors in the spotlight: the informal sector contributes significantly to the separation and recovery of waste through the work of waste pickers at both the street-level and on FDS-level. Thus, it is critical to increase knowledge and understanding of the informal sector, whose operations run in parallel to, and independently from, municipal operations.

Moreover, the NMSWMS supports the integration of informal actors into the formal sector. Such integration could offer benefits such as social security, health and safety protections and better management of the sector, among others. However, mainstreaming integration can succeed only if the informal sector actors are willing to engage and participate in the formal value chain. This reinforces the need for better understanding of these actors and their situations so they can be better integrated into existing solid waste activities in a way that is mutually beneficial, sustainable and enhances SWM services.

Informal waste recycling activities are sources of livelihood for the urban poor in low- and middle-income countries. Across the world, about one percent of the urban population, or more than 15 million people, earn their living informally in the waste sector.¹ Available data indicates there are approximately 5,000² people involved in the informal recycling and material recovery value chain in Jordan. Informal actors range from individual waste pickers to contractors who employ daily workers in dumpsites. In between, there are travelling scrap collectors with trollies or trucks, small- and medium-sized scrap dealerships, generalist and specialised brokers, and semi-formal recycling plants.³

Waste picking involves significant health and safety risks such as viral infections and injuries linked to sifting through waste without protective equipment, and heavy lifting. During the COVID-19 pandemic waste pickers may have been exposed to greater health risks from infected materials in the general waste streams. Aside from working in unhygienic conditions, waste pickers often lack social security or health insurance, are

¹ "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050", World Bank, 2018
<https://openknowledge.worldbank.org/handle/10986/30317>

² "ANNEX 1 of the Commission Decision on the Annual Action Programme 2016 (part 2) and 2017 (part 1) in favour of the Hashemite Kingdom of Jordan Initial Action Document for the Support to the implementation of the National Solid Waste Management Strategy (NSWMS)" https://ec.europa.eu/neighbourhood-enlargement/system/files/2017-04/c_2016_6629_jordan_aap_2016_part_2_aap_2017_part_1_annex_1.pdf

³ Solid Waste Value Chain Analysis in Irbid and Mafrq, Disaster Waste Recovery for the Ministry of Municipal Affairs and UNDP Jordan, June 2015
https://reliefweb.int/sites/reliefweb.int/files/resources/Jordan%20Waste%20Value%20Chain%20Report_FINAL.pdf

Vulnerable to fluctuations in the prices of recyclable materials and lack educational and training opportunities. The impact of these aspects was magnified during the shock in the system caused by the COVID-19 pandemic.

Waste pickers are often a vulnerable demographic. The factors that push people into waste picking are fundamentally economic: it is sometimes the only alternative to unemployment and poverty. Push factors also can include restrictions on employment, which is an issue for Syrian refugees, or problems with authorities, such as being wanted by the police, often for minor infractions or offences.

While the informal solid waste (SW) sector has been largely neglected in the past, the GoJ recognizes the need for appropriate infrastructure and regulations to improve working conditions for informal waste pickers. Based on recommendations listed in the National Solid Waste Management Strategy (2015) and discussions with the Ministry of Local Administration, the GoJ also acknowledges the need to transition toward a formal waste recycling and material recovery system, which provides a socio-economic opportunity to sustain landfill infrastructure as well as to improve livelihoods of many poor and marginalized workers.

2 METHODOLOGY

Field visits were conducted to several cities and dumpsites in Jordan to gather information on informal actors at the street and dumpsite levels. Semi-structured interviews explored the social, economic, and environmental aspects of informal work using interview guides and questionnaires. In addition, semi-structured interviews with scrapyards owners and middlemen aimed to gather financial data as well as to facilitate introductions to waste pickers. Interviewing middlemen and scrapyards owners proved to be an easier task than reaching the waste pickers. Challenges encountered during the field research are explored in Section 2.1.6.

The research team interviewed key actors including Action Against Hunger, the Ministry of Labour (MoL), the Ministry of Social Development (MoSD), the International Labour Organization (ILO) and the Social Security Corporation (SSC) to understand their current and potential roles and initiatives.

2.1 APPROACH

2.1.1 Field Research within the Project Context

The below figures show the specific objectives of this research.

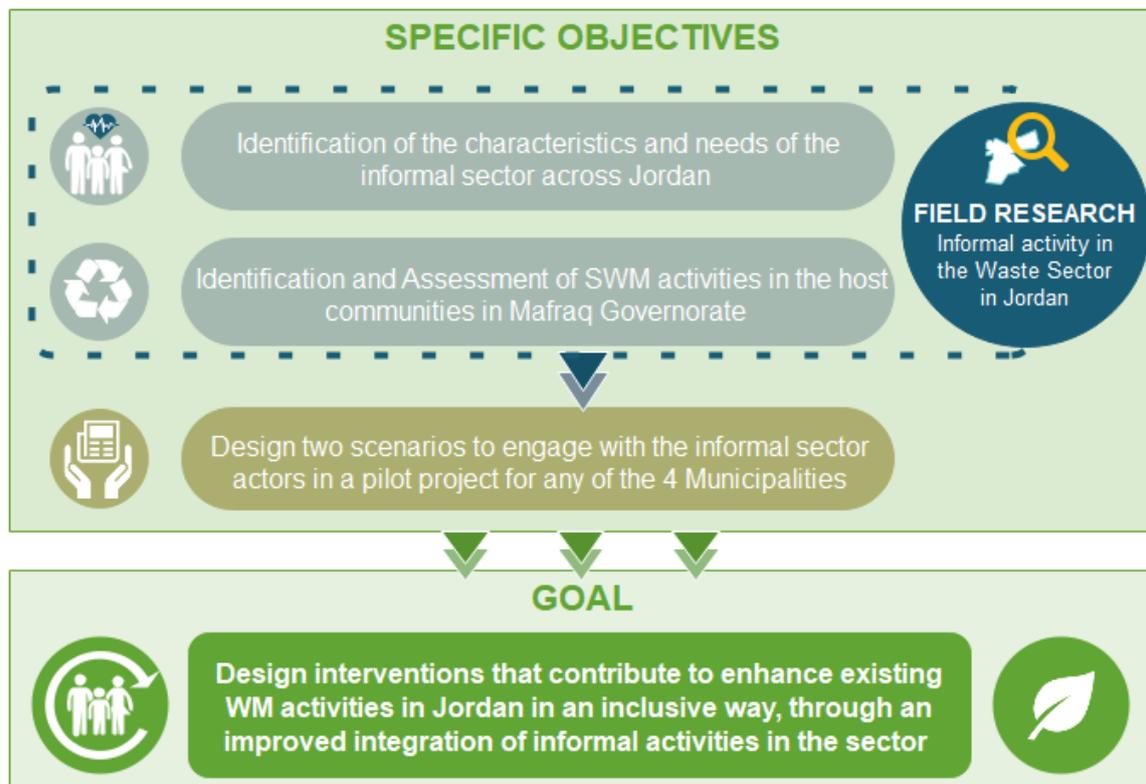


Figure 1 Field research within project context

2.1.2 Purpose of the Field Research

The purpose of the field research was to understand the socio-economic characteristics, living and working conditions of selected actors in the informal SWM sector, and to develop a comprehensive understanding of operations in the informal SWM sector and the associated value chain. The collected data also gave insight into the impact of the COVID-19 pandemic on informal sector actors. The research will guide the development of two scenarios to engage with the informal sector actors in a pilot project in the targeted municipalities.

The following table presents the areas explored in the research:

Table 1: List of factors explored in the research

	Socio-economic characteristics and living conditions of actors involved in the informal SWM sector.
	Working conditions in the informal SWM sector (incl. access to health and social security).
	Risks associated with this field of work (incl. economic, social, and health risks) as well as impact of COVID-19 pandemic.
	Needs of actors involved in the informal SWM sector.
	Drivers for working in this sector.
	Drivers to formalization.
	Participation of vulnerable groups in the informal waste sector incl. children, women, refugees, people with disabilities.
	Operation of activities in the informal SWM sector.
	Hotspots of informal activity.
	Waste value chain between waste-pickers, middlemen, and buyers.
	Capital and operational costs for each actor of the informal waste sector.
	Monetary value of recyclables and effect of informal waste actors' activities on this value.

In addition to the development of scenarios based on the field research, specific key recommendations are presented for decision-makers. These recommendations are derived from the field research and interviews conducted.

2.1.3 Geographical and Temporal Scope of the Field Research

This research addressed informal sector actors at the national level. Informal sector actors were approached in the following areas, and the percentage is an indicator of the number of interviewees:

- Irbid – 12.2%
- Mafraq – 12.2%
- Amman – 7.2%
- Madaba – 12.2%
- Zarqa – 4.9%
- Balqa - Deir Alla – 4.9%
- Karak - Southern Jordan Valley – 12.2%
- Aqaba – 12.2%
- Azraq camp (working in Madaba FDS) – 12.2%
- Za’atari camp (working in Hussainiyat FDS) – 9.8%

This research explores the socio-economic needs and characteristics of informal actors across all of Jordan; a national approach is important to identify the streams of recycling materials and any issues emerging from different government authorities.

The research then focuses on four municipalities: Um Al Jummal, Za’atari and Mansheyeh, Rehab, and Khaldeyyeh. These municipalities, located in the northern governorate of Mafraq, will be included in the selection for the pilot project, with consideration to Oxfam’s current activities in Mafraq.

The timeline of the research is illustrated below:

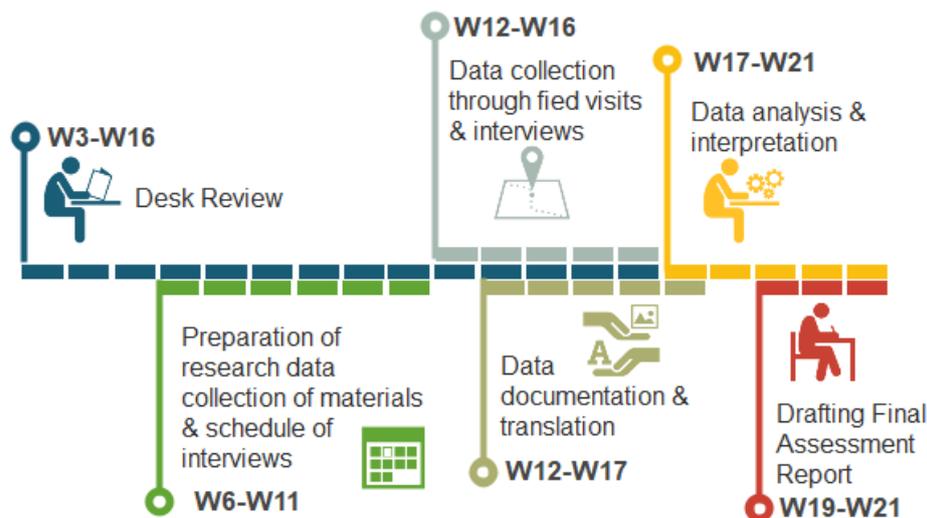


Figure 2 Research timeline

2.1.4 Data Collection Process

Data collection included desktop research as well as field visits. These visits were undertaken to collect data in the participants’ setting through semi-structured interviews.

The participants included waste pickers, scrapyards dealers and middlemen. Interviews were conducted with these actors to identify multiple perspectives using interview guides and questionnaires.

Below is a list of interviews conducted.

- **Actors working in the informal waste sector:**

Researchers conducted 41 interviews with informal waste pickers (including three women and nine Syrian refugees). On most occasions, more than one waste picker was present during the interview – usually two or three waste pickers were present and in some cases up to five. However, each interview is counted as reflecting the answers of a single respondent (categorized as the main respondent). Answers provided by the main respondent were supported and confirmed by other waste pickers present during the interview. Therefore, while the analysis that follows reflects the findings recorded through the 41 interviews, it is estimated the findings could represent the views of up to 110 waste pickers. The interviews were conducted nationally.

The following actors were also interviewed:

- 14 middlemen and scrap yard dealers (0 women or non-Jordanians found)
- 10 factories as end-users in the system
- Four contractors for waste picking activities at dumpsites.
- **Representatives of Central Authorities:**
 - One interview with the Ministry of Social Development, Child Labour Department
 - One interview with the Ministry of Labour, Syrian Refugees Unit
- **Representatives of Local Authorities:**
 - Six interviews with Joint Service Council (JSC) representatives
 - Seven interviews with municipality representatives
- **Other state actors:**
 - One interview with the SSC
- **International organisations:**
 - One interview with the ILO

2.1.5 Data Processing and Analysis

A mixed methods approach through MS Excel was used to process and summarize collected data.

2.1.6 Challenges, limitations, and lessons learned

Some challenges emerged during the field research process. The primary challenge was the lack of willingness of informal sector actors to participate in the interviews. The reluctance of waste pickers to participate may be due to lack of trust in the purpose or outcomes of the research, fears of being fined or tracked by authorities, or fears of other legal repercussions. Efforts to mitigate this challenge included approaching waste pickers via intermediaries such as waste picking contractors and scrap yard dealers.

Further, the interviews were conducted during the summer of 2021, when some COVID-19 restrictions were still in place. Despite these limitations, the data provides valuable insight on multiple issues in a field where knowledge and understanding is limited. It also

provides direction for the design of interventions, as well as a basis for future research on the informal waste sector.

2.2 INFORMAL ACTIVITY HEATMAP

Two heatmaps were developed for this research to visualize the informal SWM sector across Jordan. One map shows the hotspots for waste pickers across Jordan and the other shows the distribution of middlemen and scrapyard dealers.

The informal SWM sector in Jordan is not comprehensively mapped due to a lack of available and reliable data. The heatmaps use estimates based on information collected during the field research from Joint Service Councils, municipalities, scrapyard dealers and waste pickers.

Estimates from 2014 indicate around 5,000 waste pickers were working in Jordan.⁴ The following estimates for the numbers of waste pickers emerged from this research:

- Amman: 3,000+
- Irbid: 1,500-2,000
- Zarqa: 1,500-2000
- Madaba: 250-500
- Salt: 250-500
- Mafraq: 250-500
- Aqaba: 250-500
- Karak: 250–500
- Jerash:200-300 (especially in tourist areas)
- Ajloun: 200-300 (especially in tourist areas)
- Ma'an: 100-200
- Tafileh: 100-200

The heatmaps show a concentration of waste pickers, scrapyard dealers and middlemen in the central region (Amman, Zarqa) which correlates with the dense populations of these governorates. Also, Amman and Zarqa are the centres for plastic, metal and cardboard reuse due to high industrial activity. Middlemen and scrapyard dealers are mostly located in Sahab, Mwaqqar, Marka, Qwesmeh, and Ohud, which are part of an industrial cluster stretching from the east of Amman to the border of Zarqa governorate.

No notable variations emerged regarding the numbers of waste pickers at dumpsites across the country.

⁴ Country report on the Solid Waste Management in Jordan, April 2014. https://www.resource-recovery.net/sites/default/files/jordanie_ra_ang_web.pdf.

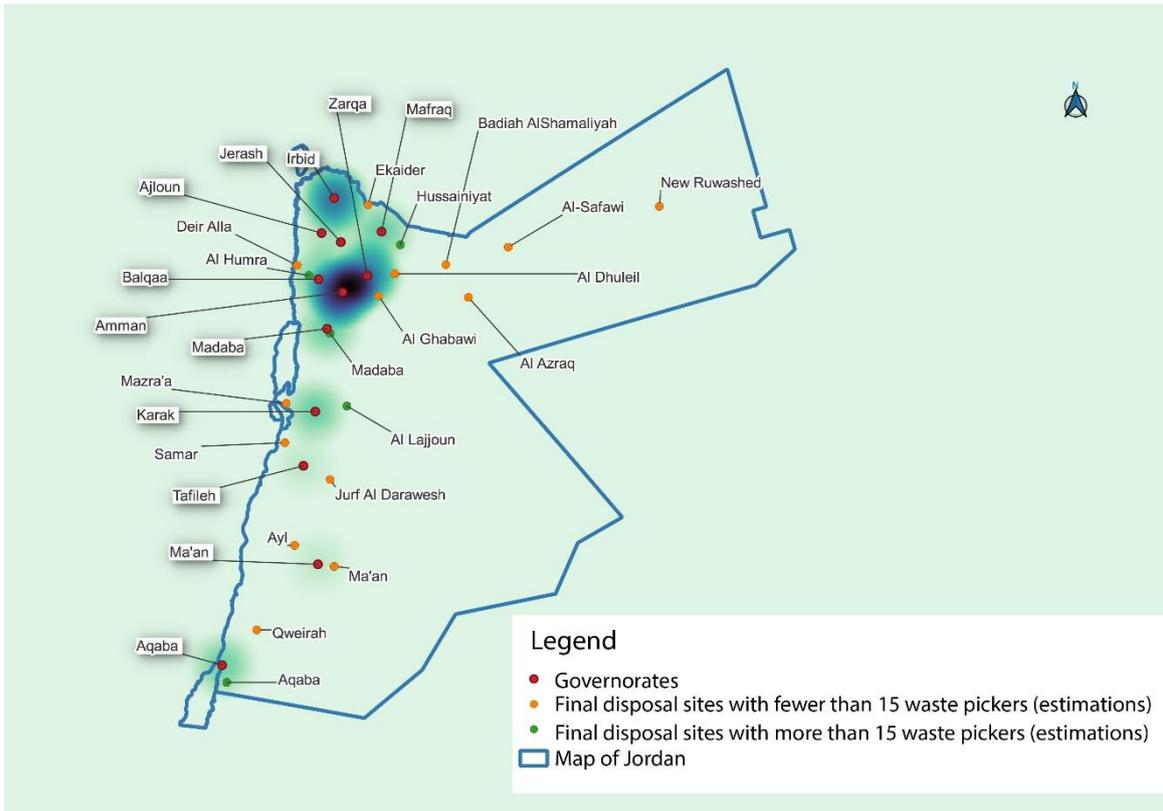


Figure 3 Heatmap for waste pickers on a national level

The following estimates for the number of middlemen and scrapyards dealers emerged from this research:

Amman: 100+

Zarqa: 50-100

Irbid: 50-100

Madaba: 10-30

Salt: 10-30

Karak: 10-30

Aqaba: 10-30

Ma'ana: 10-30

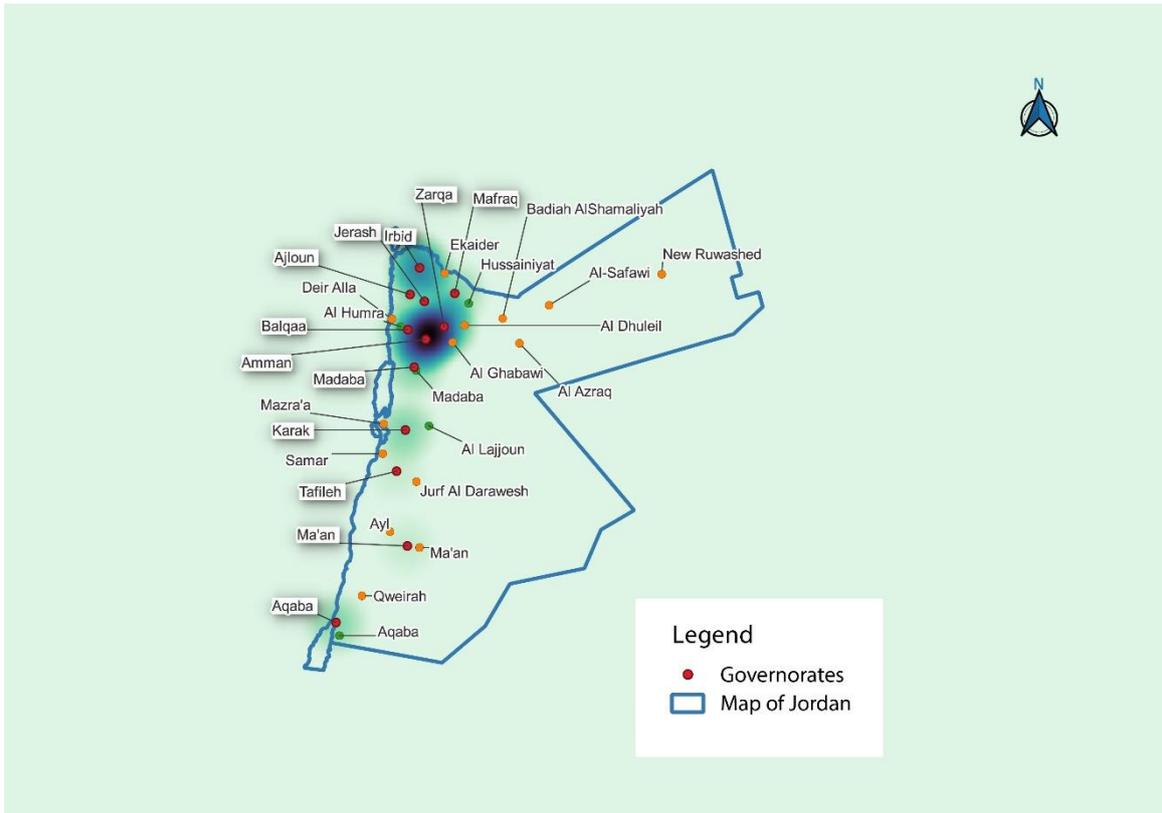


Figure 4 Heatmap for scrapyards and middlemen on a national level

3 FINDINGS ON CHARACTERISTICS AND NEEDS OF INFORMAL WASTE SECTOR ACTORS

3.1 SOCIAL ANALYSIS

3.1.1 Social Composition

This research aimed to identify and better understand the socio-economic characteristics, living and working conditions of informal SWM sector actors in order to gain a more comprehensive understanding of informal SWM operations and the associated value chain.

Figure 6 shows the demographic breakdown of the middlemen, scrapyards dealers and informal waste pickers interviewed for this research.

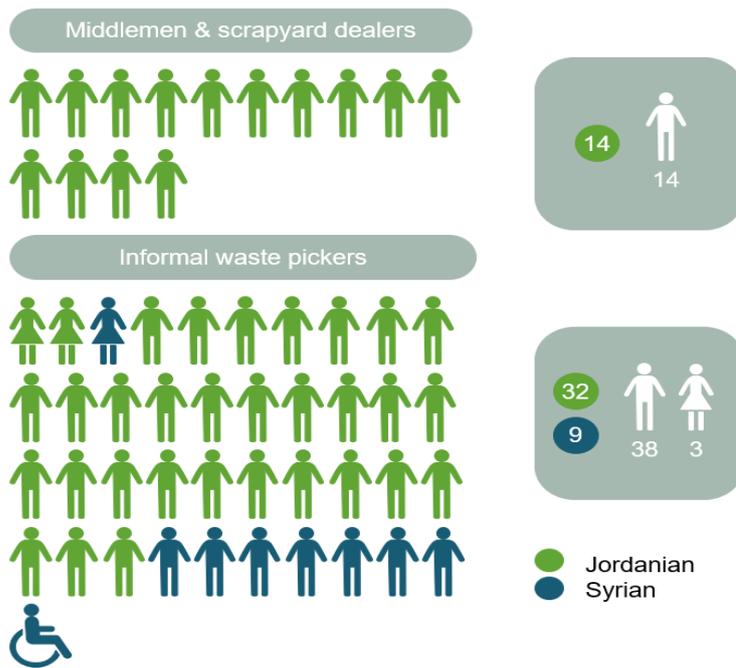


Figure 5 Overview of composition of informal sector actors interviewed.

3.1.1.1 Gender composition – all respondents

The chart below represents the gender of waste picker respondents:

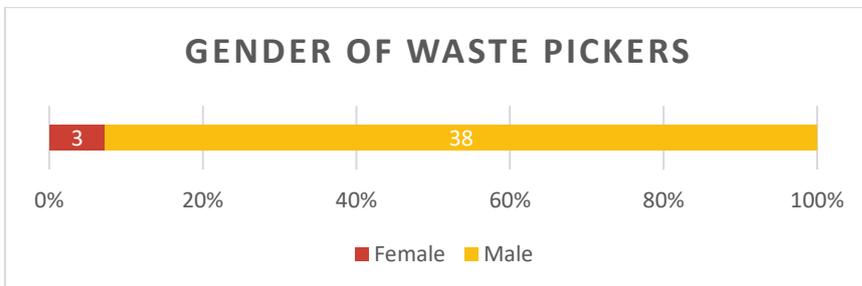


Figure 6 Gender of respondents for informal waste pickers

No female middlemen or scrapyards dealers were identified.

Key remarks on gender of respondents:

- Of the 41 waste pickers that were surveyed, only three were female. Gender issues are examined in section 5.1 of this report.
- During research conducted in May 2019 for GIZ under the project “EU Support to the Implementation of the National Solid Waste Management Strategy- Informal Sector Integration and Awareness Raising,” 10% of waste pickers interviewed were female, compared with 7% for this research. Given the sample size, this is a difference of one person. This suggests the involvement of women in the sector is limited; in addition, they may be more difficult to reach for interview.

3.1.1.2 Nationality – all respondents

The chart below represents the nationality of waste picker respondents:

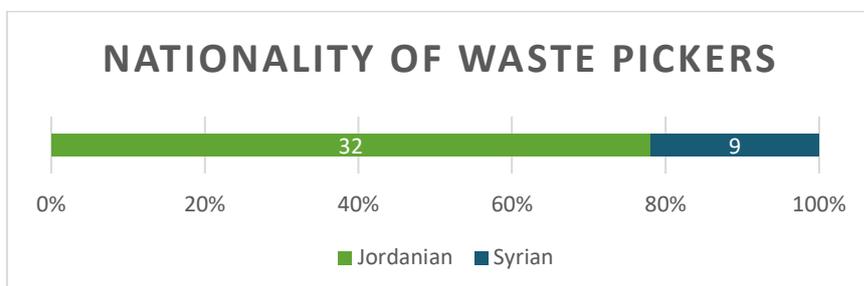


Figure 7 Nationality of respondents for informal waste pickers

Nationality of respondents

- Nine of the 41 waste pickers interviewed were Syrian, including one female. No other nationalities were identified.
- Five of the Syrian refugees live at Al Azraq Refugee Camp. Apart from one worker, who is female, the workers stay at the Madaba dumpsite where they work and only return to the camp during the weekends. The other four Syrian workers live in Za’atari refugee camp.
- Of the 19 waste pickers interviewed at dumpsites and landfills, only 5% were Jordanian with the remaining 95% being Syrian. Research conducted in 2019 for GIZ for Hussainiyat, Al Ekaider and Madaba had estimated the ratio of Jordanian to Syrian waste pickers nationally to be around 45% to 55%.
- All middlemen and scrapyards dealers interviewed were Jordanian.
- Section 5.2 of this report explores perspectives on refugees.

3.1.1.3 Disability

The chart below represents the disability status of waste picker respondents:

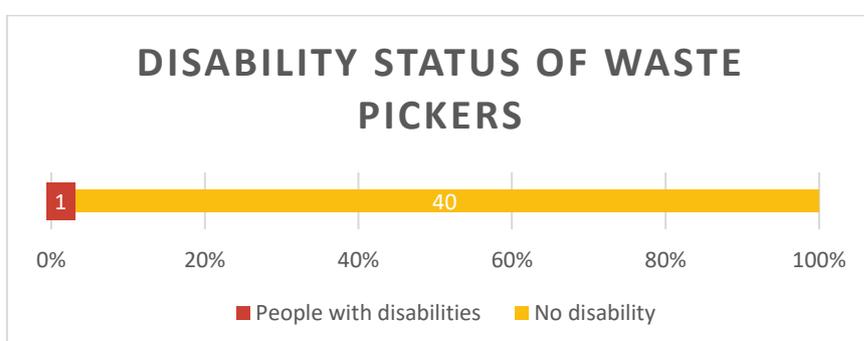


Figure 8 Respondents suffering from a disability (waste pickers)

Key remarks on disability:

- One respondent reported living with a disability related to mobility. The respondent was a male Syrian refugee.

- No middleman or scrapyard dealer reported having a disability
- Section 5.3 of this report looks at perspectives on engagement of people living with disabilities in the sector.

3.1.1.4 Age composition - waste pickers

The chart below represent the age of waste picker respondents:

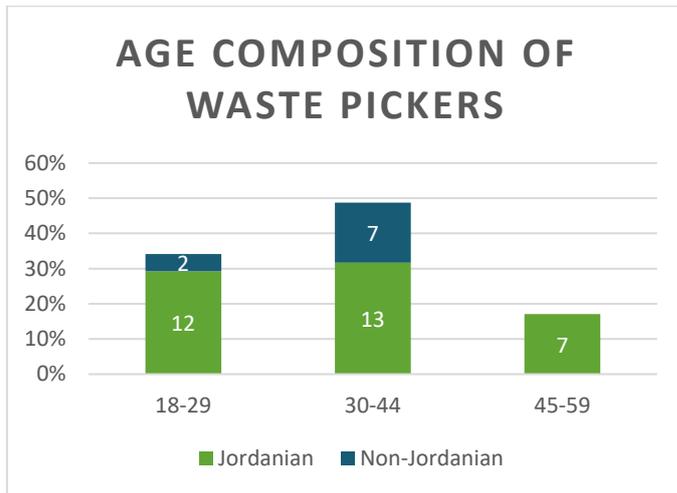


Figure 9 Age composition (waste pickers)

Age composition of informal waste pickers:

- Nearly half of the respondents are between 30 and 44 years old and about one third between the ages of 18 and 29. None were under the age of 18 or over 60.

3.1.1.5 Education levels

The charts below represent the educational attainment of waste pickers and middlemen and scrapyard dealers:

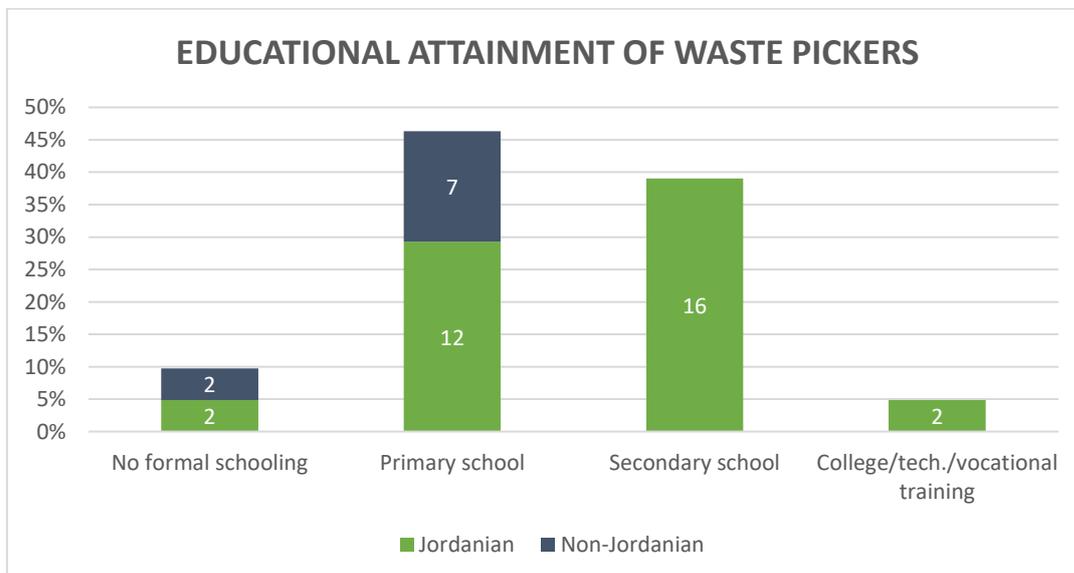


Figure 10 Educational attainment (waste pickers)

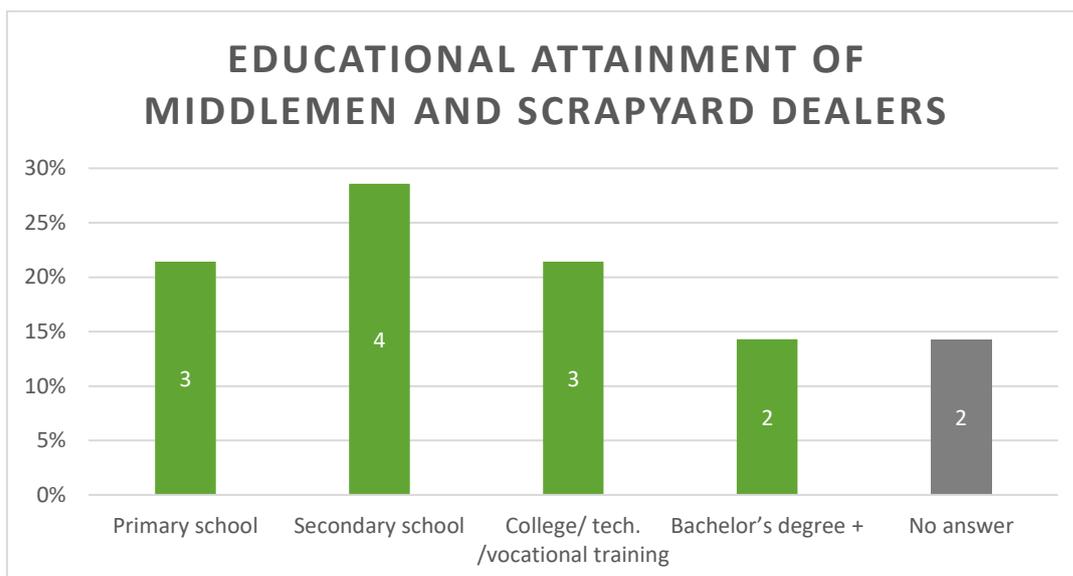


Figure 11 Educational attainment (middlemen and scrapyards dealers)

Key remarks on educational attainment:

- Most informal waste pickers attended primary school (90%) and 44% attended at least secondary school. None attended university.
- Four informal waste pickers received no formal schooling, one of whom is female. The two other women surveyed have a primary school educational attainment level. None of the Syrian refugees interviewed attended formal schooling beyond primary school.
- The proportion of waste pickers attending formal schooling beyond primary school is lower than the national average. Likewise, the gender parity in education nationally was not reflected among the waste pickers interviewed, as the education level of the female waste pickers was collectively lower than male waste pickers.
- Further research should be conducted on the link between educational attainment and informal waste picking.
- A higher proportion of middlemen and scrapyards dealers have continued their education beyond secondary school (35%) compared to waste pickers (5%). All the middlemen and scrapyards dealers interviewed attended primary school.

3.1.1.6 Household composition information - waste pickers

The charts below represent the household composition of waste picker respondents:



Figure 12 Total number of household members (waste pickers)

All but one of the respondents live with their families. Among respondents, 74% live in households of five people or more, larger than the national average household size of 4.7 people.⁵

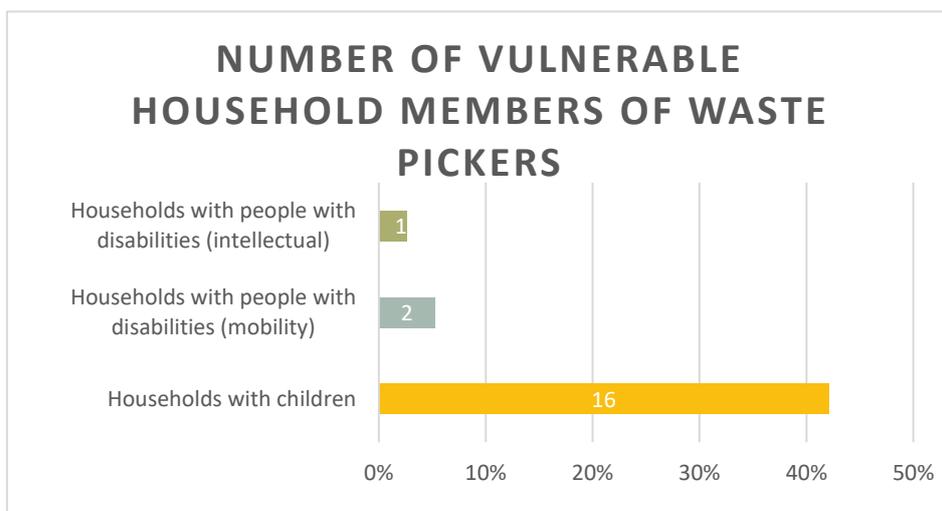


Figure 13 Vulnerable household members (waste pickers)

⁵ Jordan 2017-19 Population and Family Health Survey Key Findings. <https://dhsprogram.com/pubs/pdf/SR256/SR256.pdf>

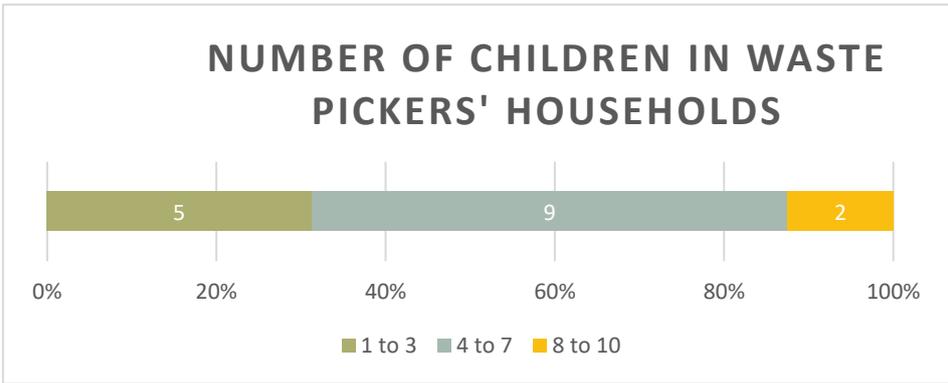


Figure 14 Number of children in household (waste pickers)

42% of respondents reported living with children, of whom 69% reported living with four or more children.

Three of the informal waste pickers reported having a household member with a disability. Of these, two lived with someone with a physical disability while one lived with someone with an intellectual disability.

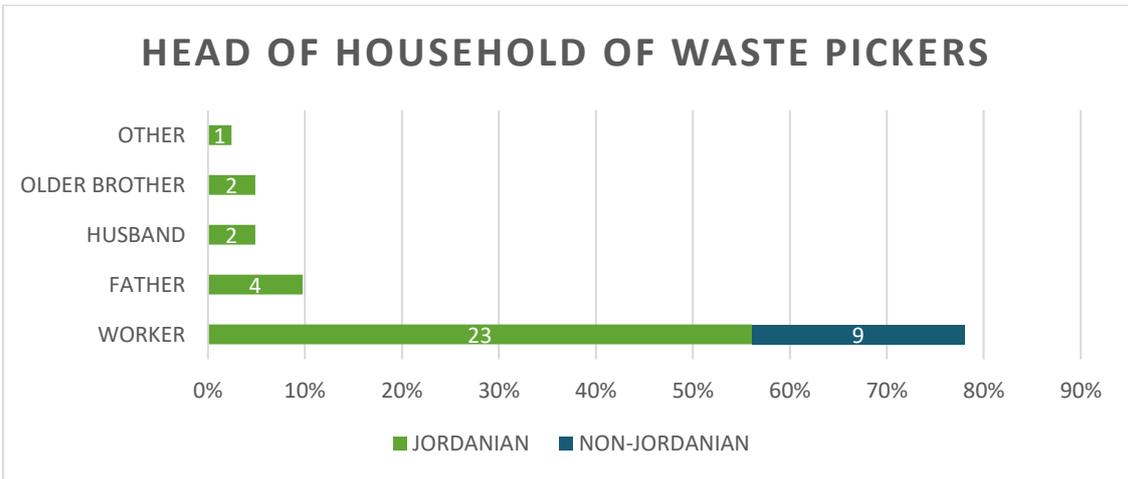


Figure 15 Head of household (waste pickers)

Only one household was female-headed. This is lower than average; nationally, 12 percent of households are headed by females.

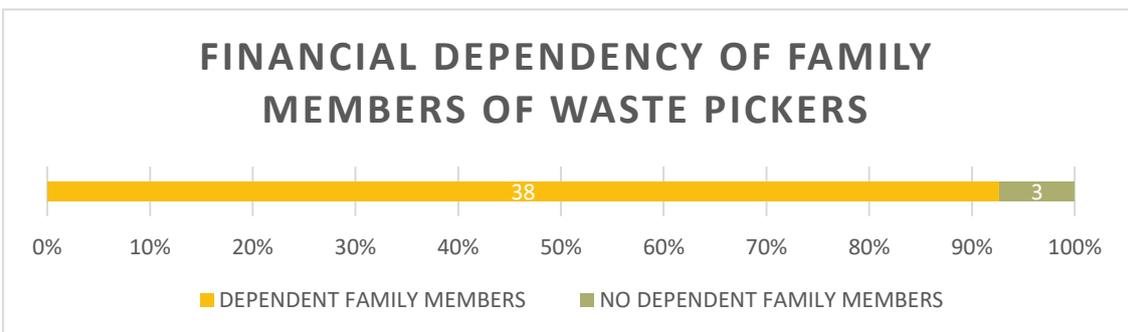


Figure 16 Financial dependency of family members (waste pickers)

All but three respondents financially support members of their families that do not work. Household income levels are examined further in section 3.2.

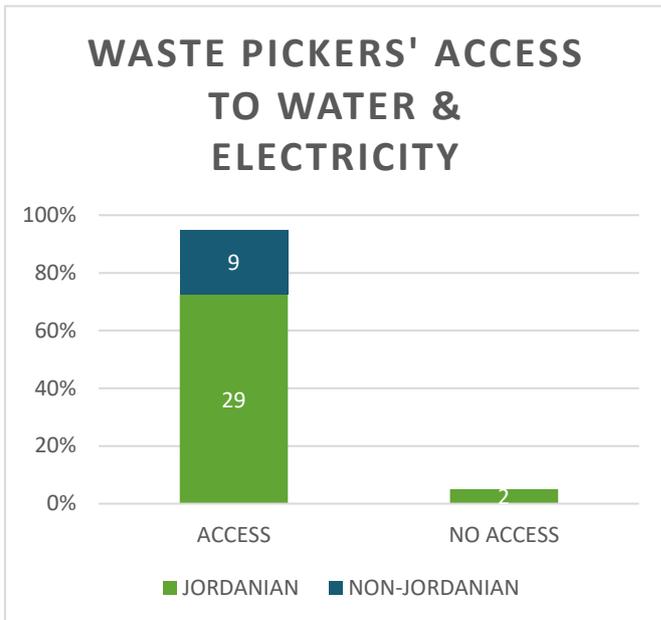


Figure 17 Access to water and electricity (waste pickers)

Three of the Jordanian waste pickers did not have access to electricity or water, a higher proportion than the national average. Nationally, 99.9% of the population in Jordan had access to electricity in 2018, according to the World Bank⁶, while UNICEF reported that more than 98% of the population has access to an improved water source.⁷

Household composition information – middlemen and scrapyards dealers

The charts below represent the household composition of middlemen and scrapyards dealer respondents:

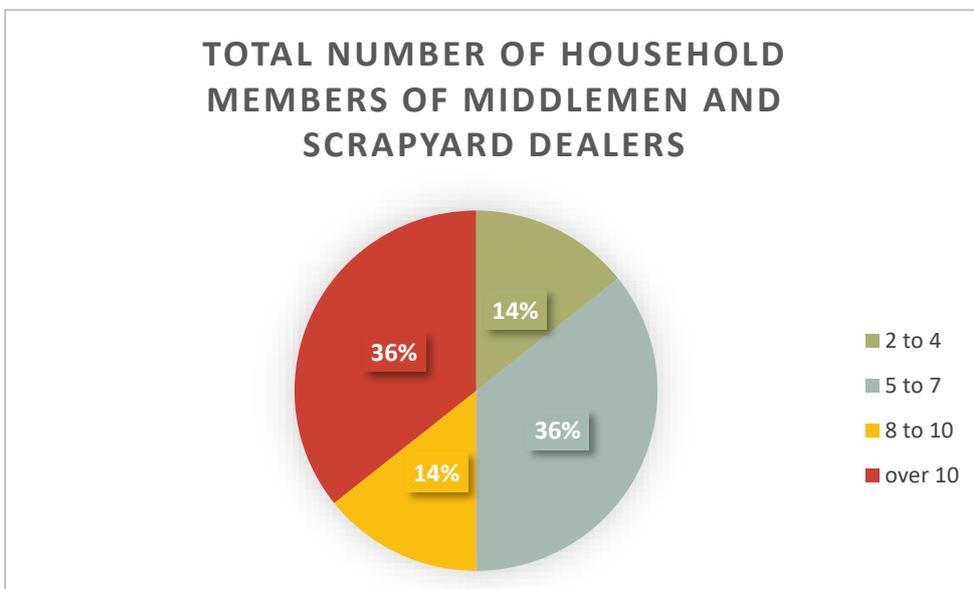


Figure 18 Total number of household members (middlemen and scrapyards dealers)

⁶ Access to electricity, Jordan. World Bank.

<https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=JO>

⁷ Water, sanitation and hygiene: Access to safe water for every child. UNICEF.

<https://www.unicef.org/jordan/water-sanitation-and-hygiene>

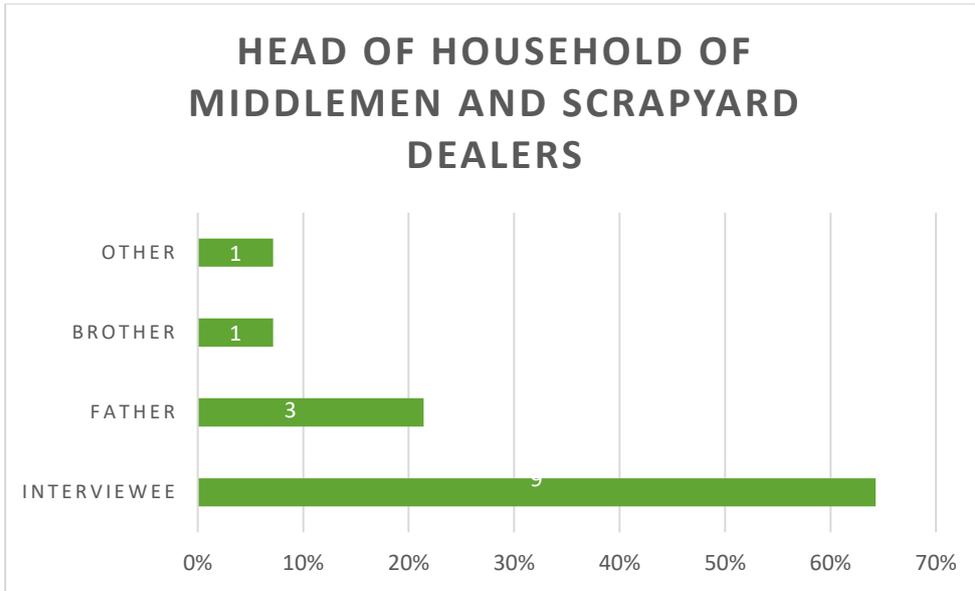


Figure 19 Head of household (middlemen and scrapyard dealers)

Household composition data for middlemen and scrapyard dealers:

- All respondents live with their families and 86% live in households with five members or more, bigger than the national average. Some 36% of respondents live with more than 10 household members.
- All households of the middlemen and scrapyard dealers are male headed.

3.1.2 Occupational Profile of Workers

3.1.2.1 Key data on occupational profile of informal waste pickers

The charts below depict the occupational profile of waste picker respondents:

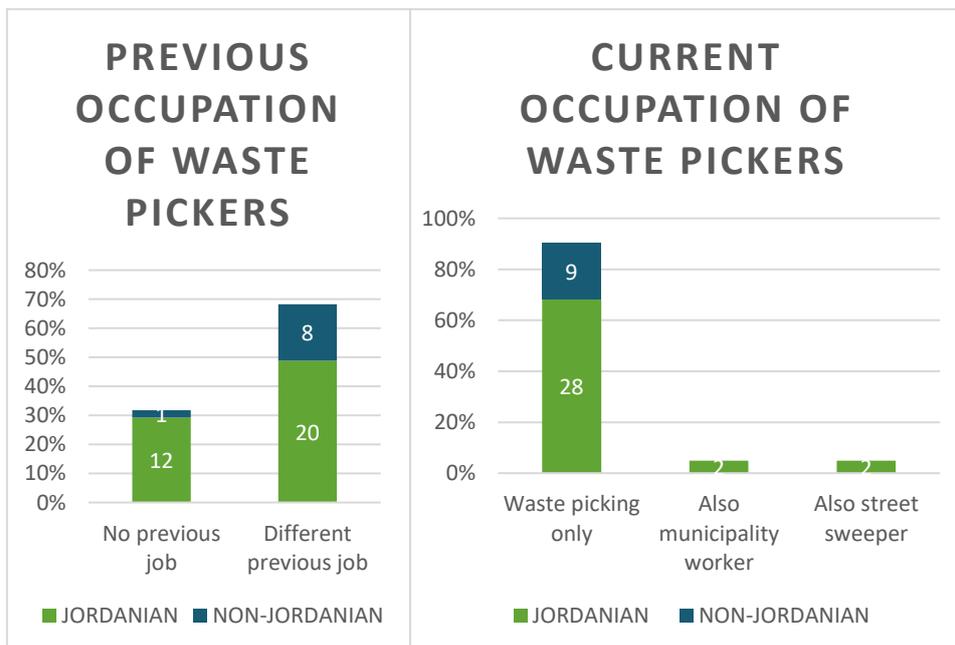


Figure 20 Previous and Current Occupation of Waste Pickers

REASON FOR OCCUPATION SHIFT OF WASTE PICKERS

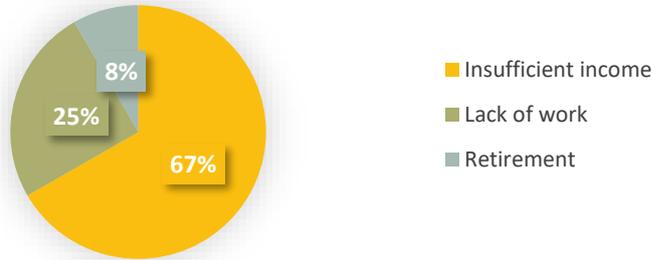


Figure 21 Reason for change of occupation (waste pickers)

Some 69% of those interviewed had experience in a different sector before they started waste-picking. Previous occupations included construction workers, farmers, mechanics, and contractors. Among this group, the reasons for entering the waste picking sector included insufficient income and lack of work. Jordan's economic growth has remained stagnant over the past decade with high levels of unemployment.

YEARS AS WASTE PICKER

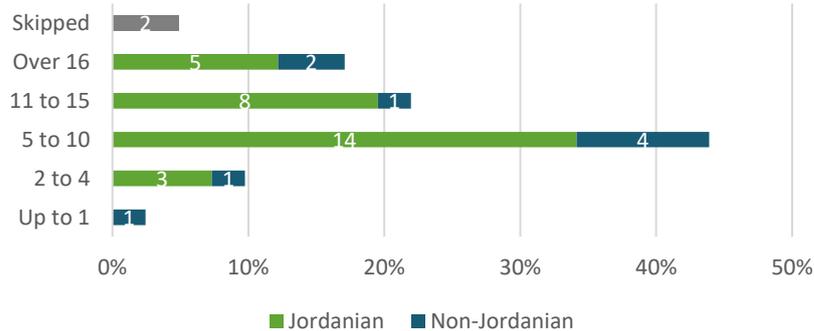


Figure 22 Years in waste picking activity

START OF WORK AS WASTE PICKER (AGE)

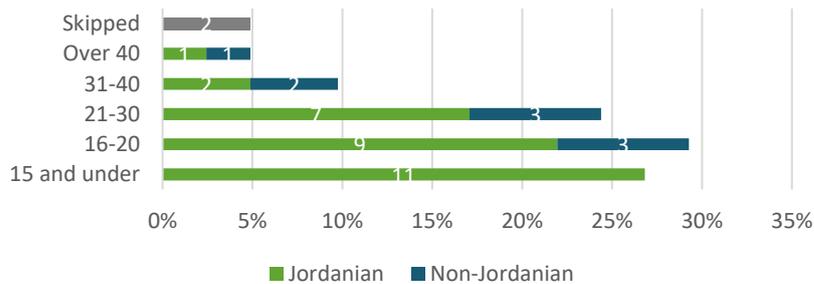


Figure 23 Age of entering waste picking activity

83% of waste pickers have been doing this work for more than five years while 39% have been working as waste pickers for 11 years or more. Most waste pickers entered the occupation under the age of 30, and more than half started before the age of 20 and more than a quarter entered the sector as children.

Considering the age of entry in the sector (over 50% before the age of 20) and the years worked in the sector (5 years or more for over 83% of respondents) it can be concluded that waste picking has been the main source of income for most respondents for most of their working life.

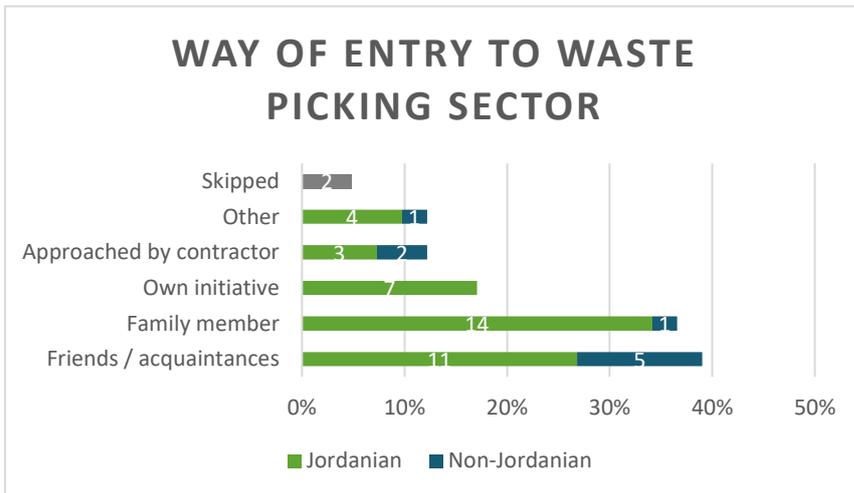


Figure 24 Way of entry in waste picking sector

Most informal waste pickers entered the sector through their social network or families.

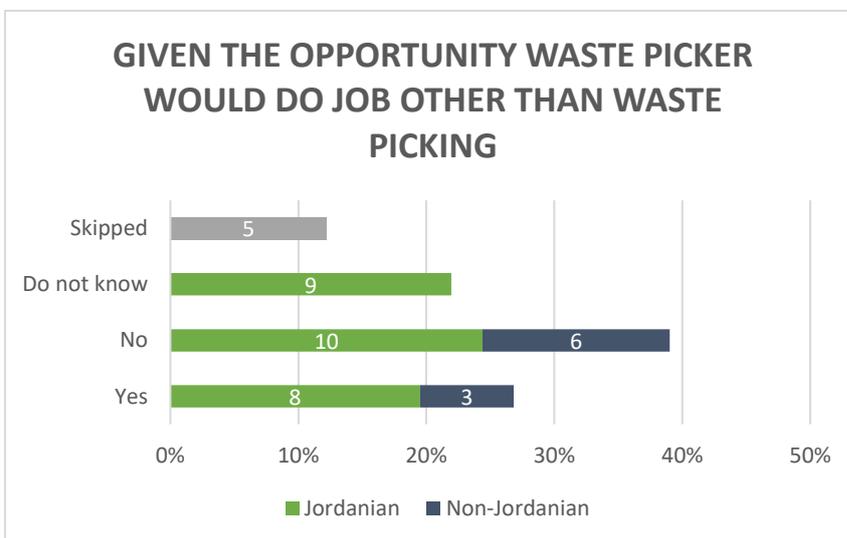


Figure 25 Waste picker would do other job if given opportunity

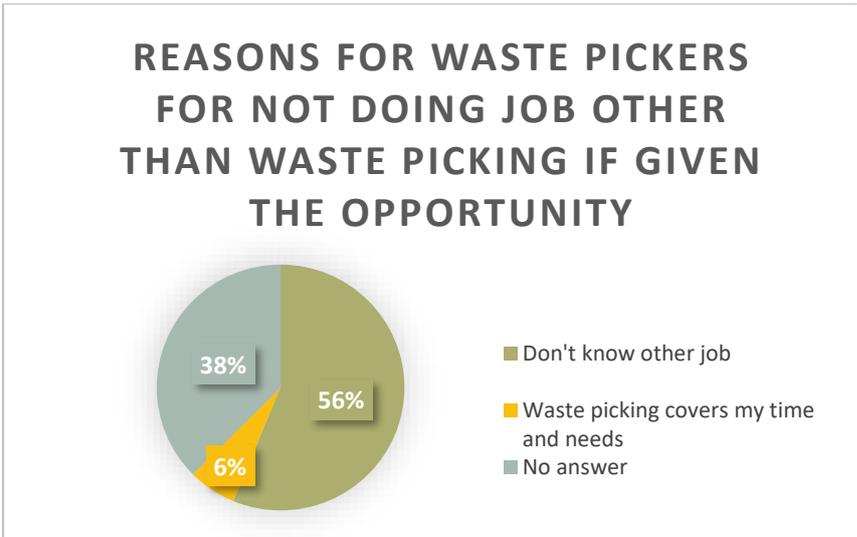


Figure 26: Barriers to undertaking different work (waste pickers)

Future intentions

- Only about a quarter of waste pickers interviewed said they would do another job if given the opportunity.
- Years worked in the sector does not seem to influence whether another job would be accepted. Among waste pickers who had previously worked in a different occupation, 70% said they would take a different job if given the opportunity.
- Most who said they would not change occupations if given the opportunity said this was because they did not know how to do another job, while some said waste picking provides more income than available alternatives.

3.1.2.2 Distances travelled by informal waste pickers

The distances that waste picker respondents travel to work are represented in the chart below:

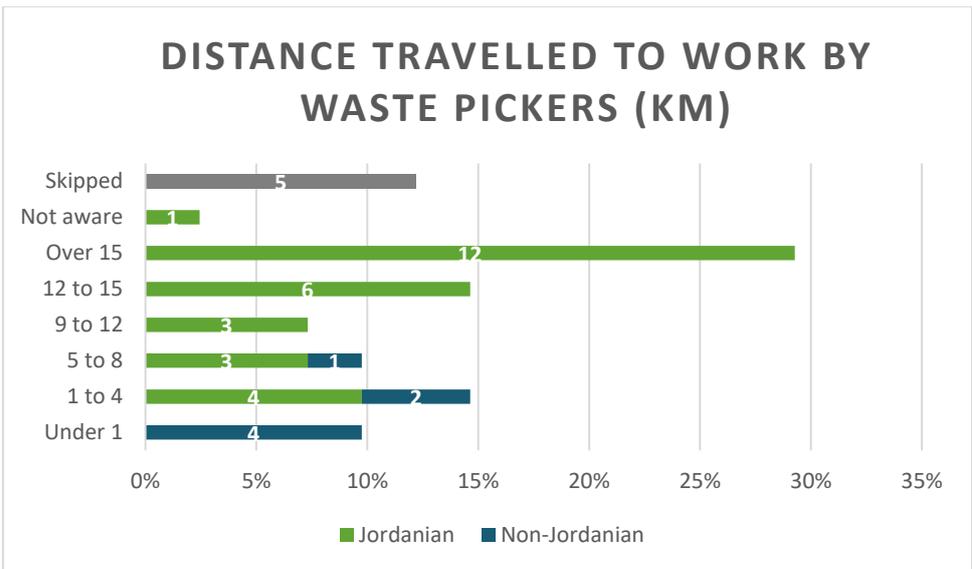


Figure 27: Distance to work by waste pickers

Around 29% of waste pickers travel over 15 km to work.

3.1.2.3 Time spent working for informal waste pickers

The majority of informal waste pickers interviewed work 6 days a week, starting between 6 and 8 AM with about 10% starting before 6 AM. About half of workers work beyond 5 PM with nearly 30% ending their working day after 8 PM. Below is a representation of waste pickers' working days and time:



Figure 28 Working days per week

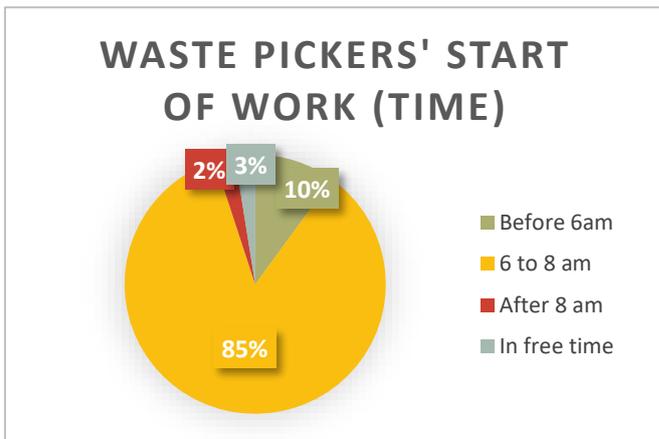


Figure 29 Waste pickers' work start

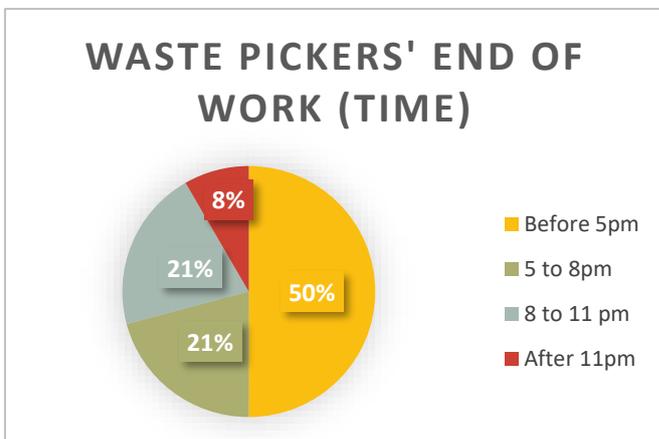


Figure 30 Waste pickers' work end

3.1.2.4

During the conducted interviews, waste pickers were asked about the key attributes for success in the waste-picking field and the advantages of the job. Below is a representation of the results:

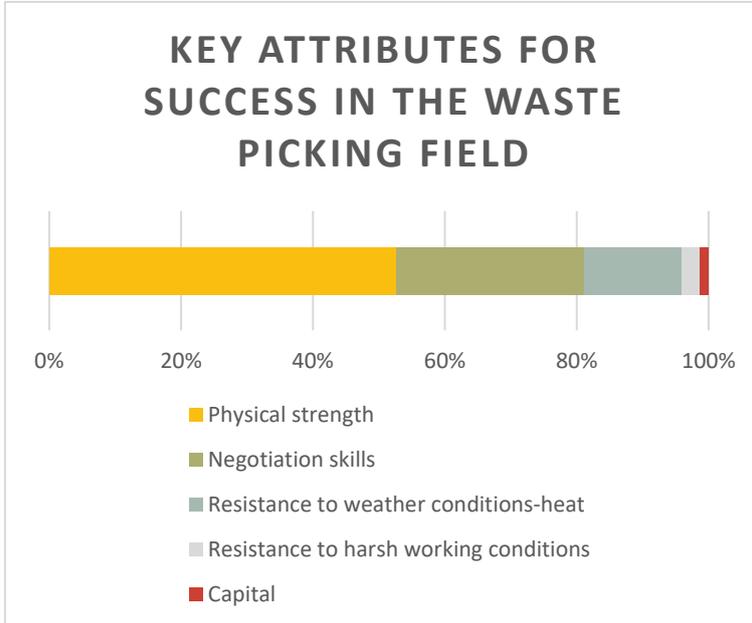


Figure 31 Factors of success (waste pickers)

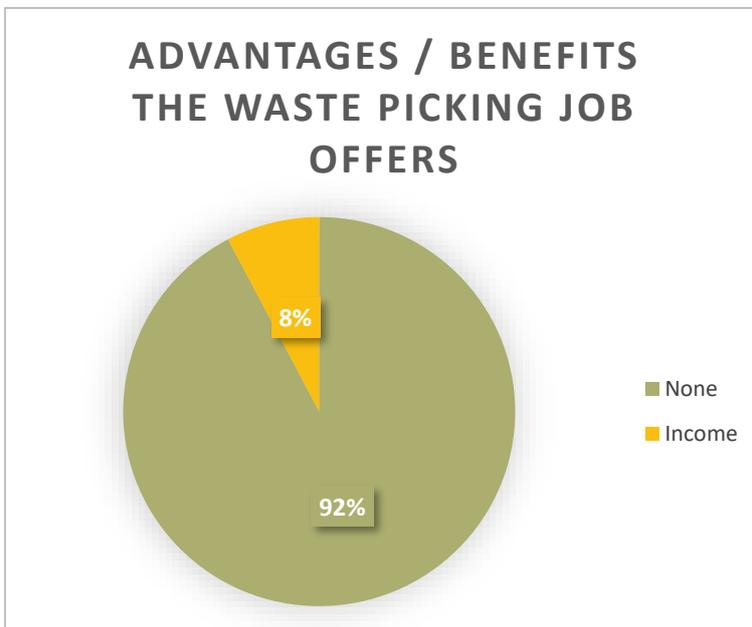


Figure 32 Advantages/ benefits of specific work (waste pickers)

Most respondents identified physical strength as the most important attribute for waste picking, followed by negotiation skills and resilience to difficult working conditions. They view their working conditions as harsh in terms of health, exposure to extreme weather, injuries from sharp objects, exposure to diseases etc. The perceived importance of

negotiating skills may be related to the lack of fixed pricing for the material they sell, thus the ability to negotiate could influence income levels.

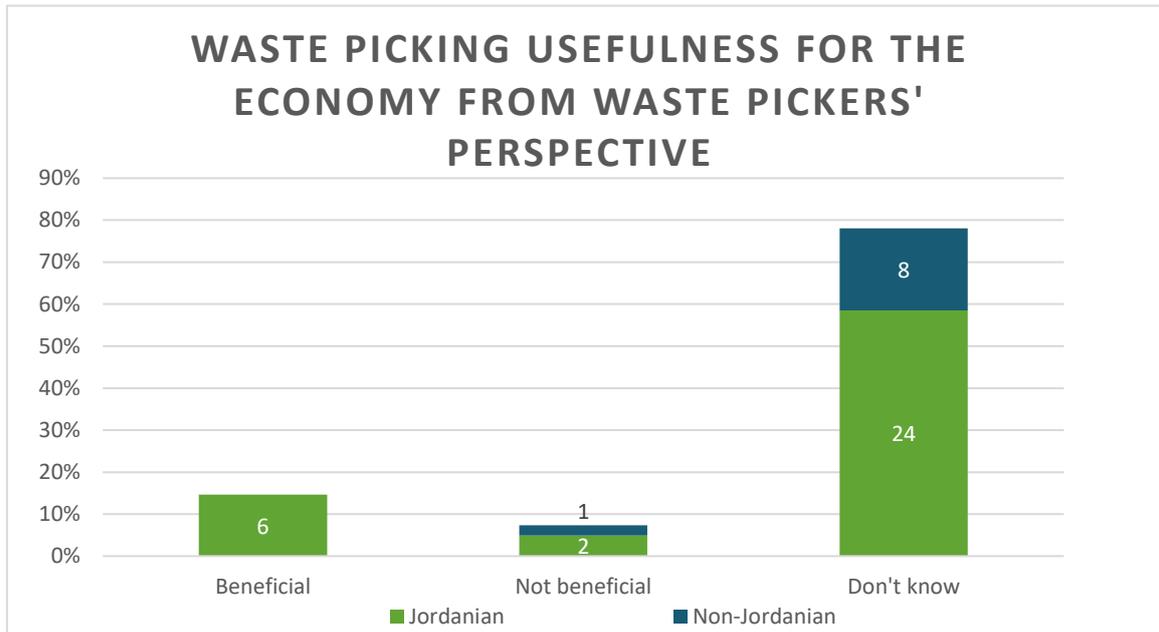


Figure 33 Usefulness of work for economy (waste pickers)

Most waste pickers see no benefit or usefulness in their work. This shows they are unaware of their contribution to recycling efforts and waste diversion from landfills.

Three waste pickers workers noted the potential usefulness of this work as a way for unemployed youth to secure an income and a further three said they viewed it as beneficial without elaborating. All those who noted possible benefits had an educational level of secondary school or vocational training.

Key remarks

Other stakeholders in the sector appeared to have some level of awareness of the contribution of waste pickers to the environment. Indicatively, during an interview with a municipal mayor, he objected to the use of the term waste pickers, suggesting it be replaced with the term “environmental sorting assistant.” Some municipal staff said they do not interfere with waste picker activities because they reduce the amount of waste and extend the life of the landfill. Others noted that waste pickers were called “environmental friends” within the community.

3.1.3 Social protection

Social protection of waste pickers was also assessed and below are representations of the results:

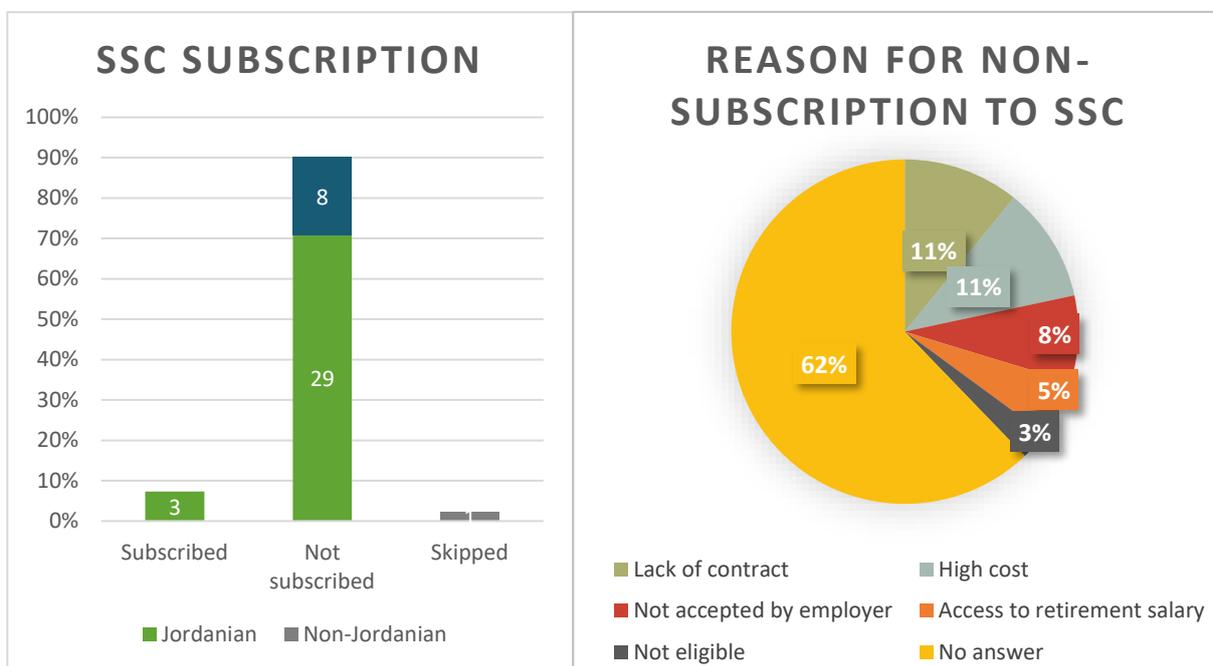


Figure 34 SSC subscription data and reasons for non-subscription (waste pickers)

Of waste pickers interviewed, 90% said they were not subscribed to the SSC. Most did not give a reason for this but those who did cited cost and lack of a contract.

SSC staff explained that Jordanians do not need an employment contract to register with the SSC. They can register online and since there is no link between the SSC and police, waste pickers should not fear repercussions from this. For self-employed Jordanians, the minimum contribution is JOD 16 monthly which is likely to be a significant barrier. Meanwhile, refugees are required to have an employment contract.



Figure 35 Access to healthcare (waste pickers)

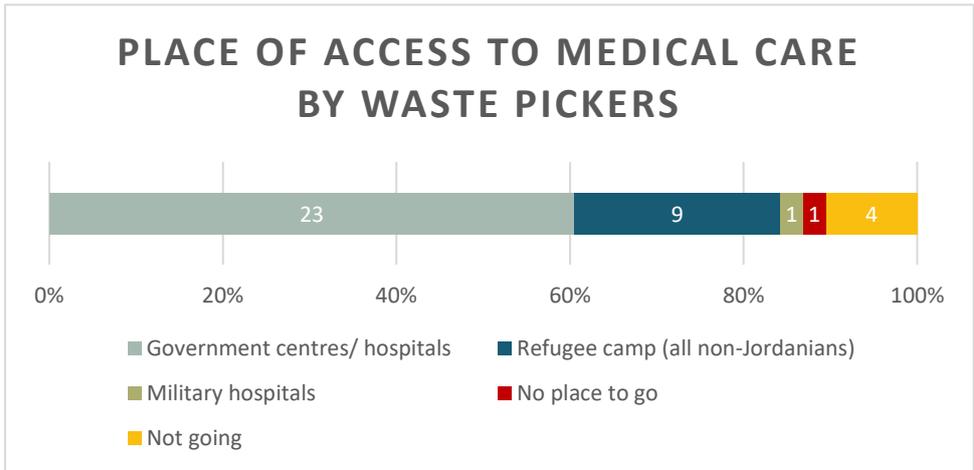


Figure 36 Place of access to healthcare (waste pickers)



Figure 37 Past access to healthcare (waste pickers)

Among waste pickers interviewed, 88% said they could access medical care either in national healthcare facilities (for Jordanians) or in refugee camps (for refugees). Those who lacked access to healthcare cited lack of transport and distance to hospital as barriers.

3.2 ECONOMIC ANALYSIS

3.2.1 Income Levels

3.2.1.1 Basic income data

Waste pickers' income, income sources, income sufficiency and access to additional financial resources were captured in the study, as follows:

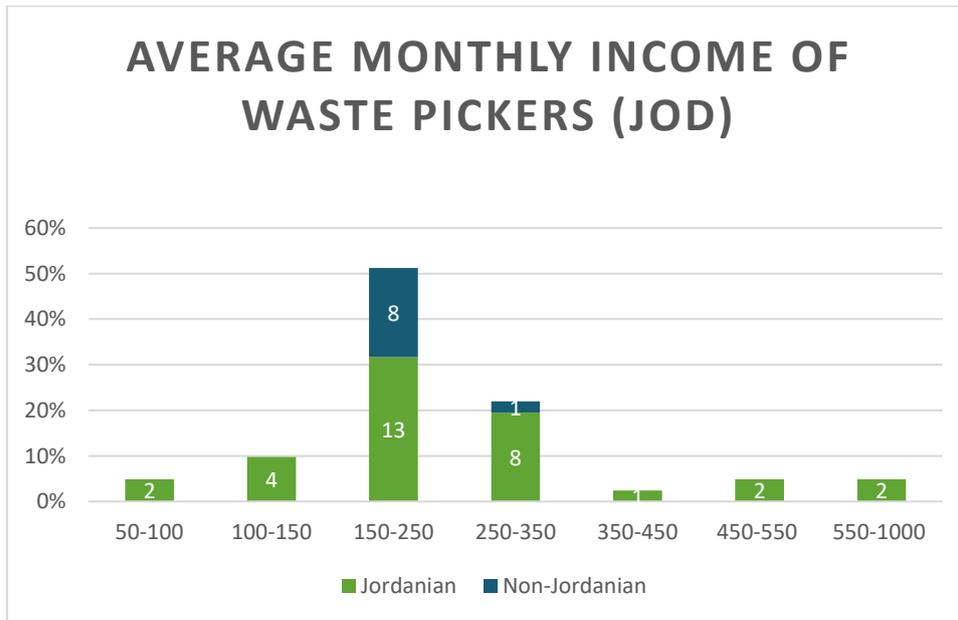


Figure 38: Average monthly income (waste pickers).

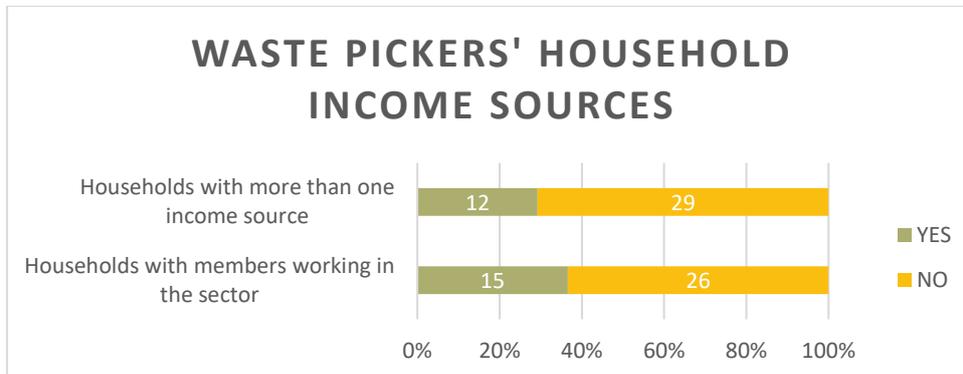


Figure 39: Household income sources (waste pickers).

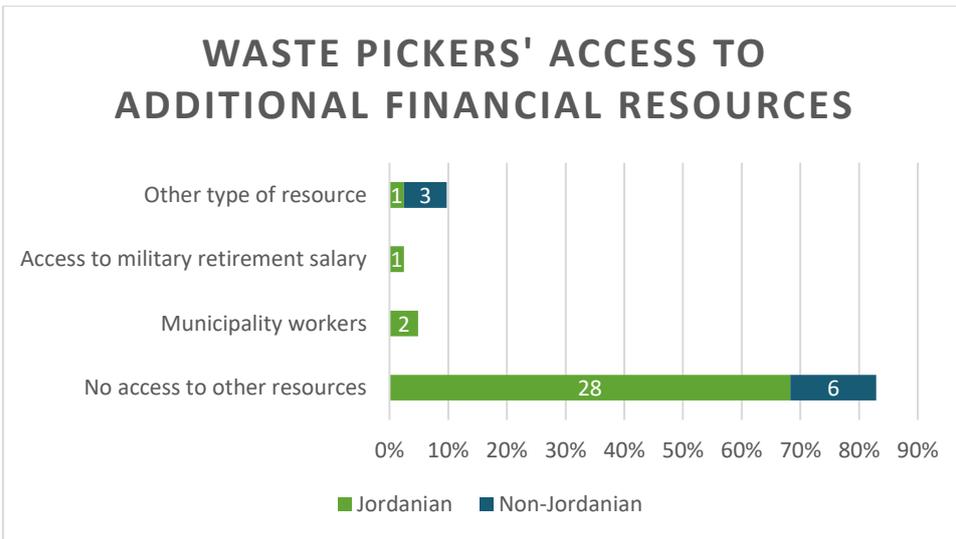


Figure 40: Additional financial resources (waste pickers)

The minimum wage in Jordan is currently JOD 260 for Jordanians and JOD 230 for Syrian refugees. Around half of the waste pickers interviewed reported monthly incomes of JOD 150-250 while 22% reported an average income of JOD 250-350, including one Syrian refugee. Only five Jordanian waste pickers reported earning more than JOD 350 including the son of a middleman, while six earned less than JOD 150. Two of the female workers reported monthly income levels of JOD 150-250 while one earned JOD 50-100 per month.

The absolute poverty rate in Jordan is set at JOD 814 per individual per year. Considering about 70% of the households of respondents have no access to other incomes and over 80% have no access to other financial resources, this would place these workers and their families below the poverty line.

Comparison with data collected in May 2019 indicates there has been no improvement in the income levels of waste pickers during the past two years. The GIZ project “EU Support to the Implementation of the National Solid Waste Management Strategy- Informal Sector Integration and Awareness Raising” found that most urban waste pickers earn between JOD 200 to 300 per month and about 27% less than JOD 200. The waste pickers in the landfills of Al Ekaider, Al Hussayniyat and Madaba were earning JOD 200-300 monthly.

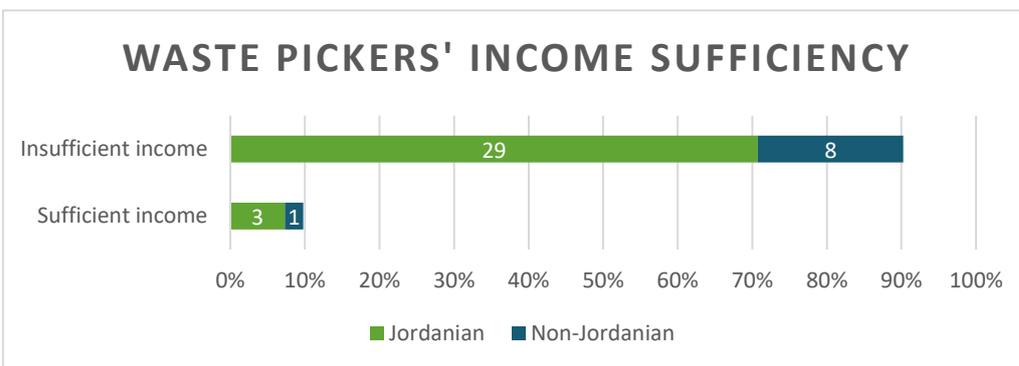


Figure 41 Sufficiency of income (waste pickers)



Figure 42 Estimated sufficient income (waste pickers)

Many workers consider their incomes insufficient and estimate a sufficient monthly income would range between JOD 350 and 500.

3.2.1.2 Use of Income

The below figures show how waste picker respondents manage their finances:

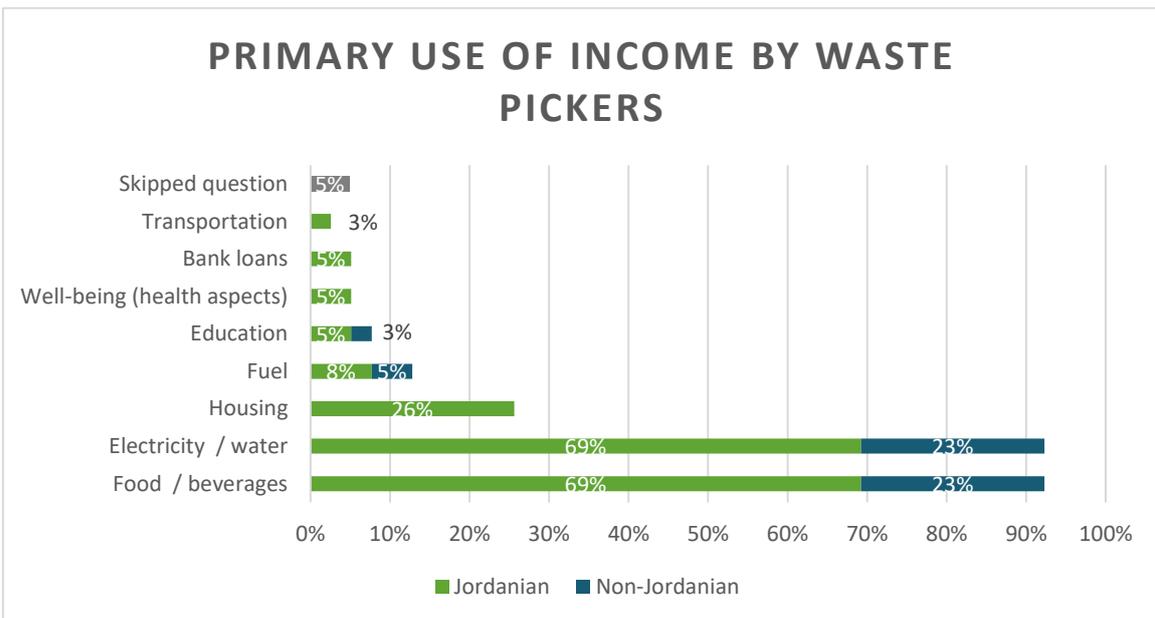


Figure 43: Primary use of income (waste pickers)

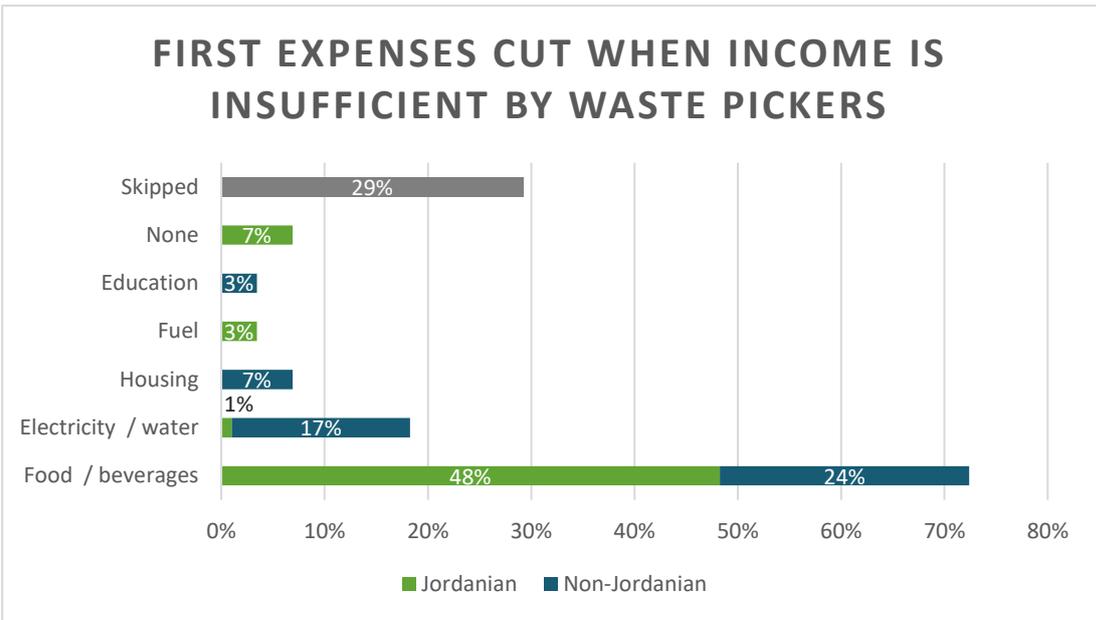


Figure 44 Reduced income impact on expenses (waste pickers)

Income is primarily used to cover basic needs such as food, water, electricity and housing. Less than 10% of respondents use income to cover education or health-related expenses. A decrease in income leads to the reduction of expenses primarily for food rather than electricity and water. Income is not spent on insurance.

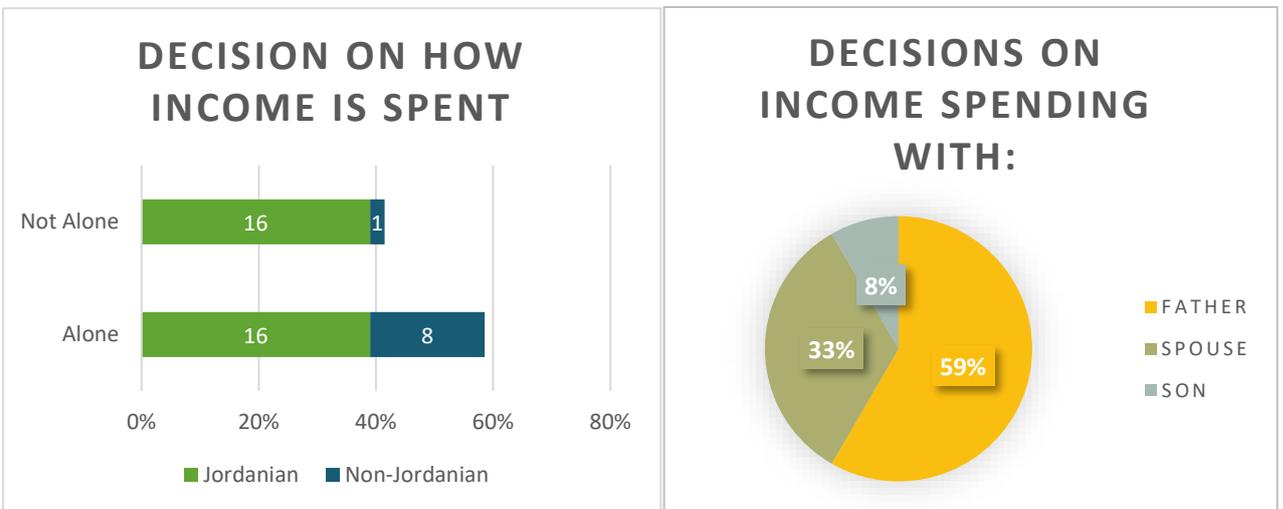


Figure 45 Decision on income (waste pickers)

Less than 60% of respondents are the decision makers on how their income is spent. The rest make decisions with their fathers or their spouses. The Syrian female worker who is the head of her household decides herself how to use her income, while the other two women decide with their husbands and sons.

3.2.2 Income Levels (occupation level)

Below are charts that represent the daily and weekly earnings of waste pickers:

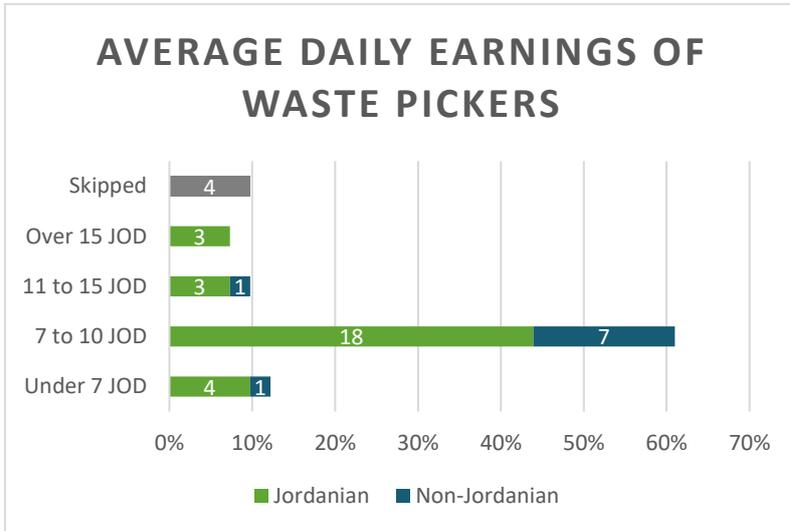


Figure 46: Earnings from daily waste picking activities

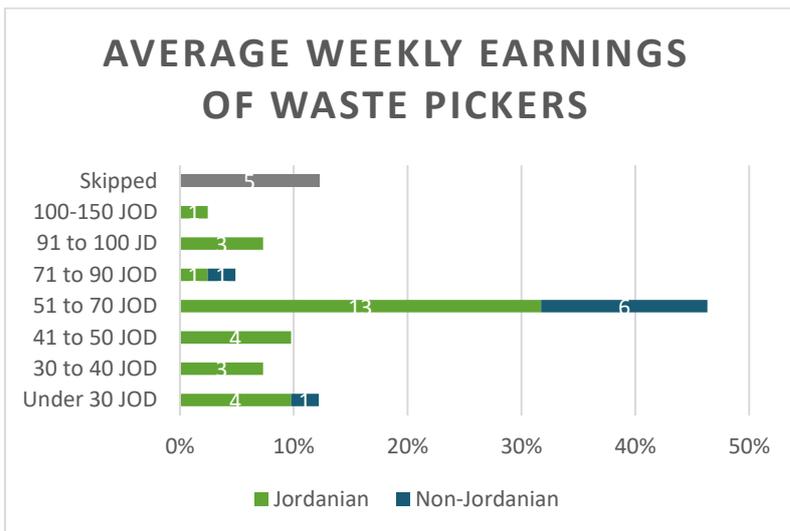


Figure 47: Earnings from weekly waste picking activities.

Key remarks

- More than 70% of waste pickers interviewed earned JOD 10 or less per day.

3.3 ASSOCIATED RISKS

When asked about risks associated with the waste-picking job, over half of the respondents reported health issues as their most common problem at work, followed by injuries. Other problems mentioned were issues with authorities and dumpsite areas being too small.

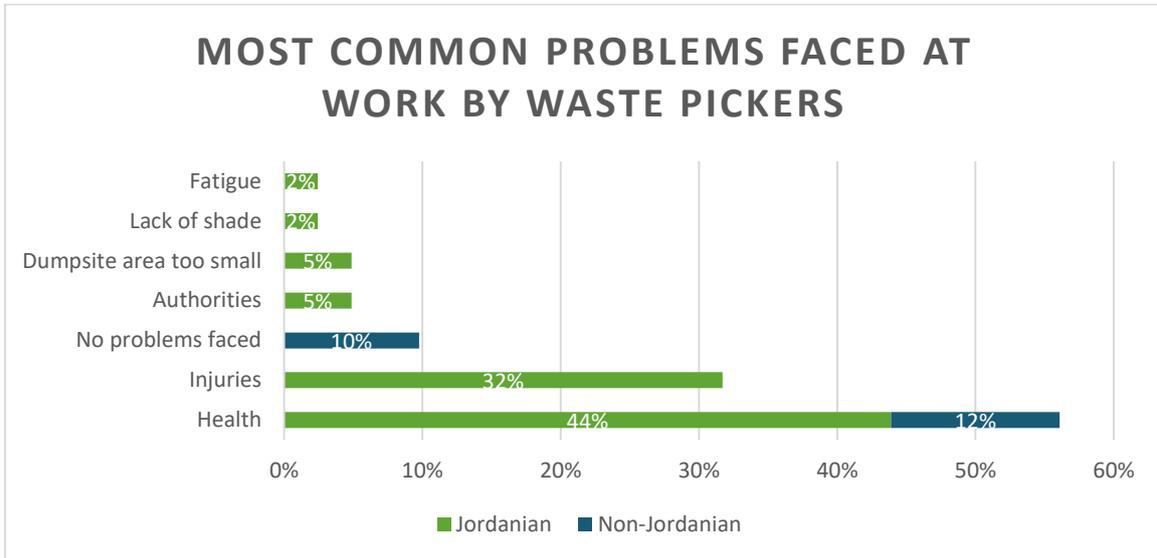


Figure 48: Work-related problems (waste pickers).

3.3.1 Health-related risks

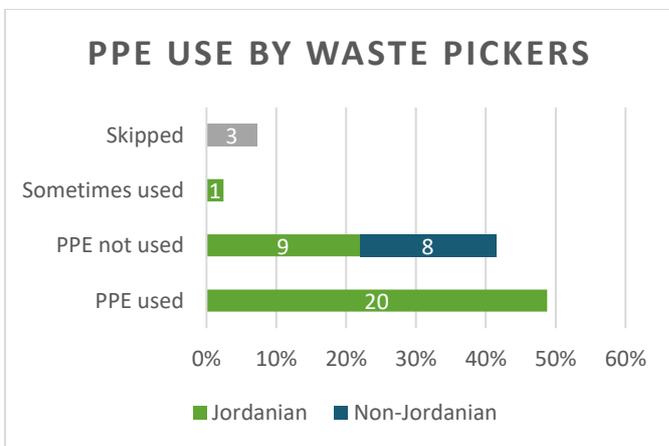


Figure 49 PPE use (waste pickers)

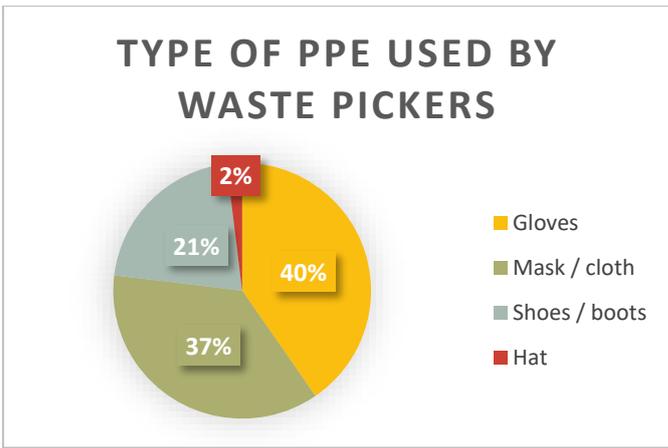


Figure 50: Type of PPE used (waste pickers)

Less than half of the workers use PPE (primarily gloves and masks), which makes them more susceptible to injury and prone to contract diseases.



Figure 51: Reasons for not using PPE (waste pickers).

The most common reason given for not using PPE was that it prevents movement. While the cost of purchasing PPE was mentioned by only 11% of workers, this may be a barrier. The cost for PPE is estimated as follows:

- Safety Boots: 25.00 JOD per pair
- Overalls: 30.00 JOD per overall
- Protective gloves: 10.00 JOD per pair
- Face mask: 10.00 JOD

PPE needs frequent replacement to ensure its quality. Gloves and overalls should be renewed every 3 months, safety boots should be replaced once a year, and the face mask should be replaced every month. PPE for one year for one person, therefore, would accumulate to JOD 305.

Based on interviews with local authority staff, for waste pickers working with contractors, obligation to provide PPE depends on the requirements of the specific contract. However, it was mentioned that even when provided, workers usually do not make use of it.

The GIZ project “EU Support to the Implementation of the National Solid Waste Management Strategy-Informal Sector Integration and Awareness Raising” found contractors rarely provide the waste pickers with PPE, and if they do, it was usually just gloves and boots. Some 37% of respondents reported wearing masks which could be linked to the COVID-19 pandemic. The impact of COVID-19 is examined in section 5.5.

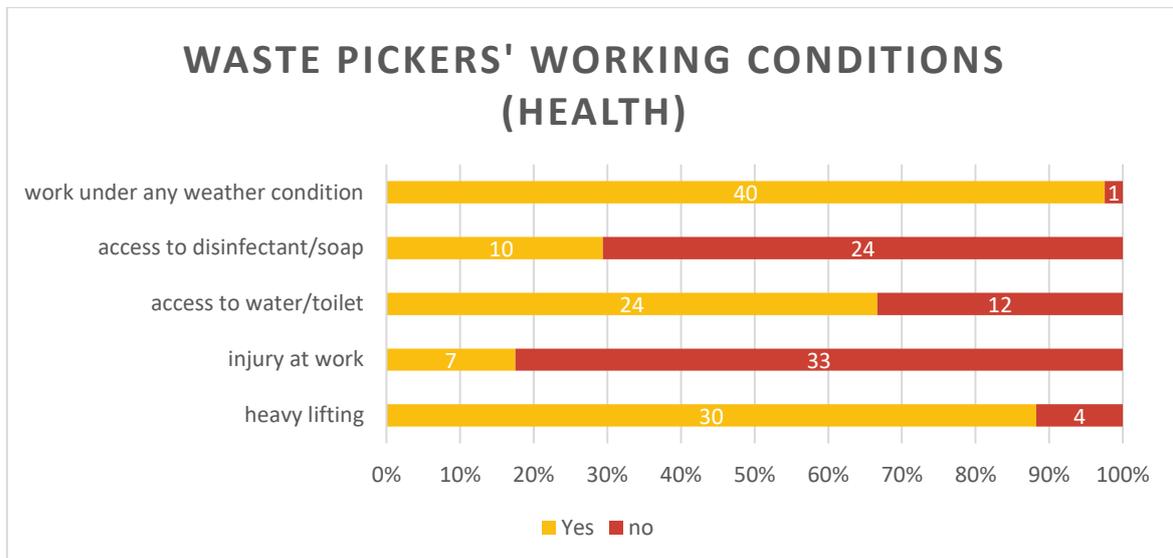


Figure 52: Health related working conditions (waste pickers)

Key remarks

- Almost all waste pickers work under any weather conditions and less than a third have access to soap or disinfectant, which makes them more vulnerable to contracting infections and diseases.
- Of waste pickers interviewed, 67% have access to water and toilets, including waste pickers at street level who have access through mosques.
- Some 18% of waste pickers said they have been injured at work. Most of them lift heavy objects, which increases their exposure to injury.

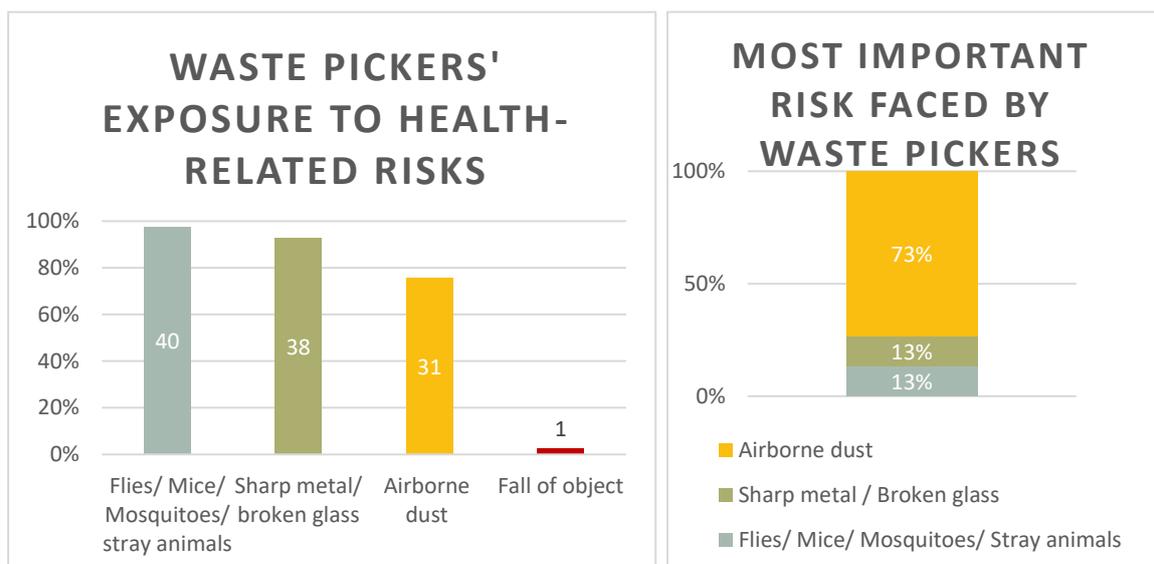


Figure 53: Health-related symptoms experienced (waste pickers).

Nearly all waste pickers said they were exposed to insects, stray animals, broken glass, and airborne dust, with airborne dust viewed as the most significant health-related risk by the workers.

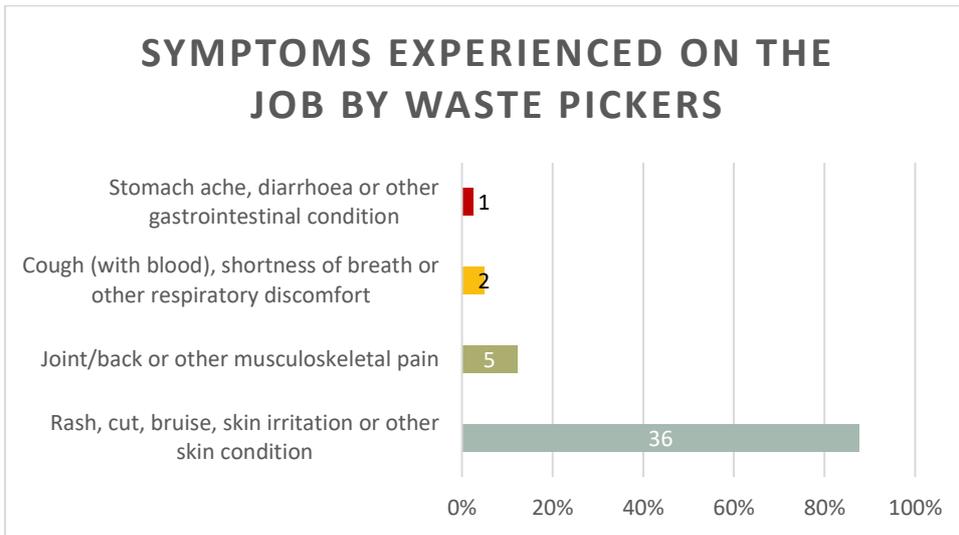


Figure 54: Exposure to Health-related risks (waste pickers)

Health symptoms experienced at work include rashes, cuts, bruises and skin irritations and conditions.



Figure 55: Relation of symptoms with occupation (waste pickers)

Most waste pickers consider the health symptoms they experience to be related to their occupation. While their health is certainly compromised by their occupation as they may be exposed to polluted air and hazardous waste, this is potentially also exacerbated by their living conditions and lack of health and social protection.

No correlation was found between age and years of work in the sector and the number or type of health issues reported.

3.3.2 Social risks – stigma

Waste pickers were asked about the social risks associated with the waste-picking job, and below are the results:

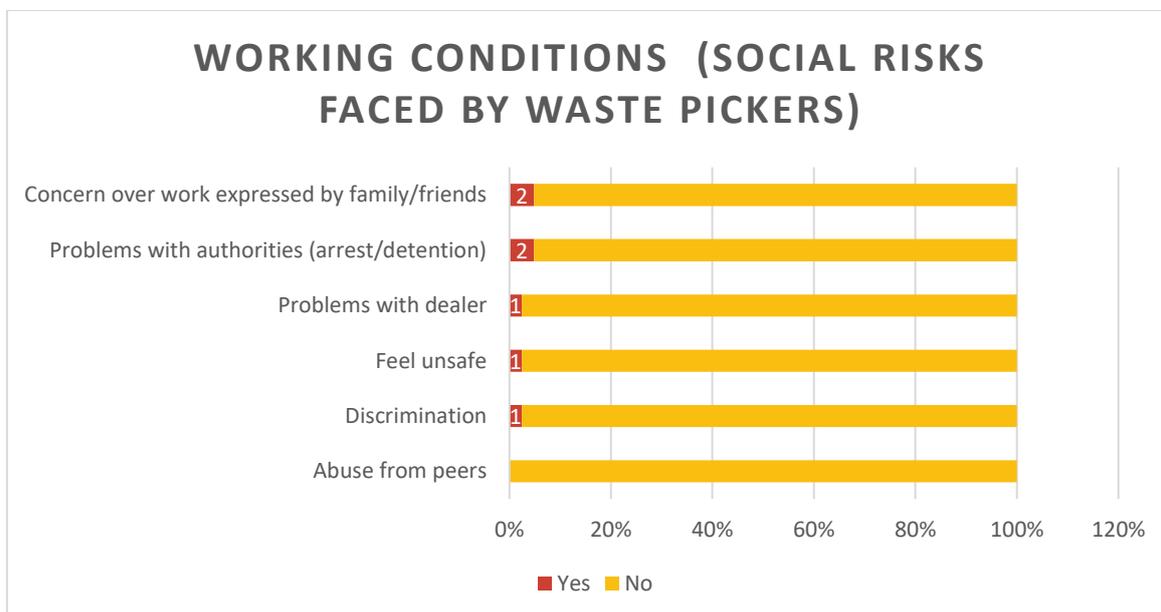


Figure 56: Exposure to social risks (waste pickers)

Key remarks

- Respondents reported low instances of stigma, discrimination, harassment and abuse due to their field of work.
- Through interviews conducted with local authorities, findings around social risks varied between municipalities. While some report societal rejection of the work of the waste pickers, others state there is no objection from the local community to the waste pickers. Acceptance is linked either to the recognition of waste pickers' contribution to environmental protection or understanding of the difficult conditions under which waste pickers live.

3.3.3 Other risks

- Other risks to waste pickers and their families include economic risks. Many of the waste pickers' households rely on a single income so they are especially vulnerable if their income is disrupted. Such disruptions could include health conditions, a drop in the prices of recyclables, lockdown or other socio-economic shocks.
- The lack of experience in performing other work and limited educational attainment are a barrier to entering other sectors. This means that interruptions in waste picking activities would increase vulnerability and poverty.

4 PERSPECTIVES ON INFORMALITY / FORMALITY

4.1 KEY IDENTIFIED DRIVERS TO INFORMALITY

Several socio-economic aspects appear to constitute drivers to working informally including:

- Low available household income
- Access to network connected to the sector, either within the family or among friends and acquaintances.
- Low educational levels.
- Entry at an early age into the sector.
- Lack of better work opportunities which may be linked to age, skills, levels of unemployment, and low income.
- Work in the sector for an extended period of time.
- Little or no experience in other fields.
- Limited opportunity to undertake other work at a later age.
- Presence of vulnerable household members combined with large households.
- High financial dependency of family members.
- No access to other income or financial resources.

These aspects are interconnected and linked to vulnerability and exposure to poverty. The figure below gives an overview of aspects and their interconnectedness.

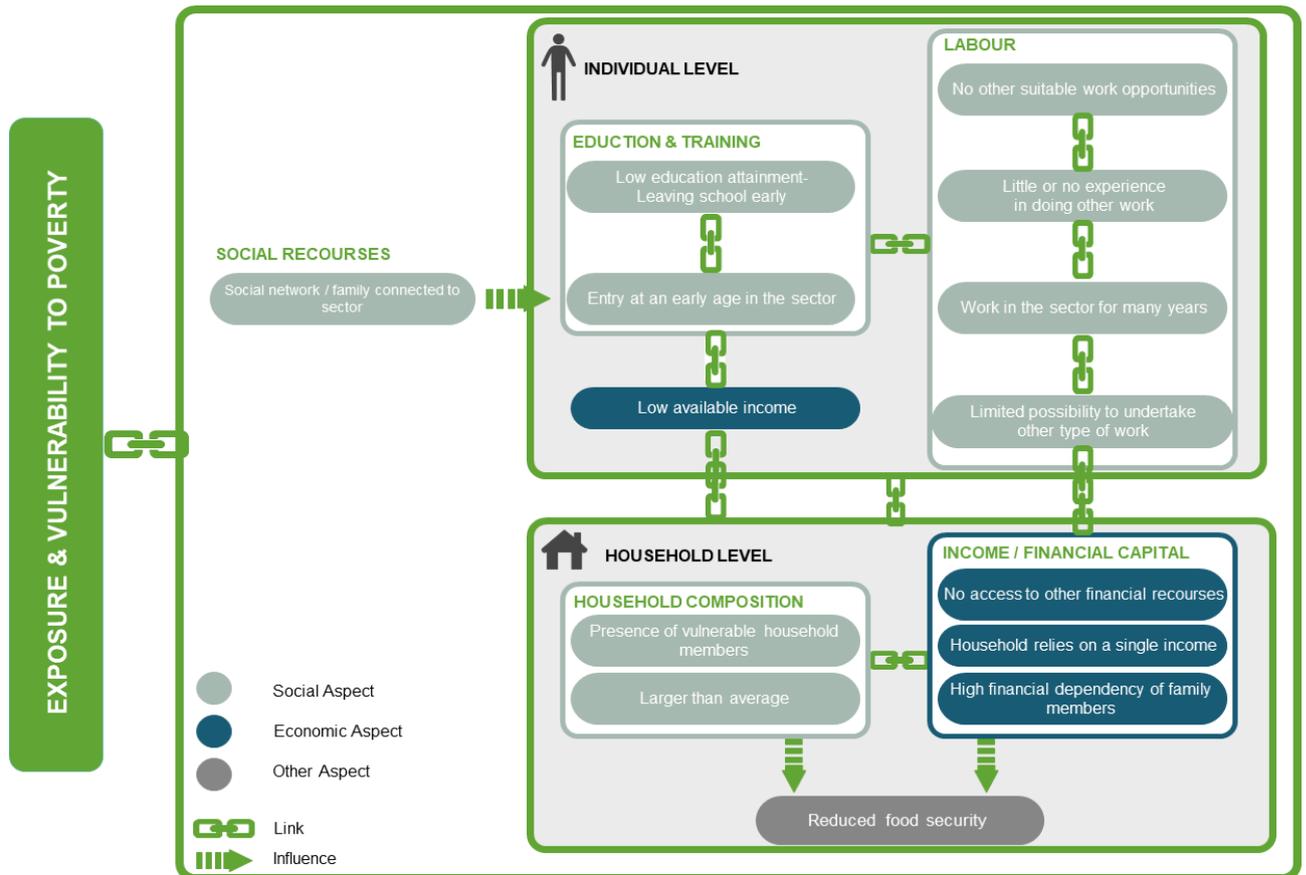


Figure 57: Overview of drivers to informality and their interaction (waste pickers)

The research findings indicate informal waste pickers are exposed to poverty and significant other risks including health and safety, social and economic risks. Meanwhile, they do not see any benefit or advantage to this type of work and their income is insufficient for their basic needs. However, most of them are unsure they would do another job, even if given the opportunity. The findings indicate that informal waste picking is a survival activity that does not offer a pathway out of poverty. Access to decent working conditions and employment on a living wage is the principal pathway out of poverty and efforts to encourage formalization could contribute to reducing decent work deficits.

4.2 KEY IDENTIFIED DRIVERS AND BARRIERS TO FORMALIZATION

Waste pickers were also asked about different aspects of formalization, including perceived benefits, their interest in working formally in the sector and drivers to formalization, and the below results were obtained:

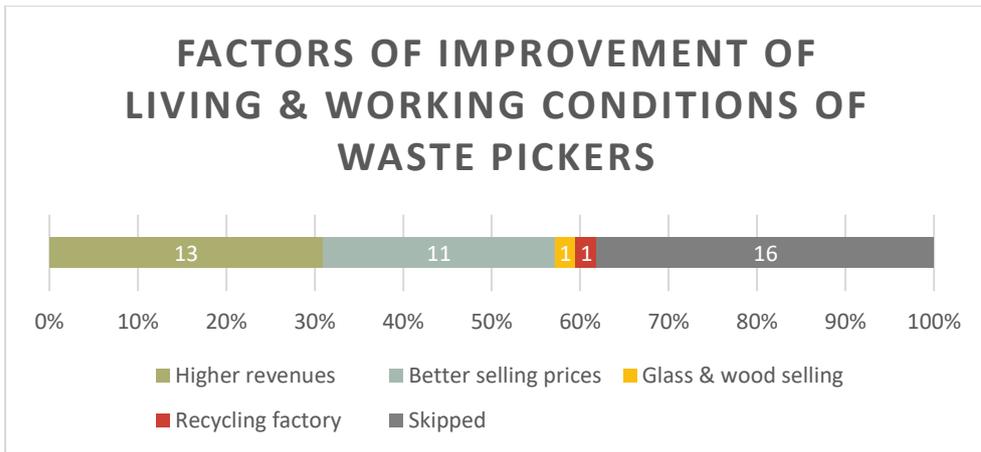


Figure 58: Improvement of living & working conditions factors (waste pickers)

When asked about what would improve their living and working conditions (without mentioning formalization or its potential benefits), informal waste pickers linked improvements almost entirely to financial aspects: Higher revenues and better selling prices were mentioned by 24 of the 26 waste pickers who answered the question. This indicates that waste pickers see the improvement of their livelihoods as primarily linked to income levels.

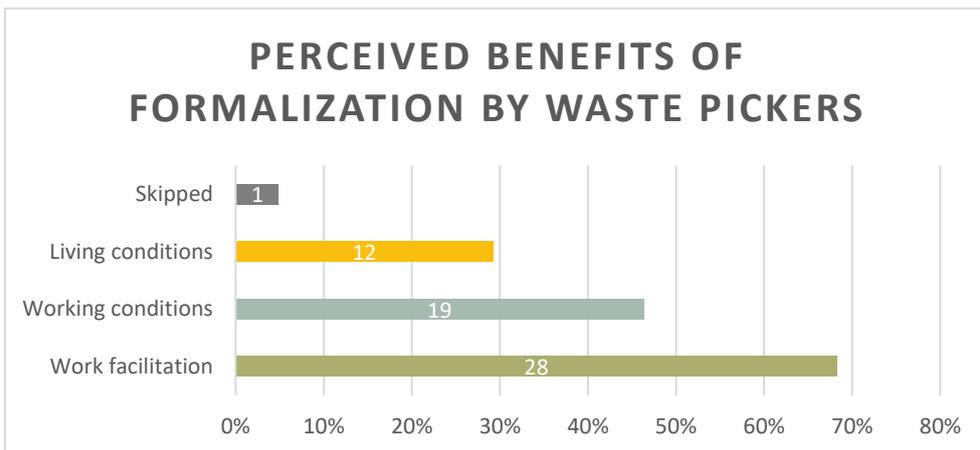


Figure 59: Perceived benefits of formalization (waste pickers)

When asked specifically about the impact of formalization, less than 30% said formalization would improve living conditions and 46% said it would improve working conditions. However, about 70% of waste pickers said formalization would facilitate their work.

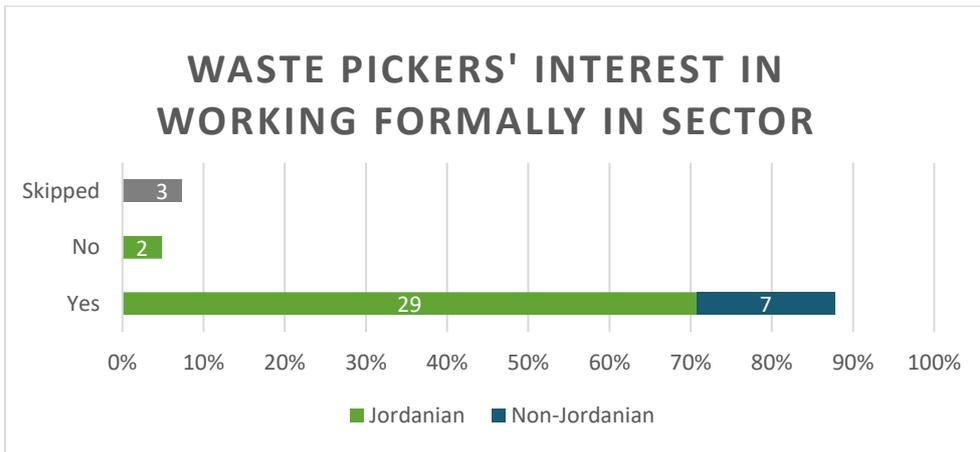


Figure 60: Interest in formalization (waste pickers)

Some 88% of respondents were open to formalization, mostly driven by income security and the protection offered by an employment contract.

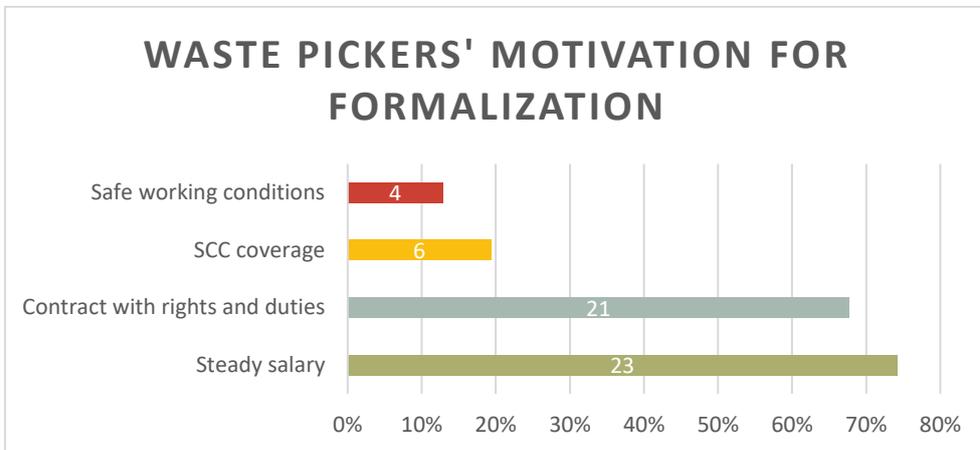


Figure 61: Motivation for formalization (waste pickers)

Less than 20% mentioned social security coverage and health and safety conditions at work as drivers for formalization, while none mentioned social aspects such as societal approval.

Several respondents indicated that they would consider subscribing to social security if they had a sufficient and steady income, but that they currently could not afford the subscriptions.

The data seems to indicate that initiatives contributing to improved income levels would be welcomed by informal waste pickers who saw a potential for formalization.

Discussion

The main drivers to formalization for waste pickers interviewed were income protection and gaining better value for their work. Despite the current lack of protection from occupational health and safety risks, securing safe working conditions or access to a social safety net were not reported as important factors in a potential transition to formalization. Similarly, addressing potential low societal esteem was not a pressing issue for those interviewed. Therefore, formalization efforts not accompanied by clear financial benefits will hold minimal appeal to informal waste pickers.

5 PERSPECTIVES ON VULNERABLE GROUPS WORKING IN THE SECTOR

The figure presents waste pickers' perceptions about whether gender, disability, or origin play a role in success in the informal waste sector.

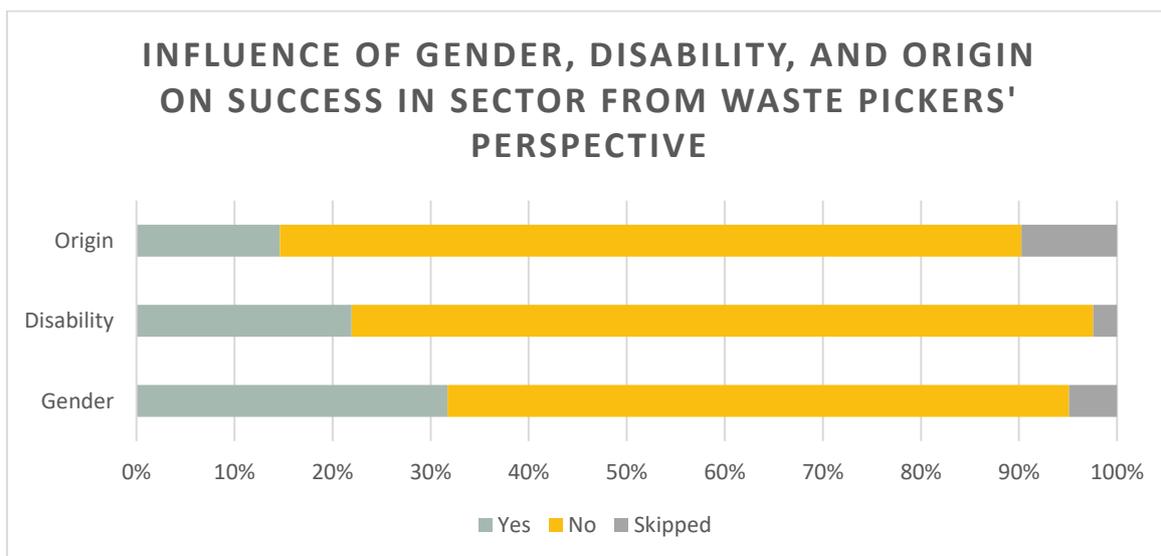


Figure 62: Influence of gender, disability, or origin on success in the sector (waste pickers' perspective)

The figure below shows the perceptions of middlemen and scrapyards dealers about the influence of gender, disability, or origin on success in the waste sector.

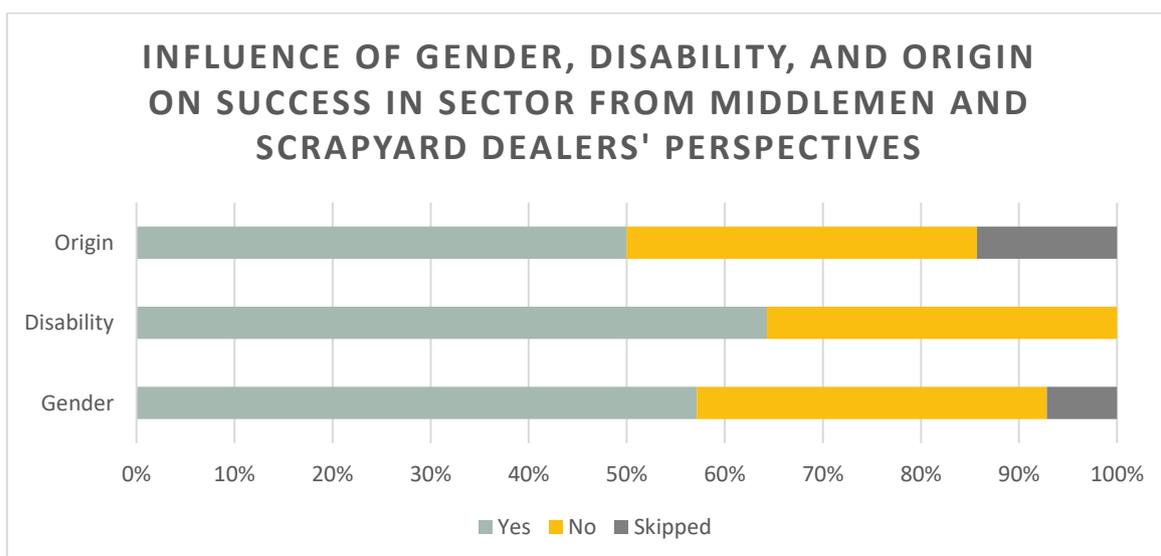


Figure 63: Influence of gender, disability, or origin on success in the sector (middlemen and scrapyards dealers' perspective)

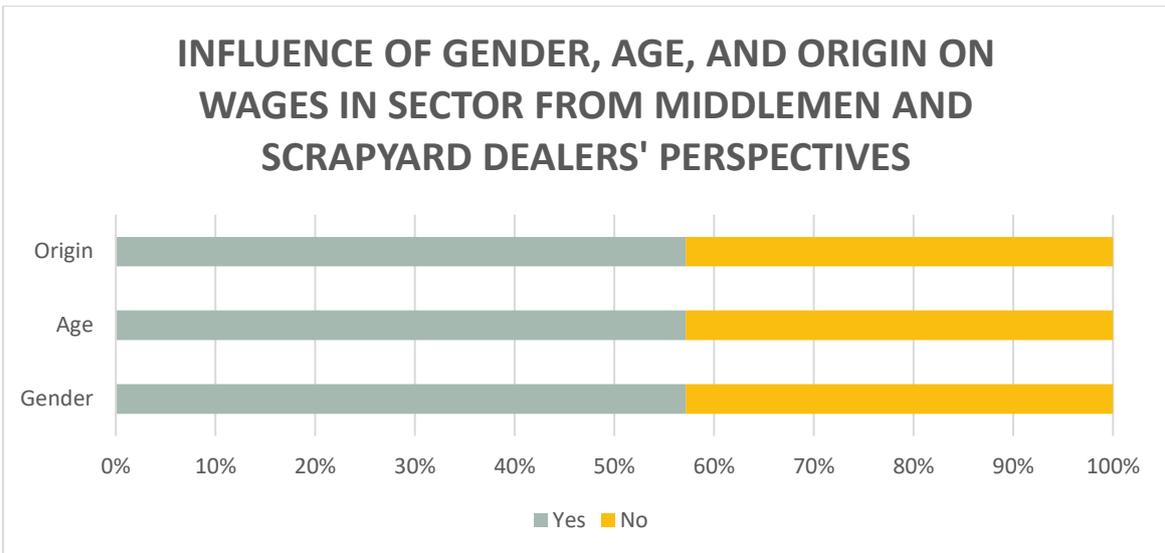


Figure 64: Influence of gender, age, or origin on wages in the sector (middlemen and scrapyards dealers' perspective)

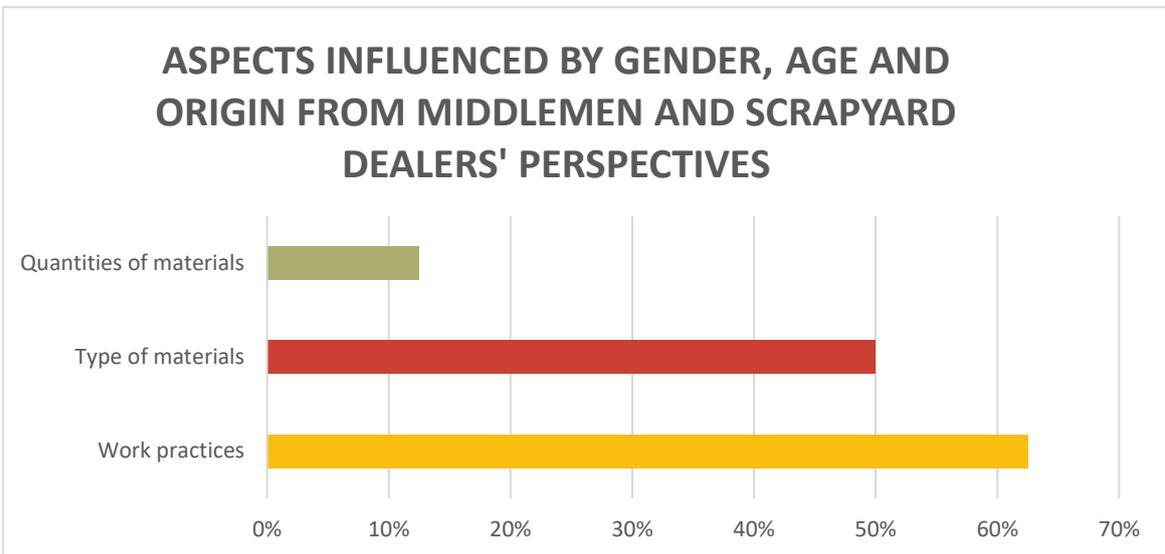


Figure 65: Influence of gender, age or origin on aspects affecting wages in the sector (middlemen and scrapyards dealers' perspective)

Key remarks

- While most informal waste pickers perceive that gender, origin or disability do not influence success in the sector, middlemen and scrapyards dealers have a different perspective. Over half of scrapyards dealers and middlemen indicate that these factors affect both success and wages, mostly because of different work practices but also with regards to the types of materials collected and sold.

In the following section, the report explores four vulnerable groups of waste pickers: women, refugees, people suffering from a disability and children.

5.1 PERSPECTIVES ON GENDER ASPECTS IN THE SECTOR

The figures below show the assumptions and perceptions of waste pickers, middlemen and scrapyards dealers regarding how many male and female waste pickers are involved in the sector.

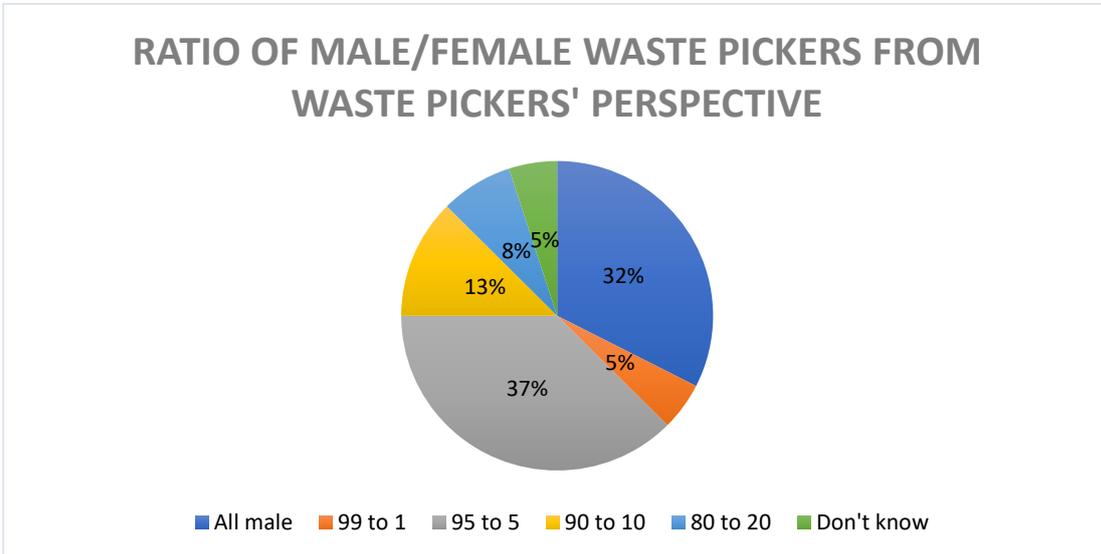


Figure 66 Perspective of waste pickers respondents on female participation in the waste picking.

Around 90% of waste pickers interviewed estimated that women represent under 10% of waste pickers while 75% of them estimated that women represented under 5%.

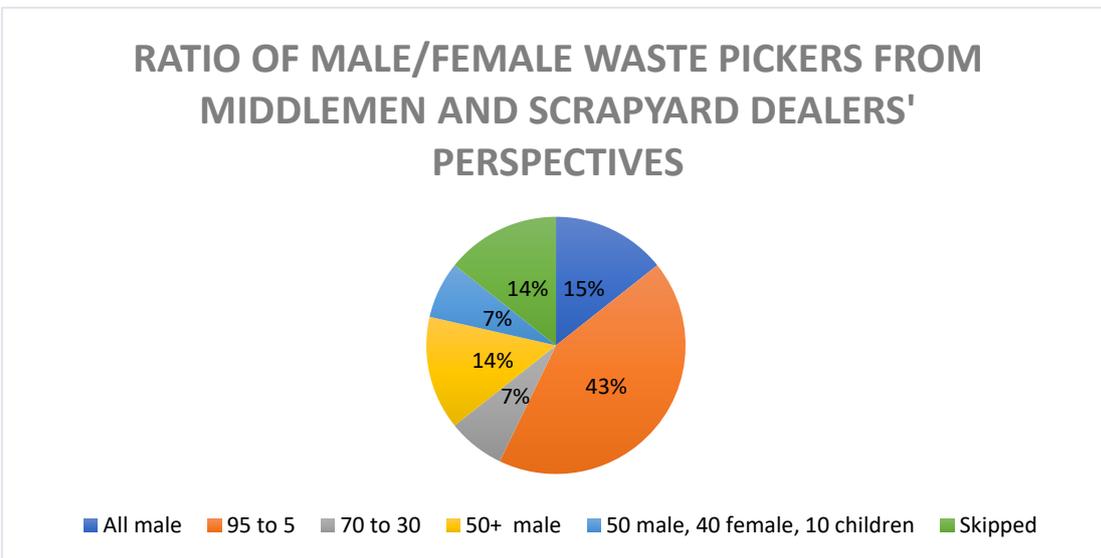


Figure 67: Perspective of middlemen and scrapyards dealer-respondents on female participation.

RATIO OF MALE/FEMALE WORKERS WITH WHOM MIDDLEMEN AND SCRAPYARD DEALERS COLLABORATE

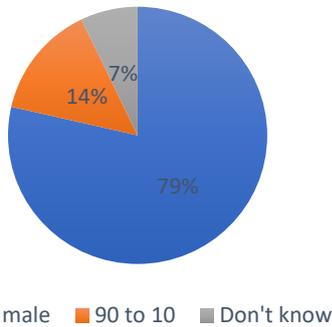


Figure 68: Collaboration of middlemen and scrapyards dealer-respondents with female waste pickers

More than half of the middlemen and scrapyards dealers surveyed said female participation was below 10%, while 11 out of 14 middlemen and scrapyards dealers reported only working with male waste pickers.

Local authorities interviewed also reported the majority if not all waste pickers they are aware of are men.

The figures below show the assumptions and perceptions of waste pickers, middlemen and scrapyards dealers regarding the differences and type of differences in work practices between men and women in the sector.

DIFFERENCES IN WORK PRACTICES BETWEEN WOMEN & MEN FROM WASTE PICKERS' PERSPECTIVE

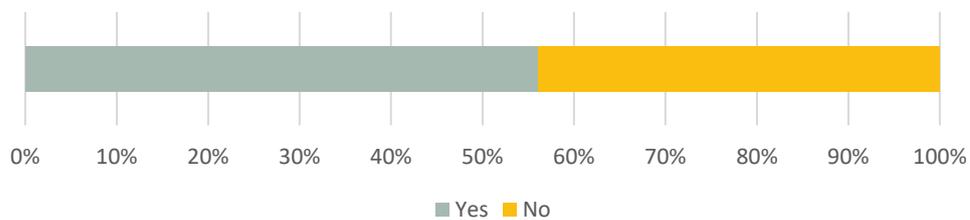


Figure 69: Perspective of waste pickers on gender-based differences in work practices (existence)

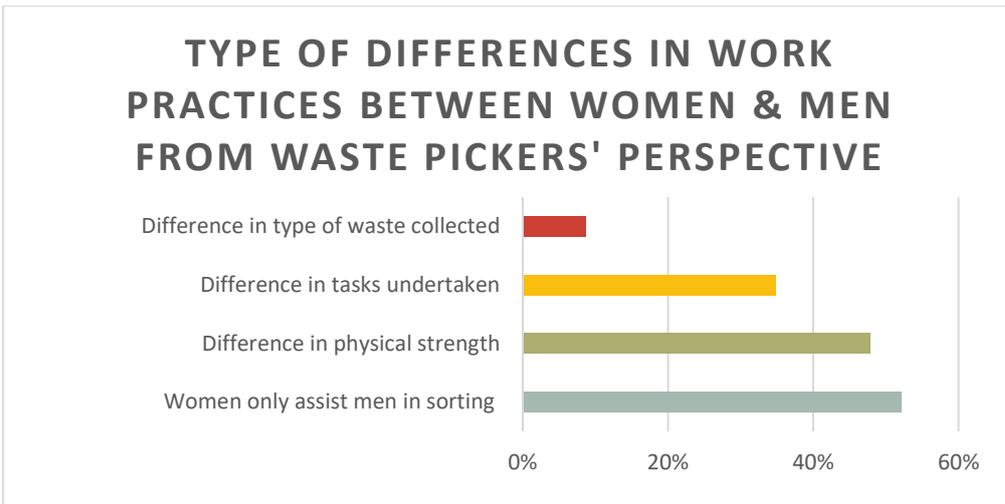


Figure 70: Perspective of waste pickers on gender-based differences in work practices (type).

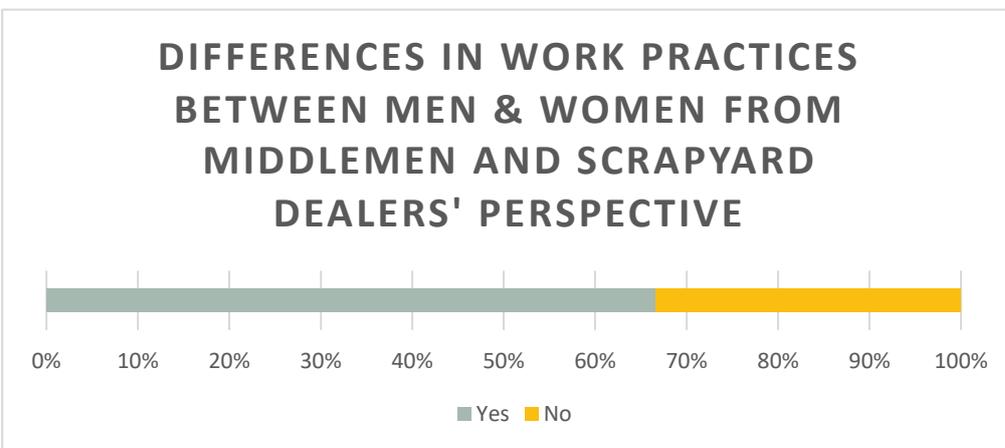


Figure 71 Perspective of middlemen and scrapyards dealer respondents on gender-based differences in work practices (existence).

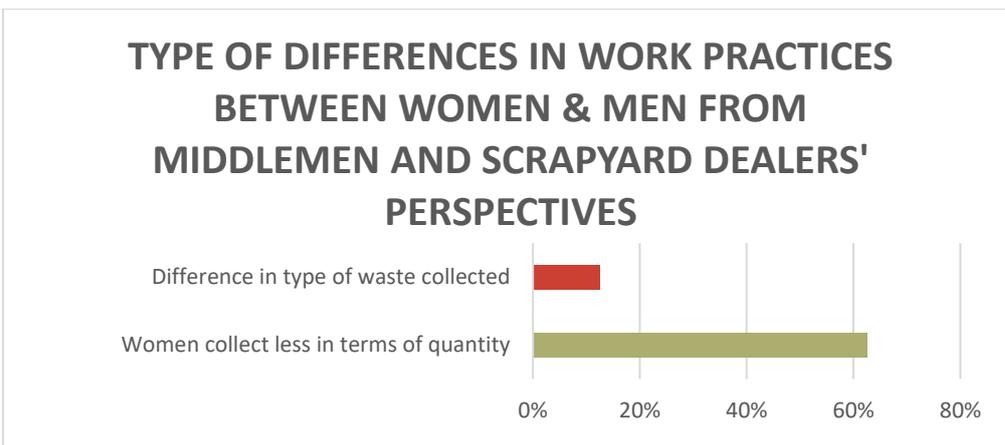


Figure 72: Perspective of middlemen and scrapyards dealers on gender-based differences in work practices.

Key remarks:

- Over half of middlemen and scrapyards dealers' respondents perceived that success in the sector is influenced by gender compared with only 32% of waste pickers. Negotiation skills and access to materials were identified as factors

influenced by gender, origin and / or disability that affect success in the sector by middlemen and scrapyards dealers.

- 57% of waste pickers interviewed said there were differences in practices between men and women with this figure being even higher among middlemen and scrapyards dealers. These differences included the assigned role of women (assisting men in sorting), tasks undertaken, their physical strength and to a lesser extent the type of waste they collect. Middlemen and scrapyards dealers said the quality of waste collected by women was inferior.

Discussion:

Data on the number of women working informally in Jordan is lacking. However, according to a UNDP study, due to traditional gender roles, women are not encouraged to pursue work outside of the home and often end up working in the informal sector.⁸ Syrian refugee women represent a large portion of women in the informal sector due to the extra challenges they face, including work permit issues. In working informally, their labour rights are not protected, and they may be exposed to exploitation. In addition, sexual harassment has been found to be particularly prominent in the informal sector.⁹ Nevertheless, women often resort to informal work due to the lack of paid formal job opportunities and because of unpaid care responsibilities.

The very low formal economic participation of women is linked to social norms, lack of access to wage employment, lack of affordable childcare options and entrepreneurship, the legal framework and poor transport options,¹⁰ all of which should be considered in designing interventions.

Consideration should also be given to the gender identity-based assigned roles, which are in place, with women taking on the sorting of waste to help men, not working directly with middlemen and scrapyards dealers.

5.2 PERSPECTIVES ON REFUGEES IN THE SECTOR

The following figure highlights the ratio of Jordanians and non-Jordanians in the sector.

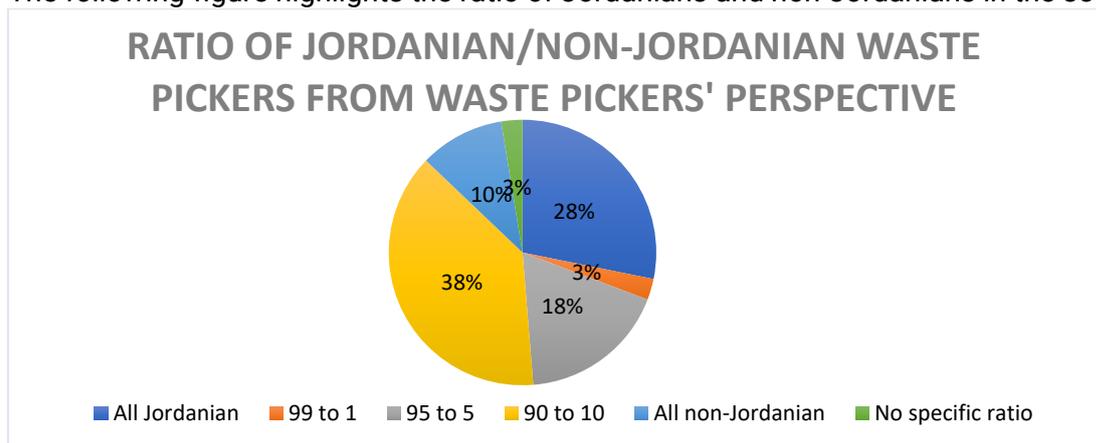


Figure 73 Perspective of waste picker-respondents on presence of non-Jordanians.

⁸ Meta-analysis on women's participation in the labour force in Jordan. 2020. UNDP. https://jordan.un.org/sites/default/files/2020-11/Meta_LR_021120%20%28003%29.pdf

⁹ Ibid, 8.

¹⁰ Jordan, Improving Women Economic Opportunities. Select Entry Points for Policy Dialogue and Operational Interventions. 2019.

<https://documents1.worldbank.org/curated/en/429441581525262376/pdf/Jordan-Improving-Women-Economic-Opportunities-Select-Entry-Points-for-Policy-Dialogue-and-Operational-Interventions.pdf>

RATIO OF JORDANIAN/NON-JORDANIAN WASTE PICKERS FROM MIDDLEMEN AND SCRAPYARD DEALERS' PERSPECTIVES

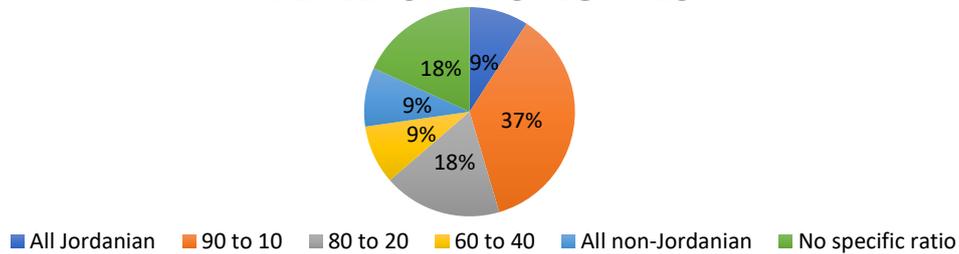


Figure 74: Perspective of middlemen and scrapyards dealer-respondents on presence of non-Jordanians

When asked about the ratio of non-Jordanian waste pickers, around 90% of waste pickers perceived that non-Jordanians represent under 10% of waste pickers and almost 50% of respondents estimating they represent 5% or less. Estimates diverged more among middlemen and scrapyards dealers. Still, all respondents perceived that most waste pickers are Jordanians, with the ratio ranging between 60-100%. According to the “Waste Sector - Green Growth National Action Plan 2021-2025”¹¹ published in July 2020, refugees are estimated to make up 4% of the informal waste pickers.

DIFFERENCES IN WORK PRACTICES BETWEEN JORDANIAN & NON-JORDANIAN WASTE PICKERS FROM WASTE PICKERS' PERSPECTIVE

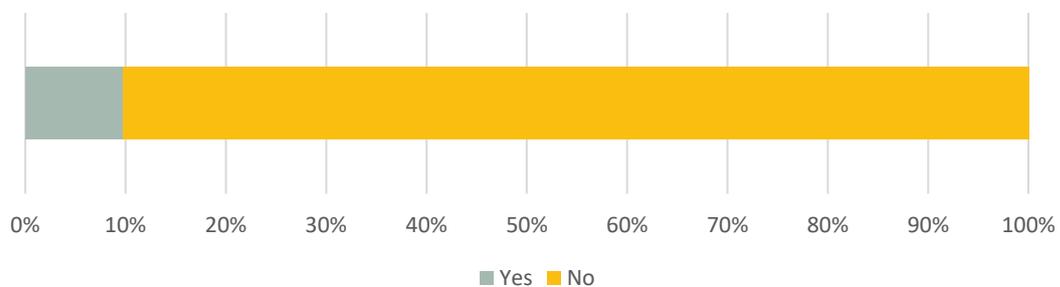


Figure 75 Perspective of waste pickers on origin-based differences in work practices

¹¹ Waste Sector Green Growth National Action Plan 2021-2025
https://gggi.org/site/assets/uploads/2020/10/20022_Jordan_Waste_v03_HL_Web.pdf

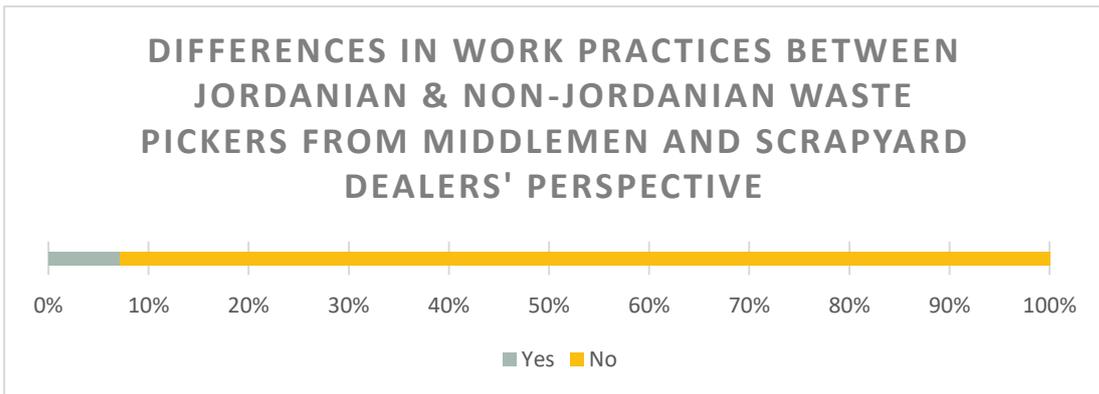


Figure 76: Perspective of middlemen and scrapyards on origin-based differences in work practices

Less than 10% of respondents, whether waste pickers or middlemen and scrapyards, reported differences in work practices based on origin. However, as illustrated in the figures above, origin was mentioned as a factor influencing both success and wages of waste-pickers by middlemen and scrapyards dealers. This suggests work practices might not be perceived by them as a determining factor for wages or success of waste pickers and that other factors might come into play.

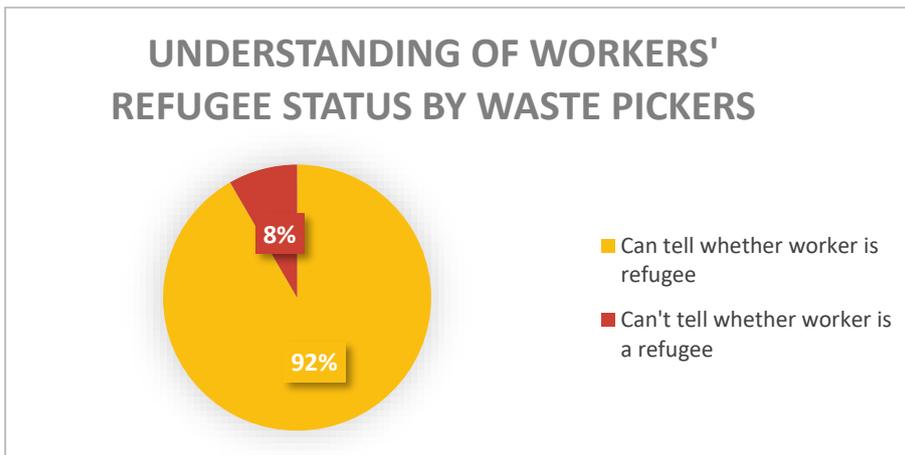


Figure 77: Middlemen and scrapyards dealers' awareness of refugee waste pickers

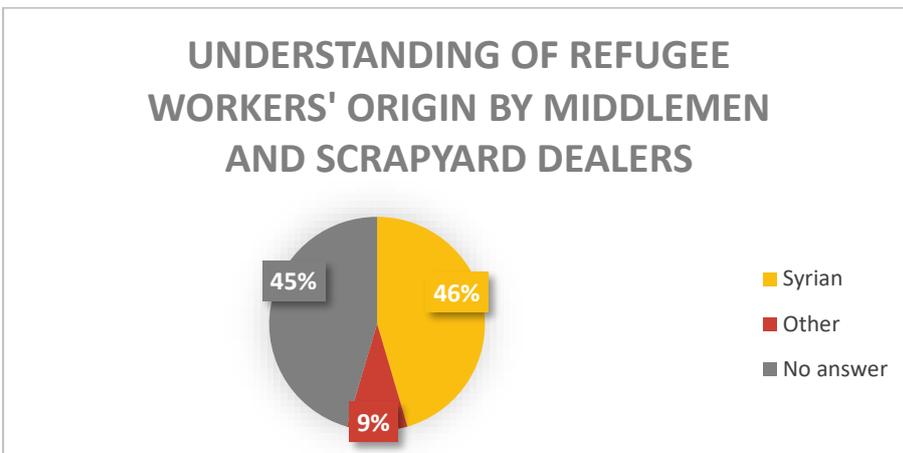


Figure 78: Middlemen and scrapyards dealers' awareness of refugee waste pickers' origin

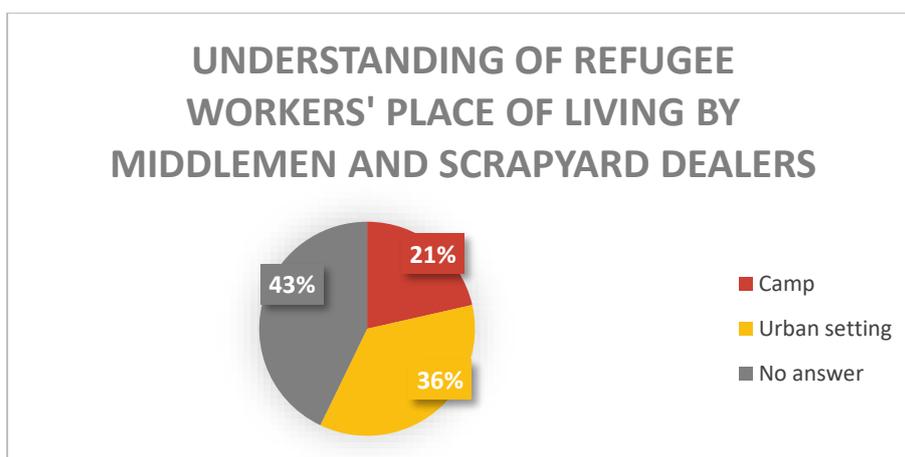


Figure 79: Middlemen and scrapyards dealers' awareness of refugee workers' place of living

Key remarks:

- More than 90% of middlemen and scrapyards dealers responded that they could tell if a worker is a refugee with more than half responding that they could identify where the workers are originally from (for example from dialects) and in what setting they currently live, whether in a camp or city. This question was raised to dismantle possible differentiations on how middlemen and scrapyards dealers treat Jordanian and non-Jordanian waste pickers. Nonetheless, it was reported that there is no difference in treatment regardless of the origin.
- No significant differences were found between the responses provided by the nine Syrian waste pickers and the rest of the workers for most questions. Socio-economic aspects including income levels, use of income, path of entry to the sector, years in the sector, access to healthcare, SSC subscription, work related problems or interest in working formally in the sector did not appear to be influenced by the origin of the respondent.
- Some differences were identified for educational levels between Jordanian and non-Jordanian informal waste pickers. None of the non-Jordanian workers attended schooling beyond primary level and none reported having entered the sector before the age of 16. It should also be noted that four of the Syrian refugees mentioned staying at the dumpsite during weekdays and only returning to the camp during weekends. Finally, none of the Syrian refugees had been vaccinated against COVID-19. Issues related to the impact of COVID-19 are explored in section 6.5 of the report.

5.3 DATA ON PEOPLE WITH DISABILITIES IN THE SECTOR

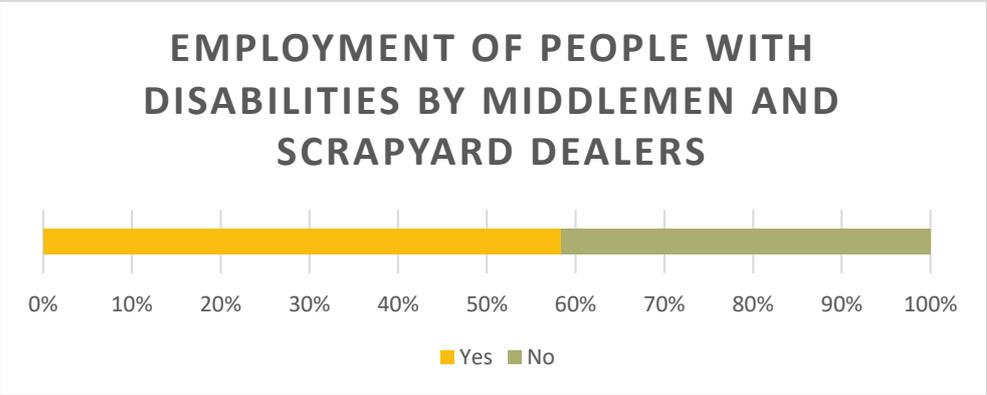


Figure 81: Employment of people with disabilities (Middlemen and scrapyard dealers)

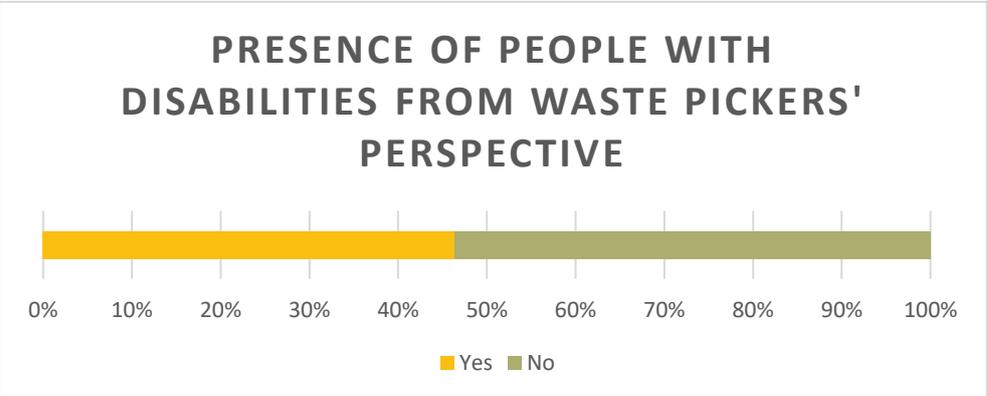


Figure 80: Perspective of waste picker-respondents on presence of People with Disabilities

While a little over half of waste pickers interviewed were not aware of people with disabilities working as waste pickers, more than half of middlemen and scrapyard dealers said they worked with people living with some form of disability.



Figure 82 Perspective of waste pickers on differences in work practices of people with disabilities (type)

Differences in work practices of people with disabilities were mostly associated with the differences in type of waste collected and sold, differences in tasks undertaken and differences in quantities of waste collected and sold, respectively.

5.4 DATA ON CHILDREN IN THE SECTOR

Below are charts that represent data that was collected on the presence of children in the waste picking sector:

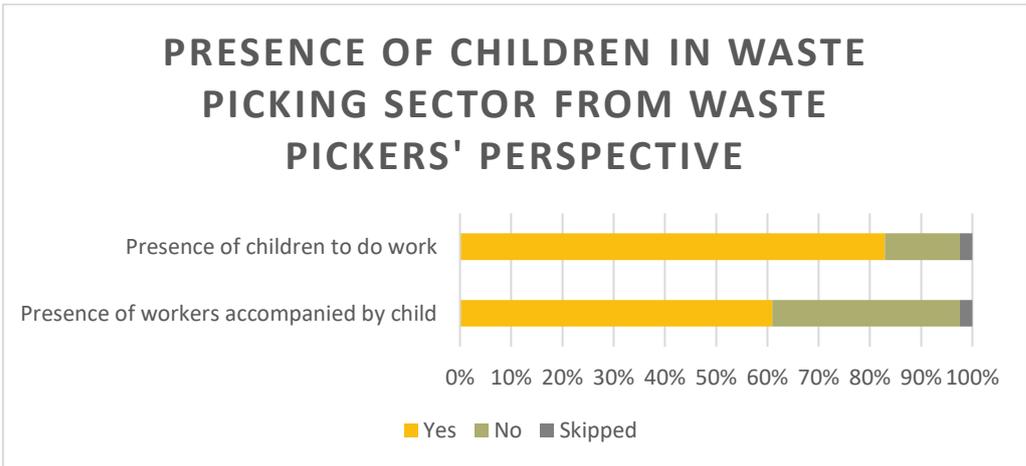


Figure 83: Perspective of waste picker-respondents on presence of children

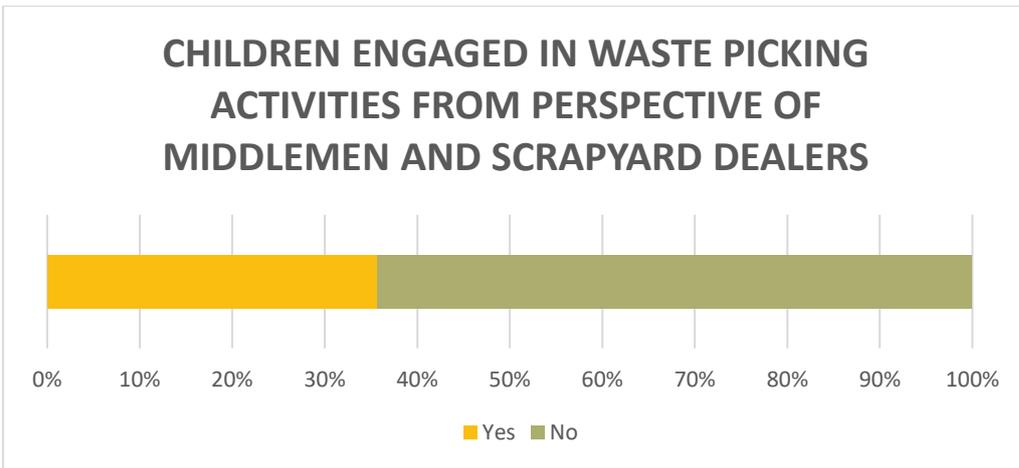


Figure 84: Perspective of middlemen and scrapyards dealer-respondents on presence of children

Most waste pickers interviewed said children were present at the sites where they work either as workers or accompanying workers. However, fewer middlemen and scrapyards dealers reported the presence of children in this line of work.

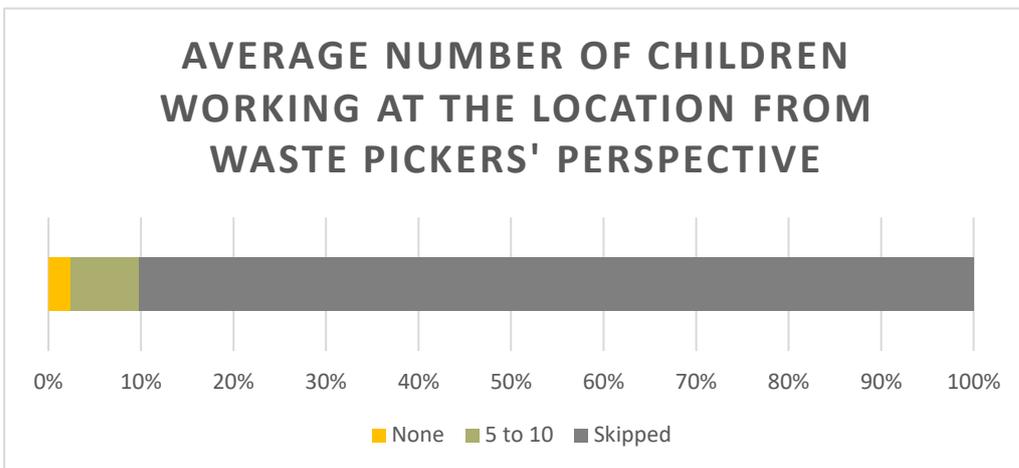


Figure 85 Perspective of waste picker-respondents on number of children

The number of children engaged in waste picking activities could not be determined as most waste-pickers preferred not to answer this question.

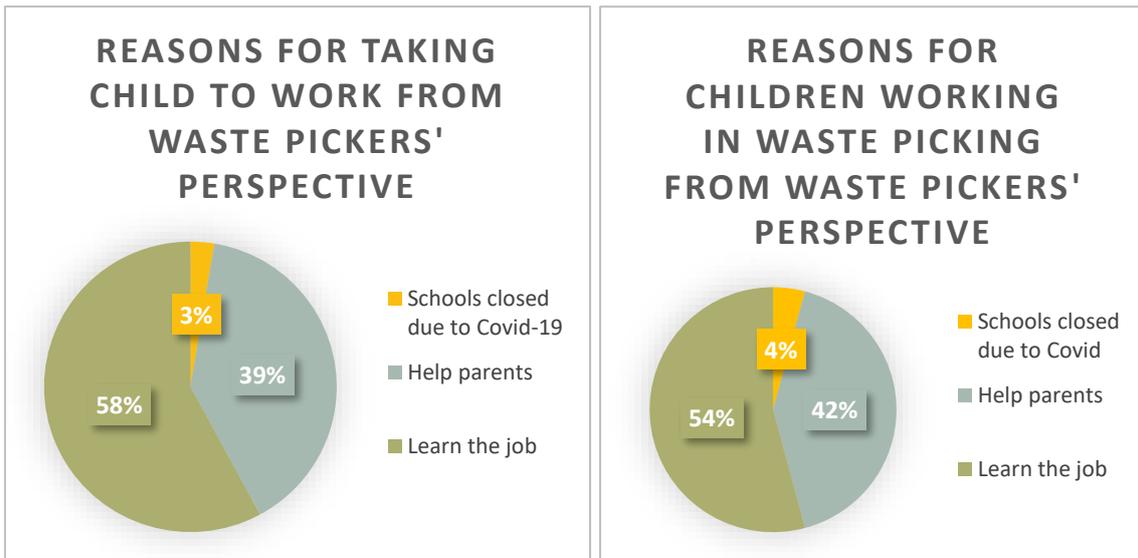


Figure 86: Perspective of waste picker-respondents on why workers are accompanied by children and why children are working in waste picking

Key remarks:

- While a few workers associated the presence of children with COVID-19 related school closures, most said children were there either to assist parents or learn the job.
- The research found that a number of children of waste pickers were helping their parents with waste picking and may be expected to continue in this activity. Consequently, it is likely these children cannot attend school, thereby missing out on their right to education.
- Precarious household finances may drive child labour in the sector, exacerbated by the low income levels of waste pickers.

5.5 INFLUENCE OF COVID-19 ON THE SECTOR

The influence of COVID-19 on the waste picking sector was captured and is represented in the below charts:

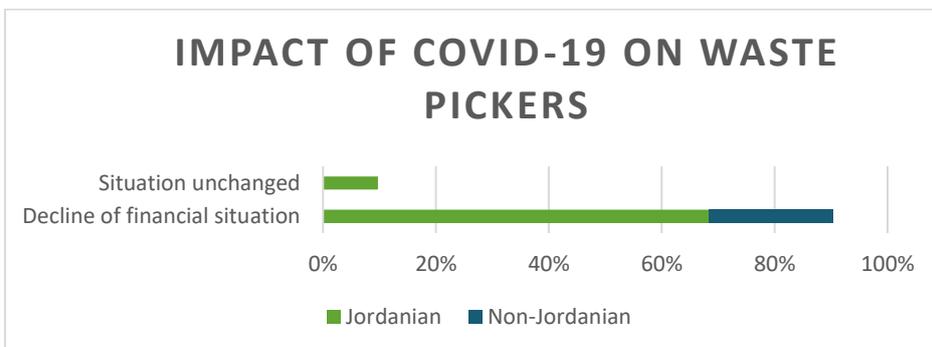


Figure 87: COVID-19 impact (waste pickers)



Figure 88: Impact on income factors (waste pickers)

90% of the waste pickers who had responded to the surveys of this assessment have stated that COVID-19 has caused a decline in the financial returns from waste picking activities. The main reason for this is the fact they were collecting and sorting waste but were not able to reach the buyers to get a financial return due to restrictions in movement.

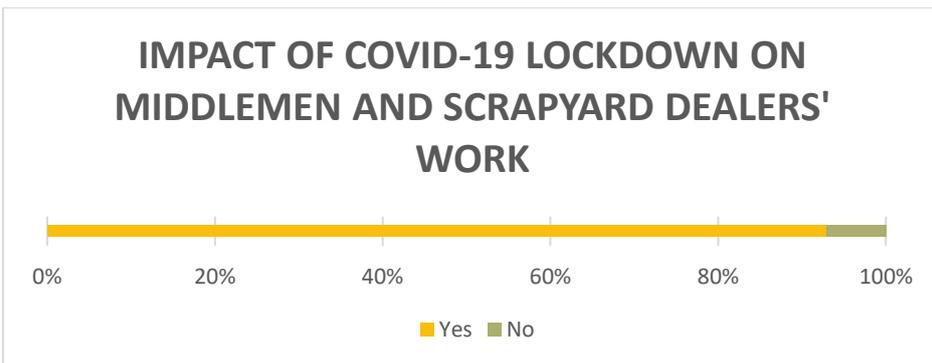


Figure 89: COVID-19 impact on work (middlemen and scrapyards)

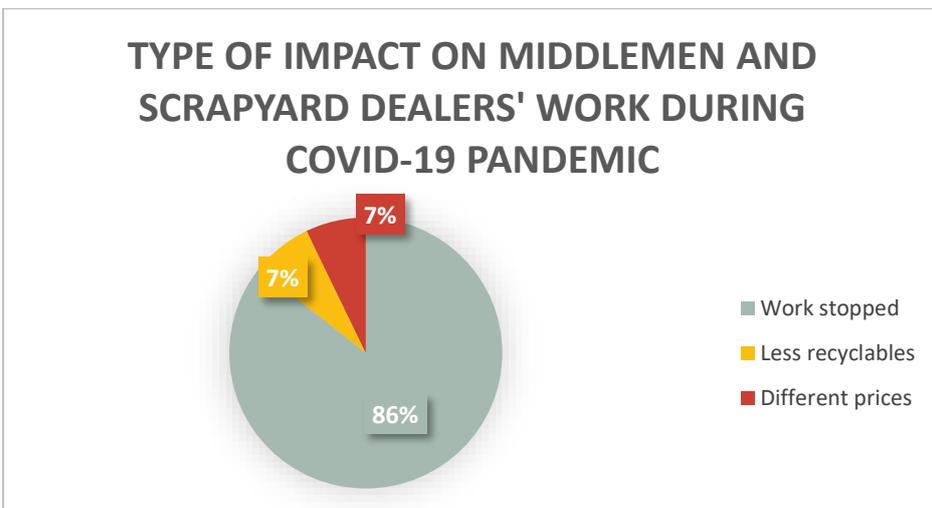


Figure 90: Impact on income factors (middlemen and scrapyards).

Around 93% of middlemen and scrapyards dealers were impacted by the COVID-19 lockdown, mainly due to the complete suspension of work.

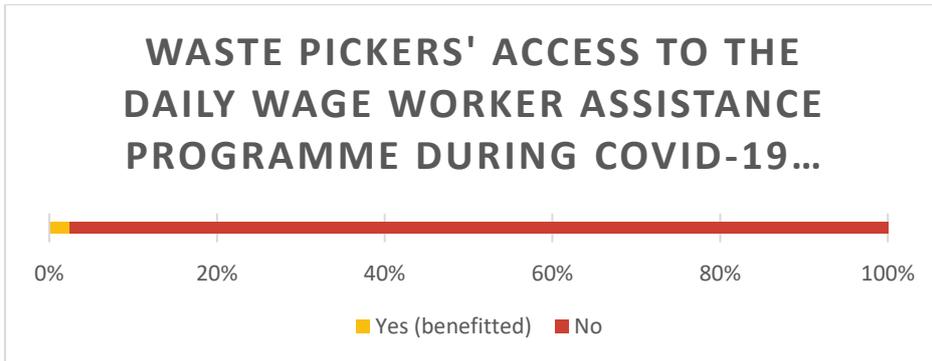


Figure 91: Access to financial support during pandemic (waste pickers).

Over 95% of waste pickers who participated in this assessment are not registered with the SSC and did not receive financial assistance during the COVID-19 pandemic in Jordan. This is probably the case for most waste pickers and informal actors across Jordan due to the lack of employment contracts and/or ability to pay necessary monthly fees (approximately 16 JOD per month for self-employed individuals). These fees are often high considering the income that can be achieved from waste picking activities, especially those focused on street-level waste scavenging.

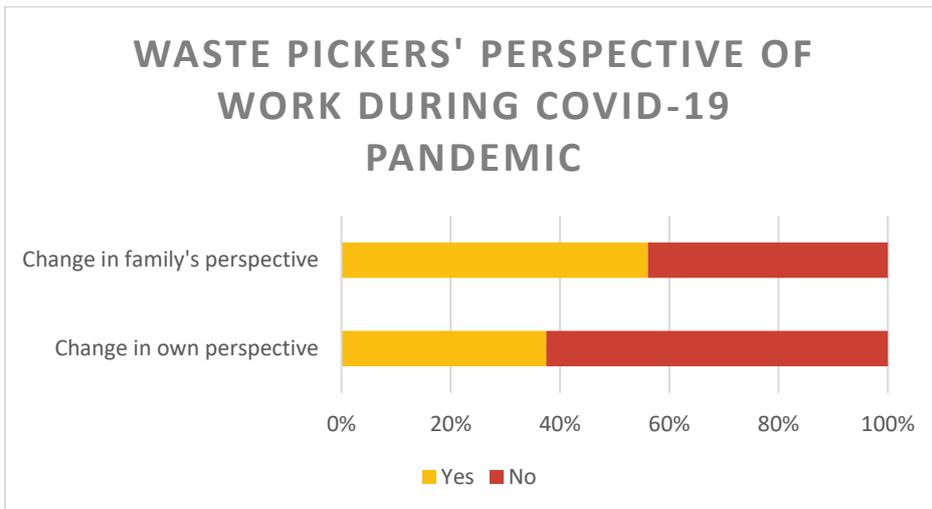


Figure 92: COVID-19 impact on work-related perspective (waste pickers).

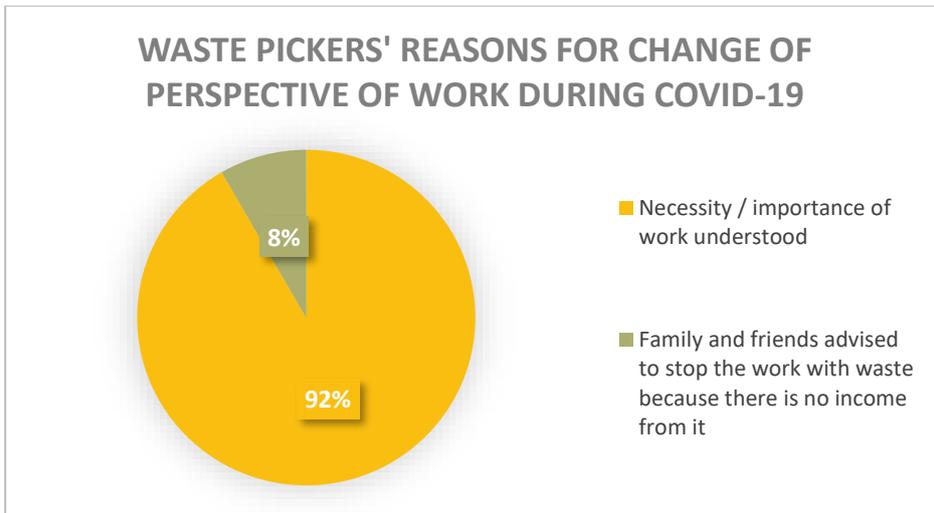


Figure 93: Reason for change of perspective on work (waste pickers)

38% of waste pickers changed their perspective on work during the COVID-19 pandemic; 92% recognized the importance of waste-picking work.

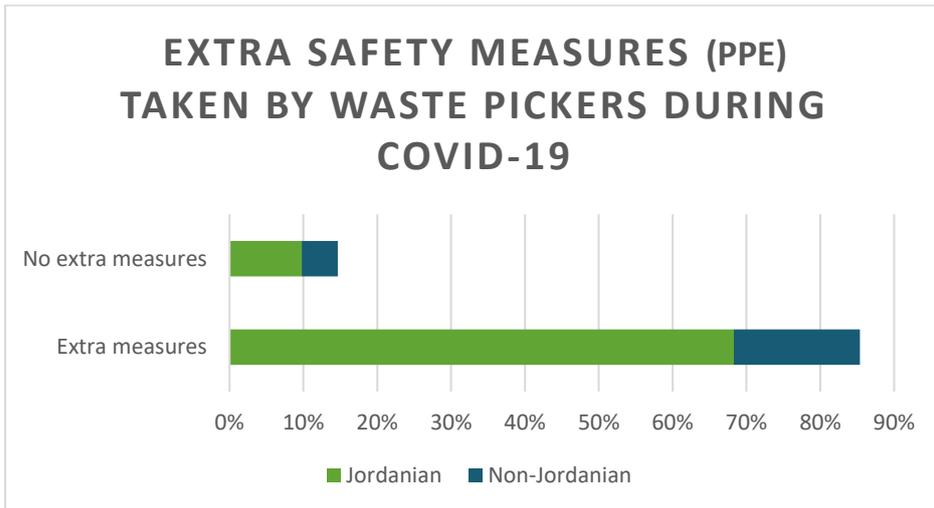


Figure 94: Extra safety measures during pandemic (waste pickers)



Figure 95: Motivation for extra safety measures during pandemic (waste pickers)

While most waste pickers used extra safety measures during the pandemic, 43% reported their motivation for this was to avoid fines.

Key remarks:

- During the COVID-19 pandemic and its strict lockdown in Jordan (March-April 2020), work stopped completely for most waste pickers, middlemen and scrapyards dealers.
- As a result of COVID-19, the Government of Jordan through the Social Security Corporation (SSC) provided income support to many affected industries and workers. Due to the decrease in economic productivity from lockdowns, curfews and other restrictions, many workers in Jordan faced risks in income generation. For those registered with the SSC, income safety was provided to an extent by paying proportions of salaries to employees across different sectors in Jordan. However, those who are not registered in the SSC schemes were not given this support. This includes informal actors as well as other part-time or casual workers.

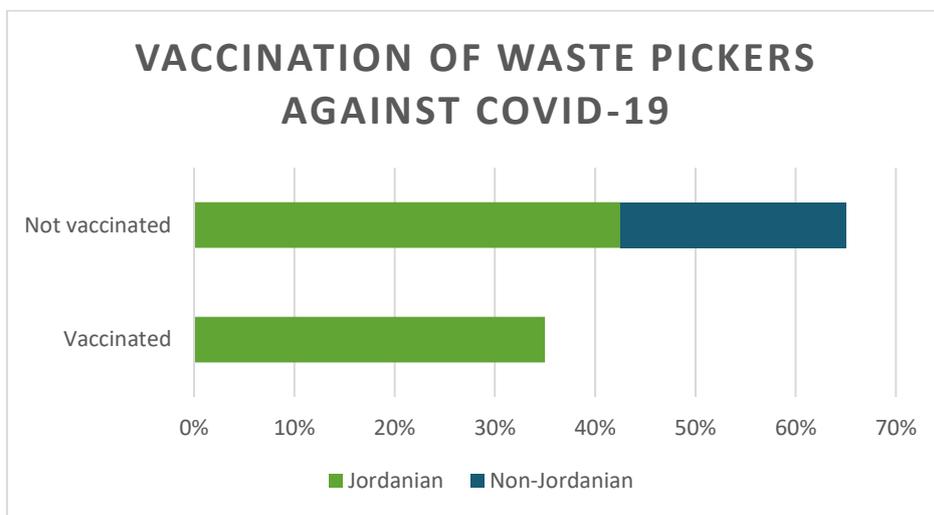


Figure 96: COVID-19 vaccine coverage (waste pickers)

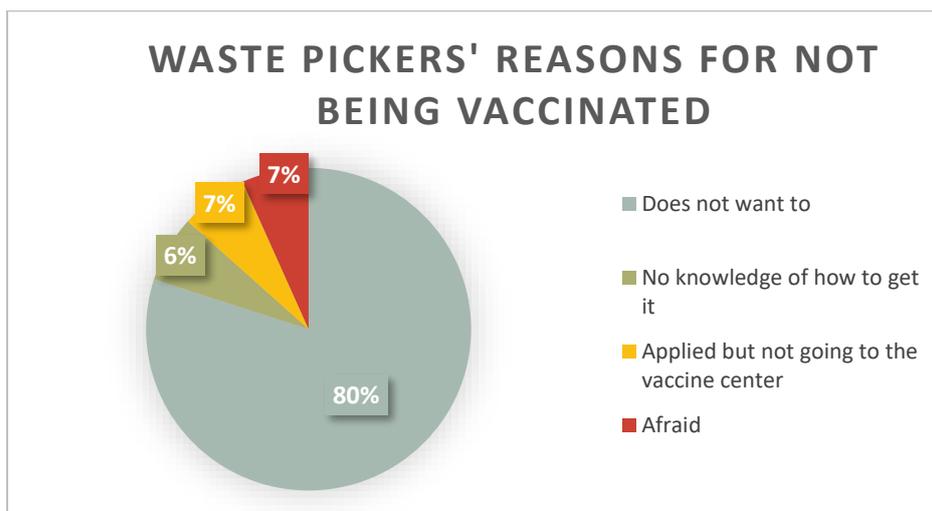


Figure 97: COVID-19 vaccine coverage factors (waste pickers)

Around 65% of waste pickers are not vaccinated, 80% of which have not been vaccinated because they do not want to.

6 VALUE CHAIN ANALYSIS

A top to bottom approach was used to analyse the recyclables' value chain in Jordan. The analysis started by contacting some major recyclers, considered the end users for a significant amount of the recycled waste. From there, communication channels were created with the brokers and middlemen alike, and in many cases, they were followed by more brokers and/or middlemen.

The recyclables' value chain can be summarized as follows:

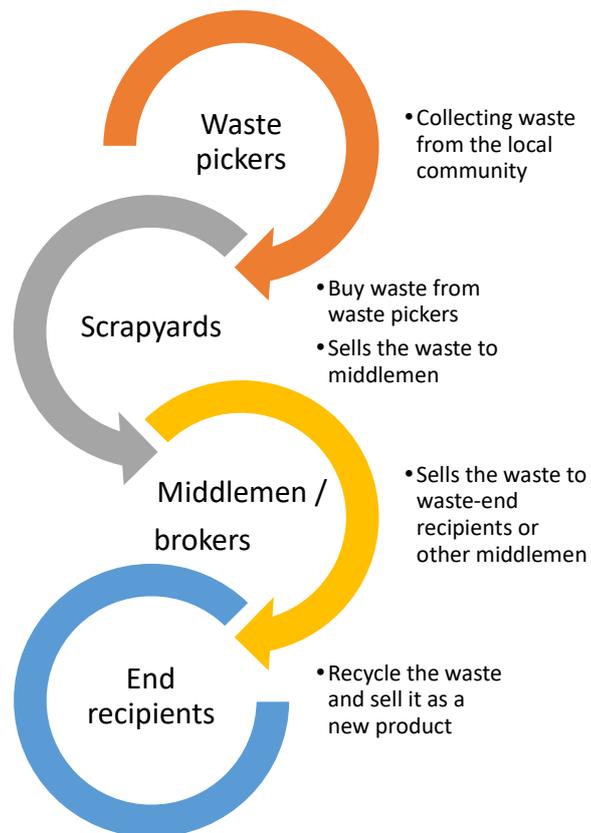


Figure 98: General description of the waste's value chain

A comprehensive value chain map that covers all recycling streams can be drawn based on the field findings as follows:

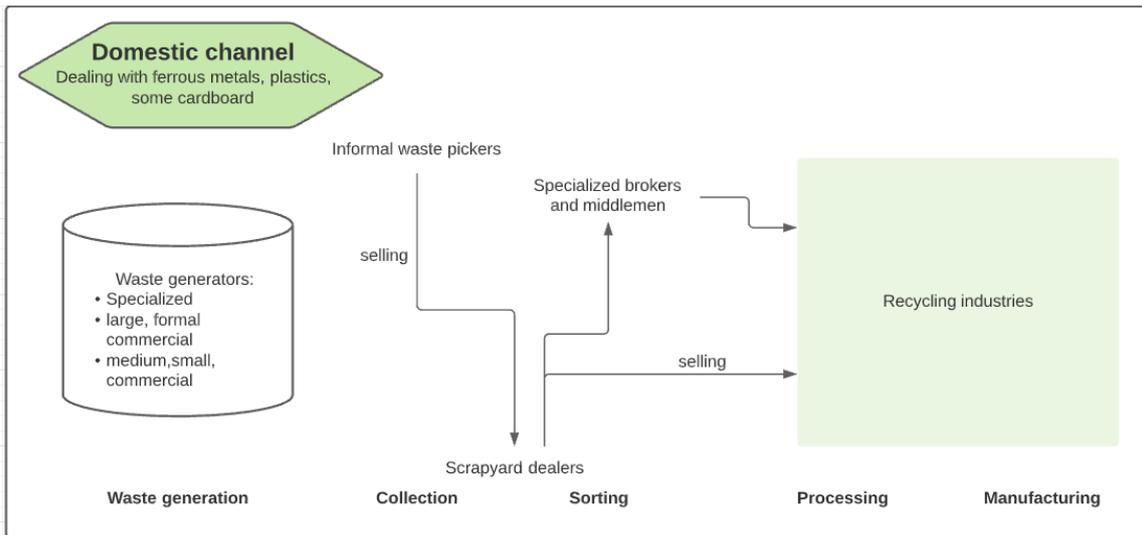


Figure 99: Domestic channel of the value chain

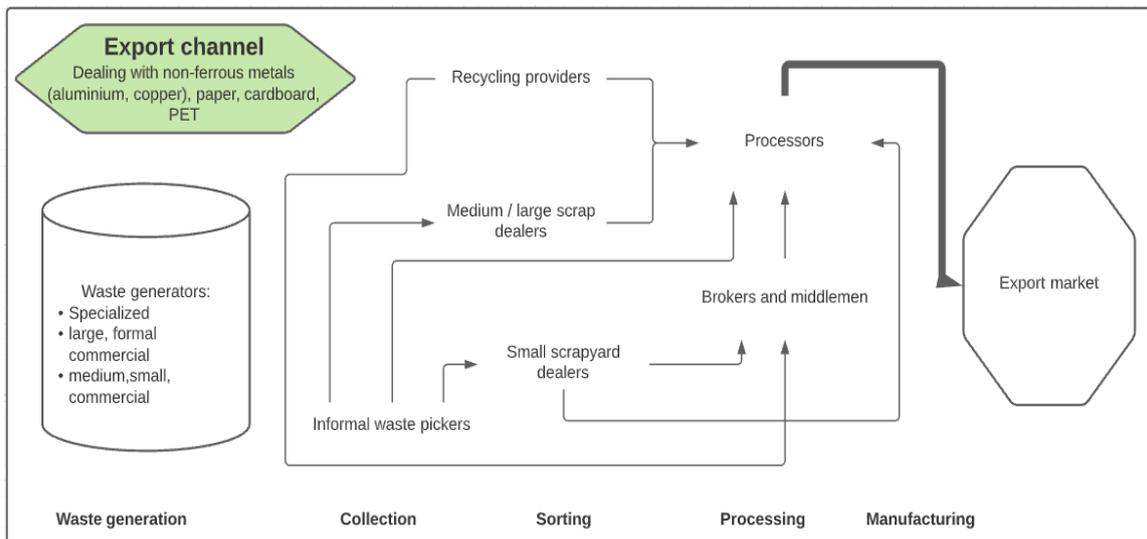


Figure 100: Export channel of the value chain

The above two figures show two primary channels in the recycling sectors:

1. **Domestic Channel:** This channel is related to ferrous metals, plastics (except PET), and some cardboard. Through this channel there is an additional domestic value to the materials within the recycling industry, which includes companies and factories that participate in the value chain with processes related to collection and processing.
2. **Export Channel:** This channel is related to materials that are difficult to add significant value to through processing in Jordan. These include non-ferrous metals (aluminium and copper), paper, cardboard, and PET. Such materials require advanced treatment processes, large manufacturing capacities, and a large use of water and energy, which are not accessible in Jordan at competitive prices. Consequently, recycling and processing operations are cheaper in other countries in the region such as the Kingdom of Saudi Arabia. The processing operations carried out in Jordan are limited to sorting, cleaning, cutting, and packaging. After these processes, the material is exported.

Waste is usually sent to recycling factories in Zarqa or Amman. Due to the limited numbers of end users, the prices of the different waste streams are broadly the same across the country. The following sections explain the market for various solid waste streams, their sub-streams, prices, and key characteristics.

6.1 ANALYSIS OF THE VALUE CHAIN

Jordan's SW sector has suffered in recent years due to a variety of factors, including the Syria conflict and the resulting border closure as well global and regional economic downturns that have impacted commodity prices. This is further exacerbated by local regulations relating to taxation, export duties, and rising fuel prices which impacted manufacturers and purchasers.

The markets for many types of solid waste, including textile and agricultural waste, are underdeveloped. Further, local regulations, as well as global and regional events, decreased the cost of all recyclables while limiting or halting commerce in others. Metals, plastics, and paper and cardboard are among the solid waste sources for which value chains have been sufficiently developed. The sections that follow explain the market for various solid waste streams, their sub-streams, prices, and key characteristics.

The value chain analysis looked at the types of waste targeted by waste pickers:

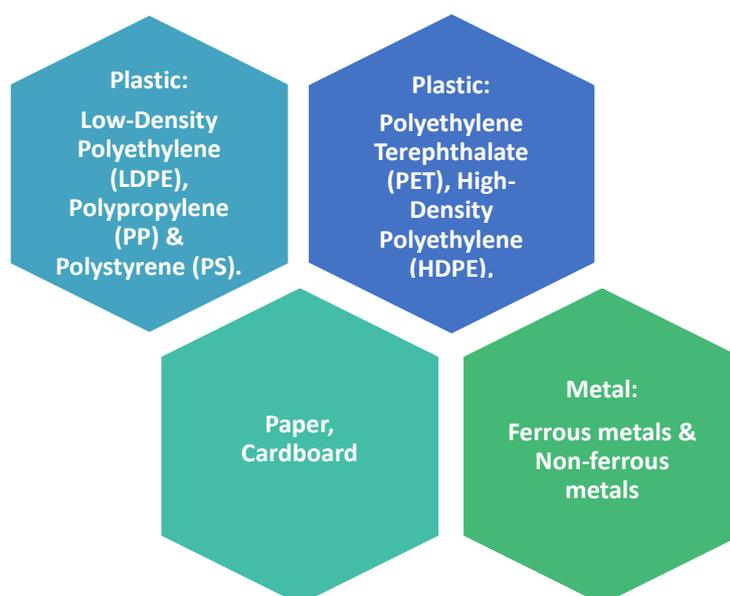


Figure 101: The targeted material in the value chain analysis

The data collection phase was followed by verification of data to check for irregularities in answers specific to prices in the surveys. Some actors were not keen to share figures, in some cases due to the volatility of the prices. Consequently, the prices were provided as ranges for each waste stream.

6.1.1 Plastics

Jordan has a well-developed plastics value chain for all forms of plastic except for PET, which is exported. There are more than 600 companies operating in the plastic industry sector in Jordan, employing around 13,000 workers. The plastic industry was valued at around USD 1.5 billion in 2020 (JCI, 2020) and represents around 5% of total industrial output in Jordan.

The prolonged decline in global oil prices has made virgin plastics more competitive against recycled plastics. This has influenced the local industry, which has tried to respond accordingly.

The current plastic sector in the recycling market in Jordan includes six plastic sub-value chains amounting to 4,000-6,000 tons per month of plastic waste. This plastic is recovered in domestic end-market industries of which there is 30% Polypropylene (PP), 20% High Density Polyethylene (HDPE), 35% Low Density Polyethylene / Linear Low-Density Polyethylene (LLDPE), 10% Polyvinyl chloride (PVC), 5% Polystyrene (PS).

Polystyrene, which includes styrofoam egg cartons, meat trays, and plastic cutlery, is recycled in Jordan but in small scale operations. The low weight-to-volume ration of PS and its value as a commodity are limiting its recycling capacity in the country.¹²

PET is exceptional because the pre-consumer PET that is generated from factories is collected for export purposes. There is currently no PET recycling industry in Jordan due to several reasons:

- The density is very high, therefore, the transportation cost is relatively higher.
- Treatment lines are very expensive and the process is rather complex, especially when aiming to produce food grade products.

6.1.2 Metals

Whilst lower in waste volume terms than plastics, the metals sector is also long established and significant in size. Ferrous metals – specifically iron and steel – are fully recycled and used domestically. Melting factories produce rebar, steel pallets, and other products used primarily as key inputs to the domestic construction sector. Non-ferrous metals (particularly aluminium and copper) are generally exported, typically with little added-value processing. Exports of non-ferrous metals were estimated to be 15,000-25,000 tons in 2019. Estimates show the metal sector employs around 6,000 formal workers full time.

6.1.3 Paper/Cardboard

Overall, it is estimated that 1,500 people are employed at various levels of the paper and cardboard value chain in Jordan, from waste pickers to cardboard manufacturers. Much of this sector is oriented to export markets with little value added in Jordan at present. However, there are around 20 small scale paper recycling mills in Amman and Zarqa working to produce basic products (e.g. egg trays) using paper waste¹³. The sector has been growing in both volume and value terms.

6.2 CAPITAL AND OPERATIONAL COSTS

Significant operational and capital costs start in the value chain after the waste pickers, as most waste pickers do not have any employees, registration, or machines etc, although a small number use pickups for collection and transportation.

¹² Your Guide to Waste Management in Jordan, Jordan Green Building Council 2016
https://mena.fes.de/fileadmin/user_upload/pdf-files/publications/Your_Guide_to_Waste_Management_in_Jordan.pdf

¹³ Based on field visits and meetings with the Jordan Chamber of Industry.

6.2.1 Capital investment

The research found that the capital investment for scrap yards ranged from JOD 1,500 to JOD 100,000 as was clear from the available equipment at their facilities. Some bigger scrapyards contained several balers, crushers and shredders as well as small vehicles such as skid loaders and forklifts.

The following figure provides shows the capital costs for the surveyed scrapyards:

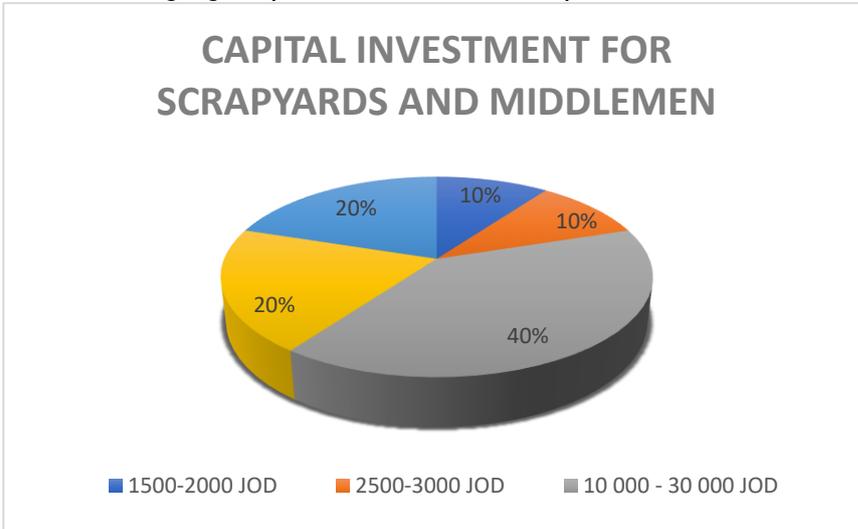


Figure 102: Capital investment for scrapyards and middlemen

The difference in capital investment is determined by several factors, primarily the number of partners, available financial resources and proximity to end users or exporting outlets (the case for Aqaba).

6.2.2 Operational costs

Operational costs were clearly correlated to the capital investment. Bigger scrapyards had more workers, higher warehouse and/or land rental costs as well as higher electricity bills. Running costs varied significantly for each scrapyard due to the instability of workers. Wages are paid daily and operational costs fluctuate. Operational costs ranged from JOD 500 to over JOD 3,000 per month.

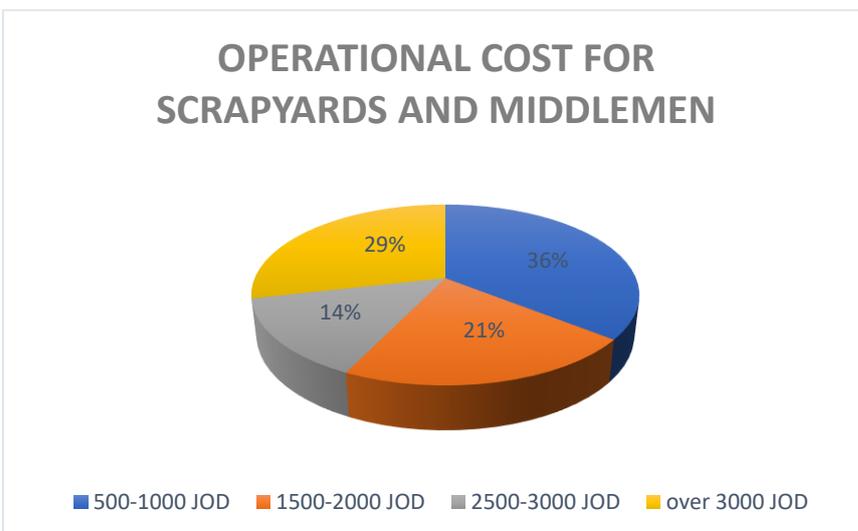


Figure 103: Operational cost for scrapyards and middlemen

Only 36% of scrapyard owners and middlemen consider increasing their investment and expanding their work, while 36% were not sure and 28% did not consider it at all. Reasons

for hesitancy to invest further included lack of financial resources and perceptions that the market was not big enough to warrant additional investments.

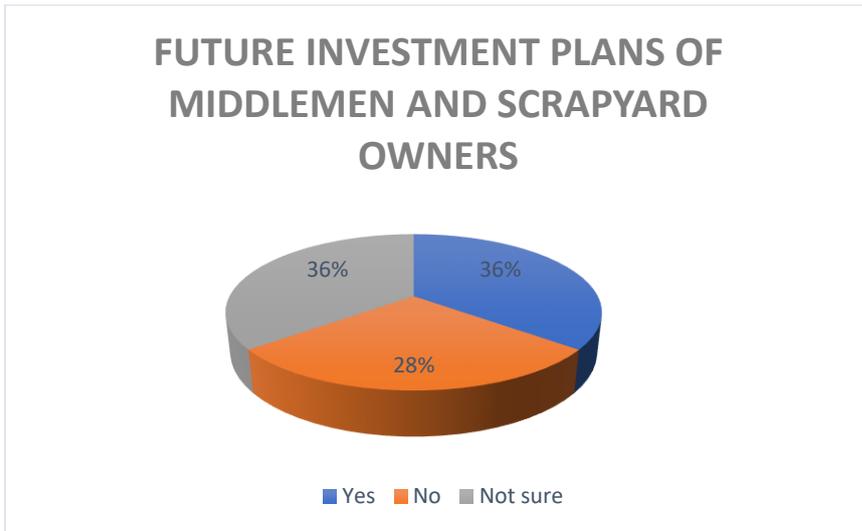


Figure 104: Plans for future investment of middlemen and scrapyards owners

6.3 RECYCLABLES' PRICE AND THE EFFECT OF ACTORS

The COVID-19 pandemic affected the prices of recyclable materials. As many countries closed their borders in the first months of the pandemic, the demand for the materials increased with no available supply, which led to an increase in prices of materials and shipping.

The following analysis shows the sale and purchase prices for materials beginning with the waste pickers and ending with the factories that recycle the sorted material, while taking into consideration the increment at each level, which is due to the operational cost and the profit margins.

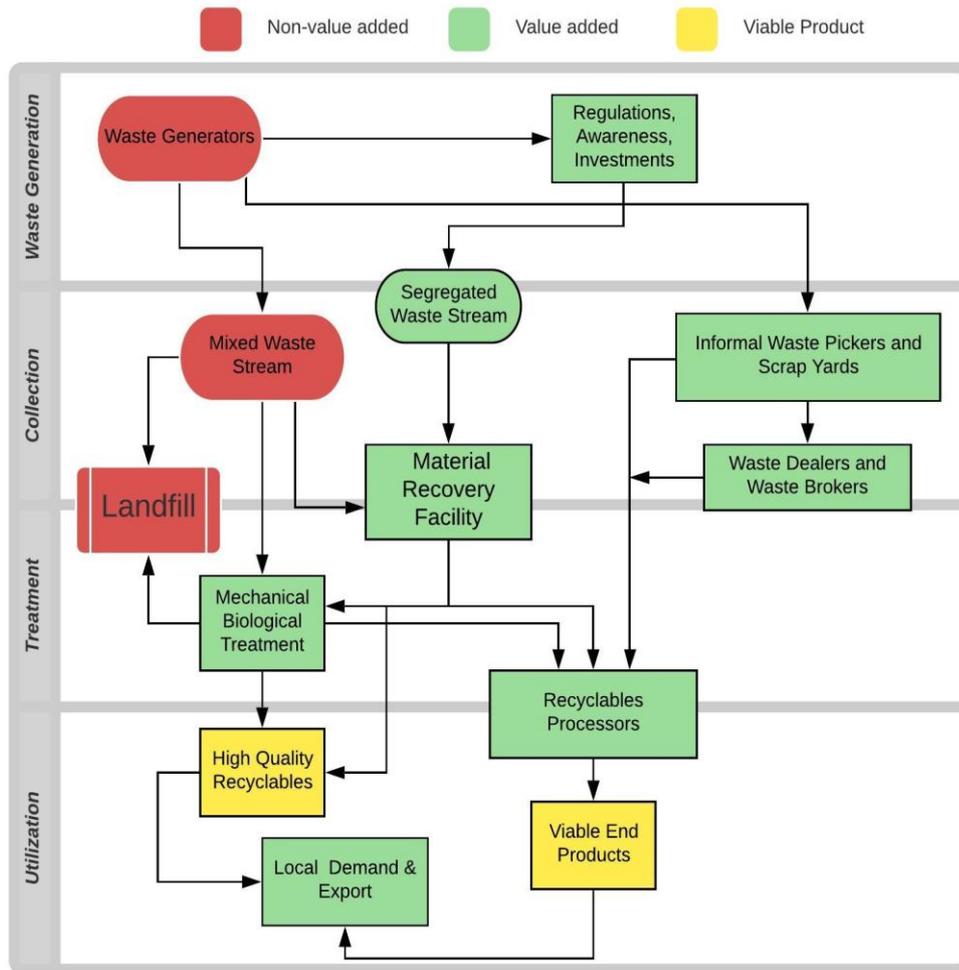


Figure 105: Changes in waste's monetary values

6.3.1 Plastic

With no separation-at-source scheme at the household level in Jordan, plastic waste is either segregated at the commercial level or scavenged from municipal waste bins or landfills by waste pickers. These waste picking groups are often itinerant waste purchasers and are sometimes sub-contracted by recycling factories, specialized scrap dealers, or waste brokers. As well as recycling factories, many industrial firms recycle plastic waste generated on-site in Jordan.

High-Density Polyethylene (HDPE—plastic bottles and pipes), Polypropylene (PP – plastic chairs), Polyvinyl Chloride (PVC – plastic pipes), and Polystyrene (PS) are the most traded plastics. High contamination levels of plastic bags and food containers, made from Low-Density Polyethylene (LDPE), make it expensive to process and manufacture, decreasing demand. Due to lower processing costs, transparent bags are preferred over coloured bags as they are easily collected and recycled.

The plastics most sought after by waste pickers, itinerant waste dealers, and scrapyards are hard plastic (Injection plastics - PP) and plastic irrigation pipes (PVC) produced at the farms in the Jordan Valley. The following table indicates the exchange

prices of plastics as per interviews conducted with stakeholders in the plastics value chain. The minimum profit margins for itinerant waste dealers and scrapyards dealers is around 0.02 JOD/kg for all recyclables in general.

Table 2: Prices of Plastic

Plastic type	Waste picker	Itinerant waste dealers		Scrapyards	
		Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Transaction	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Plastic irrigation pipes	0.07-0.11	0.11-0.20	0.22-0.25	0.20-0.25	0.35
Injection Plastic (PP)	0.07-0.11	0.11-0.17	0.19- 0.23	0.17-0.23	0.26

6.3.2 Paper and cardboard

Paper and cardboard used to have a well-established market in Jordan, but a combination of rising fuel prices and the closure of the Syrian border caused the sector to shrink. It is the least profitable solid waste stream (JOD 25-40 per ton) and is only collected in considerable numbers by specialized scrap dealers and itinerant garbage purchasers. Following the Syrian crisis, many paper recycling firms in Irbid that had previously had access to trade channels in Syria and beyond were forced to close, and only companies in Amman and Zarqa still recycle with much of the recovered paper and cardboard being sent to Saudi Arabia by specialist trash brokers.

Table 3: Prices of Paper and Cardboard

Material type	Waste picker	Itinerant waste dealers		Scrapyards	
		Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Transaction	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Paper/Cardboard	0.025-0.035	0.03-0.035	0.035-0.04	0.035-0.04	0.035-0.05
Duplex Paper/Cardboard with minimum ink content	0.025-0.04	0.04-0.045	0.045-0.05	0.045-0.06	0.06-0.07

Cardboard prices rocketed since late 2020 reaching almost JOD 200 per ton. However, most of the actors in the sector report that this is only a temporary spike and that the prices will return to normal. The price rise was related to the COVID-19 pandemic, during which the supply chain for big factories in the region was broken and they resorted to buying cardboard from nearby countries such as Jordan for higher prices.

6.3.3 Metals

Metal is the most valuable category of waste in Jordan, with the highest and most consistent returns. Iron, steel, aluminium, tin cans, copper (red and yellow), and ferrous scraps are the most traded metal waste materials in Jordan. Because of its worth, it is the only type of waste in which all actors in the value chain actively participate.

During initial collection, different actors in the value chain focus on different types of metals, with waste pickers focusing on metals they can easily scavenge for, such as aluminium cans (e.g., Pepsi and Coca-Cola cans) and tin cans (food cans) found in municipal waste containers. Itinerant waste buyers and scrap dealers focus more on larger metals, such as iron and steel. Due to the high worldwide commodity price of copper waste, it typically finds its way to specialized waste brokers, who export it rather than sell it locally.

Table 4: Prices of metals

Metal	Waste picker	Itinerant waste dealers		Scrapyards	
		Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Transaction	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)	Purchase (JOD/kg)	Sale (JOD/kg)
Yellow Copper	0.60-0.65	< 4.1	4.2 - 4.6	< 4.7	-
Red Copper	0.30-0.35	<2.0	2.1 – 2.3	< 2.4	
Aluminium Cans	0.07-0.11	0.07- 0.5	0.55– 0.65	0.60-0.70	-
Iron	0.10-0.11	0.10-0.15	0.17-0.19	0.18-0.19	-

6.4 VALUE CHAIN OF INFORMAL ACTIVITIES IN MAFRAQ GOVERNORATE

The recyclables value chain in Mafraq is small, due to the lack of recyclers in the governorate. Accordingly, the value chain in Mafraq begins with waste pickers and ends as early as the first scrapyards, and in rare cases, middlemen in Mafraq.

Despite the relatively high number of waste pickers in Mafraq (250-500, based on the findings of this study), there are no notable large middlemen or brokers, and most importantly, there are no end users. Middlemen and brokers in Mafraq run small-scale operations and recyclable material are transported to Amman and Zarqa to larger buyers. Accordingly, the prices in Mafraq do not differ to the rest of the country.

The majority of scrap yards are located in Greater Mafraq Municipality, as it is considered the economic hub of the governorate. The presence of four dumpsites (Al Hussainiyat, North Badiah, Safawi, and Ruwashed) has not contributed to a huge increase in recycling operations as waste picking activities were only observed in Al Hussainiyat dumpsite, mainly due to the amount of disposed waste.

Waste picking activities at Al Hussainiyat dumpsite are managed by a contractor that works officially in the dumpsite. The retrieved waste is being sold directly to entities in Amman and Zarqa (either end users or big middlemen/brokers), in order to get the best prices. Most of the workers at the dumpsite are Syrian refugees and the majority are working informally.

In regards to the types of recyclable materials collected in Mafraq, there is a high emphasis on metals (ferrous and non-ferrous), as well as plastic (all plastics except PET), and recently paper and cardboard, just like the rest of the country.

The following figure shows the activities that occur in Mafraq and outside Mafraq:

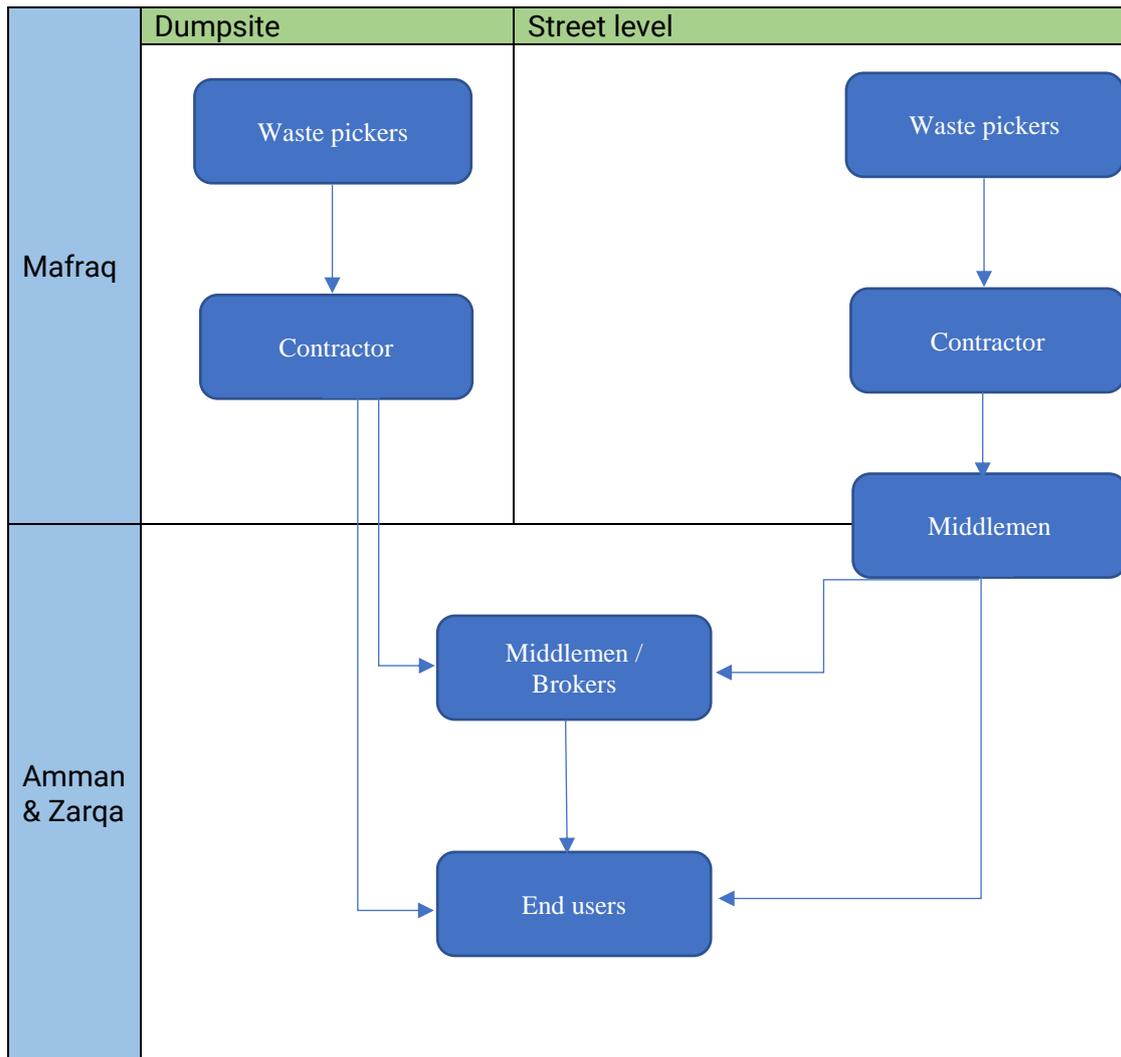


Figure 106: Recyclables' value chain in Mafraq

Waste picking is mostly categorized as an informal sector activity that has not yet attracted much official attention. Waste pickers are aware of the dangers at landfills and dumpsites as most of them consider these sites to be an unsafe working place and yet continue to work in serious harsh conditions to support their families. Despite their tough working conditions, waste pickers continue to work daily in search of recyclable materials that will generate earnings from which they can provide a livelihood for themselves and their families but also to cover health expenses, cover the cost of the education of their children and so on. While working as a waste picker provides economic opportunities, there are significant health and safety risks involved. These risks include viral infections and injuries linked to sifting through waste without protective equipment or heavy lifting. Waste pickers face significant risk to their own health and livelihoods as infected materials are often mixed in the general waste streams. During the COVID-19 pandemic, this particularly increased the chances of transmission of the virus through waste and was a cause of concern. Aside from working under unhealthy conditions, waste pickers also often lack social security or health insurance, are subject to fluctuations in the price of

recyclable materials, lack educational and training opportunities, and face strong social stigma.¹⁴

In this context, the process of closing the open dumpsites and opening of engineering or sanitary landfills and materials recovery facilities has started in different dumpsites in Jordan to be served by newly developed facilities or by turning them to transfer stations. This transition process (from (un)regulated dumpsites to engineering or sanitary landfills) represents not only an improvement in the overall system, but an opportunity for introducing innovative and effective social inclusion models to improve incomes and empowerment in the informal waste sector. To date, the inclusion of the informal sector has been done in an incomplete manner. In some cases, no consideration was made for the informal waste sector operations, resulting in a cut-off of access to recyclables and a loss of livelihood opportunities for those waste pickers. This was the case for example in Al Akaider landfill, which was previously a dumpsite, and with the transition to a sanitary landfill restricted access to waste pickers, due to international standards for sanitary landfills. It should be noted that the said transition from dumpsite to landfill was not connected to a program for waste pickers. Today, only few waste pickers work in Al Akaider.

The findings of the previous report developed by LDK for GIZ in 2019 illustrated that the landfills' waste pickers in Al Husseniyat and Al Akaider directly depend on the JSCs recycling contractors that are awarded officially by the JSC in Mafraq. The responsibility of the JSC in Mafraq, after the awarding to the contractor, is to monitor the contractor, this does not mean that the JSC is monitoring the waste pickers (compliance with PPEs, etc.), as they are under the responsibility of the contractor. The contractors do not appoint the waste pickers as formal workers nor do they offer them any form of benefits, but they are paid daily wages from 10 to 20 JODs. Due to the informal enrolment to the sector, the waste pickers are deprived from access to social security, even though they technically could register themselves, but at a high financial expense which is not accessible to most of them. Consequently, they will not receive any of the attached benefits. In fact, interviews of Jordanian waste pickers indicated their desire to have access to social security as they see it as a step toward the improvement of their work conditions.

Currently, and based on Al Husseniyat landfills records, there are 25 to 30 waste pickers (most of them are Syrians who are coming from Za'atari refugee camp). They work two days per week, which makes in total from 16 to 20 hours. On the other hand, there is a significant participation of women refugees, which forms 25% in the waste picking activity at Al Husseniyat landfill site in comparison with Al Akaider and Madaba landfills. While there was no presence for children's workers at the site.

For Al Akaider, the figures showed that the actual annual volume of the waste has increased gradually, which can be attributed to the increase of population especially after the Syrian crisis began, as well as to the change of living standards. The estimated amount of the disposed waste to Al Akaider until the end of 2010 was ranged between 800 to 850 tons per day. While from 2011 to 2019, the amount of the municipal waste in Al Akaider has increased steadily, to reach 1,300 tons per day from the 32 served municipalities in Irbid, Jerash, Ajloun and Mafraq. The total population of the 32 municipalities is estimated at 2,230,000 residents, where the Syrian refugees make for 7% out of the total population in these municipalities.

Before 2017, Al Akaider operation management elucidated that there were 35 to 50 waste pickers who had been employed informally by the awarded contractor at the time. It was also the case that some families lived beside the landfill to earn their living by working at the location via contact with some local companies. These families used to separate

¹⁴ Ibid 8

metals, copper, plastics, and cans from the solid waste piles. In that time, and regardless of the regulations, under-aged children were practicing solid waste separation.

After the rehabilitation of Al Akaider premises and the constructing of its two new sanitary cells, the number of the waste pickers has shrunk sharply, with no more than 5 workers, this is due to the new regulations of the landfill that prohibited the waste pickers from entering the site. The only allowed area that has an access for the waste pickers is the textile tipping area.

According to the management of Al Akaider landfill, the decision of preventing the waste pickers from entering the site did not affect their employment opportunities as they followed the contractor in other sites upon request, and this would contribute to maintaining their livelihoods situation until the sorting centres are established and the rehabilitation of landfills took place. The management of the landfills believes that many livelihoods' opportunities for waste pickers would be created when the sorting centres, transfer stations and the rehabilitated landfills will start to operate. Those opportunities will be varied from cleaning the areas, maintenance for the machineries and vehicles, sorting the waste inside the sorting centers, etc.

7 CONCLUSION AND RECOMMENDATIONS

The current situation of the waste pickers needs significant improvements on multiple levels, including social, economic, health and environmental. The following chapter gives an overview of the research conclusions and elaborates on recommendations.

7.1 IMPROVING SOCIO-ECONOMIC CONDITIONS FOR WASTE PICKERS

Interviews conducted with informal waste pickers indicate that drivers to this work are strongly linked to poverty and vulnerability. Multiple contributing factors, both economic and social, affect waste pickers at individual and household levels. At individual levels, these factors are linked to: **human capital aspects**, such as low educational attainment, lack of other skills due to early entry in the sector and absence of other job opportunities, which in turn contribute to remaining in the sector for many years; **social capital aspects**, i.e. people that can be drawn on for support are themselves connected to the informal waste sector; **financial capital aspects**, which can be a contributing factor both at an individual and household level, where the worker has low available income and his household has no access to other financial resources or incomes. This lack of livelihood assets combined with the large household sizes, often with young or vulnerable household members dependent on the worker, contributes to vulnerability. The combination of these factors, which are interlinked and self-reinforcing, functions as a poverty trap.

This research did not examine all factors in depth because of the difficulty of interaction with the waste pickers, which included some resistance in trusting the enumerators regarding the purpose of the study, as well as commitment to answering a lengthy

questionnaire. However, it is evident that a primary area of concern for waste pickers is the ability to earn income to provide food and shelter.

Education was not a major concern due to the availability of almost free public schooling until high school. Health-related aspects were also not deemed to be of primary importance for many waste pickers, as for most of them, access to health facilities is available, although they only seek treatment for chronic illnesses or severe injuries. Securing financial resources is prioritized over health and safety; for example, most the waste pickers sold PPE when they received it from various initiatives. During the COVID-19 pandemic, despite the increased health risks, PPE was primarily used to avoid fines.

Most waste pickers do not subscribe to social security due to the high cost and in the case of refugees, the lack of a contract.

Given the interconnectedness of the factors contributing to poverty and vulnerability, appropriately tackling each aspect could contribute to improving the socio-economic conditions of informal waste-pickers. Further research on these specific aspects could determine the usefulness of awareness campaigns around these issues.

Encouraging formalization may contribute to safer working conditions and a steady income, and potential pathways out of vulnerability and poverty. Informal waste pickers are open to formalization but primarily associate its benefits to income security and protection from the fluctuation of prices of recyclables rather than health and safety issues or benefits of social protection. This suggests formalization based on motivations other than financial ones might require an improved awareness of informal waste pickers on the importance of these aspects to better livelihoods. The role of awareness raising on the benefits of formalization to improve the success of transition processes was also highlighted by the ILO during the consultation process. Exploring the possibility of including informal waste pickers among the audiences targeted by future relevant ILO campaigns might be particularly valuable.

With regards to differences in income for performing the same work, due to the structure of the economics of the sector (values are determined by end users), no clear differences in the material prices between Jordanian and non-Jordanian waste pickers were identified. The prices are decided based on the material market value and quality rather than the person selling it, and the prices are known between the waste pickers. While the impact of recyclable market trends and shocks cannot be prevented, supporting systematic access to better quality, cleaner materials could influence the income levels of waste pickers.

7.2 IMPROVING WASTE MANAGEMENT AT THE TARGETED MUNICIPALITIES

The targeted municipalities struggle in their solid waste management. Their cost recovery percentage ranges from 48% to 61%, significantly lower than MoLA's target of 75%. Potential areas of improvements include:

- Exchange of equipment, as all four municipalities use compactors that are identified as inefficient due to high fuel and maintenance costs;
- Reconsideration of routing for more efficient collection;
- Reconsideration of container distribution within the municipalities and placing the optimal number of containers in the correct locations, to reduce unnecessary stops for the collection team;

- Capacity building for municipal staff on best practices in MSWM, including improving knowledge of legal frameworks around waste picking activities to have a clear understanding of what is possible regarding the integration of informal waste picking actors. In addition, improving documentation systems for a better understanding of the current situation of SWM in the municipality.
- As the municipalities lack authorization to integrate waste pickers, through which waste management can be improved, MOLA must initiate approaches of integration or decentralize authority to the municipalities.

7.3 RECOMMENDATIONS FOR MANAGEMENT OF INFORMAL ACTORS AT THE MAFRAQ MUNICIPALITIES

The following points highlight the main issues in the informal waste sector:

- The lack of clear legislation to govern the sector.
- The lack of clear structure for the work of the waste pickers.
- The lack of a representative body that can protect the waste pickers' interest.
- The volatility of the prices, resulting in fluctuating incomes.

Formalizing the sector could be achieved by MoLA and SSC, with the needed legislations. However, there is no immediate impact for the waste pickers, and further, many waste pickers may see it as added cost and therefore would not engage in formalization. Therefore, formalization should be a latter step after improving the socio-economic factors.

Considering the current situation of the sector, the most critical first step is improving the integration of the waste pickers in the MSWM chain. This will benefit the waste pickers on different levels as well as helping the GoJ to improve the socio-economic conditions of the waste pickers. It will also benefit the environment by reducing the amount of waste sent to disposal sites. This can be achieved in two ways:

- Increasing the amount of recyclable/dry waste made available to waste pickers for integration into the waste value chain
- Improving the quality of the collected waste, as cleaner waste has a higher value.

Once the financial situation of the waste pickers is significantly improved in a sustainable way, other aspects such as health and education can be more effectively addressed.