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JORDAN

SOLID WASTE BEHAVIORS WITHIN THE FORMAL AND INFORMAL WASTE STREAMS OF JORDAN

PUBLIC ACTION FOR WATER, ENERGY AND ENVIRONMENT PROJECT
PROSPERITY, LIVELIHOODS AND CONSERVING ECOSYSTEMS (PLACE) IQC TASK ORDER #5

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PREFACE

The Public Action for Water, Energy and Environment Project (PAP) is a public education and behavior change communication program developed to support USAID's technical and policy investments in the Jordanian water and energy sectors, and to support specific initiatives in the environment, in particular with regard to solid waste. The project has been awarded to ECODIT, a US small business holding the Prosperity, Livelihoods and Conserving Ecosystems, or PLACE, Indefinite Quantity Contract with USAID.

PAP is a five years program that has been designed in three phases:

1. Data collection and assessment phase of 9 months ending July 31, 2010;
2. Participatory strategic planning phase of 3 months that will include dialogue with the relevant stakeholders; and
3. Implementation phase lasting about 4 years.

The first phase of the project (Assessment and Baseline Phase) is to be completed by the summer of 2010. As part of this phase, ECODIT is conducting numerous surveys, including 12 or more research efforts, and it is from the totality of these efforts that the project will determine its direction and focus for behavioral change. ECODIT has divided this phase into the several rapid assessments.

Green has studied the formal and informal waste streams in Jordan, as well as the public behaviors and attitudes that influence them. Since it was assumed that the waste practices in Jordan are often sub-optimal, this study gave specific emphasis to discovering the "drivers" of these practices as well as barriers to change. The study also sought to locate examples of model behavior that already exist in Jordan so that they can be encouraged and duplicated. Entity Green's study was focused on the investigation and assessment of four general areas:

- The general attitudes of the Jordanian population that govern behavior towards waste, as well as perceptions and awareness towards waste and waste disposal.
- The poorly understood informal waste reclamation sector in Jordan, especially the systems, practices, and attitudes of waste reclaimers.
- The stream of recyclable materials (*kborda*) in Jordan.
- The formal sanitation and waste management system of Amman and Aqaba.

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EXECUTIVE SUMMARY

Jordan's waste management system is facing mounting challenges. Issues of transport, pollution and planning are exacerbated by rapid population growth and social attitudes that are slow to change, forcing Jordan to address both the conventional problems and the underlying behaviors that motivate them. The aim of this study for the Public Action Project is to illustrate the waste stream in Jordan and to chart the behaviors and practices that shape it. To reach this target, Entity Green focused its mostly qualitative research on public practices and attitudes towards waste, informal waste reclamation, the trade of reclaimed materials, and official waste management in both Amman and Aqaba.

In the study of the residential sector, data was collected regarding attitudes towards the waste-management system, perceptions and practices regarding waste within the household, and general attitudes towards reclaimers and other down-stream actors. Residents demonstrated incomplete knowledge regarding waste-collection practices and levels of dissatisfaction about waste practices in Jordan. Residents also expressed a strong willingness to participate in recycling and other sanitation-oriented activities, tempered by skepticism that such activities would produce community benefits be embraced by the broader community. Public Exit interviews focused on perceptions towards public spaces and revealed a lack of awareness about environmental information and a tendency to overlook the presence of waste in public places. Negative attitudes towards littering were clearly articulated, often accompanied by the admission that respondents themselves sometimes engaged in littering.

In the study of informal waste reclamation, several trends and characteristics were uncovered, while a complete categorization of the sector was impossible. Perhaps most importantly, Entity Green found that waste reclaimers (more commonly known as scavengers) are a highly diverse group that defies singular classification. Instead, they approach waste reclamation in a wide variety of ways, varying according to the types of materials collected, the way those materials are acquired, and the way they are transported and stored, to the point that two reclaimers might have as good as nothing in common. However, reclaiming is by no means only a way for the poor to survive – for many reclaimers it is just a job as any other – or even an opportunity for good profits and a reason to invest.

It was also discovered that reclaimers functioned in a system that was highly informal and lacked any real governance or organization. For a variety of reasons, reclaimers seemed to actively resist interaction with their contemporaries. Entity Green noted high levels of distrust among reclaimers, and the reception to suggested cooperatives was tepid. It seemed that the only etiquette inside the community was to stay out of each other's way.

Similar to reclaimers, traders of *khorda* (recyclables) can be found on many levels and in many subcategories, depending on aspects ranging from initial capital available to the types of materials handled. It was also found by the study that unique cultures have evolved around each type of material, with regard to such issues as loyalty between buyers and sellers, trade-specific knowledge and price transparency. Overall, most materials pass through a labyrinth of traders and processors to go from reclaimer to final destination. Various practices along the way, from separation to final processing and the actual re-manufacture, are not the most environmental processes and need serious upgrading for this to become a 'green' business.

There are two levels of authorities in charge of solid waste management in Jordan – legislative and operational. The former is in public hands and the latter may be either public or private. Amman's public waste management, run by Greater Amman Municipality (GAM) is a massive operation with over 4,000 sanitation workers in three shifts, who frequently reclaim recyclables from the waste, make side-incomes under a lax supervision and have drawn some complaints about their performance in certain areas. Aqaba's sanitation and waste management – outsourced to Clean City, a private sector company – keeps Aqaba clean with only 320 well-equipped sanitation staff in a strictly supervised system.

From the research performed by Entity Green in the above four categories, it appears that Jordan has a well-developed informal recycling sector and that there is widespread awareness of the importance of cleanliness and sanitary practices. At the same time, however, “the environment” and “recycling” are regarded more as Western concepts, rather than issues of general concern and importance. There seems to be little connection in people’s thinking between the existing recycling culture of collecting and selling valuable waste materials, locally known as *kborda* and “recycling” as a concept. Furthermore, certain types of waste, such as cigarette butts, coffee cups and Pepsi cans seem *not* to be considered as ‘waste’, as they have become a normal part of the surroundings and the result of an ‘acceptable’ level of littering. Greater focus on community and early education about issues concerning environment were found to key for recipe for success of integrating such ‘foreign’ concepts into local culture and behavior.

I.0 INTRODUCTION

1.1 Project Background and Objectives

Entity Green's objective in conducting this study as part of the Public Action for Water, Energy and Environment Project (PAP) is to encourage environmental stewardship in Jordan through improvement in the processes of solid waste disposal. To address this objective, Entity Green has studied the formal and informal waste streams in Jordan, as well as the public behaviors and attitudes that influence them. Since it was assumed that the waste practices in Jordan are often sub-optimal, this study gave specific emphasis to discovering the "drivers" of these practices as well as barriers to change. The study also sought to locate examples of model behavior that already exist in Jordan so that they can be encouraged and duplicated. Entity Green's study was focused on the investigation and assessment of four general areas:

- The general attitudes of the Jordanian population that govern behavior towards waste, as well as perceptions and awareness towards waste and waste disposal.
- The poorly understood informal waste reclamation sector in Jordan, especially the systems, practices, and attitudes of waste reclaimers.
- The stream of recyclable materials (*kborda*) in Jordan.
- The formal sanitation and waste management system of Amman and Aqaba.

Entity Green is a Jordanian company with a mandate of social entrepreneurship through recycling. Since 2008, Entity Green has developed and run Jordan's largest recycling collection network by partnering with companies, organizations, and hotels throughout the Amman and Dead Sea area. Entity Green has also conducted a yearlong training program to help informal waste reclaimers improve their practices and planning as well as to more fully understand the processes of material recycling in Jordan. Unlike other existing *kborda* (an Arabic word that roughly translates as “scrap,” but could also be interpreted as “recyclables”) traders in Jordan, Entity Green approaches the recycling business with an emphasis on environmentally friendly practices, and caters to clients hoping to install greener practices or meet international green mandates. Entity Green also uses its expertise in the field of recycling to build awareness in Jordan by conducting training and information sessions with clients, schools, and interested partners.

Through this experience, both within the recycling and waste disposal industry and in its public outreach efforts, Entity Green has built a solid understanding of the Jordanian waste stream and how it is perceived and understood. Entity Green also has strong connections with many *kborda* traders and informal waste reclaimers. The company's pro-stewardship mandate, along with its wide ranging institutional knowledge of solid waste issues in Jordan, gives Entity Green a solid base from which to perform this study.

1.2 Research Methodology

This was a qualitative study conducted using a mix of key informant interviews, public exit interviews, and observation. All interviews were semi-structured. Questionnaires were used for each interview, but they were not designed to provide quantitative data. Instead the focus was to pursue important and illustrative information as it arose. When interviewees hinted at information that was deemed potentially important or useful to the study, then it was given priority over other subjects contained on the questionnaire. At these times, interviewers posed questions

that clarified the topic instead of moving forward with questions on the survey. This meant that interviewees from the same category did not always receive the same questions or cover the same topics.

The sampling method also followed a qualitative model. Although basic goals were set to cover a wide range of neighborhoods, differing both in location and demographic makeup, no specific interview numbers were required. Instead, the sampling procedure was to continue conducting interviews in a given area or demographic group until clear trends emerged.

Research on topics such as the public waste authorities or *kehorda* trading industries required different tactics. Since these institutions required structural mapping, the goal was to interview actors at all levels. For example, with GAM, interviews were conducted with all levels of management, as well as street level actors.

2.0 KEY FINDINGS

2.1 Public Behaviors and Perceptions Towards Waste

As results from residential and public exit interviews overlapped significantly, they are mostly presented together, separated only by category.

2.1.1 Household Waste Practices

Responses about waste generation showed variation according to income level, but were generally consistent between Amman and Aqaba. Most respondents in the lower-mid income category said they generated between 1-3 small grocery-bags of trash a day, the most common response being a single bag. This pattern continued in Aqaba where some middle-income families reported buying garbage bags but mostly relied on grocery bags. Upper-income families used mostly larger, plastic trash bags and reported using 10-15 large bags a week. These responses are consistent with the findings of Martin Medina's studies regarding levels of waste generation i.e. "a positive correlation tends to exist between a community's income and the amount of solid wastes generated" (Medina, 1999).

Many people in upper-class homes or apartment buildings gave their trash to the guard (*baris*) or maid who disposed of the waste. In lower to mid-income homes, women seemed more involved in waste handling within the house, while men or children usually took the bag outside, either to the dumpster or just to leave it in the street. In Aqaba it was reported that usually the boys in the households take the bags to the dumpster, while in some lower-income districts they throw it directly in the streets. This was also observed in the lower-class districts of Amman. Middle and lower-income respondents in Amman and Aqaba were more likely to mention that their waste consisted mostly of food. Respondents in upper-income households reported more packaging materials such as plastic containers and cans. This information correlates with the findings of previous academic studies which found that "waste generated in developing countries contains a large percentage of organic materials," while "waste generated in (developed countries) contains more packaging materials" because of a higher usage of processed foods.⁴

When it came to the subject of re-use, some residents reported re-using materials besides bags. Examples of re-use included plastic grocery bags and glass jars used for storage containers. Some residents reported more creative practices of re-use, such as a woman in Deir Ghbar who uses cardboard and paper for art projects with her children and reuses old/torn clothes for cleaning rags. We also interviewed a woman in Tabarbour who re-used dried plant clippings and plastics for arts and crafts projects and a woman in Aqaba who collected jars to give for her. In Aqaba no re-use was reported in upper-income neighborhoods, while some middle-income households reported re-using tin boxes from sweets or chocolates. Residents largely did not associate re-use with recycling or environmental practices. Separation was uncommon, apart from the traditional practice of placing bread to the side of the dumpster, but some respondents reported separated cans and other recyclable products for reclaimers.

2.1.2 Perceptions of Waste Stream

Responses from questions regarding the waste-stream were particularly revealing. When asked about where waste goes after it has been collected, most residents displayed little knowledge of waste-management practices in Jordan. Many openly said that they knew nothing; others knew that it went to a dumpsite out of town, but few knew of the site's actual location. One 19 year-old in Wakalat Street said that "they take it far away and deal with it in a clean

way". Many people appeared to be improvising answers or many asked the interviewer for the answer to the question. Many people also thought that waste was burned by the municipality. A 26 year-old man in Hussein Park thought waste is "separated, crushed and then burned." In Aqaba particularly, residents thought that the waste went to a *mabraqa*, literally the "place of burning". Entity Green has heard that burning in Jordan's landfills was a common practice in the past, evidence of which has been observed during this research, but environmental law prohibits such activities as of 2005.

"60% of our waste gets recycled, 30% gets composted and 20% gets burned."

– Three women in an Aqaba Park

2.1.3 Perceptions and Attitudes on Sanitation System

Respondents' attitudes on GAM were generally positive. People encounter GAM sanitation workers on a daily basis and so there is awareness of their work. One 42 year-old woman in Sweifieh said that "the dumpsters are always empty," another woman in Jabal Amman stated that waste was removed extremely quickly and when asked about GAM's activities said "GAM is very good - thank you to GAM." Other respondents less satisfied with GAM's services because of either the quality of service or the workers, or their schedule. One man in Dahiat Al-Hussein said that the neighborhood was dirty because "they only come every other day." One resident in East Amman reported having to "tip" the GAM workers to clean his street well. Another 43 year-old man in Tabarbour noted that some workers were doing a good job, and some were lazy and "only helped their friends." Several residents reported the need for more bins and often smaller bins than the standard size seen in communities. A 77 year-old woman in Jabal Amman said, "we need many, many more dumpsters."

Although Entity Green did not note much discrepancy in the treatment of GAM towards East and West Amman, residents did have the perception that there was a difference in sanitation level. One resident in Jabal Amman put it bluntly; "West Amman is clean, the East is dirty." While there were scattered complaints about GAM's operations, residents were far more likely to fault the public at large for the presence of litter in Amman's streets. One 36 year-old man in Khalda said, "80% of cleanliness comes from people." Respondents often noted people throwing trash near the bins, but not inside it. This behavior seems to mirror responses about public littering discussed in a later section.

In Aqaba, attitudes on the Clean City workers were also generally positive, while some people reported inconsistency in the waste disposal system and showed knowledge about Clean City workers' activities. This was particularly true for the poorer areas of Salah Ad-Deen, Balad Al-Qadeem and Shalal, which were commonly described as dirtier than others. One woman from Shalal said "half of the people here don't know who Clean City is, maybe people in Khazzan do" – Khazzan being a slightly higher-income area that reportedly receives more attention from Clean City than the previous three mentioned. In Aqaba residents in general noticed a major discrepancy in sanitation levels between upper-income and lower-income neighborhoods and between areas with tourist traffic and those without. This discrepancy was only partly blamed on Clean City, and residents often cited low-income residents and Egyptians as the source of the dirtiness. Besides that, Clean City employees were often reported as performing odd jobs for residents after work hours.

2.1.4 Attitudes Towards Reclaimers

In questions about reclaimers, respondents were generally neutral or positive, but many people faulted them for creating messes and scattering trash into the street outside the bins. A resident in Khalda noted that sometimes their activities cleaned up the area; sometimes it made the situation worse. Other respondents were openly distrustful of reclaimers, viewing their work as *'ayb* (shameful). A few residents also reported that reclaimers are engaged in theft, one woman said, "they steal things and even break into buildings." It was also common to hear that reclaimers spill

waste in the street, one man living in an apartment in Shafa Badran said reclaimers "do not clean, they just make the area worse." One man in Tabarbour responded that reclaiming "is not a healthy thing to see" but that it seems to have become "like a career path".

“Some people see reclaimers digging through waste and feel sympathy for them... but I see them driving trucks and choosing to use those trucks to work on dumpsters... there are many other ways to make money with a truck, so scavenging must be very profitable.”

– A man from Tabarbour

In general, citizens were widely aware of reclaiming activity, particularly reclaimers working on foot. Exceptions to this were found in higher income areas of Aqaba, where one director of a large company said: "I know nothing about these people and do not desire to know anything about them. They are not of my level." In public places, as well, people knew that reclaimers worked in the area, worked independently, collected metals and plastics, and most commonly noted that those who work on foot were specifically gathering cans. In Aqaba, where reclaiming activity seems to have risen recently, the presence of reclaimers has become so normal that their activity has now moved from residential areas also to tourist and central areas of Aqaba. Residents are aware that they collect metals and plastics and assume that they work independently.

One woman reported that her child once threw a can at a reclaimer as he was collecting from a dumpster. The mother scolded her child, saying “Don’t throw a can at him, that’s ‘ayb!’” The child responded by reminding the mother that she herself had told him that it was ‘ayb to put your hand in a waste bin.

2.1.5 Attitudes about Recycling and Cooperation

Both residential interviews and public exit interviews showed that Jordanians have inaccurate beliefs about the operations of the municipality. Many people thought that GAM had recycling programs and that waste was sorted and recycled after it was picked up from the dumpsters. Results from the public exit interviews showed younger people were more likely to believe waste was recycled on the municipal level, even those studying for university degrees.

In both Amman and Aqaba middle and upper-income residents were aware of formal recycling and many referenced European or American cities as places where sorting and recycling occur. In both public exit and residential interviews respondents believed that aluminum and metals were recyclable but they also thought that non-recyclable products in Jordan, such as PET plastic and glass were actively being recycled. Few people associated reclaimers with recycling, despite reporting that their materials had value and that reclaimers made income from their work. In Aqaba, respondents from lower-income communities reported very little knowledge about formal recycling.

Respondents were largely supportive of efforts such as community awareness campaigns, recycling initiatives and waste separation-whether through the government or through collaboration with reclaimers, but they expressed skepticism that others would support it. This was reported across income categories. In Aqaba, residents in middle to lower-income areas expressed willingness to work with recycling initiatives with the government or reclaimers

while upper-income residents were supportive of government intervention but unwilling to cooperate with reclaimers.

Two sisters in Sweifieh took opposing views to recycling programs: one refused to participate in a recycling program and said she would never work with a program involving reclaimers. The other said she would participate in any recycling program and said: “My sister is very well educated and she *still* would not participate in a sorting program.”

One 35 year-old maid in Sweifieh stated that she doubted anyone would participate in such programs because “people only care up to their front step.” Even though people expressed a willingness to clean outside of their house, almost none reported doing so regularly. In general, Entity Green found little evidence of communities independently attempting to confront cleanliness issues, with a few notable exceptions. One man in Tabarbour said that if there was a recycling program he would be “the first to join”, noting that he was inspired by Umm Mu'adh, a woman also living in Tabarbour, who already separates her waste by material for the reclaimers and has encouraged her neighborhood to do so.

Umm Mu'adh is a retired teacher for the deaf and mute who has personally undertaken community building in her area, encouraging her neighbors to help in group cleaning activities and various other neighborhood beautification projects. She also organized the community to move organic waste to a nearby hillside where sheep can consume it as feed. In one recent activity, she organized neighborhood children to clean the block for 1 JD each. She has been attempting to obtain funding for community projects for some time, and only recently obtained limited support from the municipality. 8 different households participate in the activities. She said “we deal with our neighbors as one big family-we depend on each other, we know each other’s relatives... when there is a dispute sometimes the entire neighborhood gets involved. The project is not just about the environment.”

2.1.6 Public Spaces and Cleanliness

Respondents from Public Exit interviews were adamant about the importance of cleanliness in public places. One respondent in King Hussein Park said, “cleanliness is everything, there is no beauty without cleanliness.” As in the residential interviews, people primarily reported satisfaction with GAM's services. One 43-year old man told us the area was “80% clean...everyone is quite pleased,” going on to note that sanitation in smaller local parks is “not nearly as good.” On Rainbow street, which has both large and small bins regularly interspersed through the area, people reported the area as very clean and associated the status with the presence of bins and GAM workers. In a public park in Aqaba, several residents were aware the exact time the GAM employees arrived each day.

A 45 year-old man in King Hussein Park said he came to "see things of beauty", another young man in Rainbow Street mentioned his motivations for coming as "to feel in touch with people and nature. to get away from false places." When asked whether cleanliness was important for public spaces to fulfil their purpose of providing leisure space to residents, a very common answer was: "of course it is - nobody would come to a dirty park."

When asked what the main purpose of public spaces was, respondents replied relaxation, meeting with friends, "hanging out", family gatherings and play - the most common Arabic word used was *tarfeeh* - best translated as "leisure". Interestingly no respondents either in Rainbow Street or Wakalat Street reported shopping, eating, or other consumer activities as motivations for coming.

All respondents noted that they saw people littering in public areas, often attributing the level of litter in public places with the presence or lack of waste-bins.

"Rainbow street is cleaner than most of Jordan, but there still is waste everywhere – gum packs, cigarettes... I do see people throwing things away, young people... and it's not because there are no bins."

– A 23 year-old woman

Even in the areas reported as very clean, people simultaneously observed that they do see people littering, and it bothered them. Among the most common culprits blamed for littering were young people, specifically young men, and "uneducated" people.

One vendor in Jabal Amman mentioned that Rainbow Street is a "trendy" area so the municipality pays more attention to it than other areas. More waste was also reported on the weekends at night, although people also mentioned that the areas were clean in the morning.

"Busy tourist areas are clean in the morning, and get dirtier at night... it is like this every day."

– A 23 year-old man in Jabal Amman

Public areas in Aqaba generally follow the same pattern as Amman, but the beaches are well known for their poor sanitation. Observers noted the waste consists of everything from cigarette to diapers. Several interviewees in Amman mentioned that Aqaba is thought to be dirty, while respondents in Aqaba also noted that it was Ammanis coming in for the weekend that made the beaches dirty.

2.1.7 "Invisible Waste"

Like the residential interviews, people were generally satisfied with GAM's activities in public areas and tied littering problems to public behavior. Observation of the public spaces showed varying levels of cleanliness, and varying perceptions towards it. One of the elements noticed by interviewers was a tendency to over-look waste. For instance, in Rainbow Street, people were quick to point out the cleanliness of the space in comparison with other parks in Amman. While Rainbow Street was mentioned as among the cleaner areas in Amman, it is by no means free of waste. Observers noticed sandwich wrappers, cans, packaging products of various kinds and especially cigarette butts. Besides small groups of women and couples, there were large groups of young men playing music in one of the small park areas that overlooks Jabal Amman. Waste was most prevalent in these seating areas and especially around the young men.

Two young men in Wakalat Street, looking at an area strewn with cigarette butts, registered different reactions. One, raised in the United States, said "the area is filthy...since I was a small child my mother told me never to litter." The other, raised in Jordan, said the area was clean and said "they are just cigarette butts."

One 24 year-old on Rainbow street who demonstrated an otherwise high level of education on the environment said cigarette butts and ash were not littering, because they are "small, and light... they fly away."

In Aqaba, two young men mentioned it was ok to throw away "small things like cigarettes and coffee cups." A group of three women in Aqaba also thought that cigarettes "are not litter because they decompose naturally."

In King Hussein Park, where researchers observed noticeable amounts of litter, respondents continued to report the area as clean, even after the trash was pointed out to them. Some respondents who were seen littering, mentioned that since the area was already dirty, it no longer mattered. One family specifically mentioned that "they do not notice dirty things" when they are out with their family. Many people reported areas as completely clean when waste was within plain-view.

Five boys were sitting in a Tabarbour park during school hours. They were visibly surrounded by their own trash: bags of chips, cigarettes and ice-cream packaging. When asked about their behavior they said they don't keep the area clean because they "never come and find it clean themselves", and that "if it was clean to start with we would have made sure to keep it clean," a commonly stated sentiment by many in public places. "There is a guard who attends to the property who often is not present, and the few trash bins that are present are rarely emptied." One of the boys said he had gone on a field trip to pick up trash with a youth group and he said it did not affect him, he continues to litter. Despite these attitudes, the boys said they would be willing to participate in community clean-up efforts.

2.1.8 Individual Efforts against Littering

Questions on willingness to voluntarily pick up waste yielded different responses. When asked how far they would walk to dispose of waste, respondents occasionally noted that they would walk however far was necessary to throw things away. One 44 year-old man from Rusayfah said specifically that he brings trash bags with him to public parks and other areas where he could not throw trash away. He said he cannot litter "because [his] education does not allow him to" and has his children clean up the street around his home. Another 46 year-old woman interviewed on Wakalat Street said she often picks up waste when it is "convenient" and when asked if she ever litters "of course I can't litter, it's impossible for me to litter...because of my upbringing, it's unimaginable for me to throw something on the floor."

One young man in a small park in Jabal Amman said that he never litters, but also never picks up waste because "you would have to do it all day...I would go crazy." This was a commonly recited sentiment. Another pair of teenage sisters interviewed on Wakalat Street both mentioned a willingness to carry waste home if necessary. One of the sisters mentioned that she picks up waste outside her house but she can't do it very often "because she would look like a crazy person." Among respondents, women were by far the most willing to carry waste home. Respondents in some small neighborhood parks displayed less willingness to carry waste lengthy distances; some said they would walk for short amounts of time. Others mentioned various distances-responses such as "15 meters" or amounts of time-such as ten minutes. When pressed, the majority of respondents said that they would litter if there were no nearby bins.

2.1.9 The Social Visibility of Littering

Responses relating to the motivations for littering showed visibility and social perceptions. Respondents often framed littering in terms of morality or acculturation, showing littering as a lack of civility, carelessness, or lack of education. According to a 14 year-old boy in Rainbow street, it is "uncivilized to throw things away...people are not doing their job." Other respondents emphasized the importance of Islam, often saying that littering is *haram* (forbidden). One 44 year-old man made a point of saying that "because we are Muslims, cleanliness of public spaces is important...cleanliness is very important in Islam." Responses also touched on issues of reputation and visibility.

"I wouldn't walk a meter to throw waste into a bin... but I would never litter in my house... my mother would kill me! ...but when I'm out with my girlfriend, I collect all our waste neatly into a bag, to look like I have prestige."

– A young man on an Aqaba beach

The issue of visibility arose repeatedly, with respondents reporting that the motivation for where littering occurred had to do with who could see them. An 18 year-old woman from Jabal al-Hussein gave a typical response; "people throw garbage more in the places where people can't see them." Sometimes respondents said people litter in some areas because no one in their family group can see them. Interviewers in Aqaba also heard many times that people refused to throw away waste in places with security cameras, out of fear that they would be seen or receive a fine. A couple from Tabarbour said that "people litter because they don't have awareness...they just don't feel responsible" for public places. Their response was among the most consistently repeated.

2.1.10 Suggestions for Improvement

Citizens in Amman and Aqaba were adamant about issues of cleanliness in public spaces. In Amman, they were quick to give possible solutions and to fault their peers for littering. According to a 14 year-old boy on Rainbow street, it is "uncivilized to throw things away...people are not doing their job." Many residents discussing people throwing waste in the street suggested that fines should be given, and that the police should be involved in stopping littering.

"How to prevent people from throwing trash? You will have to take each and every citizen by their hand, give them a little slap on the hand and say: 'don't throw trash'"

– A 17 year-old boy on Wakalat Street in Amman

Although most respondents expressed great concern for the environment, they were not always sure the ways in which littering hurt the environment. One man interviewed in Wakalat street when asked about how litter hurt the environment "to be honest, I don't really know...but that's what are teachers always taught me." With littering, people were more likely to be concerned with issues of health, public image and personal conduct. The most common suggestion was to raise awareness of environmental issues, particularly among young people, through educational programs or the media. As the two sisters interviewed on Wakalat Street said, "you must tell people it is their land. Take care of it."

2.2 Informal Waste Reclaimers

The informal waste reclamation sector in Jordan is diverse and difficult to characterize. Reclaiming occurs at many different levels and in a variety of conditions. A combination of factors make it inherently de-centralized and unstructured. Recognizing this is not only important to understanding the nature of the sector, but also to the manner in which this research was carried out.

Entity Green's study on informal reclaimers was first carried out by driving through neighborhoods at various times of day to observe and record activity. Community members, employees of GAM and reclaimers were interviewed until it was possible to establish a basic understanding of reclaimer practices. Then interviews and observation was conducted in areas with high likelihoods of finding waste reclaimers.

2.2.1 Definition of Waste Reclaiming

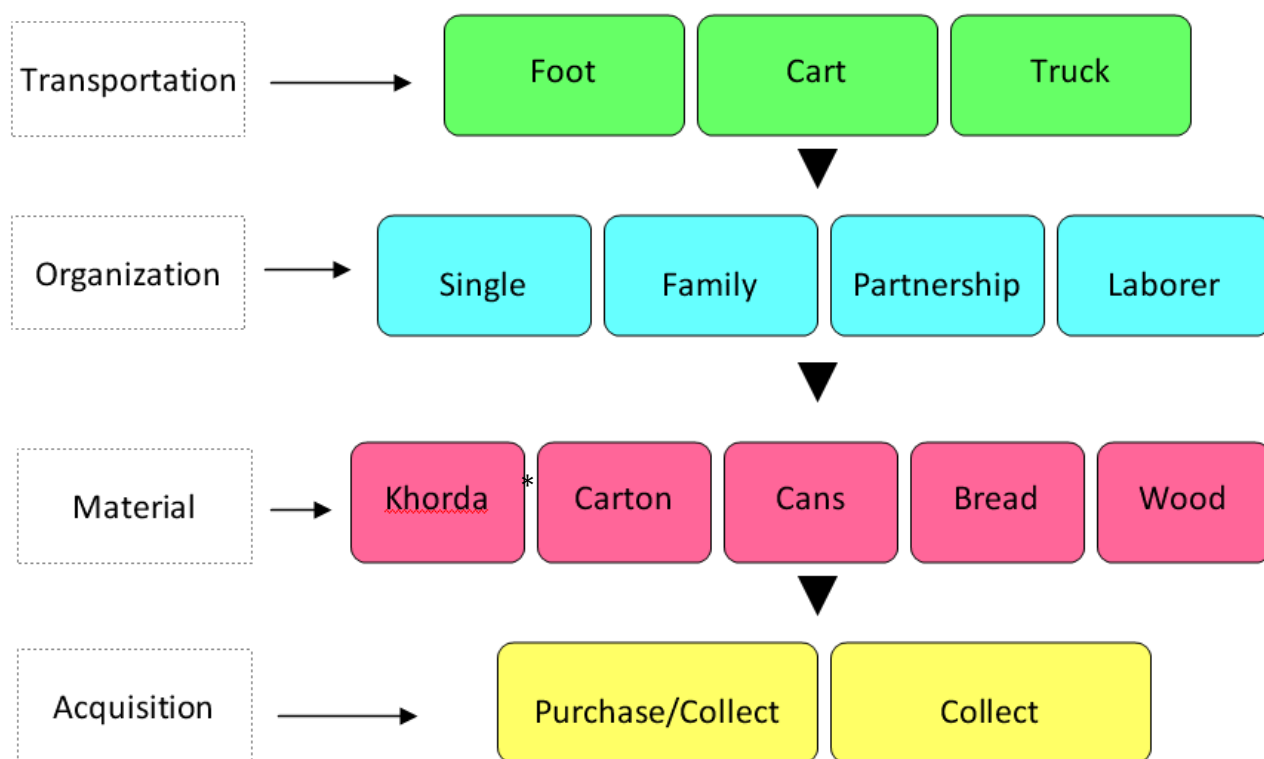
For the purposes of this study, Entity Green defined the term "waste reclaiming" as the collection and resale or reuse of materials that would otherwise be sent to landfills by the municipal sanitation system. Entity Green also focused its study of reclamation on operations that are small scale and are not incorporated as official companies, thus targeting the informal sector of Amman and Aqaba's waste stream.

2.2.2 Categorization

Reclaimers in Jordan use a wide variety of strategies and methods. Understanding the different ways in which reclaiming occurs is essential to understanding it in a broader sense. As an initial step in the study, Entity Green

created a system that roughly categorizes the many types of reclaimers operating in Jordan. The system supposes that there are four key factors that help differentiate reclaimers: their mode of transport, the type of organization they work in, the type of material they collect, and whether or not they purchase materials. The chart below further explains categorization.

Figure 1: Reclaimer type determination chart; select one from each aspect.



(*) *Khorda* is a conglomerate category broadly including metals and plastics. However, at different levels of specialization it could mean different things. Unless otherwise specified, in the below it will be used to mean "any type of metal and hard plastic" (i.e. not including "nylon" – wrapping and packaging plastic and plastic bags)

A reclaimer's category has implications far beyond the manner in which he goes about his work. Each category faces its own set of issues. For example, a waste picker who drives a truck, and purchases materials for resale is likely working in the field by choice and making more money than he would in many other professions, while a reclaimer who works on foot and only collects aluminum cans is likely to be financially distressed and have few other options for making money.

Reclaimers with trucks usually work in two or three man teams, with one person driving, and the rest collecting from dumpsters. These teams can consist of partnerships that own the truck together, of an owner with a team

of laborers, or a family team with an adult who drives and younger members of the family (brothers, sons, nephews) who collect.

Reclaimers who had worked as part of owner/laborer teams said that they usually did not have permanent arrangements, and were only hired when an owner had planned a trip that was expected to be highly profitable. These trips could include house demolition cleanup, or collections in industrial areas with high value waste.

Family teams were very common and were seen collecting *kborda* and carton. It was difficult to perform interviews with the children (sometimes as young as ten years old) because the father would inevitably dominate any discussion we had with the team. Individual reclaimers working on foot tended to be either very young or appeared to be financially distressed, often refused to be interviewed – more than other categories of reclaimers.

Observations and interviews revealed that aluminum cans and *kborda* was the most commonly collected material category. Carton, bread, wood and oil collectors were almost always specialized, and would sell to equally specialized traders. Most of the collectors on foot focused exclusively on aluminum cans due to their high value and light weight.

Entity Green has also found evidence that many public sanitation employees in Amman, but not in Aqaba, are part of the reclaiming system and play an active role in it, though only on the very lowest level, being restricted to foot or cart collection.

Reclaiming activity in Aqaba showed some significant differences to Amman. Unlike Amman, reclaiming in Aqaba almost exclusively revolved around collecting metals – aluminum cans, steel scraps and other metals such as light aluminum and copper. Only one reclaimer was found who collected *kborda* plastics, but he complained that the only buyer of plastics in Aqaba – a trader named Abu Alaa – did not distinguish different types of *kborda* plastics and bought them all at a relatively low price. There was no reclaiming of *naylon* anywhere in Aqaba. Furthermore, Entity Green found that reclaimers in Aqaba were either on foot or with a truck – none seemed to have carts.

In general, categorization of reclaimers is close to impossible – there are many permutations of categories that any one given reclaimer could fall into. The most commonly observed categories have been outlined in the chart above, but even linking the categories to each other is too intricate a task for the scope of this study.

2.2.3 Attitudes towards Work

One theme seen consistently among reclaimers was a casual approach to the work. It did not appear that many had a clear strategy on how to get the most out of a dumpster. More commonly, reclaimers said that they would approach a dumpster, take what is visible or easily collected, and move on to the next dumpster. When pressed about how they went about their work, a common response was "*ar-rizqa 'ala Allah*" ("success depends upon God").

Although this was the most common response in field interviews, *kborda* traders indicated that there were clear gradations in ability amongst waste reclaimers. One trader explained, "If you know what you are doing, collecting *kborda* can be a very profitable business."

Regarding possible health concerns as a result of reclaiming work, the vast majority of reclaimers said they have no health concerns and take no precautions. As an example, not a single reclaimer that Entity Green interviewed during this study wore gloves. One reclaimer in Aqaba, who described himself as a "recycling expert", said, "all the materials we work with are potentially dangerous. Take copper for example - when it oxidizes, it creates a very toxic green substance. Or take all the different containers for chemicals that we collect and the fumes coming from them." He too, took no precautions.

"Most reclaimers wear gloves when they start, but then soon realize that it only makes work harder and that no gloves are tough enough for this work. So they switch to working with bare hands."

– A 19 year-old reclaimer in Khalda

2.2.4 Organization and Community

There appeared to be very little organization in the waste reclaimer community outside of family connections and working as day laborers, no waste reclaimers reported any agreements or cooperation with others. It does not appear that reclaimers stake claims on areas, or that any individuals control areas or types of waste in an area. Many reclaimers recited the mantras "nobody owns the streets" and "everybody to himself". Although interactions between waste reclaimers were generally characterized as polite, many explained that it was the unofficial policy of reclaimers to "get far away" when they see one another. These seemed to be the only rules governing reclaiming conduct.

Another factor influencing cooperation, or lack thereof, is a high level of distrust amongst reclaimers. When asked to explain why they had never considered organizing or cooperating, many explained that they viewed other reclaimers as "greedy" or that they believed others would attempt to cheat them if a partnership was formed. As a group, waste reclaimers themselves displayed the lowest levels of trust and respect toward their own demographic when compared with other groups interviewed in this study (residents, traders, sanitation workers). This was especially true across reclaimer types. For example, reclaimers who worked on foot would characterize truck owners as thieves and bullies (because they could make a quick getaway after a theft), while those with trucks saw those on foot as dirty, lowly, and unworthy of attention.

Although reclaimers often cited distrust of their contemporaries as a reason for not forming cooperatives, they were also wary of outsiders. Many expressed reservations about any type of coordinating or authoritative body getting involved in their work. This attitude was especially strong towards government involvement in informal waste.

While reclaimers in Aqaba showed no trace of organisation either, there were less reports of distrust, greed or discrimination. Relations between reclaimers, though never warm or close, were generally described as cordial.

2.2.5 Reclaiming as Income Generation

Entity Green has focused its reclaiming study on street level activities, performed by independent, mostly unlicensed, unincorporated actors who work outside the formal sector. Although there are many types of reclaimers that fit into this category, the income generating aspects of collection and selling are essentially consistent throughout all categories. All interviewed reclaimers, except one exceptional case (mentioned below under 5.11 Women), cited "making money" as their main motivation to working in the field. Daily revenues proved difficult to determine, as many reclaimers were hesitant to answer these questions straightforwardly, but most reclaimers reported revenues in the range of 7-15 JD/day. Individual on-foot reclaimers, collecting cans for a few hours after their day-jobs, as was the case with several interviewees in Aqaba, might not find more than 2-5 kg of cans and make no more than 1-2.5 Dinars a day.

2.2.6 Materials

The following waste materials are widely collected and resold in the Jordanian informal waste sector: steel, aluminum, copper, brass, batteries, almost all types of plastic (except for PET bottles), discarded perfume bottles, bread, vegetable/olive oil tanks, scrap wood, cardboard, and paper.

Old or broken white goods, household electric appliances, computers and old furniture are also collected by so-called "*kborda* trucks" that drive through neighborhoods announcing their readiness to buy any of these items through loudspeakers, usually of terrible quality. While this does not amount to what is nowadays called "e-waste recycling", it does lead to at least certain elements of e-waste being recycled, though often with huge environmental impact.

Fruit and vegetable crates made of Styrofoam, plastic or wood are commonly collected and either sold for re-use if undamaged or sold simply as wood or plastic if damaged (broken Styrofoam crates, do not appear to have a market).

Metals, batteries, and heavy plastics are referred to as *kborda* (meaning "scrap") and are the most commonly collected items. Current prices for these materials at low level *kborda* traders can be found in the chart below. As some of these prices are due daily changes, this is only a rough guideline.

Table 1: Approximate material prices, May 2010

Material Prices Available to Waste Reclaimers	
Aluminum	0.50 JD/kg
Steel	0.14 JD/kg
Copper	3.75 JD/kg
Scrap Wood	45.00 JD/ton
Yellow copper	2.80 JD/kg
Vegetable Oil	50-70 JD/barrel
Carton	50.00 JD/kg
Bread	0.04 JD/kg
General Plastic	0.15 - 0.20 JD/kg
Olive Oil Tanks	0.20 JD/piece

Aside from the above-listed materials that usually follow a chain of reclaimers and traders till they reach re-manufacture, there are some items that are sold from collectors to purchasers who immediately re-use them. Two common items in this category are bread, which is usually sold from the collector straight to a sheep farmer, who feeds it to his sheep and wood chips, which are sold from producers such as carpentry shops to chicken farms. Other common items in this category include fruit and vegetable crates made of Styrofoam, plastic or wood. These are widely collected and either – if undamaged – sold for re-use to farms and wholesalers or – if damaged – sold simply as wood or plastic, except for broken Styrofoam crates, for which there did not appear to be a market.

There are also specialty materials that can be sold for high prices and are sought after by reclaimers. The most common example is discarded perfume and cologne bottles, which are sold to commercial perfume vendors. These items are refilled with an imitation substance and resold as originals. Bottles can have a street value between 0.25 JD and 10.00 JD. Some interviewees claimed that certain beer bottles could also be resold.

Some materials tend to be collected by waste reclaimers that specialize in only one material, which is separated from other recyclables right from the point of consumption. Cardboard and paper are commonly collected in commercial areas like Amman's downtown. Reclaimers pick up paper outside stores for free or for nominal sums. Reclaimers in vehicles either buy from their colleagues with carts, pick up from streets for free, or collect from specific, fixed accounts. These reclaimers then deliver the paper to factories or exporters.

The variety of materials collected is the primary distinguishing characteristic between the informal waste reclamation sectors in Amman and Aqaba. While reclaimers in Amman collect a wide variety of materials, reclaimers in Aqaba, as mentioned above, focus almost solely on metals. This is due to the fact that there is a much smaller *keborda* trading industry in Aqaba than in the Greater Amman area. As a result, reclaimers are only able to sell non-metal items if they have a means to transport them to Amman. Even when they have the capability to ship materials, reclaimers are rarely able to accrue the volumes required to offset the cost of transport. Transport is further hindered because all materials leaving the Aqaba Special Economic Zone (ASEZ) are subject to taxes.

2.2.7 Routes/Areas

While few reclaimers have set routes that they patrol every day, all reclaimers interviewed in this survey had a general area of the city that they would stick to during their reclaiming activity. Area and route planning appears to be affected by a variety of factors. Through close observation, some have learned to go to certain areas at specific times and days in order to take advantage of the waste disposal schedules of large companies or periods of high pedestrian activity. One reclaiming team with a truck targets a different industrial district each day according to when the companies in the district take deliveries or turn over their inventories. Another team targets areas with bars and lounges on weekends when those businesses experience the heaviest traffic and therefore generate the most waste.

Other reclaimers have very different motives and simply attempt to find neighborhoods where they will not be recognized because they are ashamed of their work.

2.2.8 Schedules

Direct observation showed the highest levels of reclaimer activity were between 4:00am and 10:00am and also in the late afternoons, starting approximately at 4:00pm. However, there were no set rules and reclaimers appear to work at all hours of the day. GAM collections were widely cited as a determining factor for reclaiming schedules. This is due to the fact that reclaimers want to reach dumpsters when they contain the most material, and this is typically during the time directly preceding a municipal collection. These times vary by community, but are generally in the late morning or late in the afternoon. Reclaimers also said that they designed their schedules so that they would have minimal contact with other people. One reclaimer who was working in an area with bars and nightclubs said that his team refused to start working before 4:00am because they were “shy from being around other people while they were working in dumpsters.” Although starting at an earlier time would give them an advantage both in terms of operating hours and in terms of access to un-picked dumpsters, their schedules were still governed by their own feelings of marginalization.

Two women who were married to reclaimers were interviewed in Aqaba. One said that her husband goes out at any time of day; the other said that her husband goes out only in the middle of the night because he does not want people to see him because he is ashamed of his work.

2.2.9 Marginalization

One of the assumptions made in the initial stages of this research was that reclaimers were generally a marginalized community. Although research has confirmed that this is true in some cases, it has also shown that reclaimers come from a wide variety of backgrounds. According to previous research on the subject of reclaimers in other countries, reclaimers mainly become marginalized when they are exploited by the system of scrap traders or are discriminated against by governments. When they are not exploited, they are an economically important link in the waste stream, and their work can actually rival many other professions both in terms of income generation, and in the social mobility of their family (Medina, 2000, 2007).

A short comparison of scrap prices in Jordan versus those in other countries suggests that exploitation is not a major issue. The price paid to high-level material wholesalers in India is approximately 450-1800% that paid to a low level waste reclaimer. Other countries that are considered to have non-exploitative systems still have rates from 100-400%.⁸ In Jordan, this rate of price inflation ranges from 30%-100%. Reclaimer interviews support the notion that they are not exploited by the system. Most were very pleased with the relationship they had with their scrap traders, and no one interviewed complained of feeling cheated.

Additionally, many reclaimers report incomes that place them well above the Jordanian poverty line. This is especially true for those who own trucks and are able to invest in their operations. Waste reclaimers fitting this description generally reported incomes upwards of 15 JD/day before costs. Even reclaimers who operate on foot with no mechanisms to transport and store their materials consistently reported incomes above 7 JD/day.

While waste reclaimers do report some harassment by police, there are no official government laws that discriminate against them. Their activities are legal, and some management level employees in the Amman Municipality expressed approval of waste reclaiming when it is done cleanly and responsibly.

Social marginalization was more visible among reclaimers, although this was still not a universal issue. In many interviews performed with reclaimers, it was necessary to start the interview by convincing the interviewee that he was not being shamed, insulted, or accused of a crime. Many reported consistent harassment, both by local residents and by police.

Two young men in Abdoun and Khalda stated that they are frequently stopped by police and asked for their IDs. One of them stated that this is specifically a problem because the police would take a lot of his time, sometimes half an hour until they are done checking their system. He also added that often they ask him to get into their car and they drive around and drop him off at a random spot regardless how far it is from where they picked him up.

It is also clear that many reclaimers associate some level of shame with the work. Many made a great deal of effort to work in areas that were far away from their place of residence, specifically because they did not want to be recognized while working around dumpsters. Others displayed high levels of confidence with regard to their work and made a point of emphasizing that there was really nothing shameful about it.

"Once I picked up cans in a park near a family sitting on a bench. The youngest son wanted to give me an empty can and called 'Hey *zabbal*, come here!' His father slapped him and said: 'Don't call this man a *zabbal* - that's 'ayb!'

I felt sorry for the boy and said 'There's nothing wrong with the word *zabbal* - that's my job and it's not shameful.'

– A 41 year-old Egyptian reclaimer in Aqaba

Interestingly, private residents often expressed high opinions of waste reclaimers, and some had stories about a specific incident that caused them to view them in a positive light. There was occasional awareness that reclaimers

help to reduce volumes of waste in Jordan through their work, but mostly people understood the work as a means to support a family.

This attitude of approval, though not enthusiasm, was a consistent theme.

"I once tried to give money to a man collecting waste from a dumpster and he refused to accept it. From then on I understood that they are simply trying to make a living, just like anyone else. I have respected them ever since."

– A 57 year-old woman in Rabia

Although most citizens did not disapprove of the work in and of itself, they did express two major concerns. First, there was a general fear that some waste reclaimers were criminals, and that their work gives them cover for petty theft or even violent crime. Also, many residents from neighborhoods of all classes expressed concern about the messes that waste reclaimers make while going through dumpsters.

Street level municipality workers had similar misgivings, and regarded waste reclaimers as a nuisance. Multiple employees expressed frustration that they were responsible for cleaning up the messes created by reclaimers, yet they had no authority to stop them when they caught reclaimers in the act (this is not true for reclaimers in trucks, who are subject to a 500 JD fine if their license plate is reported for spilling waste around dumpsters). GAM workers commonly complained that if they told a reclaimer to clean up his mess, or stop making a mess, he would be ignored at best. Some even described facing violent responses. These complaints were most strong from Egyptian sanitation workers, who felt especially harassed, and said that they had no recourse except to start cleaning up the mess. However, it was also acknowledged that many reclaimers go to lengths not to make a mess, and GAM employees working higher up in the organization believed that reclaimers played an important role in reducing waste volumes.

The nuanced social status of reclaimers was one of the more interesting findings of this study. Although few were proud to be working with waste, there was a tangible sense of pride that stemmed from reclaimers' independence and their ability to provide for their families. Outsider viewpoints were similarly mixed.

2.2.10 Children

Children were commonly seen working as reclaimers. Not only do they work on family teams, but they also engage in the practice independently. Although children reclaimers were very common, they were also very difficult to interview, as many were shy or avoidant. All juvenile reclaimers that were interviewed also said that they were in school full time, and only collected waste on their free time. However, it was difficult to evaluate the accuracy of their information, because they were generally very uncomfortable during the interviews.

A *khorda* trader in Ar-Rajib, who was asked who he bought the heavy plastics from that were piled up behind him, answered straight out: "From children between 8 and 12 years-old."

While children in family teams were working to generate income in support of their families, it appeared that most children working independently were not doing so as a source of income for their families. Rather, these children were working for a few minutes or hours of free time as a way to gain spending money.

2.2.11 Women

Waste reclaiming in Jordan is almost exclusively the work of men. With a few very rare exceptions, it appears that the only presence of reclaiming among women occurs in *Dom* (gypsy) communities in Amman. Given the relatively conservative societal views in Jordan about women's employment, it would have been unusual for Entity Green to encounter Jordanian women engaged in reclaiming. First, in conservative areas of Amman, women walking the streets unaccompanied by a male could be considered morally suspect except when engaged in domestic activities such as purchasing household goods. Also, as we have noted that reclaimers often operate outside of the normal working hours, they usually work alone or in family groups, and their work is often viewed with suspicion (JOHUD, 2009).

All of these factors make a woman's participation in reclaiming unlikely. Reclaimers' work is regarded as morally suspect, and the presence of women during such activities would be unusual and would likely raise objections from community and family members.

Ghadeer is a woman from Jabal an-Nadheef. She might be called a reclaimer, as she collects all types of *khorda*, bread and other materials from her immediate neighborhood and sells most of them to a local *khorda* trader. However, if she is asked for her motivation, her answer is unlike *any* other reclaimer Entity Green interviewed for this study: “Mostly, I do this for them” she says, pointing at her sister’s two children. “So that they learn and understand about the environment, about the limited resources; and to make sure they don’t get to a point when they’re grown up and there’s nothing left for them of what we enjoy now.”

2.2.12 Dom

Dom, more commonly known as gypsies, show high levels of participation in waste reclamation. Just as their customs are often distinct from those found in broader Jordanian culture, their approach to reclaiming waste is also divergent. Many of the common trends observed in the waste reclamation sector were visibly different amongst the *Dom*.

Child reclaimers appeared to work in support of their families, which was not seen elsewhere. They also commonly had females working as reclaimers.

Gathering information on *Dom* reclaimers was challenging, as they were generally very hesitant to participate in interviews, and those that did were often uncomfortable. What was clear is that the few established characteristics that were observed among waste reclaimers, rarely apply in the *Dom* community.

2.3 Informal Waste Traders

Traders play an essential part in the informal *kborda* recycling sector in Jordan. They assure the acquisition and transport of materials in nearly every area of Amman and Aqaba by providing local waste reclaimers a geographically convenient selling point. They also handle materials until their final sale to factories or exporters. Like the reclaimer sector, traders operate in a variety of ways, with different levels of material processing, storage, and capital.

2.3.1 Trader Categories

There are three discernible levels of traders that play the role of middlemen and distributors between the reclaimers and local and foreign manufacturing companies, mobile traders, local traders, and large traders. Reclaimers and traders at all levels disassemble and process materials to make them readily sellable for a higher price. Lower end traders who refuse to process make do with lower pay when they sell the items, but whether they decide to process or not is dependent on their individual situation. In some cases, higher end traders will not buy materials in need of further processing.

Storing larger amounts of material and selling it in bulk usually equates to a higher profit. For example, storing up to 50 tons of metal *kborda* would give a 10-15 JD price increase on each ton. Due to liquidity issues, not all reclaimers or traders are able to wait to reach this threshold. A lower level trader might need a month to accumulate such an amount and many reclaimers and lower end traders face daily financial pressures so they sacrifice accumulation in favor of preserving a daily income. Aside from the liquidity issue, most reclaimers and even lower level traders lack adequate storage space. Larger traders possess both the space and capital to handle and store large amounts of materials to sell at better prices. The primary factors that distinguish between trader levels are storage space, capital and liquidity.

Mobile Traders

This level of trader has relatively little capital, usually just a vehicle and a small amount of cash to purchase materials. Some also have or use empty lots of land for storage and processing. It appears that most of these traders do not have special licenses for their activities.

At its lowest economic level this type of trader is not necessarily distinct from a reclaimer, and could also pick up recyclables in or around bins (whether they are on foot or in a vehicle), but also purchase *kborda* from residences and shops. Some are known for making rounds in residential areas in vehicles with a loudspeaker, calling people to sell their *kborda*. Finally, other moving traders distinguish themselves from reclaimers by not picking up *kborda* from dumpsters, instead only purchasing materials, usually from commercial areas.

Small Local Traders

These traders' investments include a shop or area of land for storage; some have vehicles, but most depend on people coming to sell their materials. These traders often have official *kborda* trading licenses for their companies and shops. These traders are clearly differentiated from the larger traders because they would not send vehicles to do purchases from other sellers, and instead are reliant on "drop-ins." Typically they have small storage spaces, and are located in commercial districts.

Larger Traders

These traders have considerable land for storage. They usually own vehicles, which they send to smaller traders to acquire materials. Depending on the type of material, these traders are more specialized and do a fair amount of processing.

Larger yet are the final traders who are usually extremely specialized and purchase large amounts of a single commodity to either export or sell to local factories. These traders usually do not accept unprocessed materials, and a large trader might refuse to deal with reclaimers in favor of dealing with customers with larger volumes of material.

Although there are generally three main levels of traders, the path taken by materials typically do not travel linearly between the 4 levels we have described. Also, some materials can go straight from a reclaimer to a large trader, depending on availability of cash, locality, and personal relationships. That same kind of material picked up by another reclaimer might pass through 5 levels or more to get to the final destination.

Because each material follows its own specific stream, it was difficult to come up with universally applicable categories for traders. Specialization and processing might start from the reclaimer level or at any other trader level. Sometimes even a reclaimer or trader who is not specialized will refuse certain materials regardless of its value or possible trade. Cardboard for example is left by many to the specialized reclaimers and traders.

2.3.2 Traders in Aqaba

In Aqaba, all materials (mostly metals, as described earlier) are sold to one of two small traders, the brothers Abu Alaa and Abu Firas. These two establishments control the *keborda* business in Aqaba. Abu Alaa has a piece of land in the centre of Aqaba, where trucks stand in line at the end of the day to sell their day's haul. The steel scrap get loaded straight onto a large truck that sell in Amman, while other materials are temporarily stored, then compacted (cans etc.) and sent up to Amman. His brother Abu Firas has a similar scrap yard in the industrial zone outside the city center. The activity of these two brothers limits the recycling business in Aqaba, and has created limited routes for other materials to leave Aqaba. The only other vendors are independent traders from Amman, who drive down to Aqaba every week and park in a known location for the period of a day or two. Lower level traders come to these locations to seek higher prices and sell materials not bought by Abu Alaa and Abu Firas. When the trucks are filled, they return back to Amman.

There are no ways of selling wood, oil, *nylon*, less-common plastics, and paper & cardboard in Aqaba. As a result, there is no informal reclaiming of these materials except for the cardboard reclaiming activity of Clean City.

2.3.3 Material Specialization

The study of Jordan's recycling industry revealed that it was not one industry but several, each concentrated on a specific material. This made it worthwhile to make an individual study of each material, and track the culture, practices, and final destinations associated with each one.

Paper and Carton

As mentioned in the reclaimers section, cardboard and paper is an industry that is usually specialized from the moment of collection. Prices in this sector seem to vary widely and there is also a large amount of ambiguity since no one is willing to give a straightforward price when asked. Some reclaimers and small traders might sell their paper and cardboard for as low as 40 JD per ton, while a large trader would sell to a factory at 100 JD or more for clean paper.

According to large traders, the total collectible paper that is disposed of in Amman and the surrounding cities is between 6 and 7 thousand tons a month, but currently only around 4 thousand tons are collected because of damaging disposal methods. They also stated 40% of the paper and cardboard comes from reclaiming at landfills (except Ghabawi) and the rest is collected directly from shops or bins. Cardboard from the landfill is usually only 70% useful because it is very often wet and too dirty for the factories to accept.

Of those 4 thousand tons, 1.5 thousand tons go to a company that directly exports to Saudi Arabia, 1.2 thousand tons are recycled by Jordanian paper mills, and 1.3 thousand go to large traders who sell to the highest bidder, which occasionally means that it is exported to Syria, Lebanon or even India. The government has placed a 35 JD/ton tax on paper and cardboard export to protect the paper and cardboard companies of Jordan. This tax was temporarily lowered after major complaints from the cardboard sector – at some point reclaimers stopped looking for paper and cardboard because there were not enough purchases. The tax has been brought back up to 35 JD, but many of the foreign companies have since decided to share this cost with the local exporter. Many interviewees working in the field stated that the price for paper and cardboard in Jordan is not a “true” price and is much higher than the world average.

Bread

Bread is another item that has a very specific stream. Some reclaimers specialize in bread collection and usually sell directly to animal keepers. Reclaimers specializing in bread often have deals with bakeries and cone factories to take all their waste products. This study also documented cases where bread reclaimers were animal owners and used bread personally as well. Those reclaimers who sell their bread also process it, which includes drying and crumbling. Dried and crumbled bread is sold for around 2 JD for a 25 Kg bag.

In Aqaba, there is a Bedouin from Disi, who comes into Aqaba once a week to a specific location and buys dried bread for his sheep.

Wood

Wood used in construction projects for concrete framing and scaffolding is purchased by specialized traders, usually directly from construction projects, at about 45 JD a ton. Workers pull out any nails (which they sell to steel *khorda* traders) and then shred the wood, which they sell at 1 to 2 JD per bag. This shredded wood is used as bedding by chicken farms.

Oil

Used cooking oil is also recycled. A barrel of good quality used cooking oil would sell for about 75 JD (5.5 barrels make a ton). A small number of traders purchase or take used cooking oil from restaurants, filter it to remove solid particles and sell it to soap factories. The owner of one filtering facility, who claimed to have the only facility that “cleans” oil, explained filtering as removing smaller particles and odor. He stated that he processed 100 to 120 tons of oil per month and exports 60% of his processed oil to Syrian soap factories. Interestingly he stated that he would never purchase soap from the factories he sells oil to.

Khorda

Large *khorda* items like motors, radiators and others are processed by traders to separate the different materials contained in each item. A broken fan for example would yield plastic, steel, copper and other materials. Each material is more valuable when sold separately.

Plastic

Plastic and nylon are mainly collected by reclaimers. The plastic waste stream follows a path from reclaimer (mixed plastic) to general trader (mixed plastic). When they are sold to large traders, plastics are sorted by experts that can identify the many different types of plastic (up to 12 or more sub categories). Each sub-category is then sent to be processed by shredders or pelletizers. These traders are labeled as *al-jarousha* (The shredder). Unlike high end traders of other materials, plastic shredding facilities are willing to work directly with reclaimers and do not deal exclusively in high volume trade.

According to factory owners, 50% of the plastic and nylon that reaches the shredder level comes from landfills via reclaimers, 30% comes straight from factories that have defective items or an overproduction. The last 20% comes

from street reclaimers. Some materials can be sold to final remanufacturers that just require shredding, while others specifically need pelletizing. The cleanliness of each material is also a main factor, which decides how much processing is needed, because most shredders do not have a cleaning station.

Respondents estimated that there are approximately 90 shredders in the country and almost 90 pelletizing lines, and did not believe that the market had become over saturated. However, new licensing laws by the government have caused some shredders to close down and others to move farther out from Amman's center.

Interviews revealed that only about 20% of pelletized plastic is exported out of Jordan, mainly to Iraq and the West Bank. The rest of the plastic is remanufactured by local companies into packaging, but law prohibits recycled plastic from being used as containers for food or beverage. Jordanian law also prevents scrap plastic from being imported. Plastic and nylon greatly differ in price depending on cleanliness and amount of processing needed. A shredding facility could purchase a ton of clean, heavy plastic at around 350 JD while the same type of plastic that is unclean would get around 250 JD per ton. The same kind of heavy plastic would sell for 450 JD after shredding. Shredding facilities claimed that shredding costs around 100 JD a ton, and which left little profit. Pelletized plastic that is clean and came straight from a factory would sell for about 550 to 600 JD per ton.

Steel

Like many items, steel prices in Jordan are at a historic low point. Managers in the industry have said that in 2007 scrap steel sold for 0.5 JD/kg and at the beginning of 2010 the price was 0.23 to 0.24 JD/kg. Steel is currently selling at 0.175 JD/kg from high-end traders.

Entity Green was unable to locate any reclaimers/low end traders that specialize in steel, largely because steel is usually collected from items that contain several other recyclable materials. For example, a reclaimer who picks a broken fan from a dumpster would also be collecting plastic and copper by default. In the scrap steel sector, trader levels are most easily delineated by volume. Reclaimers/small moving traders handle up to 3 tons/day. Small traders handle up to 50 tons a day and large traders handle 300 to 400 tons a day if they are selling the steel directly to smelters. Traders with enough liquidity to store steel can build stocks of thousands of tons. One large trader interviewed for this study claims to currently have 26,000 tons of inventory. One professional in the steel business estimated 120 to 150 thousand tons of steel scrap are recycled in Jordan each year.

Steel scrap is divided in three general categories; the top quality is pure steel *kborda* that is generated by steel companies. Second tier steel comes from "heavy steel," which is cut from the engines of cars and machinery. The third tier steel scrap is lighter steel and other metals that can go into a steel smelting pot. The top quality steel goes directly from steel companies to large steel *kborda* traders or a steel company with smelting capabilities. The second and third level come from reclaimers or moving traders and pass through different level traders until they reach large traders. Large traders then sell to smelting companies.

Currently there are three companies with smelting capabilities that purchase all the steel scrap in Jordan. Two of these scrap companies are subsidiaries of Jordan's industrial steel refineries and supply them directly.

Steel is currently sold by the reclaimer at around 0.14 JD/kg whereas the factory would purchase steel at around 0.175 JD/kg. Steel is not exported often because of a 40 – 60 JD tax that the government has put in place. This makes it more profitable to keep scrap steel in the country and protects the local market. In some instances the government has issued laws that makes it illegal to export steel. Respondents claim that steel is sometimes exported under different names, especially from Aqaba where there are no smelting factories to purchase the *kborda* at the end level and where moving the steel to Amman would incur taxes.

Copper and Aluminum

Metals such as aluminum and copper also have specialized top-level traders. These traders are some of the only top-level traders that purchase mechanical items and cars that would need processing. They even buy and sell electronic waste – which also have further specialized traders that can remove very minimal amounts of metals from computer

chips, etc. Processing at these traders includes burning electric wires to remove copper. These traders tend to be the most secretive about their practices. Respondents were hesitant or unwilling to reveal information about their processing, vendors, and prices. One of these traders interviewed mentioned India and Europe as importers of their metals.

2.3.4 Material Sources

While collection from streets and dumpsters is the principal source of recycled materials, demolition and cleanup projects also contribute a significant segment of the waste stream. Companies and street reclaimers are often contracted to cleanup an area and dispose of the materials on site, much of which can be recycled. These projects have been a key source of materials for different types of traders. One example was an army cleanup project from which traders obtained tanks and other heavy machinery that they took apart to obtain different *kborda* materials. There are commonly recited stories that arise from these projects of reclaimers who were able to win a tender and become very rich.

Some reclaimers and/or traders also get contracts from factories to remove their waste. A plastic shredding facility could be contracted by a plastic company to take any defective products that they cannot make use of. Many traders have stated that there are entities that are contracted to remove recyclables from landfills (other than Ghabawi); this is another major source for scrap materials.

Another main source of scrap for traders comes from building projects. A contractor might sell a trader the leftover materials from the building project he is supervising. An electrician or plumber for example would also bring any leftover materials to a trader. Shop owners like car repair shops also bring materials to sell at traders. Even homeowners sometimes take the trip to the trader to sell some items.

2.3.5 General Characterizations

Although each material is an industry with an etiquette and culture onto itself, scrap traders consistently offered three general characterizations that apply almost universally.

A common theme across all levels of the scrap industry, from reclaimers to top traders is a lack of loyalty. Instead of developing long-term customer/provider style relationships, businesses look only for best prices. Interestingly, the level of loyalty varies by industry. While steel traders are constantly switching between vendors depending on the daily fluctuations of price, plastics traders are to some extent more loyal and flexible. Plastic traders even report buying and selling on credit, which was a mechanism that was not found anywhere else in the scrap industry.

In all other sectors, it appeared that instant availability of cash was principal factor in business relations. The constant availability of cash was cited as an a issue, and traders had to be astute on how to offer prices that would give them the best balance of unit per price while still using as much of their capital as possible. The consistently repeated mantra was "in this business, there is only cash." It is usually the case that any one buyer who can offer a few extra piasters per kilo (sometimes as little as 1 or 2 piasters extra) would get the sale.

Traders also complained of being at the mercy of the stock markets. This is especially difficult on small traders, who often purchase small quantities of material from sources that are not aware of how quickly prices can fluctuate. Meanwhile, the higher-level traders that they sell to are instantly aware of price changes. This means that if there is a significant price drop, they may be unable to acquire materials for days or weeks at a time, because their purchasers are buying at lower prices while the sellers are unaware of the price-drops and continue to demand out of date prices. Traders complained that it could take a long time for buy/sell prices to equalize.

Finally, traders demonstrated only very compartmentalized knowledge of the industry. Not only was very little information consistently known across sectors, but even the different levels of traders appeared to be largely ignorant about the competition's operations. This rule applies especially strongly as the levels get lower. One bread trader was observed stockpiling large quantities of nylon bags, which he uses to collect his bread in. However, when he ran out of storage space he would simply burn the nylon stockpile. He was completely unaware of the value of nylon, even though he also reported selling other types of plastic. Although there was no direct evidence of the reasons for such compartmentalization, traders often guarded the details of their operations jealously, and it appears that there was a great deal of trade secret.

2.4 Formal Waste Management

2.4.1 Actors in the Formal Waste Stream of Amman

Ministry of Environment

One of the eleven directorates of the Ministry of Environment is the Hazardous Substances & Waste Management Directorate. Its work is focused on legislation and regulation, licensing, categorization and emergencies. They are also currently performing studies on landfill performance. While the directorate is not involved in the day-to-day management of municipal waste, it is responsible for the management of hazardous wastes in the whole of the Kingdom. Its responsibilities include categorization and determination of fees and operation of the hazardous waste landfill in Sawaqa. Transportation hazardous waste to the Sawaqa landfill is the responsibility of the private companies that produce it.

Furthermore, the directorate sees itself as a catalyst of new developments, promoting best practices, international standards and introducing environmentally friendly technologies. It is also involved in the process of privatizing waste management through the National Privatization Committee, which has already initiated the privatization of medical waste treatment (a large incinerator is currently under construction near the Ghabawi landfill) and is currently weighing options for how to privatize parts or all of Amman's waste management system.

The Directorate also performs inspections, together with the Directorate of Inspections, which in turn has the technical supervision over Jordan's Environmental Police Force - the "Rangers". However, no clear plan exists to cope with recycling methods that clearly violate environmental regulations (e.g. burning cables to yield copper wire, storage of scrap metal, health & safety measures in plastic processing).

Greater Amman Municipality (GAM)

GAM's Department of Environment and Public Sanitation controls all aspects of the municipal waste management system, including the sanitation workers, the waste trucks, the transfer stations and the final disposal in the landfill of Ghabawi. It is responsible for the 4,000 sanitation workers, their schedules and zoning, as well as the many other employees in transportation and disposal.

The system of charging for waste removal is twofold: every monthly electricity bill (for citizens, enterprises and other organizations equally), includes a "waste fee" of between one and two Dinars, while larger accounts such as restaurants, hotels etc. are charged additional waste removal fees, sometimes amounting to several thousand Dinars a

year depending on a formula including surface area and various other factors. This allows GAM to cover over 60% of its waste management costs, a level considered to be very high in the region.

GAM has a community recycling pilot project in an area near Marka, where residents are asked to sort their waste into dry and wet waste in two different colored bags, which the municipality then collects separately. While the success of this project has yet to be assessed, a second such pilot project is under way in the area of Dahiyet al-Hussein. The Head of the Department of Environment and Public Sanitation admits that while GAM is actively trying to promote recycling, there is no clear policy or vision within GAM about how to best address the issue, where to start etc. The future of municipal recycling appears to depend on the outcomes of a major study currently under way, which will lay out the plan for solid waste management in Amman for the next 15 years.

Private Sector

While the private sector is heavily involved in many aspects of waste management outside Amman (e.g. several cities and UNRWA-run refugee camps in the north have private waste contractors), the core services inside Greater Amman are provided by GAM itself. However, private waste management companies do operate in Amman as contractors to remove waste from large producers such as malls, shopping centers, hotels, and similar entities. The services provided usually include no more than provision of containers, removal and disposal. Two examples of such large producers are COZMO supermarket and City Mall. Urban sanitation and waste removal inside Amman are completely under GAM, except in some isolated cases when GAM is not able to cover a certain area of its network due to a shortage of labor or equipment. In these cases a company will be appointed to cover this area until the shortage is resolved. As mentioned above, there are plans to privatize elements of Amman's waste management, but no results have been published till now.

2.4.2 Actors in the Formal Waste Stream of Aqaba

Aqaba Special Economic Zone Authority (ASEZA)

The Aqaba Special Economic Zone (ASEZ) is governed by ASEZA, commonly known in Aqaba as *al-Mufawwadiyyeh*. Of the five commissioners under the Chief Commissioner, one is solely responsible for the environment, including environmental policies and licensing, health control and marine protection. Similar to the Ministry of Environment in Amman, this section of ASEZA sets the standards for waste management and ensures these standards are met. Solid waste management and street sanitation has been tendered out to a private contractor called Clean City, which is overseen by ASEZA. Clean City is responsible for cleaning and maintaining Aqaba's public parks and beaches, and the management of the landfills. ASEZA is responsible for the removal of hazardous wastes (much like the Ministry of Environment); they are transported to the hazardous waste disposal site in Sawaqa.

ASEZA's Cleaning Department is responsible for the South beach, new residential areas not included in the contract with Clean City (such as Karameh) and the two waste removal accounts in the south - the Mövenpick Tala Bay Hotel and the Phosphate Company. For that, the department has 20 workers, two supervisors and two waste compactors. The Public Parks Department cleans and maintains the 4 major parks and smaller roundabouts and fountains with 85 workers, 20 supervisors and 20 technicians.

Clean City

Clean City, part of Nasser Investment Group Holding, is the private contractor that responsible for Aqaba's waste management services and has managed its solid waste since March 2008. Before 2008 this was done by ASEZA.

2.4.3 Current Waste Management System in Amman

A) SANITATION WORKERS

Workers and Supervisors

There are currently around 4000 sanitation staff working all around Greater Amman. Depending on the area, a team of about 20 sanitation workers work under the management of one street supervisor. The supervisor's duties include ensuring the workers are on task and in their assigned area, checking that the GAM garbage trucks are completing their rounds efficiently, and generally making sure the areas they are in charge of are properly maintained. A street supervisor can also move the sanitation workers around inside their area or to other areas if there are trouble spots. All the workers reported that their supervisors pass by at least once a day to check up on their work.

Shift System

The sanitation workers are divided into three shifts: A (6am - 3pm), B (2pm - 11pm) and C (10pm - 7am), with an average distribution of workers across the three shifts of 60%, 30% and 10% respectively. Most of the street cleaning work is done in shift A, while shift B concentrates mostly on the main streets and shift C usually consists of a supervisor with a few sanitation workers in a pickup looking for "trouble spots".

In theory, an average A shift would proceed as follows. The first two hours go to cleaning the main street and placing all waste into the bins. In the middle two hours the sanitation workers move to the side streets and residential neighborhoods with a focus on cleaning sidewalks and areas close to buildings and clearing them of trash bags. The A shift's final two hours usually see the sanitation workers heading back to the main streets before their shift ends. On major commercial streets like Garden Street, sanitation workers generally stay on a part of the main street for the duration of their shift rather than moving to side streets. The GAM garbage truck is supposed to come and empty the bins when the sanitation staff move back to the main street, by which the time they are supposed to have cleaned the side streets and residential areas and placed as much of the waste into the bins as possible. In practice, operations occur much more fluidly than the system suggests, and the street supervisors have the authority to modify tasks if issues arise. Entity Green's research has shown that issues seem to occur quite often, especially maintenance issues with garbage trucks, which result in a truck route being interrupted.

Nature of Work

For the sanitation workers, their job primarily consists of removing waste, dirt and debris from the streets and sidewalks they have been assigned to, including trash bags from residents and shops, and placing it in the nearest bin. This includes tree leaves, plant clippings, construction waste and any other debris that is not supposed to be present in the street. Most sanitation workers seemed to have carts, though some did not, but Entity Green could not determine a clear system with regard to this - a street supervisor simply commented: "it depends on the street."

Street supervisors commented that street cleanliness depends mostly on two factors: the residents and the sanitation worker. Sometimes two streets of equal characteristics would need one or two sanitation workers, depending on the cleanliness and cooperation of residents. On the other hand, an active and motivated worker can make all the difference. Interestingly, one supervisor commented that the cleanest street under his supervision is maintained by a sanitation worker who is a very active reclaimer.

Complaints from sanitation workers typically focused on external factors of the work more than the nature of the work itself. Workers expressed concerns about factors that increase workload, cases of abuse, residents' non-

cooperation, cats and reclaimers. Workers stated that many residents do not put their waste out at proper times (i.e. in the morning before the garbage truck comes), but rather at night, when cats often tear the bags and spread the contents before the worker starts his shift. Another problem with the residents is that many put their trash in small bags that are hard to manage or not in bags at all, which forces the worker to sweep and walk to the dumpster many times.

There were a few reports of physical violence against sanitation workers, either from residents and shopkeepers or from reclaimers. In general, sanitation workers seem to feel marginalized, disrespected and uncared for. Many commented that GAM does not give them proper pay or proper equipment (not even gloves). They also commented that many supervisors often deducted pay because of minor issues, causing great distress on the part of the sanitation workers.

Interaction with Reclaimers

Most of the sanitation workers stated that reclaimers are a key issue making their work difficult because they do not work neatly and spread garbage around where they work. Many sanitation workers try to avoid reclaimers because of fear of confrontations. Some have at least once told the reclaimers to leave the area clean or move away, after which some ended up getting into physical fights with the reclaimers because of what they described as the reclaimer's "hostile attitude".

Street supervisors on the other hand commented that they depend on reclaimers to remove bulk waste items from in and around the bins before the garbage trucks make their rounds. Without this work by reclaimers, GAM would have to call a special GAM truck for bulky items.

Reclaiming Activity

When the sanitation workers were asked about reports of "other" sanitation workers also collecting recyclables, most said that they did not collect themselves but knew of others who do. Some hinted that they did reclaim before GAM officially prohibited reclaiming, while most agreed that since then the risk of getting pay deducted for collecting is too high. However, the researchers' observations suggest that many sanitation workers do indeed reclaim recyclables, as was made evident by a small array of different bags for different materials, hanging in- and outside many sanitation workers' carts. This was confirmed in an interview with a street supervisor, who claimed that almost every sanitation worker collects recyclables and sells them periodically. He further stated that unless reclaiming activity interferes with the main job of cleaning the streets, most supervisors benevolently turned a blind eye to the activity. One top level GAM director shared the same opinion, while mentioning that GAM would still need to keep the general rule of prohibiting it, because otherwise it would likely get out of hand.

One street supervisor called the last half-hour of his shift the "magical hour", when all the sanitation workers would disappear to sort their materials and subsequently hide them until they can arrange for them to be picked up.

It appears that materials reclaimed by GAM workers are either sold to certain mobile traders who specifically know reclaiming GAM workers or transported by cooperative GAM truck drivers to places of sale. Some supervisors appear to accept money from sanitation workers in order to overlook their reclaiming activity. This same system was also reported with regard to supervisors overlooking absences. One sanitation worker even said that he and his colleagues used to pay their previous supervisor not to pass by at all during their shift, so that they could work as they pleased without his interference.

Special Occasions

For special occasions and large events GAM brings sanitation workers and supervisors from many districts and concentrates them around the area of the event. This often entails overtime for several days and work on holidays until the event area returns to business as usual. For this, the employees are usually given "rewards" rather than overtime, which, according to a street supervisor, is often more than what they would get as overtime. He also pointed out that the rewards are given to the superiors, who often fail to distribute them equally and fairly. In the case that the Royal family or His Majesty himself were involved in the event, the rewards come from the Royal Court, not GAM.

B) TRANSPORT & TRANSFER

Waste is generally deposited into the large municipal dumpsters. These were introduced in the second half of the 1990s. Before this there appears to have been a mixture of individual smaller wheeled bins for each house, and large, black waste bags provided free of charge by GAM, but once these became available in shops, they were no longer provided for free. The large 1000-liter metal bins are the cause of a number of problems, especially related to their weight (restricting mobility), and to their fire-resistance. Because of the latter, they often become a location for citizens to burn their green waste in. Unfortunately it is not only green waste that gets burned in dumpsters; burning bins is not an un-frequent sight in Amman and certainly poses a problem, even to GAM, despite reducing the quantities of waste to be transported.

Within the last two years, GAM has switched part of the old metal dumpsters with new, slightly smaller 750 L green plastic bins. These are lighter, easier to handle and cheaper - but pose a much greater fire risk, should the practice of burning waste in bins continue. Some areas do still have small 120 L bins for each home or building, which are either emptied into the large bins by the house owners or a guard, or are emptied directly by the GAM trucks.

Waste that is disposed into the dumpsters by citizens and/or sanitation staff gets picked up daily (in main streets up to three times per day) by GAM's waste trucks, which compact it and transport it to a transfer station inside Amman. Although officially there are three such stations – Yarmuk, Ein Al-Ghazal and Shaa'er – effectively, Shaa'er is taking the vast majority of the waste (>90%), with a small quantity still going to Ein Al-Ghazal and very few areas' waste going directly to the Ghabawi landfill (Uhud, Mwaggar and Sahab). Shaa'er transfer station operates 24 hours, with cars going to Ghabawi 16 hours per day. At the transfer station, the waste gets emptied out of the compactors either into large, open trucks covered by a tarpaulin or compacted into closed 50m³ containers.

Quantities and weights vary throughout the week and the year. In general, less waste gets to the transfer station on holidays, because 50% of GAM workers and trucks are off. In the winter the volume of waste is less than in the summer, but its weight is more compared to the summer because of rain soaking the waste in the open dumpsters.

C) DISPOSAL

All waste from Amman is dumped in the Ghabawi landfill East of Amman, between Zarqa and Sahab. It receives about 2,500 tons of waste per day from Amman and surrounding cities such as Rusayfah, Marka and Zarqa. It is Jordan's largest and only "sanitary" landfill. "Sanitary" implies the daily practice of compacting the waste and covering it with earth, as well as leachate treatment. The latter is only present in rudimentary and mostly dysfunctional form and urgently needs updating - leachate is pumped out from underneath the landfill, and then transferred into ponds for biological treatment through aeration. These aeration devices are currently not functional, and the treatment is more a case of evaporation and possibly leakage.

Unlike most other landfills around Jordan, Ghabawi - the biggest of all - does not have an official contractor removing recyclables. Other landfills have official contracts with informal recyclers, who pay up to 66,000 JD a year, which is the case of Madaba's landfill. However, since early 2010 there are an increasing number of illegal and unofficial waste reclaimers working inside the Ghabawi landfill, picking out plastics and metals mostly, in very unsafe, unhealthy and dangerous work conditions amongst unloading trucks, compacting front-loaders and mountains of waste.

2.4.4 Current Waste Management System in Aqaba

A) **SANITATION WORKERS**

Workers and Supervisors

Compared to the vast operation of GAM's sanitation work in Amman, Clean City, Aqaba's private sanitation and waste contractor has a more compact operation. The 320 sanitation workers are managed by 30 street supervisors, who make sure the work is done correctly by frequently passing by unannounced, being in contact with their workers via phone and in some cases controlling their work schedule meticulously. The much stricter supervision of Aqaba compared to Amman became particularly apparent when Clean City sanitation staff either refused to answer the questionnaires at all, broke off after the first few questions, or asked Entity Green staff to walk with them while doing the questionnaire. The argument was: "if my supervisor sees me sitting by the side of the road, I'll get in trouble."

Shift System

Similar to GAM's staff in Amman, Clean City's sanitation workers operate in 3 shifts, with the A shift focusing on all areas of the city, residential and commercial, as well as on several villages around Aqaba, the B shift focusing on all commercial areas and the C shift only on the commercial areas in the city centre.

Workers spent their whole shift in the area they have been allocated to, which usually remains the same for several months, but all report occasionally being placed in different areas. The least favorite areas to be placed were the vegetable market area (*souq al-kebdr*) and Tarbiyah.

When asked about their interactions with residents or shop-owners, most replied that there was little interaction. At the same time it became apparent that if they were based in the same area for a long time, building relationships with upstream actors – at least on a "hello-goodbye" basis – generally paid off, as it would subsequently yield them more respect and more cooperation.

A Clean City sanitation worker: "I used to work in Mohandes area, where I knew people who I would occasionally talk to and pass some time with. In this area I know nobody and nobody talks to me, so I just walk by myself all day and the shift becomes awfully long."

Nature of Work

In general, all sanitation workers are male, and most are from the Sa'eed area in the south of Egypt. Supervisors are both Egyptian and Jordanian. One 31-year old sanitation worker said he preferred the Jordanian supervisors, as they are less strict. Unlike their colleagues in GAM, all workers are equipped with a cart, a shovel, a brush, gloves and the green Clean City uniform. New gloves are provided once every month. While workers showed no dissatisfaction with regard to their equipment, one worker said he would like to be provided with a particle mask.

Complaints from Aqaba's sanitation workers focused around low wages and very limited holiday allowance (11 days per year). Complaints with regard to work routine were similar to Amman, e.g. about residents not putting their waste into bags or not into the dumpsters. One suggestion was for residents to sweep their patios before they flood them (a common practice for cleaning patios or tiled areas in front of the house), to prevent all the leaves, waste etc. to be flooded onto the street.

One Clean City worker in Aqaba, when asked who litters the most in his area, responded: "Let me think... can I say: 'the tree'?"

Interaction with Reclaimers

Reclaiming is completely forbidden for Clean City sanitation staff and unlike in Amman, Entity Green has found no evidence that this rule is not being adhered to. Most Clean City staff interviewed stated that they have no interaction with reclaimers at all, except for occasionally asking them not to leave a mess behind. One 54-year old worker mentioned that he considered Egyptian reclaimers to leave less of a mess behind than their Jordanian counterparts.

Reclaiming Activity

There was no evidence for any form of reclaiming or collecting on the side of the sanitation workers. One 31-year old worker even reported once having found a mobile phone in the waste and having diligently turned it in to his supervisor.

However, an important aspect to mention is that Clean City does itself do a certain level of recycling: since as recently as three to four months ago, Clean City started asking their sanitation staff to separate cardboard boxes from the rest of the waste and not to throw them into the dumpsters. Instead, they are flattened and stored beside the dumpsters, while in certain very commercial areas or in front of certain malls or shopping complexes, large containers are even provided for collecting carton. A special compactor then passes around once a day and collects this. Unfortunately Entity Green was not able to determine what precisely happens to this carton – where it gets sold to or whether it gets processed beforehand, nor what the initial motivation was to do this and why it was started so late into the existing contract.

B) TRANSPORT & TRANSFER

Clean City picks up the waste from the large metal dumpsters throughout Aqaba. There are 28 drivers for the garbage trucks, who transport the waste to the landfill. 17 vehicles for transport of waste are rented from ASEZA, while two compactors belong to Clean City itself. As the city is much smaller than Amman, there is no transfer station and all garbage trucks go straight to the landfill once full, to unload there.

C) DISPOSAL

Aqaba has two landfills, one for construction waste and one for municipal waste, neither of which are sanitary. Unlike the Ghabawi landfill, Aqaba's municipal waste landfill has an official recycling contractor, who pays an annual fee for removing recyclables from inside the landfill.

Unfortunately, no data on quantities of recyclables diverted is available.

2.4.5 Future Plans and Projects

GAM has received a large grant from the World Bank over 40 Million US\$ to improve the solid waste management of Amman. The first stage (a detailed study looking at various options for improvement) is on its way and is expected to be completed by early 2011. This study will then determine the implementation of institutional changes and infrastructure investments. The current plans include the construction of a new landfill cell in Ghabawi landfill (Cell No.3), a landfill gas extraction facility for Cells No.1 & 2, leachate treatment for all cells at Ghabawi and two new transfer stations to reduce the pressure on Shaa'er station.

No information on future plans are available for Aqaba. The Clean City contract will be re-tendered in 2011. Entity Green has heard from various sources inside ASEZA that there is a desire to include a recycling component into this next contract, but no details were available.

2.4.6 Observations

Although GAM has many (positives) like maintaining Amman generally clean (cleaner than many other cities) and getting most of their money back from taxes (60% recovery), there are still many issues that GAM faces at all levels. Aside from lower end issues reported above, like the sanitation workers complaining about lack of proper tools and abuse from supervisors, issues arise at every level going up the managerial ladder.

A common theme is that *wasta* and tribal ties interfere greatly with decisions taken by GAM, especially relating to employment and positioning. One mid level interviewee stated that people end up in positions that don't suit them; he said, "Someone with a degree in agriculture would end up being in charge of the garbage trucks. When a truck driver wants the day off he will remove a part from the truck and tell his supervisors that it is not working" and the truck driver will get his day off. He stated that these kinds of problems are very common and that bigger problems like mismanagement and bad planning occur because of unqualified employees. Another GAM employee also indicated that tribal and family ties have a large effect on how things are run, he said that he specifically has his current job (in the area of choice) because of a relative higher up.

Aside from just family ties, personal vendettas and relationships also affect the workings in many levels. A street supervisor had commented that rewards and bonuses are not distributed fairly because whoever is in charge picks people that he likes.

Other corruption issues also span all levels; garbage truck drivers have been said to take extra money from certain people/organizations like hotels or certain commercial shops to make sure he always hauls their garbage away without delay. Certain areas are talked about as being "more important" because certain "important" people live in those areas or pass through certain streets. These areas have been said to have stricter supervision. Also there was mention of "masked unemployment" as a drain on GAM's finances.

Other problems involving finances and mismanagement include the overburdening of all available garbage trucks for all areas in shift A, without backup trucks or plans. This causes frequent "breaking" of routes. If one garbage truck needs maintenance, it becomes very hard for all the people involved (from the street sanitation worker to the transfer station personnel) to deal with the problem, and the specific route that the truck takes is many times left until shift B.

Upper level issues may have the biggest effect on how GAM is operating. Interviewees at all levels mentioned problems arising from the top levels. One top level GAM manager stated that lack of a clear plan or vision is a major problem for GAM, usually intertwined with upper level persons' lack of ability to make concrete decisions because they fear being liable. Another GAM employee stated that top-level managers make decisions without knowing the real facts about what is happening "on the ground" and thus cause great inefficiency within the system.

One major piece of information gathered from a lower level supervisor is that there is talk of an American company taking over the sanitation responsibilities of GAM; the interviewee said many GAM employees are now afraid of major change and specifically the potential of losing their jobs. An upper level director did not mention a private company as something in the works, but did indicate that GAM must think of how to deal with reclaimers if a private company was to take over the sanitation work, saying "if the reclaimers are taking materials that this company would otherwise be benefiting from, then the company would start problems with GAM because they would technically have bought the trash from GAM."

3.0 RECOMMENDATIONS AND ANALYSIS

3.1 Awareness Campaign Targeting Public Jordanian Environmental Concern

This study found that there were high levels of awareness and concern about issues such as littering and recycling. Individuals from the public exit interviews and the residential interviews consistently voiced willingness to take action on environmental issues in Jordan. However, the vast majority of these same individuals believed that the larger public was not willing to make even slight adjustments to their waste disposal practices. Many stated that the Jordanian public was not ready to make a positive impact on the environment. This perceived lack of concern amongst the broader public was cited as one of the principal reasons that people were not taking action on an individual scale. Paradoxically, this study suggests that the vast majority of people would support such activity.

Research revealed that this paradox is actually a widely studied phenomenon in the field of social psychology, relating to "perceived norms" and "pluralistic ignorance" (Miller and McFarland, 1987). There are other intensely studied examples of people who privately disdain and publicly condone a behavior because they believe that acting otherwise would put them in a minority. Previous studies suggest that in cases where perceived norms differ greatly from reality, awareness campaigns offering more realistic representations of a community's attitudes and practices can be effective at modifying behavior (Berkowitz, 2004).

To apply these lessons here, Jordanian attitudes on environmental issues must be confirmed through quantitative research. This is an essential step, because earlier marketing campaigns based on normative awareness have found that trustworthy and comprehensive statistical information must be present for a campaign to be influential. Nationwide samples would need to be polled about their opinions on littering and their willingness to participate in community beautification and recycling programs. If these results are consistent with the qualitative research performed in this study, these results can be incorporated into a public awareness campaign. Such a campaign would emphasize the high percentage of Jordanians who have concerns about the environment and environmental stewardship.

This would be accompanied by an effort to publicize efforts by individuals who are already taking positive action in their community. Promoting such work would provide positive examples to individuals who would otherwise practice or condone environmentally destructive behaviors.

3.2 Support Existing Community Projects and Encourage New Ones

This research suggests that the programs currently having the highest levels of social and environmental impact are small scale and community driven. Although they are not having sweeping effects on public attitudes and practices, they are having deeply transformative effects on the small areas where they are based. They are also inexpensive and locally sustained by individual actors.

It would be our recommendation that we continue to study the individual doers located through this research in order to more fully understand why their projects have had success, and how they can be improved. Concentrating these administrative mechanisms, rewards programs, financing, and sustainability would provide the PAP with models that can be systematically documented.

Once the PAP has an understanding of successful models, they can be made available for replication by other citizens interested in having community projects. Because they would be implemented on the community level, they would be small and manageable. Projects would only be started when individuals from a community wanted to take responsibility and ownership of a community improvement project. This would ensure that projects would only occur when there was existing public support, and would not be solely based on pressure or initiatives from above. A variety of different models could be made available by the PAP, varying in degree of commitment and scale. Examples could be as simple as designing and placing a pro-cleanliness sign in key location, to administering and monitoring a full-scale green community beautification project.

Umm Mu'adh's community-building efforts in Tabarbour are an example of a small-scale model, which seems to function based on simple shared values and individual relationships and almost no external support or funding. When asked about the factors that made the project continue to succeed, she pointed out that everyone in the neighborhood owns their house and so they have a vested interest in keeping the area clean. She has future projects in mind and understands the dynamics of the community and the barriers to change. As an example, she mentioned an idea for a community playground that she discarded because she believed that too many neighborhood children would gather, because it would be the first playground in the area. Such minor details could easily have escaped the notice of an external planner, even at the municipality level. Local actors have the best information on their communities and are best suited to implement and sustain projects on the local level.

3.3 Community Recycling Bank

This study points to community based programs to most effectively address environmental and beautification issues. They are also the best opportunity for household-level recycling and sorting. In fact, there are already existing community level programs, and although they are small in number and size, they can easily be integrated into a larger model. In Tabarbour, families participating in Umm Mu'adh's community project are already being asked to separate waste into recyclable categories and there are high levels of participation. Currently there is no material reward for participating in the recycling, and it is only done to help ensure that separated items do not enter into the municipal waste stream.

Community based recycling could be used as income generators to support other aspects of the programs. Much like in Umm Mu'adh's program, recyclables would be separated on the household level. However, instead of being delivered to the dumpsters along with other household waste, they would be stored at a community recycling bank. This bank could be as simple as a storage shed that would be used to keep recyclable materials. Recyclables that have been separated and stored can then be sold to waste reclaimers or scrap traders already working in the area. In turn for access to the pre-sorted recycled materials, reclaimers would be asked to comply with standards when they work inside that particular community. Standards would include cleanliness when working with dumpsters. Proceeds from these sales would be used to fund other aspects of the community projects.

In communities without larger programs, recycling banks could be set up independently. Instead of supporting other programs, individuals that bring recycled materials would have private accounts, and could accumulate a cash or point credit balance over time.

4.0 CONCLUSION

Although this study has a wide scope and covers a variety of very specific, loosely related topics, a few consistent trends have emerged that are relevant across all aspects of Jordan's waste stream. These trends help to illustrate the drivers of behavior and attitudes regarding waste and environmental stewardship and highlight some of the recommendations given earlier.

Ownership

Perhaps the most basic and important driver centers on the concept of ownership. There can be no doubt that Jordanians take great care of places and things that they feel ownership over. This was powerfully illustrated by the uniformly immaculate condition of all Jordanian households visited in the course of this survey. While participating in questionnaires, some residents were asked about the probability of them littering in different situations. While they typically said that they were never likely to litter, hypotheticals about places where they were likely to have a strong sense of ownership (houses and yards) were met with shock, dismissive laughter, and incredulity. Possessions were regarded as precious, and given diligent care. But paradoxically, many Jordanians are perfectly willing to throw waste in the areas immediately surrounding their land, where it will accumulate, rot, and eventually be burned in toxic fires. Ownership, it seems, often ends at the front door of one's house, and public areas are treated with abuse and neglect. Any program hoping to affect behavior must tap into this sentiment, and the precedent for expanding the Jordanian sense of ownership already exists in the small but numerous examples found during this study.

The one factor that was consistently seen to influence stewardship was a strong sense of community and familiarity. Examples included the sanitation worker, who was happier and more effective when he knew the residents of the area in which he worked. Umm Mu'adh was another example, whose magnetic personality helped her build relationships with her neighbors and influenced them to start a community stewardship program. By building relationships outside the typical networks of family, these individuals have been able to make others feel responsible for new places and thus expanded the boundaries of ownership.

Perceptions of waste

Beyond issues of ownership, another disconnection that became obvious was between the concepts of "dirtiness" or "littering" and the omnipresent cigarette butts, coffee cups, pieces of packaging, sandwich wrappers, crisp bags etc. All of these could be spread around an individual in ample quantities in a public park, without him or her perceiving the place as "dirty", or be thrown out of a car window without that being perceived as "littering." Illustrative examples of this were presented in section 4.7, where people seemed even physically unaware of waste. Besides being unaware of waste, they seemed to have very little knowledge of the possible uses or values of waste, apart from the people with knowledge of reclaiming who understood items had monetary value.

Recycling vs. *khorda*

There appears to be an underlying disconnection between "recycling" (translated into Arabic as *i'adat at-tadweer*) and "*khorda* business" – the former seems to be perceived mostly as a Western concept related to environmentally friendly practices, that is known through documentaries about e.g. Japan or Germany, while the latter is simply a relatively lowly form of business that holds little prestige, but is at the same time perceived as profitable. Two Egyptian reclaimers in Aqaba, for example, had absolutely no understanding of the processes that happens to the cans they collected after they sold them. They were only aware that they collected aluminum cans that others threw away in order to sell them. On a wider point, it was noticed that in all interviews conducted with reclaimers during this survey, only one single person – Ghadeer from Jabal An-Nadheef – was aware of reclaiming as having a positive impact on the environment. All others simply regarded it as a way of generating income, supporting their family, as an occupation like any other, or at the very bottom: as a way to survive. As soon as the words "recycling" or "environment" dropped into a conversation, the topic was not perceived as something connected to the

local *keborda* business. Rather it was seen as something modern and advanced, as if it were a concept new to the Arab region that was being introduced by Westerners.

General awareness

While students are taught in school that the environment is an issue of great significance and of a certain immediacy, they have little background information and awareness, neither of the reasons why it is so significant and immediate, nor of the global and local connections. Answers to questions such as: “What are the causes of the global environmental crisis? How does it affect me and my region? What can I do about it?” etc. don't seem to be widely available. Again, the environment appears to be more of an abstract, possibly imported concept, rather than having direct links to local, daily life. Apart from misconceptions and lack of awareness about environmental practices in general, there are also misconceptions about the most nearby actors in the waste-stream. Since so little is known about the common practices of Jordan’s waste management system, there is little societal incentive to take positive actions for the environment. If, due to the apparent disconnect between theory and practice, citizens cannot understand how environmental issues apply to them, they will be unlikely to act on them and to know how to act appropriately.

Environmental awareness is a socially appropriate attitude because it is taught in schools and conveyed through the media, but it is a concept that has not taken root in the Jordanian consciousness. Much more engrained are ideas of proper conduct and cleanliness, as in Arab and Islamic cultures.

These themes can be more broadly understood as providing Jordan with context that makes environmental stewardship relevant. The people who have been able to effectively bring change have not done so by citing global themes about waste and environmental protection. Instead, issues must be addressed on a local level, using culturally appropriate premises.

5.0 ANNEXES

5.1 Annex A: List of Interviews

Residential Interviews

Amman - 46 interviews performed in Sweifieh, Rabia, Dahiat al Hussein, Jabal Amman, Jabal al-Jofa, Deir Ghbar, Khalda, Tabarbour, Tila' Al-Ali and Shafa Badran

Aqaba - 61 interviews were performed in the third, fifth, sixth, seventh and tenth districts, Manarah, Rimal, Mahdood, Alamiyah, Shalal, Balad Al-Qadeem, Al-Khazzan, and Salah Ad-Deen.

Public Exit Interviews

Amman - 37 interviews performed in Rainbow Street, Wakalat Street, King Hussein Park, and the Tabarbour Park

Aqaba - 20 interviews performed in Al-Hammamat Al-Tunisiyeh, Darb Street, and South Beach

Waste Reclaimer Interviews

Amman - 27 interviews performed in Sweifieh, Abdoun, Jabal Hussein, Wadi Al-Seer, Al-Bayader, Jabal Al-Nuzha, Khalda, and Downtown

Aqaba - 9 interviews performed across neighborhoods with separate socio-economic demographics, but largely centered on industrial parks

Khorda Trader Interviews

Amman - 11 Interviews performed with traders of various specialization and size in Sahab, Zarqa, Rusayfah, Downtown, and Wadi Al-Seer

Aqaba - 4 Interviews performed with large traders and mobile/small commercial traders

Authority Interviews

Amman - Interviews performed with a high-level official of the Ministry of Environment's Hazardous Substances & Waste Management Directorate, a high-level official of GAM's Solid Waste Management Department, a GAM Transfer Station Manager, a manager of the World Bank Solid Waste Management Project, two street supervisors, and 9 GAM Sanitation Workers

Aqaba - Interviews performed with a high-level official of ASEZA's Chemical Safety and Occupational Hygiene Division, a mid-level official of ASEZA's Cleaning Department, an ASEZA employee in the Department responsible for evaluating Clean City, and a mid-level manager in Clean City

5.2 Annex B: Bibliography

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Internet Resources

<http://siteresources.worldbank.org/INTUSWM/Resources/463617-1190232794490/MedinaWastePickers.pdf>

http://www.metap-solidwaste.org/fileadmin/documents/country_data/SWM_Jordan_A4.pdf

http://www.metap-solidwaste.org/fileadmin/documents/Country_data/Country_Report/JordancountryrepFinal_150104_.pdf

<http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=315130&menuPK=315162&Projectid=P104960>

<http://www.eng-forum.com/.../Solid%20Waste%20Management%20in%20Amman.ppt>

http://www.csbe.org/urban_crossroads/urban_crossroads63/where_should_garbage_go.htm

http://www.csbe.org/urban_crossroads/urban_crossroads98/solid_waste_management.htm