



Management of World Heritage Sites
Urban Regeneration Project for Historic Cairo

Solid Waste Management Component



Environics, Consultant

Final Report

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Project Team

- | | |
|-----------------------|---|
| 1. Anwar Sarwat | Project Manager
Environmental Management
Consultant |
| 2. Samah Shaalan | Project Advisor
Environmental Management
Consultant |
| 3. Shoukry Hussein | Principal Investigator
Institutional Development
Consultant |
| 4. Abdallah El Etreby | Solid Waste Management
Consultant |
| 5. Asmaa El Hakim | Community Development
Consultant |
| 6. Ahmed Okasha | SPSS Specialist |
| 7. Mostafa Gouda | GIS and Remote Sensing Specialist |

1. Introduction

1.1 Background

The Urban Regeneration Project for Historic Cairo (URHC project) aims at preparing the planning and management tools necessary for the conservation of the heritage values of Historic Cairo, together with its socio-economic revitalization and environmental upgrading.

In the present phase of the project a pilot field study is requested in order to provide the URHC project with a vision of the Solid Waste Management (SWM) in a selected area through a comprehensive approach. This would highlight the weaknesses and strengths of the current SWM and propose a first outline for a strategy that addresses waste accumulation and pollution in Historic Cairo.

The UNESCO has selected Environics to perform the requested studies aiming at serving the above-mentioned objectives.

The present report presents the collected baseline data, mainly obtained through interviews with stakeholders and field investigations and complemented through relevant reports and literature, as well as the related findings, which have been utilized to achieve these objectives.

1.2 Geographical Scope of the Study

Based on discussions with URHC project team, it was established that the scope of the SWM study would be the Action Project Area. In fact, the same Action Area investigated during the different components of the URHC project was kept in order to complement the information obtained through other studies with the SWM information and strategy and, hence, acquire an integrated vision of the different issues of the Action Area that could be converted in the future into an integrated Action Plan.

As for the criteria of selection of the Pilot Area where the survey took place, it was agreed that sampling would mainly focus on areas surveyed by URHC, with the possibility of extension to other areas if needed. In addition, Environics took the outcomes of the URHC GIS as a reference, for the distribution of the samples. The survey sample included 200 residents and 100 business owners and was chosen according to a set of criteria.

1.3 Objectives and Scope of Work

The main objectives of the assignment are to select a representative pilot field study and perform the required investigations aiming at achieving the following tasks:

- Provide the URHC project with a vision of the Solid Waste Management (SWM) in a selected area;
- highlight the weaknesses and strengths of the current SWM; and

- propose a first outline for a strategy that addresses waste accumulation and pollution in Historic Cairo.

In this respect, the following aspects have been covered:

- Literature review
- field surveys and walkthroughs;
- Preparation of survey forms;
- Meetings with secondary stakeholders, including:
 - URHC Project Team
 - Officials at Al Khalifa and Sayeda Zeinab Districts
 - Officials at Cairo Cleaning and Beautification Authority (CCBA)
 - Meeting with Head of Historic Cairo Project at the Ministry of Antiquities
 - Meeting with Consultant Dina Shohayeb
- Households' survey;
- Focus Group discussions and individual in-depth interviews;
- Business owners' survey;
- Data analysis;
- Preparation of SWM strategy.

1.4 Structure of the Report

The current report includes the following sections:

1. Introduction (this section), presenting the geographical scope and objectives of the study;
2. Approach, explaining the general study approach;
3. Methodology, clarifying the methodology used for data collection and analysis as well as constraints;
4. Local Context, presenting the main features of the study area;
5. Stakeholders Mapping, presenting the different project stakeholders;
6. Findings and Data Analysis, presenting an analysis of collected data highlighting the current SWM system with its positive and negative aspects, examining the current impacts and potential threats on the study area, as well as the main area constraints and sensitivities that could affect project implementation; and
7. Proposed Solid Waste Strategy, dealing with the proposed SW strategy to be implemented in Historic Cairo, based on the results of meetings with stakeholders and findings of the households' and business owners' survey.
8. References, includes the utilized references.

2. General Approach

Over the past decades, donors have agreed with decision-makers and local stakeholders on the importance of providing technical support and preliminary studies for projects aiming at improving the environment, including those being implemented in urban areas.

Previous experience with operators in the field of collection and disposal of solid waste has shown that they face significant challenges due to their lack of knowledge concerning feasibility studies and on-going programs and plans, which led to the suspension of many local activities.

Moreover, according to the official development strategy, the privatization of solid waste services is fundamental to overall government plans for the rehabilitation of areas of historical Cairo. However, the objectives of the rehabilitation plans tend to favor business interests while threatening the interests of the local population (Fahmi, 2005)¹.

Therefore, the team has adopted a pragmatic approach, designed for the present task, based on the implementation of basic principles aiming at ensuring the effective participation of local stakeholders in the project. The team took into account the privacy and credibility of the participants, with commitment to honesty in dealing with local stakeholders and recorded the results of field investigations with accuracy and reliability. In light of this, the team followed a set of steps based on:

- Ensuring a diverse representation of all segments of society in the study sample to include a representation of the geographic areas in the study area.
- Ensuring the effective participation of the beneficiaries and encouraging them to participate without unnecessary pressure.
- Team work to clarify the objectives of the mission and methods of work with participants.
- A commitment to honesty, integrity and transparency concerning the implementation of the task in a balanced and unbiased way.

This approach depends on the implementation of a set of basic principles that guarantee the effective participation of the participants in the project, taking into account privacy and credibility of the parties involved.

Moreover, continuous and iterative interaction and cooperation between Envionics team and the URHC project team has been maintained along the assignment to ensure a fruitful cooperation and an effective flow and exchange of information.

¹ Fahmi, W.S. (2005). The impact of privatization of solid waste management on the Zabaleen garbage collectors of Cairo. *Environment & Urbanization*, Vol. 2, pp 155-170.

3. Methodology

By understanding how to implement the study the consultant has taken into account the following principles:

- **Community based.** Community based programs are more successful than individually focused program. This is particularly relevant where the benefiting population is homogeneous or is dependent on the use of a common resource.
- **Participatory.** Project or program interventions that have been participatory not only during the design of the interventions but during implementation have shown to be more successful in their implementation and more sustainable in their impact. The transfer of knowledge from qualified technicians on both design and implementation has been facilitated by the participatory approach.
- **Demand driven.** Programs which are successful are ones that have responded to a demand expressed by the beneficiary population. Demand driven programs involve a population who live a common constraint and therefore are more responsive and willing to participate and take decisions.
- **Flexible and Accountable.** A major aspect of programs in SWM is the ability to respond to changing circumstances and allow flexibility in program implementation. Flexibility in resource utilization along with accountability are two very strong parameters that contribute to the project success.

According to the framework and objective of the assignment, the team focused on understanding the current status of solid waste management project of the study area (technical, financial, regulatory, legal, and environmental status) and worked to create a database of collected information, with a good understanding of the problems currently facing the study area and the obstacles facing solid waste management systems.

In the following an overview of the methodology utilized for secondary and primary data collection and analysis is presented. Data limitation is also made clear in a separate paragraph for justification.

3.1 Stakeholders' Identification

The initial identification of project stakeholders is usually based on an analysis of the institutional, legal and administrative framework of the project, in addition to the nature and location of the project and its potential impacts.

The stakeholders' identification process generally occurs early during the scoping phase of the project. However, stakeholder identification is a continuous process that is carried on during the subsequent phases of consultation and project development, as meetings provide further information for the stakeholder identification process. Accordingly, other stakeholders might be added or excluded, according to their effective role in the project.

3.2 Secondary Data Sources

Review of available secondary data, in addition to review of GIS maps of project area, aims at a better understanding of the local socio-economic and socio-cultural environment. Disaggregated statistical data provides a base for the description of the socio economic context in which the project operates. Relevant technical reports and studies conducted previously for other relevant development interventions in this area. Secondary data sources include, but are not limited to: CAPMAS data, maps and satellite images, official statistics and reports, relevant project material and technical reports, studies and academic reports on project area and/or local community.

3.2.1 Literature Review

Information and data on SWM in Cairo in general, and Historic Cairo in particular, were compiled from published material and reports. They assisted in highlighting the positive aspects and focusing on the constraints of the system and to determine the main expected challenges. Findings of the field surveys refined and supplemented data obtained from published information.

Moreover, URHC has provided a CD containing:

- Sector-studies of the UHRC project, including: the waste disposal management study, the environmental risks study, the socio-economic study, the community-oriented activity patterns, Living and Working in Historic Cairo, and the frozen assets study;
- Socio-economic profile of the Action Project area;
- CAPMAS Cad map; and
- Satellite image of Historic Cairo.

These documents have been reviewed and analyzed and relevant information will were used to complement the SWM study.

3.2.2 Topographic Maps and Satellite Images

Analysis of recent satellite images of the area, followed by field verification, was carried out to get acquainted by the general environmental features of the study area, the main components of the landscape and assisted in delimiting the pilot project area.

In addition, the URHC scientific coordinator also asked Envionics to utilize the thematic maps produced by URHC for some of the Shyakhnas in the study area, which include information on buildings and streets/open spaces.

3.2.3 Meetings with Secondary Stakeholders

These are agencies, experts, interested parties and anyone able to influence the outcome of the development, because of their ability to contribute with their knowledge or ideas, or due to their influence on the development; in addition to those likely to be indirectly affected by the project. They include Central Government, line ministries, local government/authorities, implementing

agencies, project staff, active Civil Society Organizations (CSOs) and Non Governmental Organizations (NGOs), private sector firms, media, etc.

The list of interviewed officials includes:

- **Cairo Governorate**
 - Chairman of the Central Department of the Cairo General Authority for Cleaning and Beautification;
 - District Heads (Al Khalifa and Sayeda Zeinab);
 - Director of the Central Department for Monitoring and Assessment
 - Head of the South Cairo Area Branch, Cairo General Authority for Cleaning and Beautification;
 - Head of the Cleaning Branch – Al Khalifa District, and some supervisors and workers;
 - Head of the Cleaning Branch – Sayeda Zeinab District, and some supervisors and workers;
 - Head of the Monitoring Branch at Al Khalifa and Sayeda Zeinab Districts;
 - Contractors under contract with the General Authority for Cleaning and Beautification and with Al Khalifa and Sayeda Zeinab Districts.
- **General Authority for Antiquities**
 - Person in charge of Historic Cairo at the General Authority for Antiquities;
 - Areas / Shyakhass officials.

In addition, informal meetings with local garbage scavengers, "*nabbisha*", will be carried out whenever possible.

3.3 Primary Data Sources

Primary data builds on a number of activities. These include: field visits and walkthroughs in local community, Key Informant Interviews with key stakeholders and Focus Group Discussions with sensitive receptors in the local communities.

3.3.1 Field Visits and Walkthroughs

Walkthroughs in local community and project proposed area help better understand local socio-economic context by portraying the interactions between the physical environment and human activities over space and time. They were useful for identifying community's natural characteristics and gathering information. Walkthroughs also help in ensuring the representation of maximum geographical, resource and socio-economic variations in the community. In addition, walkthroughs and field observations enable identifying potential positive and negative impacts likely to occur during preparation and implementation in proposed project area, which may affect locals.

Photography is also used to enhance participatory methods and reflect community concerns and issues. In some places or situations, photos were not made possible because of social sensitivity or safety/security reasons.

Preliminary site visits have been performed on the 27th of January and the 2nd of February 2014 to become familiar with the project area and detect neighboring environmental and social constraints. As official permits had not been issued yet, and taking into account the suspicious behavior of people due to the country current unrest, the visits were carried out in the form of discrete walkthrough surveys. Neither interviews with primary stakeholders have been performed nor have photographs been taken. The walk-over survey was carried out in the following places:

- Al Hattaba
- Al Mahgar
- Darb Al Gamamiz
- Al Syoufeya Street
- Mohamed Ali Street
- Ibn Toulon Street

The households' survey has started on the 5th of March 2014, while the Business Owners' survey has started on the 31st of March, 2014. Results of site surveys are provided in Section 6 – Findings and Data Analysis.

3.3.2 Preparation and Testing of Survey Forms

Survey forms in the form of questionnaires have been designed and prepared in Arabic specifically for this assignment. A preliminary survey and informal meetings with some area residents and business owners have been carried out in order to prepare the forms. The following documents have been prepared:

- Households' Form
- Business owners' Form
- Guide for Focus Group Discussions – Residents
- Guide for Focus Group Discussions – Contractors
- Guide for Focus Group Discussions – Workers and Supervisors

The forms have been translated into English and sent to the URHC Project to obtain their feedback. The forms were reviewed and commented by the URHC Project and revised accordingly. Moreover, the residents' and business owner's forms were tested *in situ* on a limited number of residents and commercial/industrial activities and refined. Residents' and business owners' survey forms are presented in Annex A.

3.3.3 Training of Surveyors

The training was carried out on February 19, 2014. It included six surveyors who were briefly introduced to the project and its objectives. The form was presented and each question was explained. The training also aimed at unifying the concept and accordingly, the required modifications on the form were performed.

The team was also briefed on March 5, 2014 before the surveys start-up.

3.3.4 Key Informant Interviews

Quantitative data were obtained using survey forms. A sample of 200 households and 100 business owners, aiming at being representative of the community present within the Action Plan Area, has been surveyed.

3.3.5 Focus Group Discussions and In-depth Interviews

Five Focus Group Discussions were planned to be conducted after completion of the households' survey, as follows:

- Two Focus Groups for resident women;
- One Focus Group for garbage collection contractors;
- One Focus Group for workers of the Cleaning and Beautification Authority;
- One Focus Group for supervisors at the Cleaning and Beautification Authority.

In addition, individual in-depth interviews will be also carried out. Accordingly, interviews will be based on a mix of Focus Group discussions and individual in-depth interviews.

The Consultant also monitored the level of hygiene awareness among residents in general and the importance they give to monuments and archeological sites cleanliness and preservation, in particular.

3.4 Data Limitation and Constraints

Some secondary data available is outdated and/or projected and informal activities are not inventoried. Primary data collection for this report would not have been made possible without the collaboration of local officials and residents. They have provided all possible help and mobilization for primary data collection. However, primary data still implies limitations as time constraints have restricted the collection of extensive qualitative information.

Most time constraints are related to the time spent in order to issue the permits.

In fact, Environics needs official permits to carry out field surveys without problems in the study area. Therefore, The URHC Project has provided a presentation letter addressed to CAPMAS that indicates Environics as the project consultant. Accordingly, a request for permits for Environics team has been presented to CAPMAS on the 5th of February, 2014. A Decree from the Head of CAPMAS has been issued on February 13, 2014 (Decree 180 of 2014) and received by Environics on February 16, 2014.

According to Article 9 of the Decree, Environics should inform Cairo Security Directorate (CSG) and provide them with a copy of the permit and the list of surveyors. These documents were presented to CSG on February 20, 2014.

However, CSG contacted Envionics on February 23, 2014 and informed that the documents should be re-delivered to the Media and Relations Department of the Ministry of Interior in the form of a permit request, as an official security permit should be issued before undertaking any activity. The request has been presented on February 26, 2014. No reply has been received. Accordingly, field visits have been carried out based on the decree issued by CAPMAS.

3.5 Selection of the Pilot Project Area

During the meeting held on the 10th of February 2014, the URHC scientific coordinator suggested giving special attention to the areas surveyed by URHC in order to provide tangible results concerning the SWM system for a sample area (ex. tools, equipments, and spaces needed for SWM). Accordingly, it has been agreed that the sampling will mainly focus on areas surveyed by URHC, with the possibility of extension to other areas if needed.

Therefore, to define the Pilot Area, the following criteria have been adopted:

1. Population/building density
2. Areas including many partial-ruins, ruins and un-built plots
3. Types and concentration of activities (residential, residential/commercial, commercial, industrial) and concentration of markets
4. Type of solid waste service provided
5. The street typology

Based on the above, the Pilot Project Area was identified after applying these criteria on the different Shyakhahs of the Action Project Area. Additional areas were added based on field surveys, meeting with consultant Dina Shohayeb. The cemetery south of Arab Al Yassar, located outside the Action Plan Area, was included to the Focus Group Discussions / Individual In-depth Interviews activity, according to the URHC Project team's request.

3.6 Distribution of Samples

According to the meetings with CCBA officials and field investigations, it was found that there is a huge disparity in SW collection system, which can differ significantly from one place to another, as the service is regular in some areas, irregular in others and completely absent in some places.

To better investigate this disparity, the following was taken into account in distributing the samples in the selected Pilot Project Area:

- To cover every street, *hara* (lane) and *zoqaq* (alley) of the Shyakhah under survey;
- The number of samples for each street would be proportional to the street length and the number of buildings present in it.

3.7 Data Analysis

Literature and field information have been analyzed to obtain representative data on the study area, including current SW management system, its potentials and constraints, residents' and business owners' requests and complains, area sensitivities, current impacts and potential threats. Statistical data analysis on the collected information has been performed to assist in the preparation of the SWM strategy.

4. Local Context

4.1 Historic Cairo Area

Historic Cairo suffers from social, economic, physical and environmental degradation; its neighborhoods enjoy a number of assets, including historic buildings and an enterprising and diverse population.

The long term decline in the appearance of Historic Cairo continues, however, that quality of life in various aspects has either stabilized or improved in the last twenty years (illiteracy and unemployment).

Historic Cairo remains an attractive place for residents because of its proximity to the center of Cairo, access to transportation, access to services and low rents in comparison to new areas (popular areas/unplanned areas) where rent might be lower but transportation is costly and access to schools and other services is extremely bad. Unemployment rate in Historic Cairo over the last 20 years seems to have significantly decreased, at 4%, and could be a direct result of the increased commercial businesses that have increasingly popped up in places like Al Muski and Bab Al Sha'ria.

As more and more businesses have expanded into public space, streets have become places that are not pedestrian friendly. These intrusions have created an additional negative impact to the area that is becoming a conflict between residents and businesses in some places. Solid waste is widespread and requires urgent solutions (Zaghow, 2011)².

Concerning the problematic of solid waste management in Historic Cairo Debout (2012)³ reached the following conclusion: *“Regarding the urban conditions, Historic Cairo is a popular district characterized by a high urban density, which has important impact on waste generation. Even if people of the low or middle-income areas produced less waste, the high density and concentration of population in low-incomes areas leads to a higher waste production per km². Thus, the need for collection is most important in term of frequency and capacity. Secondly, the urban physical shape is also an obstacle to an easy waste collection operation. The narrow streets ask for specific equipments and increase consequently the cost of service provision. In addition, the narrowness of the streets leaves no space to locate the basic permanent equipment as street containers or transfer station”*.

4.2 Action Plan Area

The Action Plan Area is composed of Al Khalifa District, divided into 10 Shyakhnas and Sayeda Zeinab District that includes only one Shyakhna (Figure 1).

² Zaghow, S. (2011). Rehabilitation of Historic Cairo: Socio-economic Survey. Urban Regeneration Project for Historic Cairo, UNESCO.

³ Debout, L. (2012) Management of World Heritage Sites in Egypt: Preliminary Study on Waste Disposal Management in Historic Cairo. EVS UMR 5600 / University of Lyon II – France.

The Action Plan Area has been identified by the URHC project based on the following considerations (URHC, 2013)⁴:

- The presence of the Citadel, which is completely separated from the historic fabric, but a potential “hinge” between Historic Cairo and the metropolitan area;
- The presence of important “anchor” monuments – notably the Mosques of Ibn Tulun and Sultan Hassan, besides the Citadel – and some of the major historic “spines” with high heritage value, but heavily dilapidated in many parts and in need of revitalization;
- The presence of large derelict areas with high potential for regeneration programs;
- The presence of economic activities (namely markets, and some scattered tourist attractions) of interest.

The Action Plan Area is also characterized by the presence of different types of historic urban fabric, in diverse state of conservation and physical conditions.

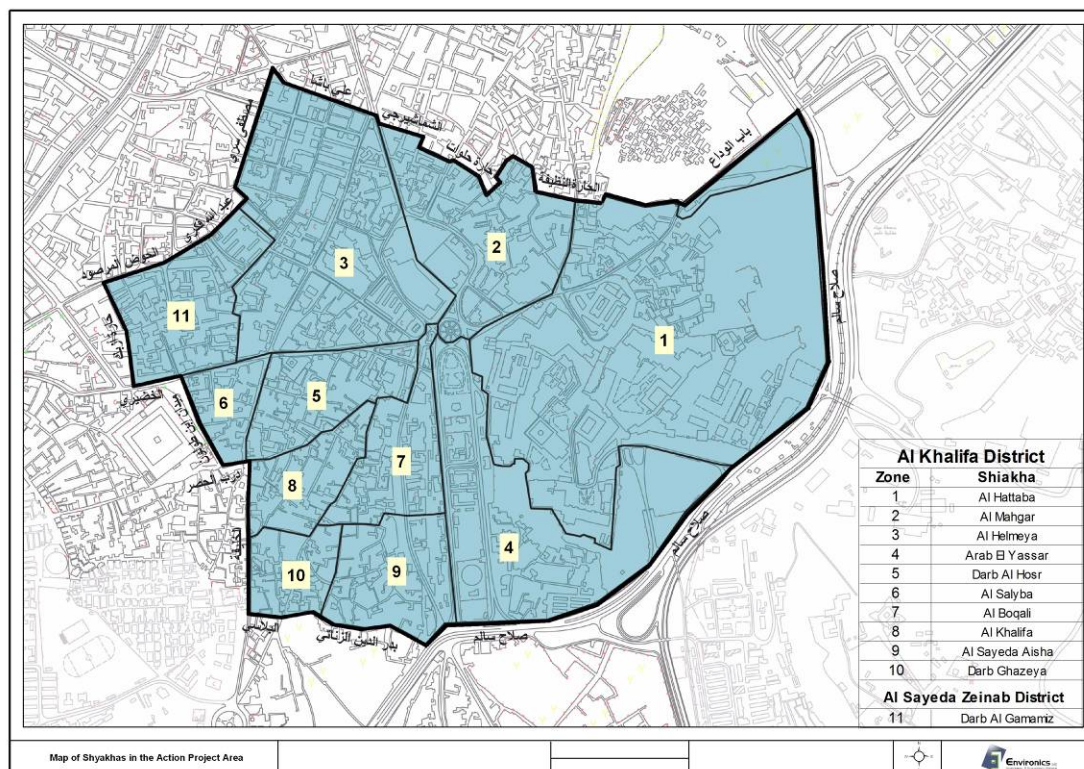


Figure 4-1: Shyakhkas of the Action Project Area

4.3 Pilot Project Area

As previously mentioned in Section 3.4, the pilot area, where the sampling would take place, was delimited taking into account the objective to focus on areas surveyed by URHC, with the possibility of extension to other areas if needed.

⁴ URHC (2013). Action Project Layout. UNESCO World Heritage Center, Management of World Heritage Sites in Egypt, Urban Regeneration for Historic Cairo.

4.3.1 Application of Criteria on Areas Surveyed by URHC

The areas surveyed by URHC were included in the following Shyakhas: Al Hattaba, Arab Al Yassar, Al Boqali, Al Khalifa, Darb Al Hosr and Al Mahgar. To define the Pilot Area, it was verified whether each criterion is present in the areas surveyed by URHC⁵.

a. Criterion 1: Population/building density

The highest average population density was found to be in Darb Al Hosr (782.8 inhabitants/ha) followed by Al Boqali (550.7 inhabitants/ha); while the lowest average population density was in Al Hattaba (68.7 inhabitants/ha), as shown in the following table.

Criterion 1	
Shyakha	Population density (inhab/ha)
Al Hattaba	68.7
Darb Al Hosr	782.8
Al Khalifa	429.1
Al Mahgar	422.7
Arab Al Yassar	80.2
Al Boqali	550.7

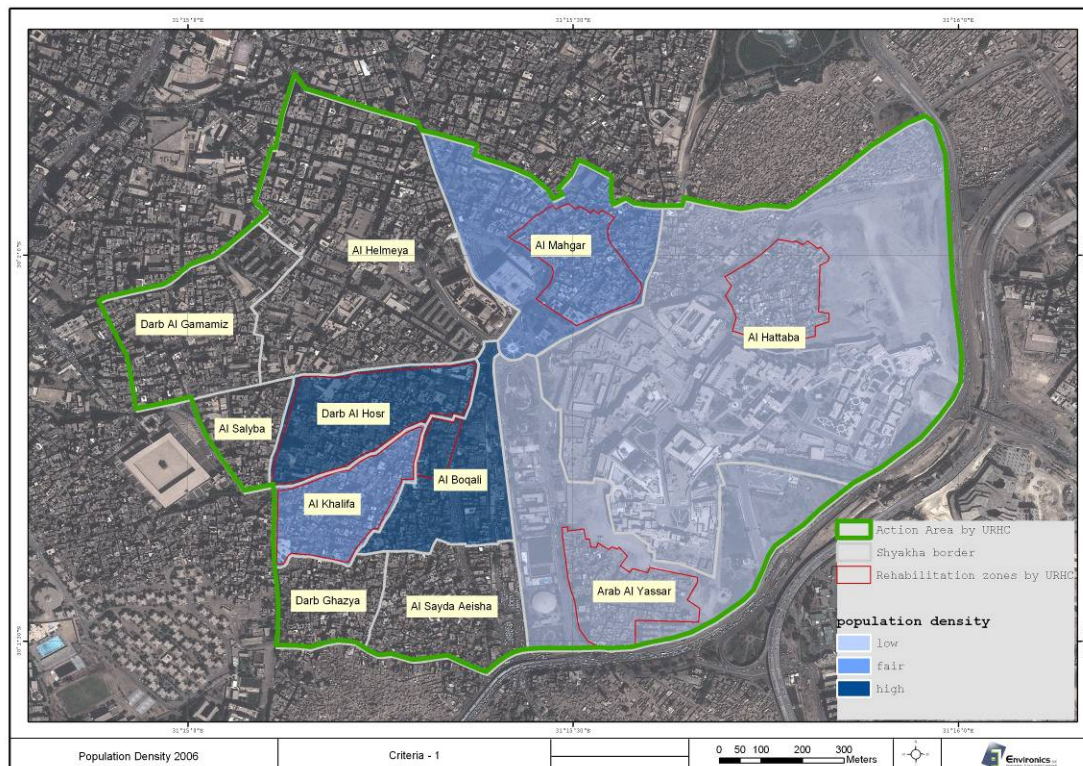


Figure 4-2: Population density in areas surveyed by URHC

⁵ Data for the application of the criteria are obtained from the GIS database for population density, buildings, streets and open spaces based on the survey carried out by the URHC Project team.

b. Criterion 2: Areas including partial-ruins, ruins and un-built plots

All areas surveyed by the URHC contain almost the same number of dilapidated buildings, except at Al Bokaly where ruins were very few compared to other areas and amounted to 10 buildings. On the other hand, Darb Al Hosr included the highest number of ruins / partial ruins.

Criterion 2			
Shyakha	Types of building footprint		
	un-built	full ruins	partial ruins
Al Hattaba	3	25	35
Darb Al Hosr	3	24	42
Al Khalifa	3	24	38
Al Mahgar	3	23	37
Arab Al Yassar	-	-	-
Al Boqali	1	4	5

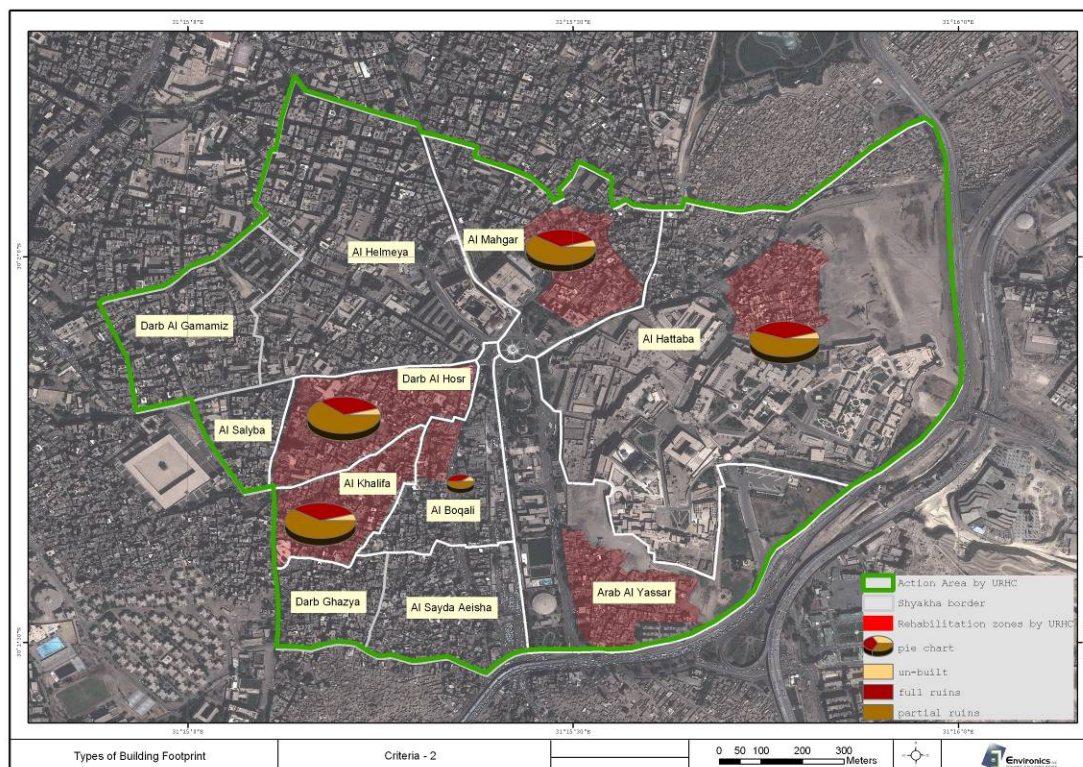


Figure 4-3: Areas including partial-ruins, ruins and un-built plots within areas surveyed by URHC

c. Criterion 3: Types and concentration of activities and markets

In general, the number of industrial activities and workshops was similar with an average 36 per area. Darb Al Hosr included the highest number of industrial activities and included 40 workshops and/or factories and also the highest number of commercial/residential buildings (69). The number of residential buildings was very close in all areas with an average 226 building/area except in at Al Boqali (31 buildings).

An important market is located in Al Sayeda Aisha, outside the areas previously surveyed by URHC.

Criterion 3						
Shyakha	Types and concentration of activities					
	services	commercial, residential	industrial, workshop	religious	residential	other
Al Hattaba	4	53	35	9	221	70
Darb Al Hosr	2	63	40	12	243	78
Al Khalifa	3	56	35	6	227	69
Al Mahgar	3	54	36	7	216	52
Arab Al Yassar	-	-	-	-	-	-
Al Boqali	1	5	1	4	31	11

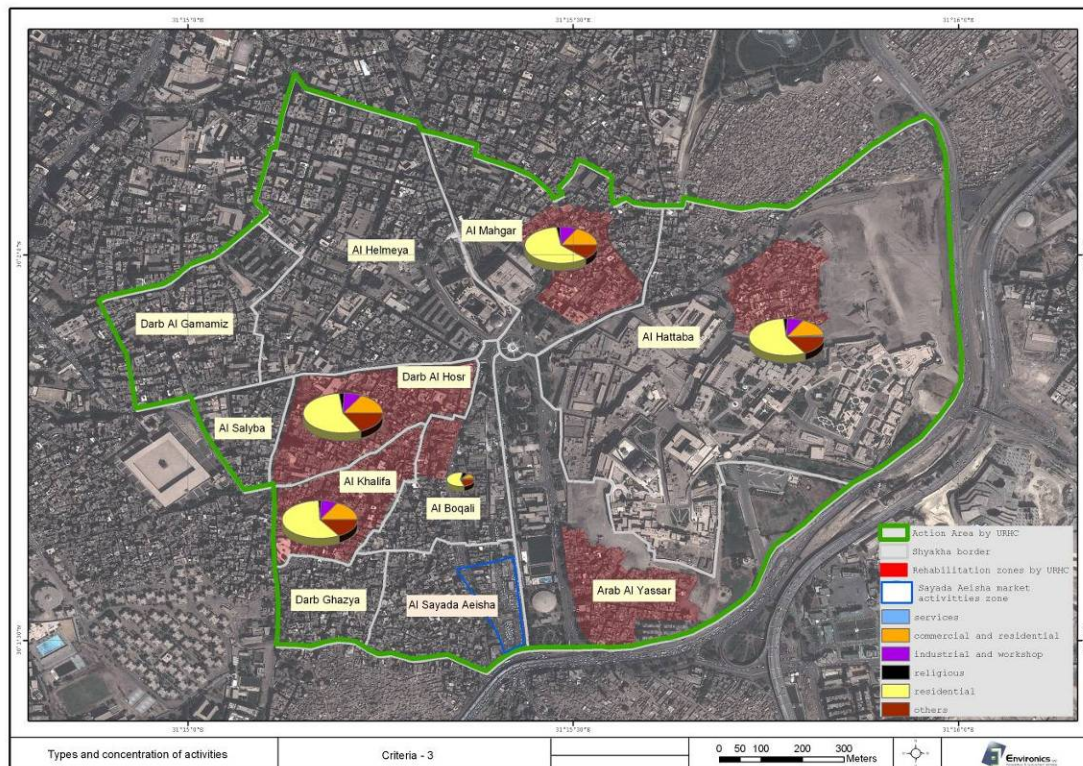


Figure 4- 4: Types and concentration of activities in areas surveyed by URHC

d. Criterion 4: Type of solid waste service provided

The same type of service is provided in all areas through CCBA contractors.

Criterion 4	
Shyakha	Type of solid waste service
Al Hattaba	CCBA contractors
Darb Al Hosr	
Al Khalifa	
Al Mahgar	
Arab Al Yassar	
Al Boqali	

e. Criterion 5: Street typology

The width of streets has been used as an indicator of the street typology as it could affect the circulation of equipment used in garbage collection.

In general, about 50 to 70% of open spaces have a width ranging from 2 to 6 meters. According to the results presented in the table below, this width is mainly found in Darb Al Hosr (35.2%) and Al Khalifa (34%).

Criterion 5			
Shyakha Name	open spaces width (m)		
	<2	2-6	>6
Al Hattaba	6	24	15
Darb Al Hosr	8	69	9
Al Khalifa	13	56	14
Al Mahgar	-	-	-
Arab Al Yassar	-	-	-
Al Boqali	0	8	4

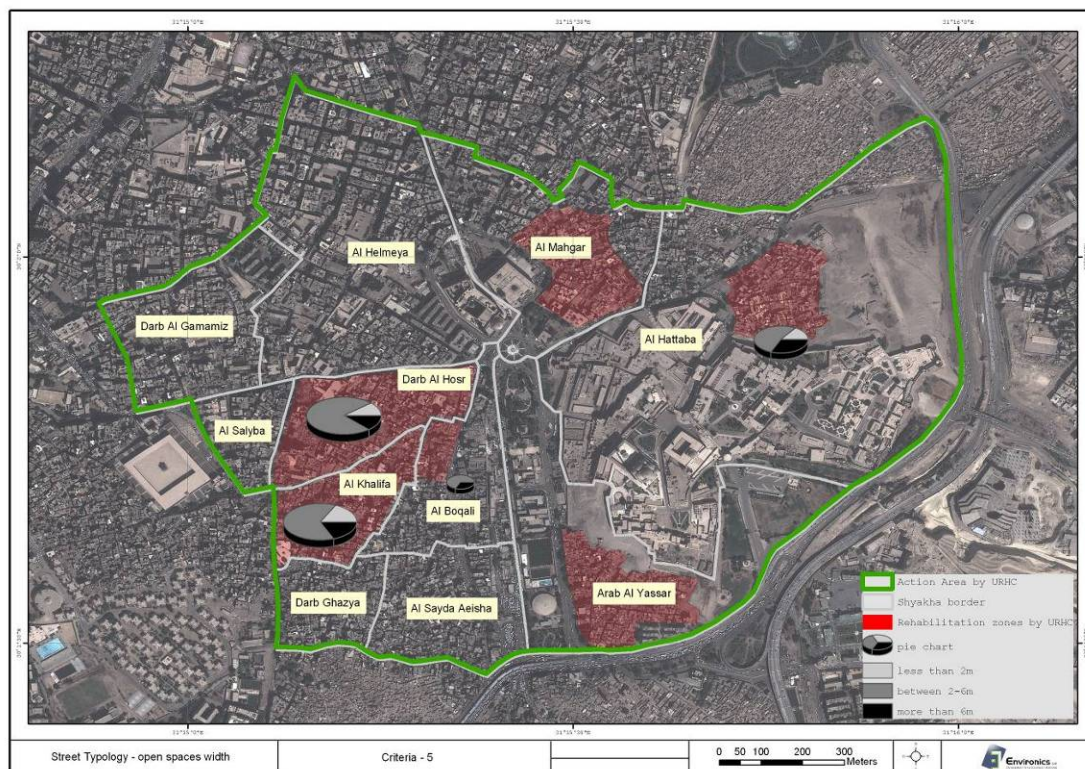


Figure 4-5: Street widths in areas surveyed by URHC

4.3.2 Areas Selected as the Pilot Area

The areas' selection aimed at being representative of the Action Plan Area and was based on the following reasons:

- Both high and lower population densities are included which is reflected on produced waste quantities;
- Presence of partial-ruins, ruins and un-built plots where solid waste is and/or can be disposed;
- Most types of industrial and commercial activities are represented, thus producing different types of waste;
- Different street typologies are represented, as this has to be reflected on the method adopted for waste collection.

Accordingly, the following areas were selected to form the Pilot Area in which sampling would take place:

a. *Households' survey*

It includes Al Hattaba and Darb Al Hosr, as they met the selection criteria. Due to data deficiency concerning Arab Al Yassar, this area was also included.

b. *Business owners' survey*

It covers Darb Al Hosr and Arab Al Yassar. However, according to the results of field investigations and meeting with Consultant Dina Shohayeb, it was decided to include also Al Hattaba, Al Mahgar and Al Sayeda Aisha market (Figure 4-6). This was mainly based on the fact that Darb Al Hosr and Arab Al Yassar did not include enough and diversified commercial and industrial activities.



Figure 4-6: Al Sayeda Aisha market

Based on the above, the selected pilot area is composed of the following:

- Al Hattaba, Darb Al Hosr and Arab Al Yassar (households / business owners survey)
- Al Mahgar and Al Sayeda Aisha⁶ (business owners survey only)

It should be noted that Al Sayeda Aisha was the only area included to the Pilot Area from outside the areas previously surveyed by URHC.

⁶ Only the market was surveyed.

Moreover, based on URHC Project team request, the cemetery south of Arab Al Yassar (located outside the Action Plan Area) was briefly assessed to find out the level of SW service in this area⁷.

Figure 4-7 presents the selected Pilot Area in which the households' and business owners' survey would take place.

Selection criteria maps are provided in full-page landscape format in Annex B-1.

⁷ Information on SWM in the cemetery was gathered through interviews with CCBA.

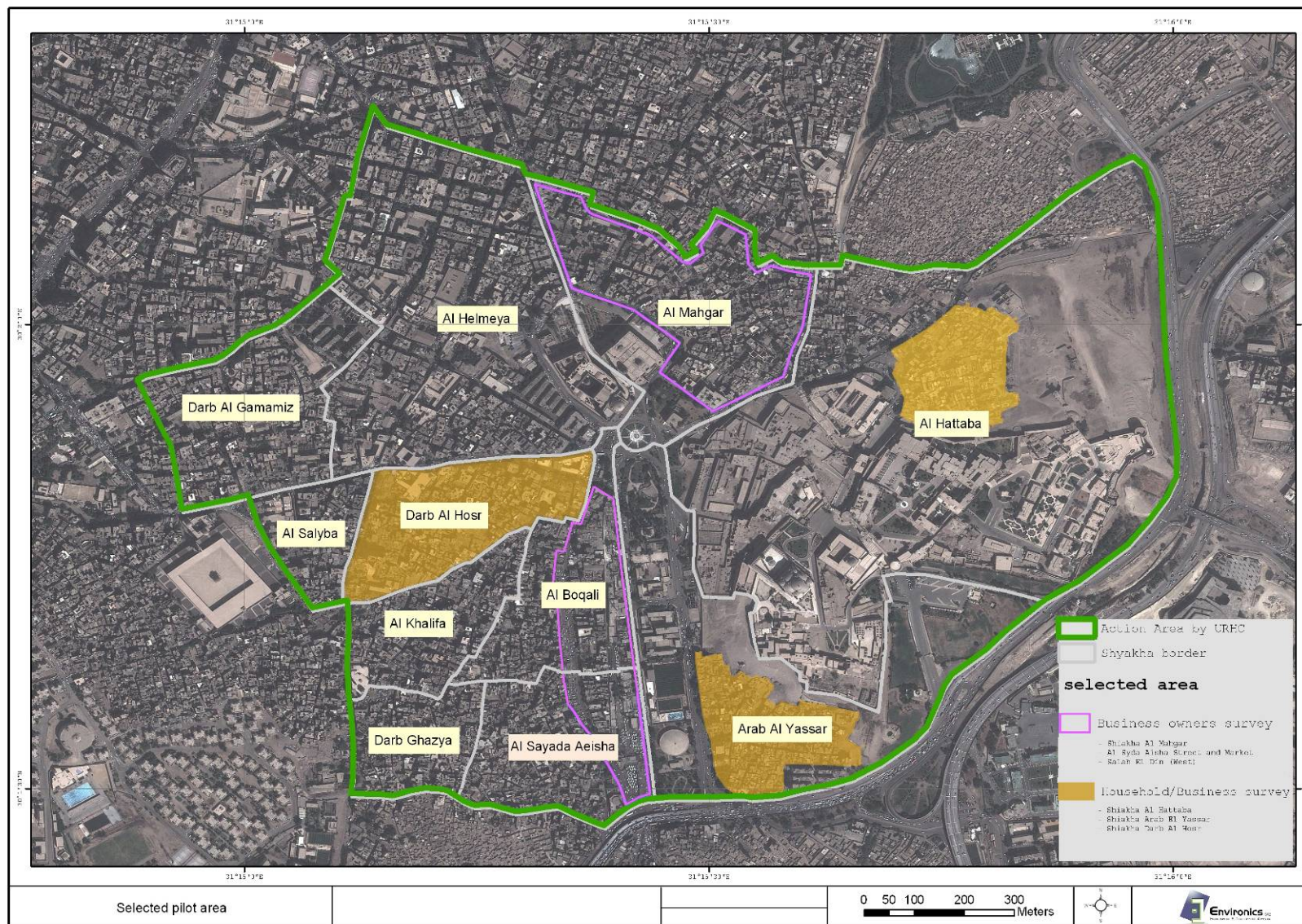


Figure 4-7: Selected Pilot Area

5. Laws and Regulations

This chapter presents a review of the most important laws and decrees which can be used in managing and controlling the solid waste management system. These laws and regulations deal with the different problems that might hinder the regularity of work or violate the rules governing the activity.

In addition to the laws and decrees presented below, some cities have their own ordinances; and if a specific rule is broken an inspector will issue a notice, which would usually be followed by a fine.

5.1 Laws

1. Law No. 38 of 1967 concerning cleanliness and its Executive Regulation issued by the Minister of Housing, Utilities and Urban Communities' Decree No.134 of 1968.
2. Law No. 43 of 1979 (Local Administration Law) concerning responsibilities related to infrastructure to City Councils.
3. Law No. 137, 1981 concerning occupational safety.
4. Law No. 48 of 1982 and its Executive Regulation issued by the Minister of Irrigation's Decree No. 8 of 1983.
5. Law No. 4 of 1994 promulgating the Law concerning the Environment and its Executive Regulation issued by Prime Minister's Decree No. 338 of 1995.
6. Law No. 10 of 2005 amending certain Provisions of Law No. 38 of 1967 concerning the Public Cleanliness.

Accordingly, solid waste management is regulated by several environmental laws and ministerial decrees. Main aspects of the laws are presented below.

5.1.1 Public Cleanliness Law No. 38 of 1967 and its Executive Regulations

The main legislation relating to solid waste management is Law 38/1967 as amended by Law 31/1976. The law regulates the collection and disposal of solid waste from residential areas, commercial and industrial establishments, and public places. It imposes a cleanliness tax on all housing units equivalent to 2% of the rental value.

Article 6

It requests a license to be issued by the local council for all workers employed as waste collectors. Law No. 31/1976 defines garbage and solid wastes as including domestic and industrial waste. It also specifies garbage containers, means of transportation, and the periodicity of solid waste collection.

Provisions of the Law and its Executive Regulation aim at avoiding throwing all kinds of waste in places not allocated for this purpose in order to protect the public health of the citizens and to avoid fires or spoil the aesthetic

appearance and cleanliness of the city or village. It also regulates the process of keeping, transporting, processing and final disposal of the waste, either by the competent local councils or the private sector, which must obtain a license before practicing its work. The regulation also defined the specifications of Waste Storage Containers and waste and leftovers trucks whether solid or liquid, in addition to the requirements on landfills and waste disposal methods. The provisions of the law shall be applied on cities and villages by a decree of the competent governor.

Articles of the law include the following:

- The law prohibits throwing garbage and leftovers in places other than allocated by the Local Council.
- All kinds of garbage and leftovers shall be kept in special containers and discharged in accordance with the specifications and conditions prescribed by the Executive Regulation. In the case of absence of the mentioned containers, the local council shall prepare these containers and get the price from the violator.
- The collection, transportation and disposal of garbage and leftovers as well as transporting and storing volatile materials shall meet terms, conditions and specifications prescribed by the Regulation.
- 2% Cleaning fees shall be collected from rental value of dwellers of buildings for public cleanliness affairs.

Executive Regulations of the Law

Collection, transportation and final disposal

Shall be carried out by the agency responsible for cleaning services:

- Local government units in the rest of the governorates (in accordance with the Law No. 38 of 1967) "
- To arrange with a licensed private contractor as waste and garbage are delivered in containers to the garbage collector of the container. The authorities specialized in public cleanliness of municipalities shall identify the places to be allocated to the throw the waste then to be transferred by competent authorities of municipalities.

Specifications of Waste Storage Containers

- The container shall be made of metal material or the likes
- It shall be free from holes
- It shall be provided with tight lid and two handles.
- Its capacity shall fit the amount of waste.

Specifications and requirements of means of transport

The garbage and waste shall be only transferred by the means of transport of the competent authority of public cleanliness or the contractor or those who are authorized to do so and must have the following requirements:

- It shall have a sufficient capacity and in a good condition.

- It shall not have holes through which wastes can be fallen.
- It shall be provided with Tight lid
- It shall be padded from inside with tin or zinc or any similar material.
- It shall be washed and cleansed regularly
- It shall only be used in this purpose. It shall only be positioned or cleaned in the places allocated for this purpose.

Public or private landfill

Garbage and waste shall be transferred to the places prepared for that purpose which is determined by the competent authority. Public or private landfills shall have the following requirements and specifications to get rid of garbage and waste, which contained in the Regulation, including:

- The site shall be in the area of easy transportation and in the opposite direction of the prevailing wind.
- The distance between the site and residential areas shall be 250 m.
- The area of the site shall absorb the amount of waste
- The site shall be surrounded by a wall of a suitable material with height of not less than 1.8 m. it also shall be provided with a door allow garbage or waste trucks to enter.
- Other requirements stipulated in the Regulation.

Waste and garbage disposal

- Waste and garbage shall be disposed by healthy backfilling in layers as it shall be covered by dust of thickness of 15 cm with well tamping
- In the case of disposal by burning. The site shall be equipped with oven or more with suitable capacity allows the waste to be burned fully. The burning process shall not be resulted in volatile exotic materials lead to pollute the air. The waste shall be sorted before burning.

5.1.2 Law No. 43 of 1979 (Local Administration Law)

The law assigned the responsibilities of infrastructure to City Councils. In accordance with Local Government Law No. 43 of 1979, occupant fees may be imposed by no more than 4% of the total rental value paid by dweller of the premises, whether an owner or a lessee. Imposing this fee requires a decree issued by the competent Governor or by the Minister of Local Government.

5.1.3 Law No. 137 of 1981

Law No. 137/1981 deals with occupational safety. It only has peripheral relevance here, but includes (Article 117) the requirement that an employer should inform his workers of the hazards associated with his non-compliance with safety measures and that personal safety equipment, together with training on its use, should be provided to the worker.

5.1.4 Law No. 48 of 1982 Concerning Protection of the River Nile and Waterways from Pollution and its Executive Regulations

This important Law aims at protecting the Nile River, its branches and other waterways such as canals, drains, lakes and aquifers from all liquid, solid and gaseous forms and types of pollution, from all sources, such as individuals, factories and sewage treatment plants, or from installations which were built on the shores of waterways and the River Nile and its branches. The law is also intended to maintain the integrity of these waters and preserve their natural qualities to be utilized for different purposes such as drinking, agricultural irrigation, industrial water and others.

Article 2

It prohibits dump the solid, liquid or gas waste from commercial, industrial and tourist establishments and properties and sanitations and others into waterways in full length and its surface only after obtaining a license from the Ministry of Irrigation according to standards, requirements and controls stipulated in the Regulation.

The Law defines the following penalties:

“Whoever violates the provisions of Articles 2, 3 (final paragraph), 4, 5 and 7 of Law No. 48 of 1982 concerning the Protection of the River Nile and waterways from pollution and its applicable decisions shall be punished by a fine no less than two hundred pounds and no more than twenty thousand pounds. In case of recidivism, the punishment shall be imprisonment and a fine set forth in the preceding paragraph”.

5.1.5 Environment Law No. 4 of 1994 and its Executive Regulations

The protection of the environment is a collective task carried out by many parties of the society including official bodies, individuals and civil societies. Law No. 4/1994 (the Environmental Protection Law) had adopted this principle in Article 103, which stipulates that every citizen or association concerned with protecting the environment shall have the right to report any violation of the provisions of this Law.

Complaint or report shall be submitted to the Egyptian Environmental Affairs Agency (EEAA), its branches or offices of Environmental Affairs of the governorates or local units of the districts. The complaint or the report may be submitted to the prosecution, which in turn will seek the assistance from the judicial officer of these authorities to verify it and take the necessary inference procedures towards it. In all cases, judicial officers shall take the responsibility of verifying the facts subject of complaints and reports.

Law No. 4/1994 has influence on solid waste management. Prime Ministers Decree No. 338, 1995 promulgates the Executive Regulations of Law No. 4, and the Executive Regulations cover many areas of environmental protection.

The law requires environmental review assessments of certain new developments, including industrial projects. It established the Environmental Protection Fund to fund various relevant environmental projects. The Fund is supported financially by the government, donors, and the proceeds from fines paid by those contravening environmental regulations.

The Law advocates setting up a system of incentives to be offered to organizations, individuals, and others, to carry out projects for environmental protection; and covers the protection from pollution of the land, water and air environments.

In terms of solid waste management, the most specific stipulations of Law No. 4/1994 deal with the handling and circulation of hazardous materials, including wastes, and the prohibition of the installation of facilities for treating hazardous waste without a license (the place and conditions of any such license to be determined by the Ministry of Housing after consultation with the Ministry of Health and Industry and the EEAA). More particularly:

Articles of the Law directly concerning solid waste include:

- Article 37 / Act, prohibits dumping the solid waste in places not allocated for this purpose.
- Article 87 / Act, determines sanctions on violators of the previous article.
- Article 38 / Regulation, sets the requirements of solid waste disposal and procedures in the case of burning some solid waste.
- Article 103 /Law, which stipulates that every citizen or association concerned with the protection of the environment shall have right to report any violation of the provisions of this Law.

Article 29

It forbids, without a license from the competent administrative authority, the handling of hazardous substances and wastes.

Article 30

It declares that the management of hazardous wastes shall be subject to the procedures and regulations stated in the Executive Regulations of the Law. The Executive Regulations shall designate the competent authority which, after consulting EEAA, shall issue tables of dangerous wastes to which the provisions of Law No. 4 shall apply.

Article 31

It forbids the construction of any establishment for treating dangerous wastes without a permit from the competent administrative authority and before consulting with the EEAA. The disposal of hazardous wastes shall be according to the norms and conditions stated in the Executive Regulations of the Law. The Minister of Housing, Utilities and New Communities shall assign, after consulting with the Ministries of Health, Industry and the EEAA, the disposal sites and the required conditions to authorize the disposal of hazardous wastes.

Article 33

It makes it mandatory for those who produce or handle dangerous materials in gaseous, liquid or solid form to take precautions to ensure that no environmental damage shall occur.

The owner of an establishment whose activities may result in the generation of hazardous wastes shall maintain a register of those wastes and the method of disposing thereof, as well as contracting concerned agencies for receiving those wastes. The Executive Regulations shall state what data are to be recorded in that register and the EEAA shall be responsible for following up the register to ensure that it conforms with reality.

Article 37

It prohibits the burning, disposal or treatment of solid waste except in designated areas far away from housing or industrial or agricultural areas as well as from waterways. (Article 38 of the Executive Regulations for the Law permits the incineration of infectious waste generated by medical care in hospitals and health centers, with certain provisos).

Article 102

Without prejudice to the provisions of Article (78) of this Law, the staff of the EEAA and its branches in the governorates, who shall be appointed by the Minister of Justice' decree in agreement with the competent Minister of Environmental Affairs shall have the capacity of judicial officers to prove the crimes that violated the provisions of this Law and its decisions.

Article 104

Inspectors of competent administrative authorities, as well as the Egyptian Environmental Affairs Agency inspectors, who have the capacity of judicial police in relation to environment areas all in their areas of competence, shall notify their authorities any violation of the provisions of this Law, the competent authorities shall take the necessary legal procedures.

Certain Articles of the Prime Ministers Decree No. 338, 1995 promulgating the Executive Regulations or the Law for the Environment are also of particular relevance:

Article 39

It states that collectors of garbage and solid waste shall maintain their garbage bins and vehicles in a clean state. Garbage bins shall be covered tightly so that no offensive odors shall emit, and also to avoid becoming a source for attracting and growing flies and other similar insects, or a focus for attracting stray animals. The garbage contents shall be collected and transported at suitable intervals according to the conditions of each area. The quantity of garbage shall not exceed the capacity of any of these bins at any time.

Table 5-1: Crimes and faults related to solid waste management

Type of Violation	Penalty	Articles in Law 4/1994
Crimes		
Intentional commission of acts of violation of the provisions of Law 4/1994:		
– Resulting in the injury of one person with a permanent disability which cannot be healed	Imprisonment not exceeding 10 years	95
– Resulting in the injury of three or more persons with this permanent disability	Imprisonment from 3 to 15 years	95
– Resulting in the death of one person	Temporary hard labor from 3 to 15 years	95
– Resulting in the death of three or more persons	Life imprisonment (hard labor)	95, 101
Faults		
Disposal or discharge of solid, liquid or gaseous waste in waterways without a license	A fine from 200 to 20,000 EGP; in case of recidivism the punishment shall be imprisonment and the mentioned fine. The offender is required to remove the infringing works or correct them within the time specified by the Ministry of Irrigation. If this is not undertaken, removal or correction would be carried out through administrative means at the expenses of the offender with the right to cancel the license.	<ul style="list-style-type: none"> – 2, 3 of Law 48/1982 – 89 of Law 4/1994
Discharge or disposal of any untreated material or waste or liquid causing pollution of Egyptian beaches or their adjacent waters (whether it is done intentionally or unintentionally, directly or indirectly).	A fine of 200 to 20,000 EGP. In case of recidivism the punishment shall be imprisonment and the mentioned fine. Each day of discharge is considered as a separate violation.	69, 87
Disposal, treatment or burning of garbage and solid waste in non-designated areas (away from residential, industrial and agricultural areas or waterways as defined in ER articles 38 and 39).	A fine of 1000 to 20,000 EGP. In case of recidivism the punishment shall be imprisonment and the mentioned fine.	37, 97
Failure to take the necessary precautions for safe storage and transportation of waste or dust resulting from excavation or digging or construction or demolition, or their transfer without preventing volatility and dispersion.	A fine of 500 to 1000 EGP with the possibility of suspending the license from a week to 6 months. In case of recidivism license can be cancelled.	39, 86

5.1.6 Law No. 10 of 2005 Amending Certain Provisions of Law No. 38 of 1967 Regarding Public Cleanliness

This law was promulgated after the rejection of most citizens to pay subscription of cleanliness on electricity bill and filling lawsuits and a ruling to stop these decisions, which urged the government to issue the Law No. 10 of 2005 amending certain provisions of Law No.38 of 1967 concerning public cleanliness, shall be replaced by text of the articles (8,9) of Law No.38 of 1967 concerning public cleanliness. The two following texts:

Article 8

Occupants of the built property and exploited vacant lands in the governorates shall pay a monthly fee as follows:

- a. From one pound to ten pounds for one residential unit in the capitals of the governorates and cities that for which a Republican decree of a private nature was issued.
- b. From one pound to four pound for one residential unit in the cities which are not the capitals of the governorates.
- c. From ten pounds to thirty pounds for commercial and industrial shops and exploited vacant lands and units used as headquarters of profession activities and entrepreneurship.
- d. Places of worship shall not pay this fee. The collection of the fee shall be for providing waste and garbage collection services from units and vacant lands, which are subject to the provisions of this Law and transporting it to the places allocated for this purpose, to get rid of it safely by competent local unit - alone or by a third party

The payment of the referred fee shall not contradict the special contracts signed by the local unit with some facilities on the fees it shall pay for providing all or some the referred services.

The amount of the fee shall be determined among the amounts set forth in clauses (a, b, c) of this Law and collection procedures by a decree of the competent Governor, with the consent of the municipal council of the governor, and after taking the opinion of municipal council of the local unit which is subject to the provisions of this law. This determination shall take into account the economic and social conditions for each unit.

The fund for cleanliness shall be established in every unit of local administration and public bodies for cleanliness that are subject to the provisions of this law, in which proceeds of the following shall be deposited:

- Proceeds of the fines, reconciliation charges and the amount prescribed in accordance with the provisions of Article (9) of this Law, with an exception of the requirements of Article (18 bis) of the Criminal Procedure Code.
- Revenue of recycling the waste and garbage
- Credits included in the budget of the Governorate for cleaning services.

The proceeds of this account shall only be use in this purpose. The competent local units shall establish local offices to receive the complaints of citizens in the case of being affected by the violation of provisions of this law, and refer them to the competent authorities to take the necessary action.

Article 9

Without prejudice to any severer penalty prescribed in another law, perpetrator of any violation of the provisions of this Law or its resolution shall be punished with a fine of no less than twenty pounds and no more than fifty pounds. The local Unit shall have the right to mandate the violator to remove the causes of the violation within the period specified by it or otherwise it shall remove it at his expense with the collection of expenses administratively. The violations due to non-compliance with the provisions of articles (1, 4) of this Law may be reconciled for paying five pounds for pedestrians and ten pounds for other violators during the week from the date of the offense, and criminal case shall be finished upon this reconciliation.

5.2 Decrees

- Minister of Housing, Utilities and Urban Communities decree No. 134 of 1968, determines the guidelines for collection and transportation of solid waste generated by domestic and industrial activities, and the ways of disposal, either by burning or burial or conversion into compost.

Presidential Decree No. 272 of 1982 regarding the transfer of some competencies to local government. The decree included the transfer of competencies undertaken by the Ministry of Housing according to the laws, regulations and applicable decisions to local units in many areas including: Public Cleanliness Law (Law No.38 of 1967 and its Executive Regulation).

The decree stipulated the replacement of the words "Ministry of Housing and Minister of Housing" with "Competent Governorate" and "Competent Governor" wherever mentioned in the laws, regulations and decisions in force in the areas included in the decree. The competent authority of public cleanliness in local government units shall implement the provisions of this Law.

- In cities and villages mentioned in the decree issued by the competent governor, the fine shall not be more than 100 pounds, with no prejudice to any severer penalty provided in another Law (Article 3 of Law No. 129/1982 amending certain provisions of Law 38 of 1967).

In the villages which are not determined by a decree of the competent governor, the Penal Code with amendments contained in Presidential Decree No. 169/1981 on the cleanliness waste in these villages (paragraph 1 of Article 377) shall be applied with a fine no more than one hundred pounds.

- Presidential Decree No. 284, 1983 established the Cairo and Giza Cleansing and Beautification Authorities. The mandates of these authorities include the collection of garbage and solid wastes and their disposal in special areas.

5.3 Reconciliation Procedures

Article 18 of the Criminal Code (bis) stipulates the possibility of reconciliation in all violations and misdemeanors punishable by a fine only. This applies to the following articles of the Law 4/1994:

- Article 35 concerning the air quality requirements.
- Article 37 concerning burning and disposal of solid waste.

6. Stakeholders Mapping

As mentioned in Section 3, Stakeholders' identification took into account the characteristics and location of the project and the nature of potential impacts, as well as institutional, legal and managerial framework applicable to the project.

A list of potential stakeholders and other important actors is presented in the following table.

Table 6-1: Stakeholders and their relevant role and/or potential interest

Stakeholders	Role / Potential Interests
Secondary Stakeholders	
Egyptian Environmental Affairs Agency – EIA Central Department – Solid Waste Management Department – Inspection Department – Cairo Regional Branch office	Overall coordinating body of monitoring, enforcement and regulating developments through setting the EIA system, managing the protection and preservation of natural environment in coordination with concerned and responsible authorities.
Cairo Governorate: – Cleaning and Beautification Authority (CCBA) – General Directorate for Monitoring – Environmental Management Unit (EMU)	Governorate official bodies responsible for licensing, implementation and follow up of regulations. According to Presidential Decree No. 284, 1983, the mandate of CCBA includes the collection of garbage and solid waste and their disposal in special areas.
Al Khalifa and Al Sayeda Zeinab Districts	Local coordination and follow up
Ministry of Antiquities / Supreme Council for Antiquities	Protects and promotes the cultural heritage of Egypt, both independently and in cooperation with national and international organizations.
Garbage Scavengers	Do not have an official role in the system. Carry out informal waste segregation to benefit from recyclable materials.
NGOs	Safeguard the environment and influence decision-making, representatives of the public
Primary Stakeholders	
Residents and local community	Project beneficiaries. Can be involved in project management activities.
Business owners (shops, workshops, etc)	Project beneficiaries. Can be involved in project management activities.
Other Involved Actors	
URHC Project	A UNESCO project aiming at preparing the planning and management tools necessary for the conservation of the heritage values of Historic Cairo, together with its socio-economic revitalization and environmental upgrading.
Scientific community/ Consultants	Research in related topics and influence decision-making through public channels.

Identified stakeholders effectively related to SWM Component of the URHC Project fall into two main groups, namely secondary and primary

stakeholders, in addition to other involved parties who have an influence on the project planning as well as pressure groups who do not necessarily have a direct or indirect stake in the project, but could affect, in one way or another, its implementation. In the following, results of meetings with main project stakeholders are presented.

6.1 Secondary Stakeholders

As mentioned in Section 3.2.3, secondary stakeholders are those able to influence the outcome of the development, in addition to those likely to be indirectly affected by the project.

6.1.1 Egyptian Environmental Affairs Agency

The role of the EEAA concerning SWM management is well known as it operates at the planning and strategic levels with no effective operations on the ground and no specific responsibilities in the project area. Therefore, meetings with EEAA officials were not deemed necessary.

6.1.2 Sayeda Zeinab and Al Khalifa Districts

Preliminary meetings with Mr. Hossam Al Din Raafat, Secretary General and Acting Head of Sayeda Zeinab District and Mr Adel Abbas, Head of Al Khalifa District were carried out on the 2nd of February, 2014. The latter requested the approval of the Governor of Cairo concerning any requested information. Accordingly, a list of officials to be interviewed and required information was prepared and forwarded to the Governor through the URHC project.

During the meetings, some data and information on the Shyakhnas of Al Khalifa District were informally obtained. These included data on residential units, commercial, industrial and service facilities, NGOs, equipment available at the Cleaning and Beautification Authority, solid waste contractors and number of workers, etc.

According to the Head of Al Khalifa District concerning district cleanliness especially in historic areas, there is a lack of awareness on the part of the community to the historical value of the place as well as to the lack of activities or programs implemented by concerned parties especially the Ministry of State for Antiquities. He gave examples where this lack of appreciation takes place and mentioned Shagaret Al Dorr Street and graffiti on the walls and fences of historical buildings such as the fence surrounding the cemetery and the Aqueduct. He also sees that it is of utmost importance that an integrated strategy for site management and preservation be developed taking into consideration that development is not only carried out on the level of historical monuments but also on the people as well by improving their living conditions.

Another meeting was planned on February 26 2014, but could not be performed. A new date will be set in coordination with the Governorate.

6.1.3 Cairo Cleaning and Beautification Authority

The preliminary meetings held on February 2, 2014 also included heads and officials of the Cleaning and Beautification Authority at Al Khalifa and Sayeda Zeinab Branches as well as the Head of South Cairo Area.

The Head of the Cleaning and Beautification Authority – Al Khalifa Branch – provided some information concerning the service system, a general description of the current situation⁸ as well as the appropriate times to meet with workers. They also requested the approvals of the Governor of Cairo and Head of CCBA concerning any requested data.

a. Meeting with Chairman of CCBA

A meeting with Eng. Hafez, Chairman of CCBA, was held on February 25 2014. The meeting focused on the current SWM situation in the study areas (Al Khalifa district and Sayeda Zeinab) and the CCBA operations and its relations with private companies.

The CCBA Chairman indicated that Al Khalifa and Sayed Zeinab lie south of Cairo governorate and it is the CCBA that undertakes the collection of street, business activities' waste as well as street sweeping. The waste management services at Al Khalifa district are managed by the CCBA branch; some areas are serviced by private contractors and each contractor provides service according to his potential. Those with lower capacity are contracted by the CCBA to cover no more than 3000 household units, while those of higher capacity provide the service to about 10,000 units. The remaining areas are covered by CCBA itself. Table 6-2 shows the different contractors operating at Al Khalifa district, the number of unit serviced by each contractor, as well as the areas in which they operate.

Table 6-2: Contractors operating at Al Khalifa

Name of Contractor	License code	Number of units	Area	Boundaries
Mohamed Abdel Hamid	2502	3963	Al Hattaba	Streets (Shamashergi, Salah Eldin, El Rifai, El Qalaa to Ibrahim street to Salah El Din Square)
Mohamed Abdel Hamid	2503	4170	Sayed Aisha	Darb El Hesn, El Salibeya and El Basaly
Said Ahmed Mohamed	2505	5094	El Salibeya	Darb El Hosr street to Salah Salem to Salah El Din to El Ashraf
Ahmed Mohamed Ahmed	2504	5467	El Helmeya	Shaykhoun Street. Berket El Feel, Abdallah Fikry, Mostafa Sirri, Mohamed Ali to Mohiedine Square
Ibrahim Ghandar	2501	2350	El Kadreya	Sayed Aisha, El Hamam Market and El Kadreya
Gamal Shaaban	2510	7424	El Tonsy	Tahaweya, El Bahs, El Hamam Market to El Kordy
Gamal Shaaban	2511	3755	El Emamein	Tahaweya, El Kordi, Ain El Hayah
El Pharouneya	2506	4234	Arab El Yassar and Abageya	All Arab Al Yassar and Abegeya

⁸ Some of the obtained information reflect the point of view of the service provider.

The CCBA Chairman added that waste is transferred to the transfer station in Basateen (about 5 km away from the study areas). He explained that the SWM system faces a number of challenges, the most important of which are:

- Lack of adequate funding in the different stages of the process. The CCBA Director indicated that the revenues of the CCBA does not exceed EGP 180 million to EGP 200 million per month and the expenditure by far exceeds this to reach EGP 500 million. The Ministry of Finance funds the difference. This is in addition to inability to raise fees because of the current political/economic situation in Egypt. Figure 6-1 shows the CCBA revenue/expenditure cycle.

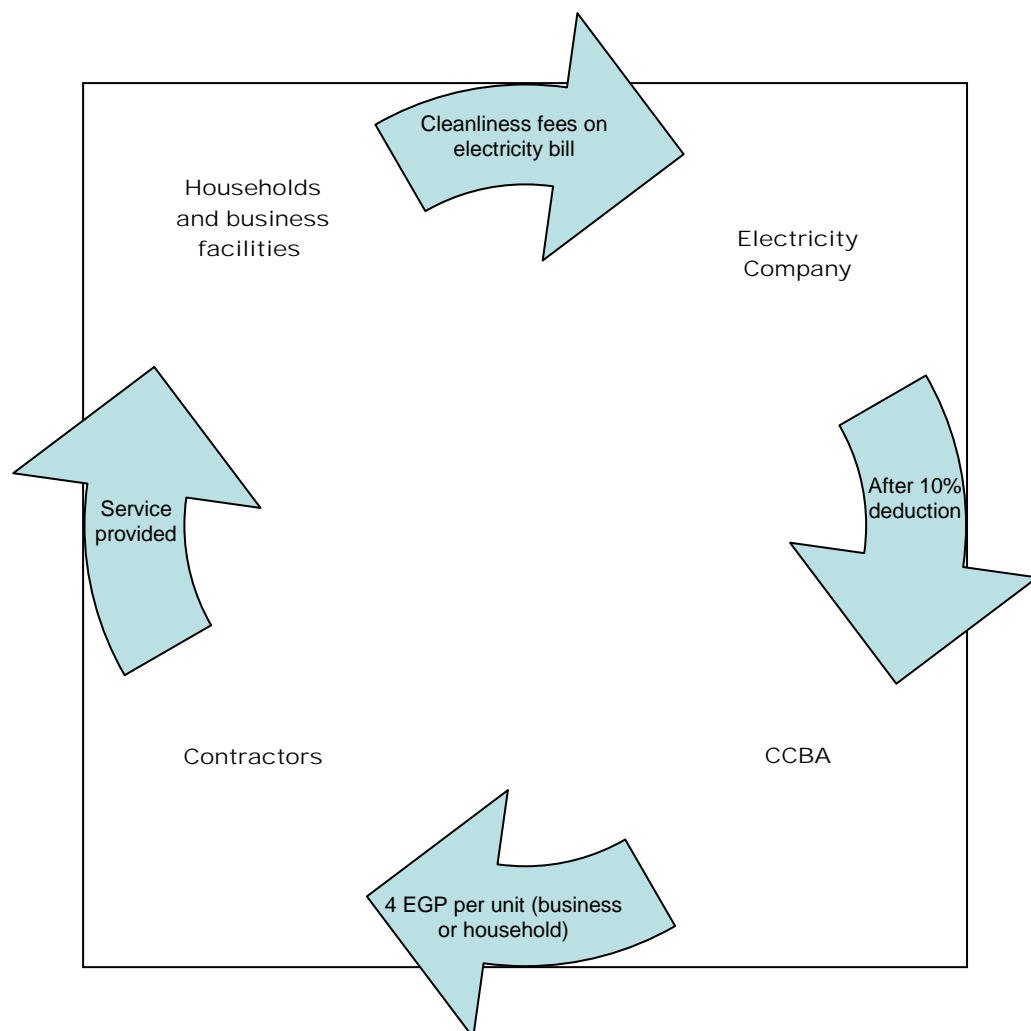


Figure 6-1: CCBA revenue/expenditure cycle

- Shortage of labor and drivers (coupled with the state policy of not hiring new labor) which impacts on operations and hence waste collection rates.
- Residents get rid of demolition and refurbishment waste in streets in addition to scavengers who select waste items for recycling from garbage bins and garbage disposal sites. This trend has been rising as a result of the lack of security.

- Continuation of the problem due to slaughtering of pigs because of swine flu. Garbage collectors used to breed pigs which ate enormous amounts of organic waste which comprises 50% or more of the waste components in residential areas. What happens now is that waste is sorted in the streets and organic waste remains.

The CCBA used to pay to contractors EGP 1.5/month per each serviced residential unit. Starting from March 15 2014, all contracts were modified and fees were increased to EGP 4 per serviced unit. In addition to residential units, the CCBA included commercial and industrial activities in the new contracts. Each residential unit pays 3 EGP per month through the electricity bill while the CCBA collects from business activities from 10 to 30 EGP. However, contractors will receive for each commercial and/or industrial activity the same fees received for households (4 EGP).

As for coordination between various stakeholders in historic areas in Cairo, the CCBA Director emphasized the need for concerted efforts of all parties concerned: Ministry of Antiquities, Cleaning and environmental authorities. He said that all must collaborate to develop a fixed strategy to preserve historic areas as it represents national resources and historical heritage. He added that the Ministry of Antiquities has a role to play by hiring guards to protect these locations. This is to be done after the CCBA removes all accumulations of waste in the areas of historic Cairo.

The CCBA Director sees that improvement of the service will only come about if the above mentioned challenges are dealt with. This is in addition to the need for an improvement in the overall stability of the country. As for his vision on the procedures that are needed to make the system more regular and effective, he pointed out to the following:

- Direct collection of household waste from households (collection from the source).
- Begin with the process of sorting waste from the source (organic and non-organic).
- Removal of garbage bins (after collection of waste directly from the source).

The CCBA Director had presented some data that was required by the team which included information on equipment, labor and information on the contracted private companies. This data will be submitted to the Governorate to be sent to project management. The team agreed with the CCBA Director that there will be another meeting after the study is completed and a draft of the proposed strategy is discussed with him.

b. Meeting with Head of Al Khalifa Branch

A meeting with Eng. Hany, Head of Al Khalifa CCBA branch, was held on March 3 2014.

After obtaining approval from the CCBA Chairman to conduct meetings, another meeting with Eng. Hany was carried out to receive his views on the current situation. He indicated that the reason for accumulated waste is the

lack of resources and hence capability of the private companies in terms of labor and equipment which does not allow them to undertake their responsibilities except for only 50% of the residential units contracted for. The waste of the remaining 50% of the units is what is seen on the streets and vacant plots of land. Because private companies subcontract other garbage collectors, he sees there is another problem with that and that is that contracted garbage collectors focus on the more affluent areas as the value of waste is higher and hence low income residential areas are neglected because of the low value of waste components there. Hence, residents dispose of waste on the streets or on vacant plots of land or abandoned buildings which results in the poor state of affairs that is witnessed. Eng. Hany indicated that this represents a burden on the CCBA branch especially in wake of lack of sufficient labor and irregularity of maintenance of equipment which is in bad condition anyway.

As for his vision on the nature of the area and its historical value, Eng. Hany explained that he is alarmed at the stark abuses that he sees daily on historic monuments. He said that the last incident was in Al Rakbia Street where a historic site was vandalized and built on and nobody did anything. He also was careful to point out his fears about the cleaning campaigns undertaken in the area as the equipment that is used to lift waste may damage the historical monuments/buildings. He also said that the area suffers from a complete lack of appreciation and understanding of the historical value of the area and he believes that the SCA is only concerned with Al Moez Street and neglects this area and its historical value.

Eng. Hany explained that the CCBA agreed with private companies to modify the contractual arrangement so that fees for each residential unit are increased to EGP 4 per month instead of EGP 1.5. The companies will then provide a daily service of removing waste from streets and shops. Shops will be required to provide a garbage bin in front of the shop. Private companies will be working from 7 am to 2 pm after which the CCBA will provide services from 2 pm to midnight. This will be implemented as of March 15, 2014. Eng. Hany promised to meet with the team again after implementing the new experiment and holding meetings with representatives of private companies.

6.1.4 Ministry of Antiquities

A meeting with Mr. Mohamed Abdel Aziz, head of the Historic Cairo Project, was held on February 17 2014. The meeting focused on environmental problems of monuments in the WH property, with special reference to the Action Project area of URHC.

Mr. Mohamed Abdel Aziz explained that the environmental problems in the site are mainly related to:

- The extreme financial crisis of the Ministry at the moment; where resources decreased to a great extent due to the aftermath of the January Revolution and its effect until now. (In 2010 monthly revenues used to be EGP 115 million, now it does not exceed EGP 2 million). The Ministry

budget does not have a budget line item to provide funding for cleaning historical areas.

- The lack of qualified calibers due to the Prime Minister's decision to not hire any labor in ministries or government agencies.
- The lack of proper coordination with Cairo Governorate and the Ministry of Environment.
- The lack of security and shortage of hired guards appointed by the Ministry. The Antiquities Police focus only on protecting the site from inside and does not deal with abuses outside the antiquity or around it.

He explained that they are mainly focusing on the rehabilitation of al Muizz and al Gamaliya streets, and that they have a contract with a private cleaning company (for 150 000 EGP/month), which is in charge of cleaning Al Muizz street. Young calibers in the Ministry started some cleaning campaigns of monuments in Historic Cairo.

He also pointed out to other constraints in dealing with many areas in Historic Cairo due to the prevalence of antiquities in the midst of informal settlements (low standard of living coupled with a low standard of education) in addition to the absence of any planning to integrate the local population with the benefits of the historic monuments on the community through livelihood programs, and hence its preservation, impacts negatively on the antiquities and its surroundings. People deal with the antiquities as if it were "financial resources without an owner".

Mr. Mohamed Abdel Aziz was asked if they tried to involve the local community or NGOs in their initiatives, He mentioned that one of the 12 departments of the Historic Cairo Project is concerned with the awareness raise, and that they are dealing with one of the famous charity organizations (Risala, which is not in Historic Cairo). No collaboration or joint activities or awareness programs with the local NGOs in the area exist.

He clarified that he is convinced with the idea of the adaptive reuse of monuments (as an efficient way to protect them against deterioration), but that he is facing many internal obstacles and aggressive media campaigns whenever they initiate anything new in the Project.

At the end of the meeting, Eng. Hany concluded that the current state of affairs will continue as it is so long as the state does not take the issue of the preservation of historical sites seriously. The idea of the state and the political determination are not there and as a matter of fact, antiquities do not seem to be among the priorities of the state at the moment. Hence, the current state of affair will continue and the evidence is there in what we see realistically on the ground. What coordination takes place between parties only happens on the level of holding meetings on a theoretical level and when implementation is required, this is another story altogether as there is no coordination between concerned parties and each other (Local administration, the environment, etc).

6.1.5 Garbage Scavengers

Garbage scavengers (*nabbisha*) select recyclable materials from dumpster and dumpsites. With the increase in use of containers deployed by CCBA and waste management companies, scavengers have been increasingly collecting recyclables from waste bins and containers. However, these activities have caused discomfort to residents due to the litter spread in the streets during the waste segregation process (Debout, 2012).

In addition, during the Focus Group discussions, several residents complained of their behavior as they are considered thugs (*baltageya*) who represent a menace to public security according to some residents.

6.2 Primary Stakeholders

Those directly affected by the project, i.e. the project beneficiaries, are herein considered as primary stakeholders.

6.2.1 Local Residents

The households' survey has started on the 5th of March 2014 and was completed on the 13th of March 2014. It included a questionnaire survey of 200 households distributed in three Shyakhass (Darb Al Hosr, Al Hattaba and Arab Al Yassar). The survey took into account the diversity and variation present in the area (gender, age, location, floor of residence, etc).

In addition, three Focus Group discussions were organized and held, one in each Shyakhha, attended by 11 persons in Darb Al Hosr (women only), 15 persons in Al Hattaba (men and women) and 8 persons in Arab Al Yassar (women only).

Collected data entry and statistical analysis started on the 18th of March 2014 and associated results are presented in Section 6.2.1.

Figure 6-2 presents the surveyed households locations. Detailed households' survey maps for each surveyed Shyakhha are presented in Annex B-2.

6.2.2 Business Owners

The business owners' survey started on the 31st of March 2014 and lasted for about one week. It included a questionnaire survey of 100 commercial, service shops and industrial activities distributed in five Shyakhass (Darb Al Hosr, Al Hattaba and Arab Al Yassar, Al Mahgar and Al Sayeda Aisha). The survey took into account the diversity and variation of activities present in the area.

Collected data were statistically analyzed after the completion of the households' data analysis and results are presented in Section 6.2.2.

Figure 6-3 shows the surveyed business facilities locations. Detailed business owners' survey maps for each surveyed Shyakhha are presented in Annex B-3.

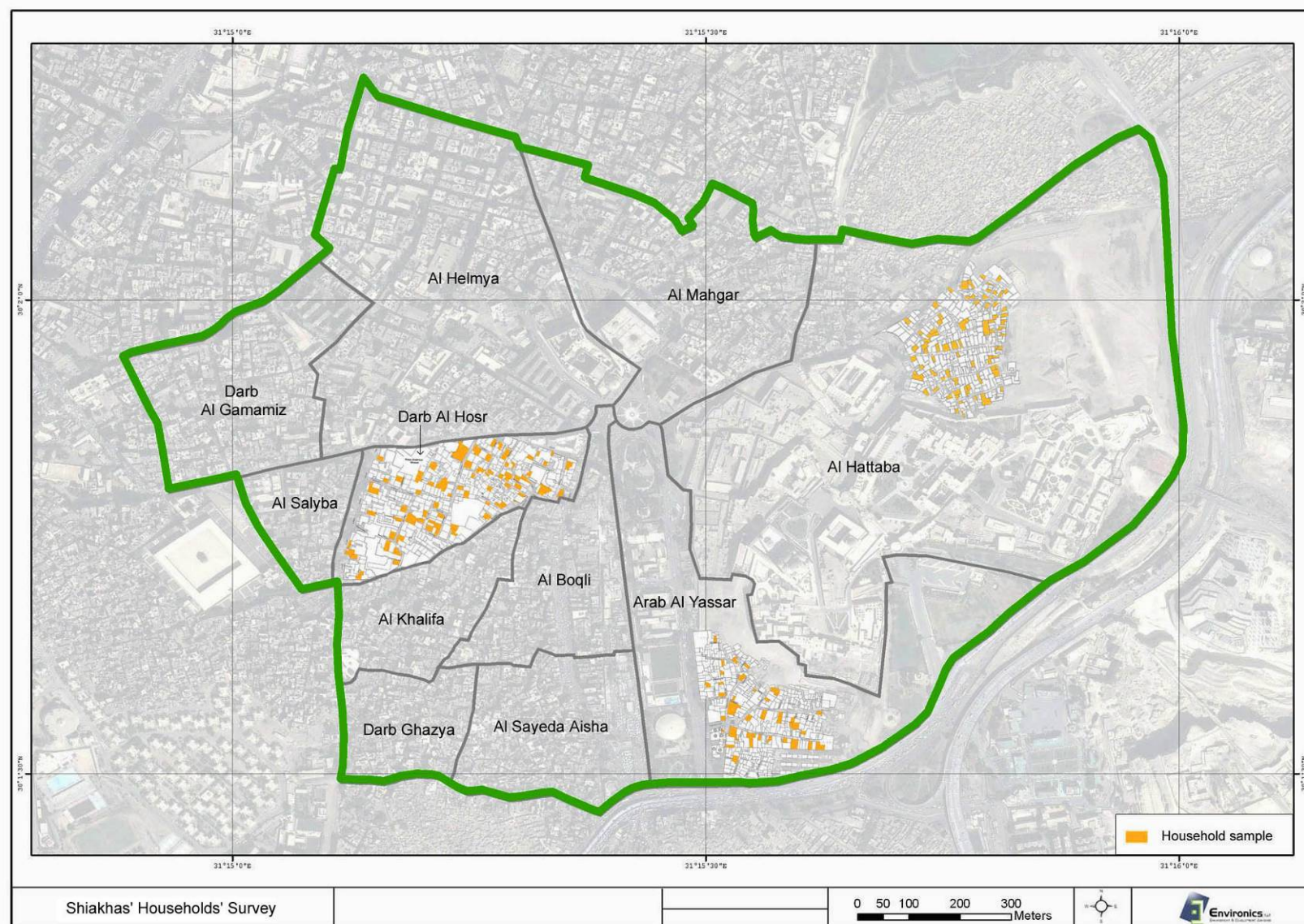


Figure 6-2: Households' survey map

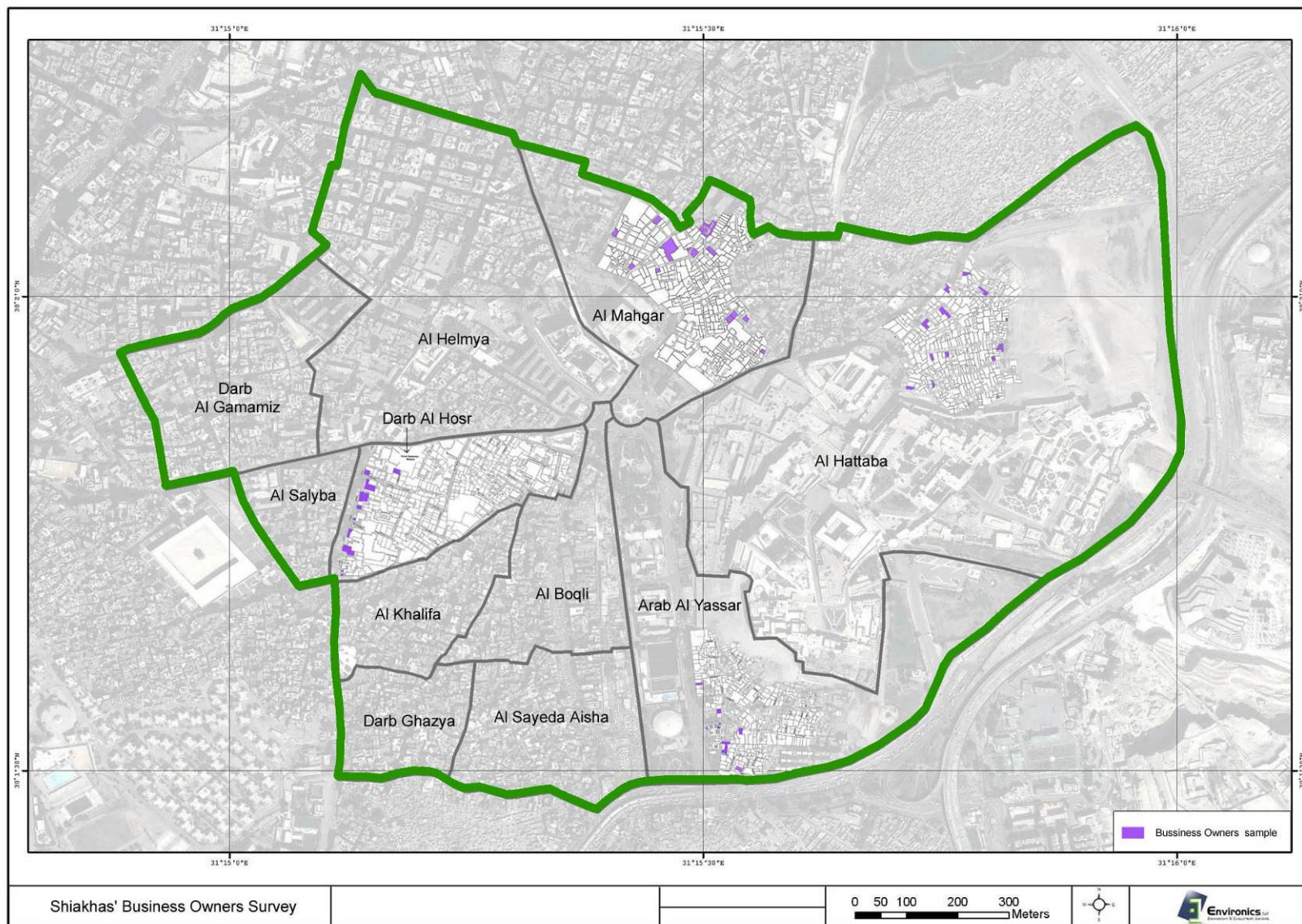


Figure 6-3: Business owners' survey map

6.3 Other Involved Actors

6.3.1 URHC Project Team

Several meetings between the URHC project team and the key members of Environics team were carried out allover the project duration. The second and seventh meetings were also attended by the URHC project manager and the project scientific coordinator. Starting from the kick-off meeting, Environics gave feedbacks on activities and outcomes carried out during the different project phases, including surveys and interviews with stakeholders. Accordingly, all aspects of the study were discussed and commented, including work plan, intermediate and draft final reports. Details of the meetings are provided in Annex C.

6.3.2 Other URHC Consultants

a. *Consultant Dina Shohayeb*

A meeting with Consultant Dina Shohayeb was held on February 18, 2014 to synchronize between the environmental study and the study of the Sayeda Aisha market. Ms Shohayeb explained the types and concentration of activities in the market as well as the complete Action Project Area.

The views of Dina Shohayeb are based on experience accumulated in dealing with various areas of Historic Cairo. The meeting included a discussion on the relation between residents especially those old residents of the area with the antiquities. The meeting also included a discussion on the classification of historic Cairo.

On the various activities and artisanal crafts in the area, Dr. Shohayeb sees that maintenance of antiquities is neglected and so is its preservation. Dealing with antiquities, she claimed is like dealing with “loose money” and hence there is an urgency in getting people involved in the preservation of antiquities and making them feel that they play a role. She also sees that the area still attracts old residents but does not take into account that there should be a harmony or consistency between the modern buildings and the spirit of the place.

She said that the dilapidated buildings encourage people to use them as garbage dumpsites. She added that there are disparities between the areas that are considered having special features, like Darb Al Ahmar, Helmiya Al Gadida or others with less economic potential like Sayeda Aisha. Dr. Shohayeb concluded by saying that concerning the enterprise survey, the sample should include a diversity of activities which will require classification of enterprises according to the type of activity and amount of waste it generates. This survey, she said, should include the market in Sayeda Aisha as part of the study.

b. Consultant Lise Debout

Consultant Lise Debout, who had previously carried out a preliminary study on waste disposal management in Historic Cairo, attended the meeting with the URHC Project team held on the 16th of April, 2014.

6.4 Other Pressure Groups

Pressure groups include political parties, Local Popular Council, members of the People's Council (Parliament) and of the *Shura* Council (Senate), NGOs and Civil Associations. According to field activities and meetings with residents and government officials it was found that no pressure groups that could have an influence on the project are active within the Project area. This is mainly due to the current situation of unrest in the country limiting initiative-taking among previously influent pressure groups.

7. Findings and Data Analysis

The present section includes an overview of the main environmental and social findings that have been taken into account for the preparation of the SWM Strategy.

7.1 Current Solid Waste Management System

The CCBA assumes multiple tasks in the SWM system of Cairo including private operators' contracts as well as supervision and monitoring of these contracts. This is in addition to sweeping and cleaning streets and management of transfer stations and landfills. Moreover, it is responsible for the management and operation of Al Fustat Company for Cleanliness.

There are some of the CCBA responsibilities are contradictory, which affect its performance as well as its administrative subordination to the Governor of Cairo. The Local Administration is responsible for the coordination and integration of efforts of the governorates to implement service projects. On the other hand, the CCBA is required to observe the policies of the Ministry of Environment on which they depend in planning and technical assistance which, in fact, is lacking. Accordingly, integration and coordination of roles is requested; however, this is not currently available thus leading to inconsistencies, overlap and lack of clear roles which impacts the SWM system on the national level and on the governorate level including areas in Historic Cairo.

CCBA divides Cairo into four areas, namely North, South, West/Middle and East. Historic Cairo lies in the South Cairo Area. This part of Cairo is divided into 2 zones; South A and South B.

Zone A is composed of 5 districts; Sayeda Zeinab, Al Khalifa, El Mokattam, Dar El Salam and Basateen. The CCBA branches in previous districts are responsible for all solid waste management activities. These branches have contracted waste collection companies as contractors to provide service to households and businesses activities, Areas not covered by contractors are managed by CCBA itself.

In Zone B Maadi and Torah districts are serviced by a company named Europe 2000, while Helwan and Maasara are serviced by company named Nahdet Masr belonging to Arab Contractors.

The geographical boundaries of Historic Cairo render the area to be spread along several administrative divisions within the governorate of Cairo. These divisions are the various city districts and the CCBA is the administrative body responsible for solid waste management at the level of the city of Cairo. The CCBA has branch offices in each district responsible for all cleaning activities as well as maintenance of parks. Based on this, services related to SWM are provided in Historic Cairo by means of branch offices of the CCBA in the districts of Al Khalifa, Sayeda Zeinab and Al Darb Al Ahmar.

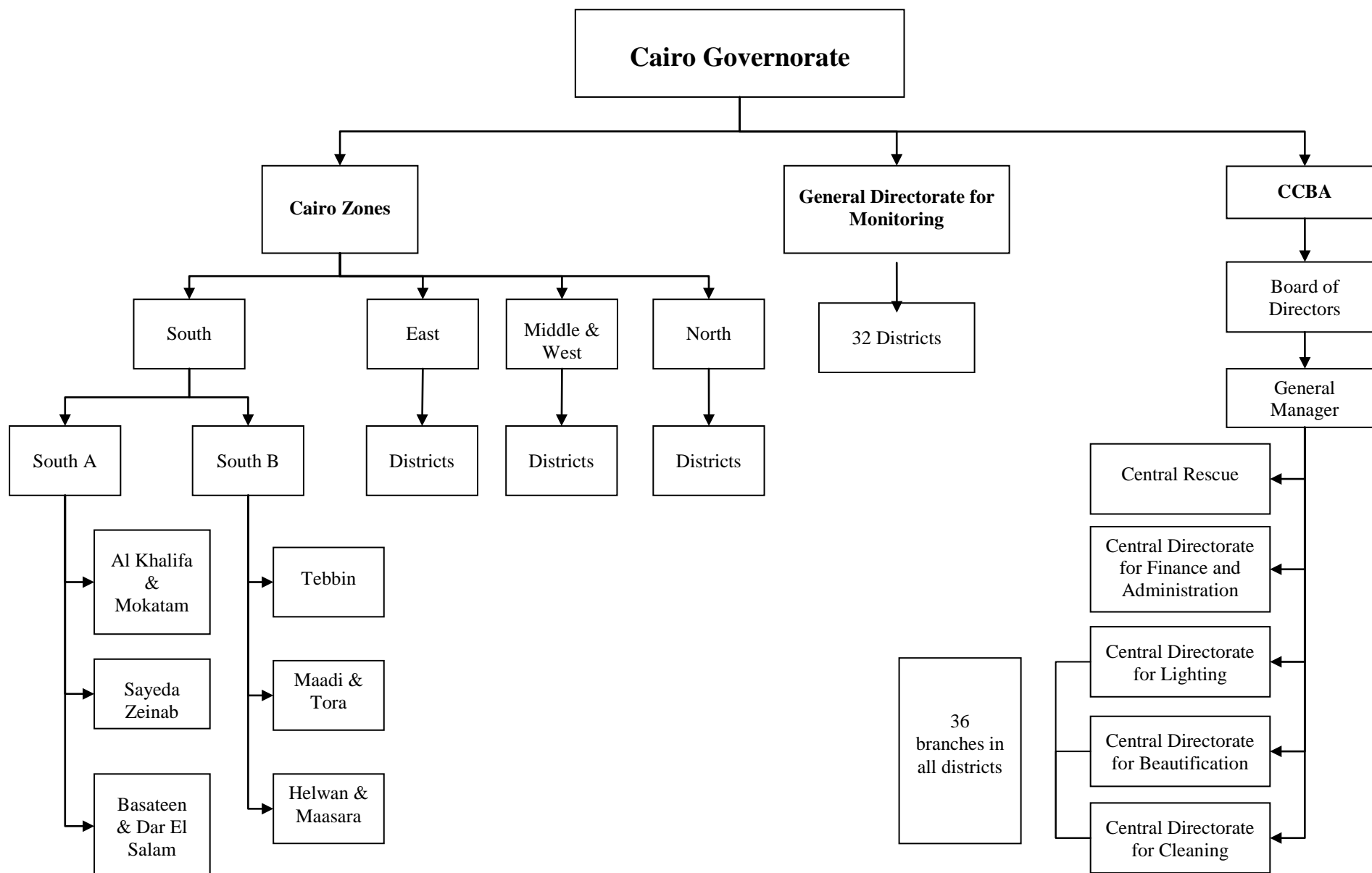


Figure 7-1: SWM organizational structure

7.1.1 Collection and Disposal Approaches

a. Collection

The CCBA adopts two approaches in providing collection of waste to the concerned districts; these are:

1. Waste collection system from streets, commercial, service-related and manufacturing businesses/shops

The CCBA branch is fully responsible for the implementation of this system which included sweeping streets, emptying garbage bins distributed across the streets in the districts and also removing accumulated waste. The CCBA workers are also committed to the removal of waste generated by commercial, service and industrial businesses in the vicinity of the district. This was until 15 March 2014 when the contracts were amended to include contractor companies that would collect all waste from all shops, commercial, service and industrial establishments and the financial items were modified, so that the CCBA assumes responsibility of lifting all accumulations of waste from various activities by means of its workers and equipment. Garbage bins distributed on the streets are emptied and the capacity for each bin is one cubic meter. Garbage bins are lifted through a garbage compactor trucks. However, as for accumulation of waste it is removed using small sized and large sized tipper trucks with ability to maneuver in the narrow streets. These trucks have a capacity of four cubic meters. Large trucks can move in wide streets such as streets which house the Sayeda Aisha market. The branch has information on the locations and size of accumulations of waste because they are specific and known to them. Hence, there is a work schedule for lifting equipment on a regular basis. All street, shop waste and accumulations of are removed by means of the CCBA equipment and transfer to the transfer station in Basateen.

The CCBA branches are also responsible of street sweeping and removal of all accumulated waste in the streets. Metal garbage bins of one m³ capacity distributed along the district streets are emptied by using CCBA compactor trucks. Waste accumulated in the streets is removed using light tipper trucks having capacity of 6 m³ and all waste is transported to the transfer station.

2. Household waste collection system

The CCBA divides the districts to smaller divisions or blocks and these are presented in a tender for competing private companies. For example, in Al Khalifa district there are 8 companies that have contractual agreements with the CCBA (refer to Table 6-1 in Section 6.1.2). The number of housing units serviced by each company is in the range of 3,000 to 10,000 units. There is a contract between the company and the CCBA outlining the work methods and commitments and obligations of each party. The main obligations mentioned in the contract are as follows:

1. The contractor is required to collect waste from residential units every two days and from businesses facilities on a daily basis.
2. All collected waste is transferred directly to the transfer station at El Basateen district located about 4 km from Al Khalifa district.

3. It is forbidden to segregate waste in streets or in buildings.
4. It is forbidden to transport collected wastes to garbage collectors (*Zabbalin*) settlements
5. It is forbidden to subcontract any contractor.

Fines are as follows:

- 5 EGP per unit in case of collection delays;
- 50 EGP in case of not using uniforms;
- 100 EGP in case of waste segregation in buildings or residential units;
- 500 EGP in case of reloading wastes at a non designated area.

Concerning cemeteries, there are licenses issued to waste collection contractors such in Al Tonsy and Al Imamayn cemeteries. These cemeteries comprise about 11,500 residential units as well as 2,500 commercial shops. In Sidi Omar Ibn Al Fared, waste collection service is carried out by a contractor. The rest is carried out by a CCBA branch where waste is collected every Thursday and Saturday. Waste is collected from Al Qadriya street by means of a loader and campaign vehicles and as such waste collection services in the cemetery areas is inconsistent by the CCBA branch which impacts on the accumulations of waste in these areas.

b. *Transfer Station and Disposal*

All "Zone A" collected waste is transferred to the transfer station located at El Basateen. Private contractors are also transport their collected waste to the transfer station, where large tipper and compactor trucks (22 to 28 m³ capacity) are transporting all South Cairo waste to the 15th of May landfill where a composting plant, with several recycling lines, operates. After fulfilling the plant capacity, the remaining waste and plant rejects are disposed of in the adjacent sanitary landfill. The compositing plant and sanitary landfill are operated by ECARU, a private company, contracted by CCBA for a period of 15 years.

7.1.2 Monitoring and Control of Work

There is a department affiliated to the governorate responsible for monitoring. This department has directorates on the district level responsible for monitoring performance abuses carried out by companies and assumes the supervision and monitoring of performance and tracks irregularities.

This department monitors the collection and disposal process and presents regular reports to the District Chief up to the central administration of monitoring and supervision in Cairo governorate which is designated to supervise and track irregularities of contracted companies working in waste collection services on the Cairo governorate level. This is in addition to determining financial fines and sending it to the CCBA to be deducted from company reimbursements. This also makes its role in most of the cases as a participatory one in achieving the objective of cleanliness before signing the fine.

a. Organizational Structure

The Central Administration for Supervision and Monitoring is followed by 5 areas including 35 districts (except Tebbin and 15th of May districts). These areas include:

- The southern area (A) followed by the districts of Sayeda Zeinab, Al Khalifa, Old Cairo, Dar Al Salam, Al Basateen.
- The southern area (B) (Helwan, Al Maasara, Tora and Maadi).
- Eastern area.
- The northern area.
- The western area.

b. Duties of the Monitoring Unit

1. Management of facilities (landfills, garages, equipment).
2. Household collection of waste.
3. Cleaning of streets.
4. Awareness.
5. Monitoring the collection of medical waste in the eastern area, as the collection of medical waste from the northern and western areas is carried out by hospitals. There is no collection of medical waste in other areas.

c. Problems of the Monitoring Unit

Lack of adequate number of staff and low salaries

Through the meeting the team had with the Central Supervision and Monitoring Administration staff of Cairo governorate, 35 out of the 35 districts each has a supervision and monitoring unit responsible for monitoring the performance of companies in accordance with the contracts signed with them. However, the number of staff in these units is not enough to do the work required as well as the low salaries (EGP 500 to EGP 600 per month). This is in addition to the lack of incentives (most work in other jobs to increase their income) which reflects on the performance of the company and the quality of the service provided. For example, there are approximately 645 blocks in Cairo governorate and 84 staff members of the Supervision and Monitoring Unit are supposed to follow up and monitor the performance of companies in the absence of means of transportation and communication.

From a practical point of view the supervision and monitoring process focuses on the problems followed by the Governor or District Chief and there is no plan that can enable employees to monitor the performance on a daily basis which in turn encourages the non-compliance of contractors and companies in service rates and abiding by terms of contracts.

Non-application of automated monitoring

There are no monitoring devices for staff which delays the follow up of violations of companies for more than 24 hours and thus monitoring of violations becomes useless. Documentation of monitoring is done manually through written reports which consume time to communicate with the district and CCBA.

Working one shift

This is due to the lack of staff, poor salaries and lack of incentives.

Absence of a hotline

The absence of a hotline to connect end users/service beneficiaries and those working in monitoring and supervision impedes the prompt and efficient dealing of irregularities and violations especially in the absence of means of transportation.

Lack of training for monitoring and supervision staff

There is no training to build the capacities of those working in monitoring and supervision.

Absence and poor outreach of activities

One of the main activities of the monitoring and supervision administration is to raise awareness.

According to officials met the reality is that the poor quality awareness raising activities carried out focused on a few seminars and awareness activities in mosques without direct contact with the local population (public disclosures) and this stopped since 4 months due to the following problems:

- There is no awareness raising plan.
- Lack of adequate and qualified calibers to carry out awareness raising plans (most of them are women who have limited mobility under the current security vacuum).
- Lack of resources and necessary capabilities for the implementation of awareness raising activities.
- Non-cooperation of the community and civil society organizations in outreach and awareness raising efforts.
- Delay in issuing security permits for the team to work with the community leaders and NGOs in awareness activities.

7.1.3 System Potentials

Available resources to implement the collection and disposal of waste are herein presented.

a. Available resources at the CCBA branch in Al Khalifa District

These include:

- One loader;
- One mini-loader;
- Three tipper trucks with a load capacity of 20 tons (two operational);
- Seven tipper trucks with a load capacity of 4 tons;
- Four tipper trucks with a load capacity of 2 tons (2 operational);
- Six compactor trucks;
- Two large compactor trucks (one operational);
- One transportation vehicle;
- 19 containers;
- 133 workers for cleaning and 43 for maintenance of gardens.

It is noteworthy to mention that Al Khalifa district does not have any transfer stations for the equipment mentioned above. Al Khalifa branch has problems with workers which can be summed up in the government abstaining from

employing new workers in spite of the fact that many have retired due to reaching the legal age of retirement. This same discrepancy applies to drivers of vehicles and equipment which do not work to their full capacity. This was noted during the field visits where few garbage bins were observed surrounded with litter and waste, which gives an impression of lack of labor force.

b. Available resources at the CCBA branch in Al Sayeda Zeinab District

These include:

- One loader;
- One mini-loader;
- One truck with a load capacity of 4 tons;
- Pick-up vehicle (not operational);
- 43 containers;
- 240 workers for cleaning (workers and supervisors) and 44 for maintenance of gardens.

In addition, CCBA equipment used in Al Sayeda Zeinab District include:

- Two compactors;
- Two large tipper trucks;
- Four tipper trucks with a load capacity of 4 tons;
- Three tipper trucks with a load capacity of 2 tons;
- Five trucks (Ford – Turkish);
- Four trucks (Mercedes – Turkish).

c. Resources available to the private companies subcontracted by the CCBA

With regard to equipment and workers, the contract stipulates private companies to collect household waste in the following way:

- One worker per 300 residential units out of the total units assigned for the contract;
- One truck with a load capacity of one ton per 800 units per contract.

7.1.4 System Constraints

Based on the field visits and preliminary inspection of the team to the areas under study and also based on some meetings that took place between officials, it was noticed that the waste collection and disposal system of Historic Cairo faces a number of challenges and constraints. These can be summarized as follows:

a. Lack of cooperation and coordination

There is a lack of cooperation and coordination between all concerned parties as well as each party blaming the other. In an interview with the Chairman of the CCBA, he emphasized the need for concerted efforts of all bodies involved: the Antiquities department, the Cleaning departments and the Environmental department.

All parties should work together to develop a fixed strategy to preserve historic sites as they serve to provide national wealth and historical heritage. He added that antiquities play an important role to assign guards to look after

these sites after the CCBA removed also accumulated waste found in Historic Cairo.

On the other hand and during a meeting with the Historic Cairo Project Director at the Supreme Council for Antiquities (SCA), it was noted that his vision was that all waste collection and cleaning services in Historic Cairo as well as in historic sites is the responsibility of the governorate and not the SCA. That said he added that Local Administration is not doing its job and he sees that the responsibility lies on the shoulders of the governorate where it concerns cleaning and removal of waste in historical areas. The latter is not undertaken regularly which leads to waste being dumped near or on historical sites. In addition, he said that there is an absence of the role of the Ministry of Environment in this regard and bigger challenges in the way people deal with antiquities.

Contracts were actually implemented which determined obligations for each contractor in terms of providing collection with a rate of one worker per 300 residential units as well as making available a vehicle with a capacity of 1 ton for every 800 units calculated according to waste generation rates, which is 1.5 kg per residential unit. The contractor is also committed to collect waste from commercial shops located in the vicinity of the area under license. As for the collected waste, it is emptied in compressor vehicles belonging to the CCBA branch to be transferred to the transfer station after which it is transported to the treatment plant where it is finally disposed of in the safe landfill located in 15th of May City, south of Cairo.

It was noted that the quality of service has not improved to the level required. There is still lack of workers and equipment among the majority of contractors which reflects on the amount of waste found on streets and vacant land. This is even more of a problem in wake of lack of proper monitoring from those concerned with supervision and monitoring which represents a serious challenge for the regularity of household collection of waste. The household survey results revealed that only 35% of residential units use the formal waste collection system while the remaining dispose of waste outside the formal SWM system.

b. Lack of resources

There is a lack in equipment and human resources, as follows:

CCBA district branch

The main problem facing the branch which is responsible for the collection of waste from streets and shops is lack of workers. There are only 133 workers at Al Khalifa district distributed across services in lifting of waste accumulations, loading waste on trucks and sweeping streets. This number is also likely to decrease as the public policy of the state is to suspend all appointments to public bodies. This is in addition to the low wages earned by workers which results in high turnover rates and escape to the private sector. This problem is not only with cleaners but also with drivers. The CCBA is beginning to suffer from a significant shortage of drivers of heavy trucks or heavy equipment (loaders and vehicles with high load capacities).

On the other hand, there are 240 workers serving Sayeda Zeinab. As the residential area of Al Khalifa covers an area of about the triple of the area of Sayeda Zeinab, there might be a need to re-evaluate and revise the workforce distribution in the two districts. However, visual assessment shows that there is almost no difference concerning the cleanliness of the two districts, as the high population density at Sayeda Zeinab might have a strong influence. Accordingly, it is probable that human resources are insufficient in both Al Khalifa and Sayeda Zeinab.

Private companies

Private companies did not abide by contract articles in terms of providing the number of vehicles and cleaners required according to contract terms and conditions. Hence, this decrease in resources brings down the level of performance to 50%. Private company owners relate this problem to the low value received from each residential unit (EGP 1.5) which did not allow the company to provide adequate equipment and workers. This is in spite of the fact that the government takes EGP 3 from each residential unit through the electricity bill. These reasons impacted the level of overall performance in all areas such that some areas do not receive the service at all.

However, the CCBA has met the companies in an effort to solve their problems and increase the quality of the service on the district level. New financial terms and conditions were agreed to allow the improvement of the status of contractors and service. This contractual arrangement became effective on the 15th March 2014 on the basis of the sum of EGP 4 to be paid by the CCBA on behalf of the residential units with a commitment to provide a door-to-door service to remove waste every two days. The contractor shall also collect waste of business facilities falling within the scope of the sector under contract for the same fee (EGP 4) per month. This is on the condition that shops provide bins in front of the store so that waste is emptied regularly.

The CCBA will remove waste accumulated in the afternoon and evening to preserve the general appearance of the area.

c. *Weak revenues and financial allocations for cleaning*

The SWM in Cairo faces a general problem of finding appropriate funding to deal with the problem in its different stages. As pointed out by the Chairman of the CCBA, the revenues of the CCBA do not exceed (EGP 180 million to EGP 200 million per month). The expenditure by far exceeds the revenues reaching EGP 500 million. The difference is paid by the Ministry of Finance. He noted that the collection of fees under Law 10 for the year 2005 which is concerned with cleaning waste stipulates that household collection of waste ranges from EGP 1 to EGP 10 per unit/month and the shops should pay between EGP 10 to EGP 30 per month. However, what actually is paid is EGP 3 per unit/month in poor to medium income districts and EGP 15 to EGP 25 per shop/month. The current situation does not allow for any increases and so the problem is perpetuated. The Historic Cairo Project Director also indicated that the Ministry of State for Antiquities does not have a budget line item to spend on waste collection and cleaning. However, it should be mentioned that this is not among the responsibilities of the Ministry of Antiquities

d. *Sorting during collection*

This problem represents a serious challenge for the regular collection and disposal of waste in a regular and safe manner across Cairo governorate in general. The CCBA Chairman explained that the SWM system encounters a main problem in:

- The presence of scavengers and those who sort waste for recycling purposes (paper, plastic, etc.). In order to obtain these materials, waste is scattered all over the streets from garbage bins.
- The workers of private companies (garbage collectors) sort waste during collection and dispose of the remaining waste in different locations in the district, such as the garbage bins in streets and vacant land. The CCBA Chairman emphasized that this behavior has been on the rise since the slaughtering of the pigs due to the swine flu scare. The pigs were bred by garbage collectors to feed on the organic content of the waste which is more than 50% of the waste components in residential areas.

e. *Some residents do not abide by collection and disposal times*

These residents get rid of waste on vacant plots of land or near historical sites and demolished buildings. Locations of these informal disposal sites for the surveyed Shyakhahs are shown in Figure 7-2. Detailed maps of informal disposal sites for each surveyed Shyakhah are presented in Annex B-4.

f. *Absence of security*

It is not possible for concerned parties to deal seriously with the abuses especially those that concern demolition waste, litter in the streets, disposal near historical sites, demolished buildings and vacant land.

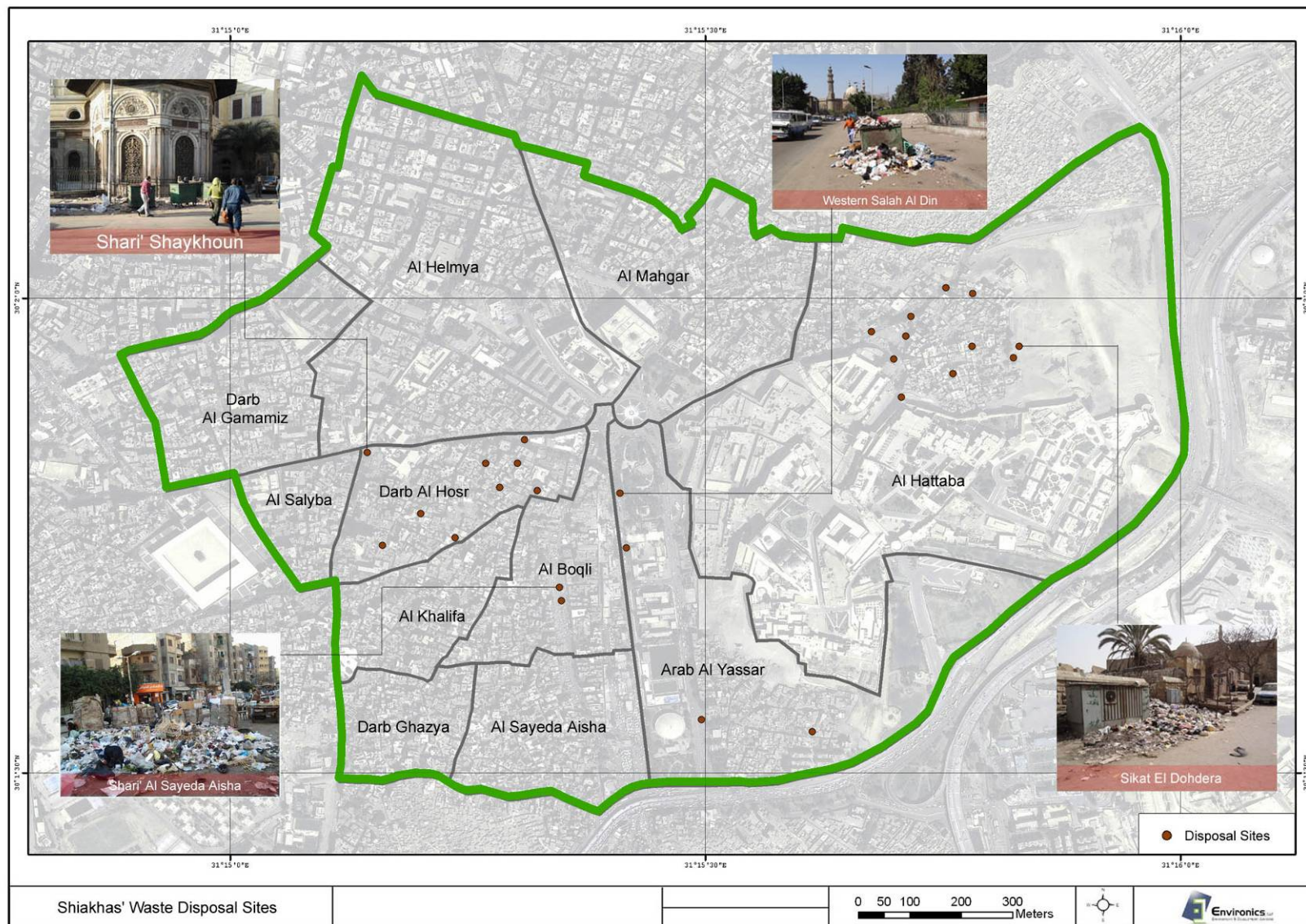


Figure 7-2: Waste disposal sites

7.2 Survey Results

The following sections present the results of the survey carried out on a sample of 200 households, 100 commercial and industrial facilities owners, as well as Focus Group Discussions with local residents.

7.2.1 Local Residents

A survey was carried out on a sample of residents in the Shyakhnas of Darb Al Hosr, Al Hattaba and Arab Al Yassar. This survey phase was very important to get to know the current situation directly from the community and how they deal with waste and their vision for a regular and appropriate SWM that suits the nature of the community, including:

- Waste disposal methods;
- Waste disposal locations;
- Timing and waste disposal rates;
- Means used to get rid of waste;
- Type of waste generated in households;
- Types of waste that is utilized and ways of making use of this waste;
- The impact of the current SWM system on the area and the historical locations;
- Vision of the community for an appropriate and regular SWM system:
 - Waste disposal methods and system;
 - Waste collection rates;
 - Timing of collection;
 - Costs of collection of waste;
 - Factors that lead to the sustainability of the system and its success;
 - Specifications and criteria for garbage collectors;
 - How to maintain the area's level of cleanliness;
 - The role of the district and the role of the community in the waste collection system;
 - Ways and interventions for appropriate awareness.

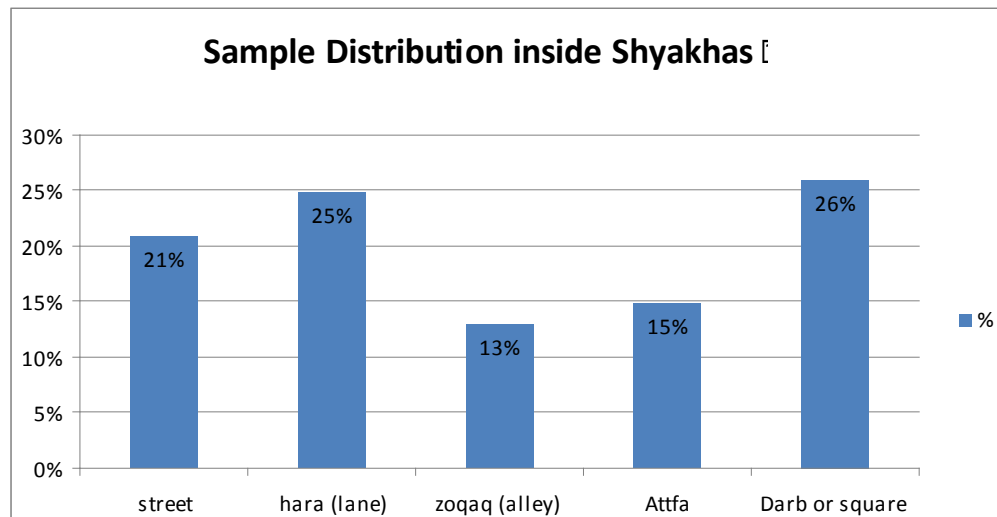
The survey was carried out on a random sample of residents (200 questionnaires). The sample was selected randomly from streets, alleys, pathways in each Shyakhna in order to obtain quantitative information. This was in addition to qualitative information that was obtained from individual in-depth interviews and focus group discussions conducted in the areas where field work took place in the Shyakhnas of Darb Al Hosr, Al Hattaba and Arab Al Yassar. The results of the survey and individual in-depth interviews and focus group discussion revealed the following:

a. *Sample features*

This includes location of sample, gender, number of family members, number of flats in the building and number of floors in building.

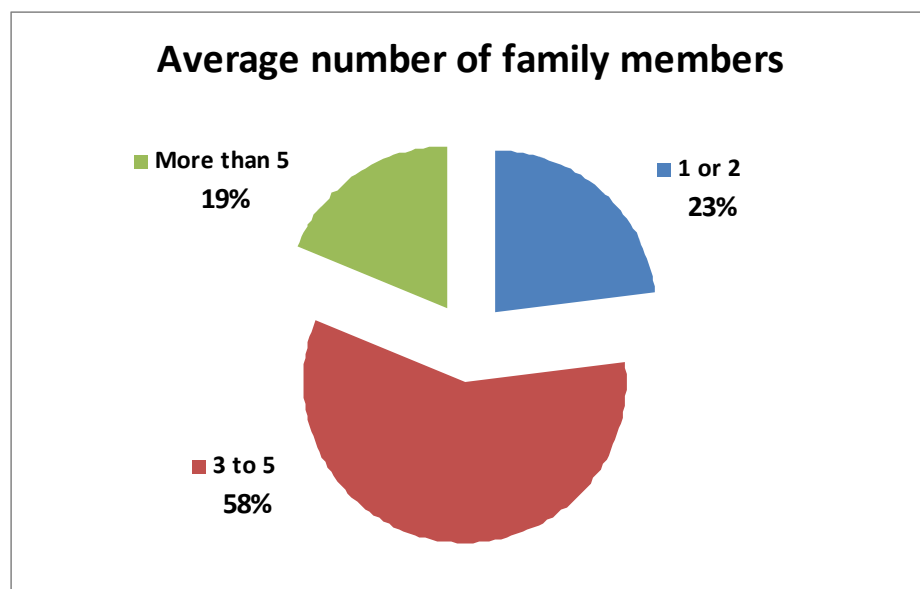
Due to the nature of the areas, care was given to select the sample from all locations within the areas so that the team could evaluate the current situation of the service realistically. The survey results revealed that 21% of the sample

was in houses located in streets, about 25% of the sample was in alleys as opposed to 13% in pathways, 15% in “*atfas*” and about 26% between *Darb* or square or path).



The sample was comprised of 77% women, 23% men and the average number of family members for those families in the sample was found to be:

- 23%: (one or two members because the nature of the community is comprised of elderly people).
- 58%: (3-5 members).
- 19%: more than 5 members.

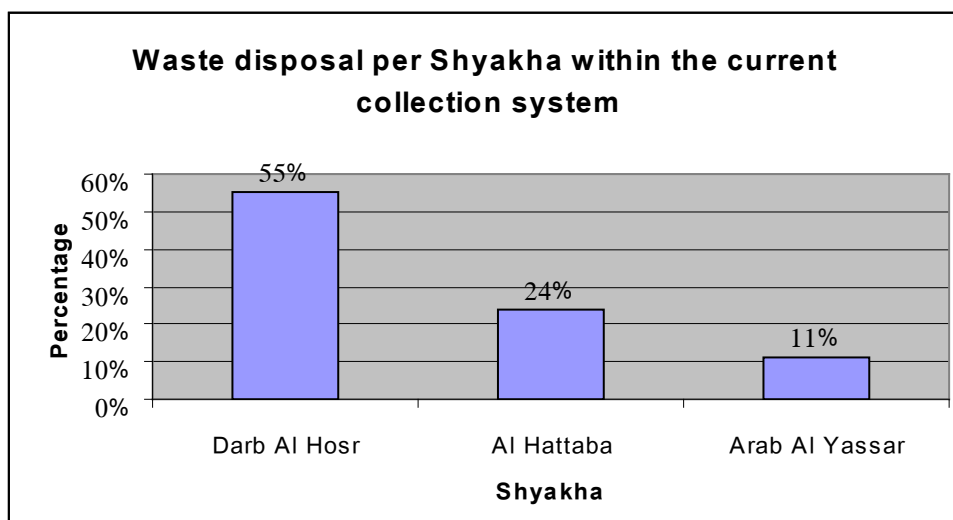


As for the number of floors, it was found that 34% of houses consist of one or two floors as opposed to 30% with 3 floors and 31% of houses in the sample were found to have between 4 to 5 floors. Only 5% of the sample of houses has more than 5 floors. Concerning the number of flats in each house/building it was found that 22% has 1 to 2 flats as opposed to 36% with 3-4 flats and 20% have 5-6 flats. About 22% of the sampled houses have more than 6 flats.

Looking into the above results it was found that there is a variation of the sample and its distribution on the streets and houses and their nature, with the aim of getting a realistic evaluation from the participating residents living in the areas where the study was carried out. There was also variation in the study between those families living on the ground floor, first floor and upper floors to get to know the actual situation on the service of all floors and the direct question of the nature of the service for each floor.

b. How residents dispose of waste

During the design of the questionnaire which was reviewed by the project management, the team of consultants was keen to know from the sample members themselves, whether women, men or youth, how they dispose of waste and where they dispose of it. The survey results showed that almost 35% of the sample gets rid of waste via the garbage collector or a private company (the contractor). Of these, 55% are from Darb Al Hosr, 24% are from Al Hattaba and only 11% are from Arab Al Yassar which reflects the current level of cleanliness in the Shyakhahs.

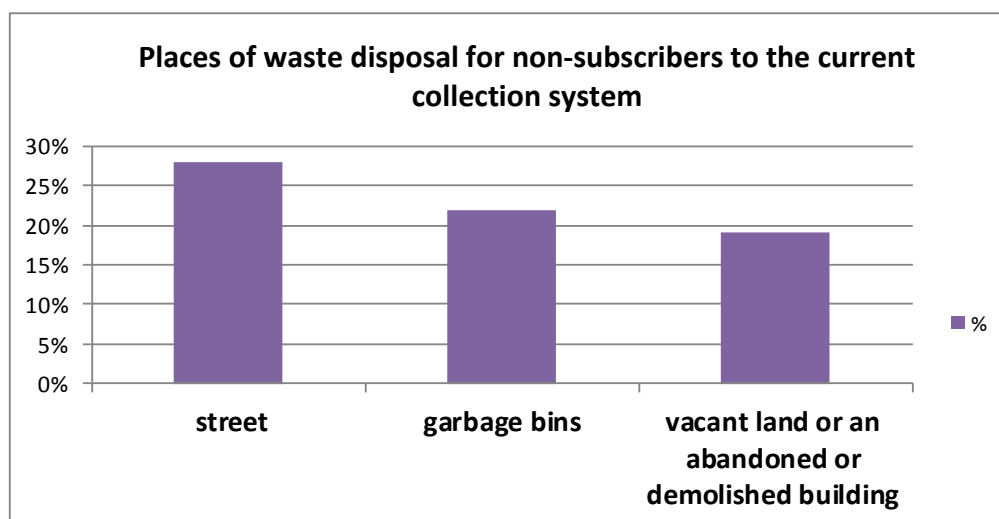


About 65% of the surveyed sample do not benefit from a waste collection service from companies or contractors. These get rid of waste in numerous ways and some using more than one way. Study results revealed that about 28% of the sample gets rid of waste in streets (16% in the same street where they live and 12% in an adjacent street). About 22% of residents dispose of waste in garbage bins. During discussions in Darb Al Hosr, garbage bins was a frequently reported concern. Some interviewees requested that garbage bins be removed because they block traffic due to their being placed in main streets and near schools as well as the timing of their being emptied during civil servants going to work and school times. This causes streets being littered because people do not throw in the garbage bins but near the bins and when bins are small in size they get stolen. Respondents said that placing the bins near antiquities sites damages the sites. For example, the bins placed in front of the “Sabeel” of Om Abbas in Al Darb Al Ahmar. Those same respondents believe that if the traditional garbage collector returns and bins are removed this will help in cleaning the area. Other respondents believe that there are

great benefits to the garbage bins, such as absorbing amounts of waste at any time due to the different timings when residents take out their waste and to the nature of the residents in refusing to keep certain types of waste in their homes. They also believe that garbage bins allow waste to be collected in the bin rather than be littered in the streets due to the stray cats and dogs scavenging through the garbage bags which has been on the rise in the past few years and which they see is on the rise because of the absence of pigs and the traditional garbage collector. The latter state of affairs has caused accumulations of waste and prevalence of stray dogs and lack of “shots” in the agreements with the mercy of animals.



About 19% of the sample disposes of waste in vacant land or an abandoned or demolished building which reflects the accumulations of waste in all areas of the Shyakhnas in spite of the existence of contractual agreements with the contractors covering historical Cairo.



A group of women from the Shyakha of Arab Al Yassar during the focus group discussion expressed their concern in the following statement: *“We all get rid of waste in the vacant land in Darb Al Dowra which is a location where a demolished building used to be and has now become a garbage disposal site”*.

Because of the nature of the area, being old, and it being subjected to the earthquake without allowing for restoration works there, many buildings needed to be demolished. Hence, each group of buildings has a vacant plot of land near it making it easier for garbage to be disposed there.

Accumulations of waste are removed on behalf of the community by collecting EGP 3 to EGP 4 from each individual reaching a total amount of about EGP 30 to EGP 40 on occasions and religious festivities like during the month of Ramadan and Bairam and when there is a wedding or the youth want to play football, they find a clean plot of land.

A number of interviewees in a focus group discussion held in the Shyakha of Al Khataba said: *“Most of us throw waste in the mountain which surrounds the area and is close to the citadel (which is the main dumpsite of the area and has tons of waste). This is also true for Bab Al Qalaa and the microfilm and the Sidi Shaheen primary school which is also abandoned. These locations surround the area from all sides”*.

Nobody comes to remove waste from the mountain (accumulations) and may only come after numerous complaints when waste is abundant and reaches the “tap”/ “hanafiya”. Only then do they elevate it without collecting it. In this case the community collects money from residents occasionally (EGP 150 to EGP 200) to give to a group of laborers who can remove the waste or to any contractor who has a loader who is asked for help and then the residents pay the driver and the workers.

Focus group discussions in Darb Al Hosr revealed that those residents who do not rely on the garbage collector to collect waste throw waste in garbage bins available in their areas or they throw it in areas where waste is accumulated in the dome or opposite the Ameer Taz or in front of Sayeda Rokaya and Shagaret Al Dorr.

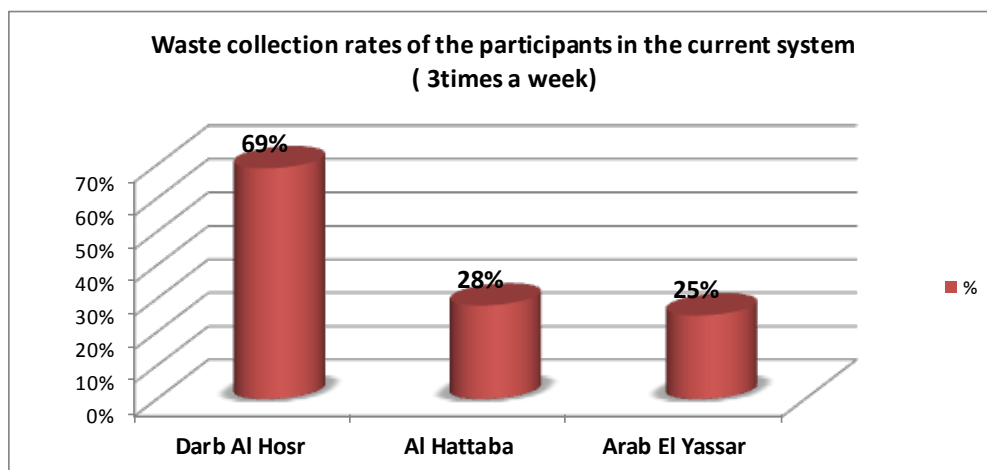
Some women, especially employees, take the garbage bags and throw them on the main streets between parked cars. This is done to the extent those housewives at home who sit in the balconies and fight with those women who do on a daily basis to stop them from doing this. Women who throw the garbage bags in the streets claim that this will force the officials to remove the accumulations of waste from the streets.

In depth interviews with the community and focus group discussions confirmed this and that disposal methods vary from one Shyakha to another. In some Shyakhas like Darb Al Hosr there is a regular waste collection service with a garbage collector or district worker. This is less true for Al Hattaba and is worse in Arab Al Yassar.

c. Evaluation of subscribers for the current collection service (with a garbage collector)

1. Waste collection rates

It was important to get to know the collection rates from the current subscribers of the service in the community (those who deal with a garbage collector from a private company contracted by the CCBA). Fifty six percent of respondents indicated that collection takes place 3 times a week (this percentage increases in the Shyakha of Darb Al Hosr, 69%, decreases to 28% in the Shyakha of Al Hattaba , 25% in the Shyakha of Arab Al Yassar).



This variation reveals the different levels of the service in terms of quality and regularity. However, 27% pointed out that the collection service is twice a week. About 10% of the sample enjoys a daily service, most of which is through the District worker, especially in the Shyakha of Arab Al Yassar where 75% of those who have a regular service with a garbage collector (the District worker) gets rid of waste on a daily basis (this is because there are workers from the District office as the Shyakha lies between Salah Salem and Salah El Din streets where there are workers for the cleanliness of streets).

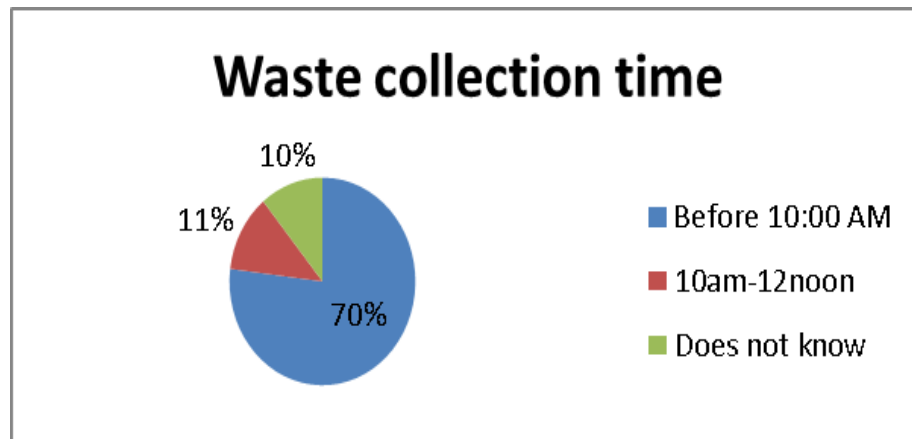
There are 61% of those with a regular service with a garbage collector who see that the number of days where collection takes place is adequate. About 39% of the sample sees that the number of days where collection takes place is not sufficient. This is especially true for those in the Shyakha of Al Hattaba where the percentage increases to 72% which reflects irregularity of the service and waste gets disposed of on streets and vacant lands on days where there is no service.

When asked about the adequate number of days for collection services, 59% of the sample dealing with garbage collectors said that 3 times a week was adequate as opposed to 30% who requested that the service is a daily service. This is because people are used to throwing waste on vacant land on a daily basis.

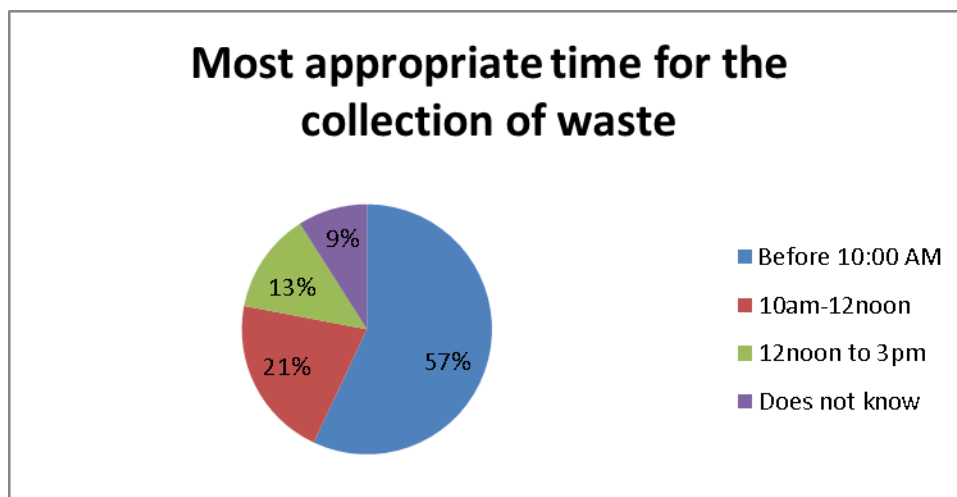
2. Waste collection time

It is important that the timing waste is collected is appropriate to the nature and circumstances of each area. About 70% of the sample who deals with a

garbage collector indicated that collection takes place before 10 am in the morning as opposed to 11% who said that collection is between 10 am to 12 noon. Another 10% expressed that there is no definite timing for the collection of waste. This was higher (25%) in the Shyakha of Arab Al Yassar.



Concerning what the sample sees as the most appropriate time for the collection of waste, 57% indicated that before 10 am in the morning is the most suitable. This was higher (67%) in Darb Al Hosr as opposed to 33% in Hattaba. Another 21% prefer from 10 am to 12 noon. This was higher (44%) in Hattaba as opposed to only 15% in Darb Al Hosr. Thirteen percent of the sample would prefer collection to be from 12 noon to 3 pm. This was higher (25%) for Arab Al Yassar and Darb Al Hosr.

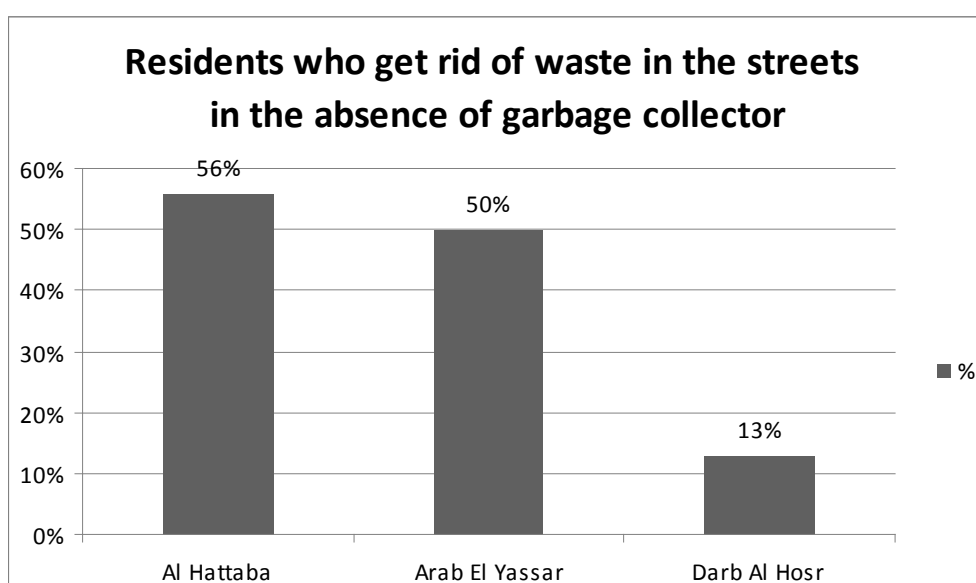


These results reveal that the current waste collection times are not appropriate according to the views of the sampled residents in each Shyakha. In Arab Al Yassar, interviewees during focus group discussions and in depth interviews revealed that due to the composition of the area which is comprised of large numbers of elderly people who go to bed early and due to the lack of lighting in the streets, they are able to wake up early to give their waste to the garbage collector. In Darb Al Hosr, interviewees prefer from 10 am to 12 noon (housewives) and from 3 pm for those who work. As for Al Hattaba, they did not indicate a specific preferred time because they ultimately prefer the use of

garbage bins and that the role of the garbage collector is supplementary to the existence of garbage bins.

3. What residents do in the absence of a garbage collector

Responses from interviewees varied according to the means of disposal. Each means of disposal also differed according to the nature of each Shyakha. In Darb Al Hosr, 27% of the sample indicated that in the absence of a garbage collector they take the garbage out and dispose of it in garbage bins located on the streets. Twenty six percent said that they dispose of garbage in the streets. It should be noted that throwing garbage in the streets does not mean accumulations of waste. This was true for 56% of the respondents in Al Hattaba, 50% in Arab Al Yassar as opposed to only 13% in Darb Al Hosr. In comparison to the Shyakha of Darb Al Hosr the team observed the prevalence of accumulations of waste in the Shyakhas of Al Hattaba and Arab Al Yassar.



Another 21% of the sample indicated that they wait for the garbage collector to reappear on another day and 10% said that they dispose of the waste by throwing it on piles of accumulated waste in the area. Another 11% had varying responses ranging from giving the garbage to the District garbage collector or disposing of it on abandoned plots of land or plots of land. Interestingly, about 4% of the respondents said that the garbage collector is always present.

4. Cost of the service

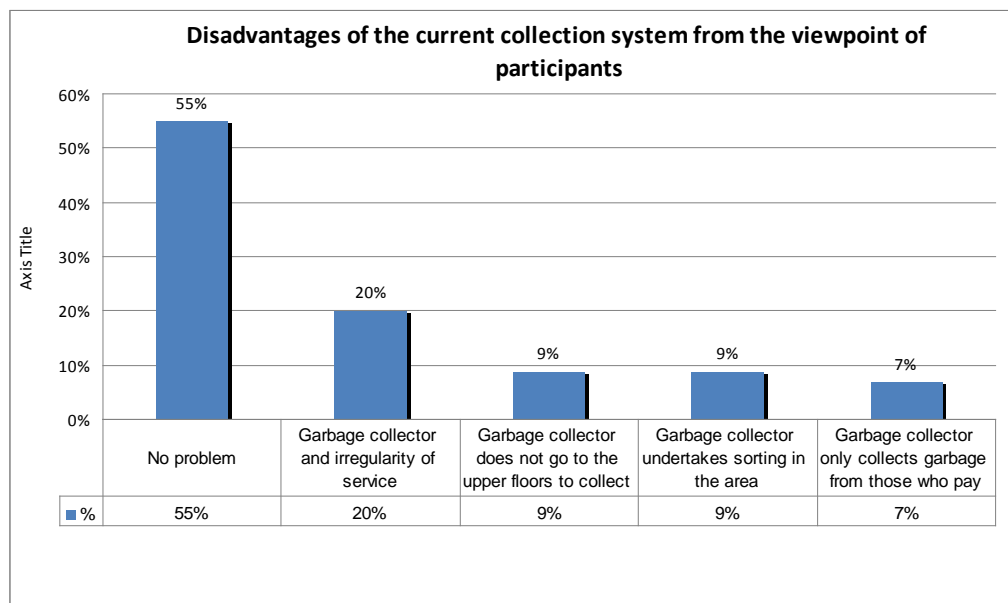
The CCBA collects fees for the service of collection of waste on the electricity bill which is EGP 3 per month. In the focus group discussion in Darb Al Hosr it was noted that some people pay EGP 5 on the electricity bill per residential unit. However, the contractors also collect fees other than those collected on the electricity bill. Results revealed that 80% of respondents pay the garbage collector for the service on a monthly basis. About 53% pay amounts ranging from (EGP 3 to EGP 5 per month. This amount increases in Darb Al Hosr (67%) and decreases in Al Hattaba (22%). Another 8% pay more than EGP 7 per month and about 7% -pay the garbage collector from EGP 1 to EGP 3 per

month. Moreover, 20% of the respondents do not pay the garbage collector. This increases (61%) in Al Hattaba and 50% in Arab Al Yassar. Of those who deal with a garbage collector, 85% of them believe the extra amount paid is reasonable.

5. Drawbacks of the current collection system from the point of view of those who deal with a garbage collector

The current collection system from the point of view of those who deal with a garbage collector revealed a number of points. About 55% of the sample of those who deal with garbage collectors do not see there are any problems with the system. About 45% point to a number of problems as follows:

- 20% indicated to an absence of the garbage collector and irregularity of the service.
- 9% said that the garbage collector does not go up to the upper floors to collect waste.
- 9% of the sample sees the problem in the garbage collector who undertakes the process of sorting in the area and leaves the remaining waste in garbage bins or on accumulations of waste.
- 7% see that the garbage collector only collects garbage from those who pay and also that the garbage collector does not accept all waste components.



Respondents were also asked if they knew where the garbage collector disposed of garbage. 69% of respondents said that they do not know where garbage collected is disposed of.

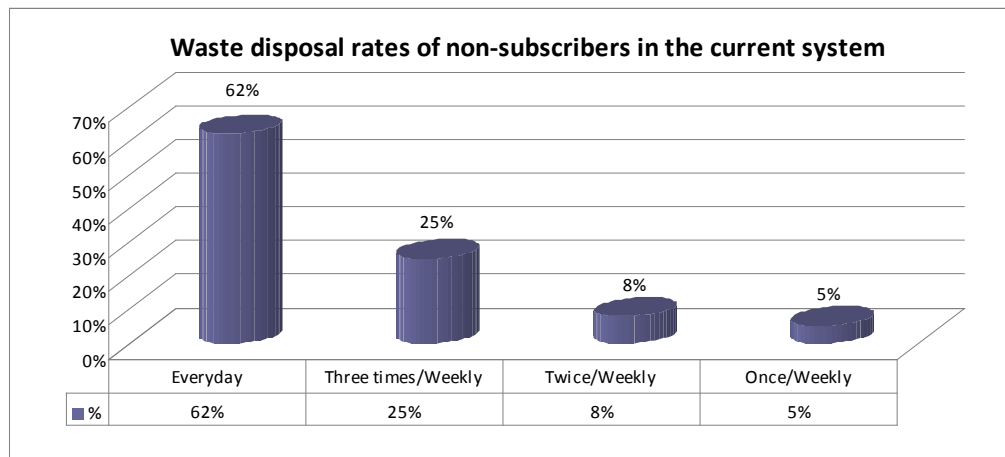
d. Views of respondents who are not members of a waste collection service on the current situation

As previously mentioned, 65% of the sample get rid of waste using different methods outside the current system whether through a garbage collector or contractor who is part of a company or the District. It was important for the

team to get to know from respondents waste disposal rates and timings as well as their views on the problems they face currently when they dispose of waste.

1. Waste disposal rates

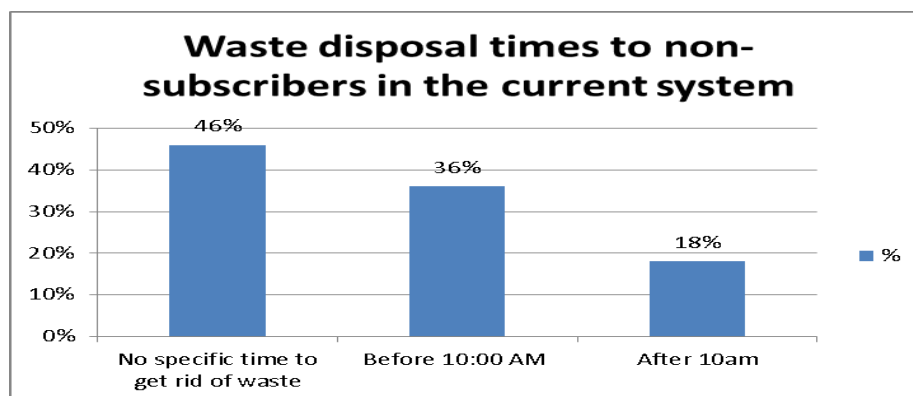
Because almost two thirds of the sample dispose of waste outside the current waste collection system with contractors, it was important for the team to ask about disposal rates. Results revealed that 62% of respondents get rid of waste on a daily basis as opposed to 25% who dispose of waste three times a week. Moreover, 8% dispose of waste twice a week and also 5% only once a week.



This gives an impression, without a doubt, the reasons why waste gets accumulated because the majority of those who are not members of the current waste disposal system get rid of waste on a daily basis as opposed to only 10% who deal with a garbage collector.

2. Waste disposal times

Forty six percent of the sample indicated that there is no specific time to get rid of waste. This was said in contrast to 36% who said they dispose of waste before 10 am (as opposed to 70% of those who deal with a garbage collector).

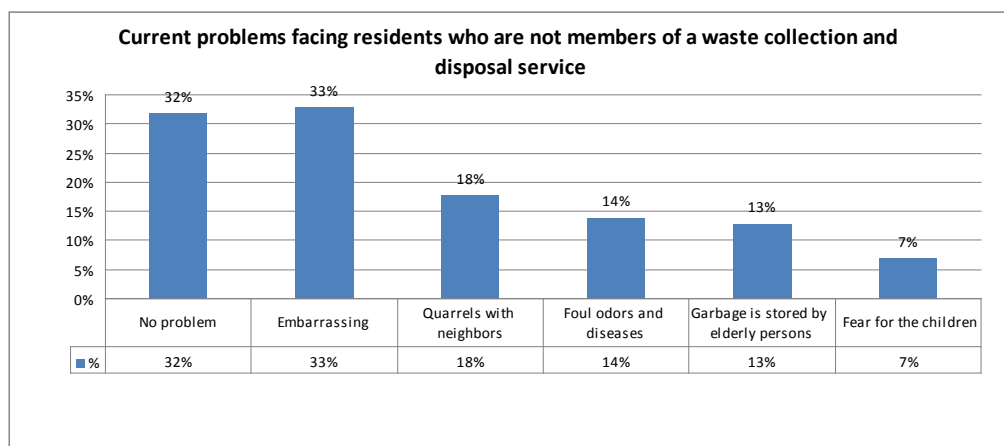


Hence, it can be noted that the majority who are not members in the current system and does not benefit from a collection service even when they pay the fees on the electricity bill. For those, disposing of waste takes place almost daily and at different times during the day which impacts negatively on the

level of cleanliness in the areas and the prevalence of accumulations of waste almost the entire time. This shows the importance of garbage bins in their view because it absorbs the constant flow of waste. However, the smaller bins are numerous and are placed near the residential buildings so as to protect them from the residents. These bins are emptied daily or else they lose their benefit.

3. Current problems that face residents who are not members of a waste collection and disposal service

Those residents who are not members of waste collection service had their own responses about the current way waste is disposed of. Results revealed that 32% of them do not see they have a problem. Another 33% said waste causes them embarrassment or difficulty in going down the stairs (especially the women and elderly). 18% pointed out the quibbles between neighbors because of the way waste is disposed of. Also 14% said that the way waste is disposed of causes diseases and foul odors because waste is not collected regularly and 13%, most of whom are elderly are unable to regularly get rid of waste. Furthermore, 7% are afraid to send their children to dispose of the waste.



An overview of the results of the survey previously mentioned reflects a waste collection system in the study areas that suffers from numerous problems which led to 65% of the residents to abandon the current system and to deal with waste outside the current collection systems or programs.

e. *How residents dispose of waste*

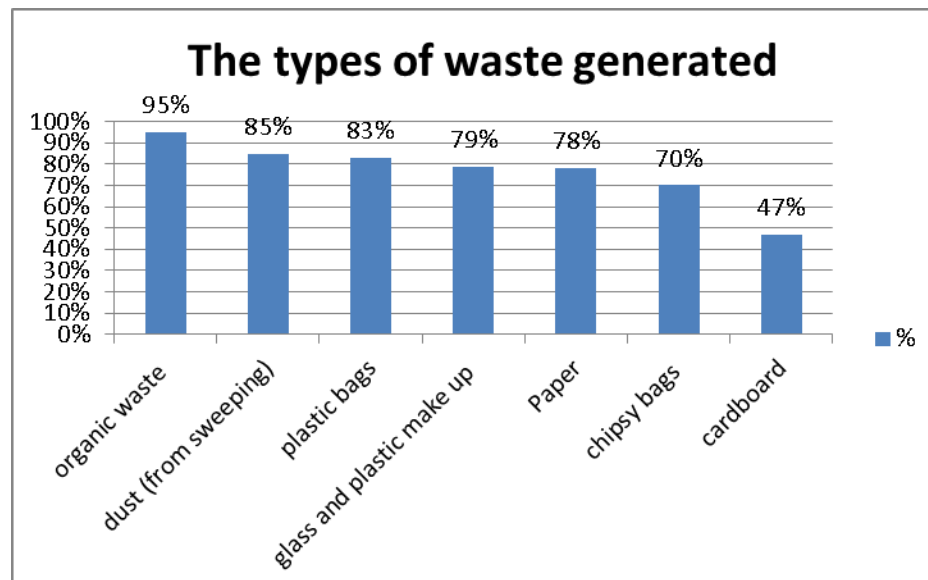
Eighty seven percent of residents dispose of waste in plastic bags. Most respondents use the same plastic bags that are purchased with goods they buy from the market. This is true for 95% of the respondents in Al Hattaba and 92% of the respondents in Arab Al Yassar. There is another 18% in the Shyakha of Darb Al Hosr who use other means such as a plastic bin or a plastic container or even a tin bin.

f. *Poultry raising*

Results of the study revealed that there are approximately 20% of the sample who raise poultry and some have sheep and or goats. This is particularly true for Arab Al Yassar (33%) as opposed to 17% in Darb Al Hosr and Al Hattaba.

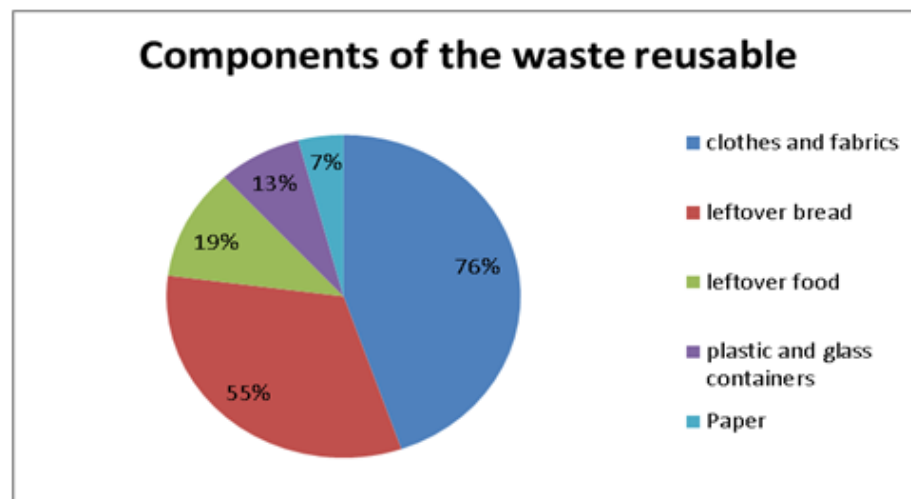
g. Waste components and their benefits

The main waste components in the study areas are organic waste, plastic bags, plastic containers, dust from sweeping, *chipsy* (potato chips) bags and paper. About 95% of the sample indicated that they generate organic waste composed of leftover food, while 85% said their waste is composed of dust (from sweeping) and another 83% said they their waste is mainly composed of plastic bags. Another 79% indicated that glass and plastic make up their main waste composition. In addition, 78% said that paper was among their waste components and about 70% of the sample said that *chipsy* bags are among the major components of their waste. Finally, cardboard makes up waste components for 47% of the sample.



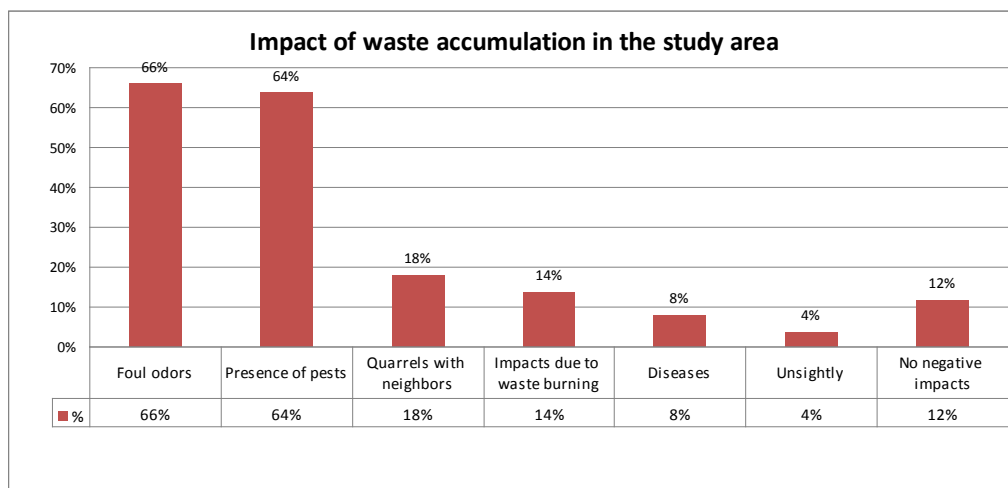
As for benefitting from waste components, results revealed that 76% of the sample recycles clothes and fabrics 55% of the residents benefit from leftover bread and 19% benefits from leftover food.

Thirteen percent of the sample reuse plastic and glass containers and paper was found to be the least recycled waste component where only 7% of the sample said they made use of waste paper.



h. Impact of waste accumulations on the study areas

When asking the sample about the most important problems and the impact of waste accumulations on the area and the consequent negative impacts, 66% said that accumulated waste causes foul odors lasting for long periods of time. In addition, 64% said that there is an abundance of flies, mosquitoes and rodents as well as an increase in the number of stray dogs because of accumulations of waste which affects the passer by.



This was confirmed during focus group discussions where respondents indicated an increase in stray animals especially dogs to the extent that they expressed that the animals have become more than humans: “*They have become more than the humans and they are unable to count them*”.

Respondents went on to say that they are unable to leave garbage outside their homes or to leave the front door open. They referred this to the amounts of garbage found on streets and to the absence of the traditional garbage collector as well as to the irregularity of the service. This also shows that residents also refuse to bring out their garbage to the garbage collector or they wait for him to collect the garbage or that the garbage collector does not come during appropriate times.

Focus group discussions revealed that some women resort to different coping mechanisms in dealing with stray animals. Some women hang the plastic bag with a pin. Others place a rock on top of the garbage bin cover and even place bottles of water to scare cats away. 18% of the sample said that it causes neighbors to quarrel while 14% said that burning waste or its combusive nature causes problems for children and the elderly. Another 8% said that it causes diseases while 4% said that it is ugly. Finally 12% said that waste does not cause negative impacts or problems.

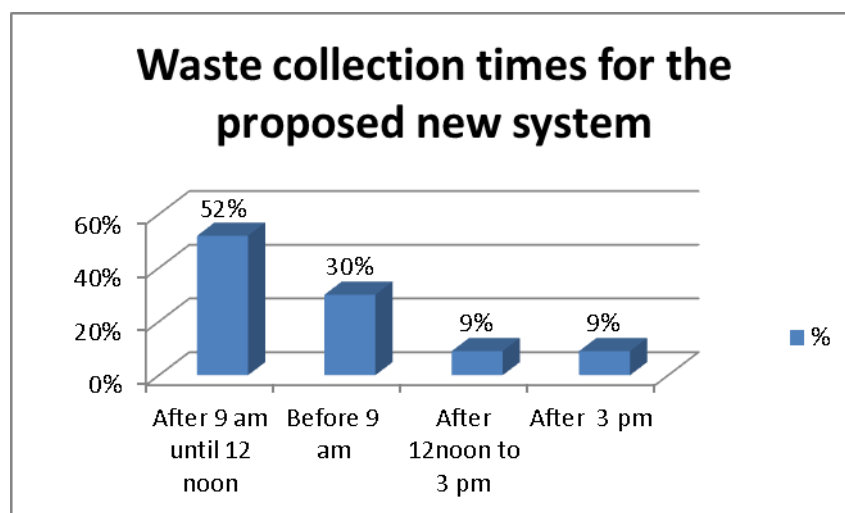
i. Most appropriate proposed waste collection system from the community’s point of view

After becoming familiar with the current situation and how the sample deal with waste whether those who deal with a garbage collector or those who do not and the associated problems, the team tried to understand what proposed

solutions that the community sees appropriate for the waste collection system. The following summarizes what they expressed.

1. Waste collection times

The time when waste is collected is important for the overall SWM system and plays a major role in the regularity of the collection system. The survey results revealed that about 51% of the sample sees the appropriate time to be after 9 am in the morning until 12 noon. The percentage reaches 64% when the collection time is extended to 3 pm. 30% said they preferred waste collection to take place before 9 am (17% preferred from 5 am to 8 am) and 9% indicated for collection to be after 3 pm.



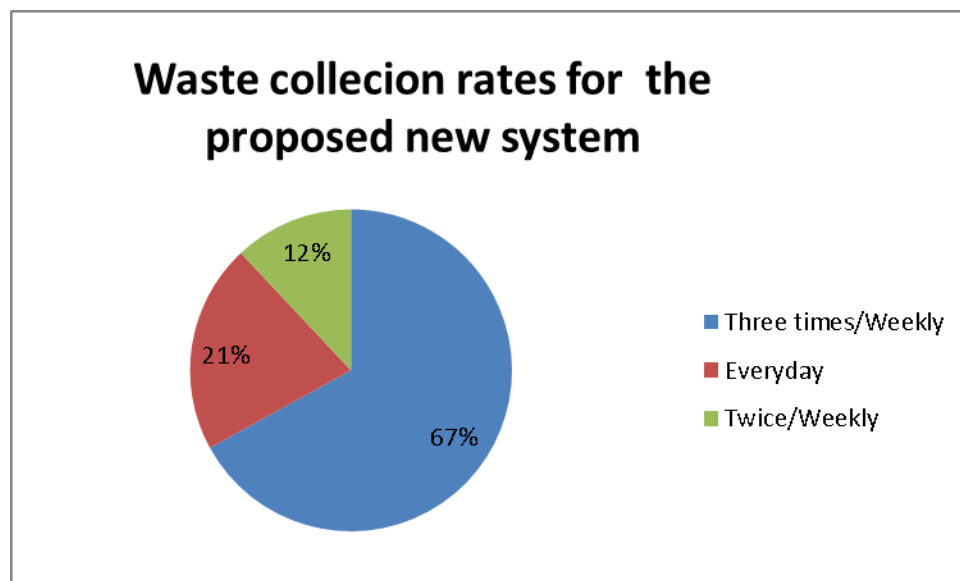
Preferred collection times differed from one Shyakha to another. In Darb Al Hosr, 83% prefer that waste collection is carried out before 10 am in the morning as opposed to 76% in Arab Al Yassar prefer from 9 am to 12 noon.

These results when compared to the current situation shows that 70% of those who deal with a garbage collector claim that the garbage collector does not come before 10 am which contradicts with what they proposed for appropriate times and hence a significant number of potential subscribers for the service will not do so because of the inappropriate time waste is collected. This was also mentioned by the garbage collector himself claiming that residents do not abide by the morning collection times, the result of which causes lack of a strict time that is observed for collection and disposal. 46% of those who are not subscribers of the collection system said that they bring out their waste at any time as opposed to 36% who said they bring out their garbage before 10 am. Therefore, it is important before any waste collection system is to be established that these conflicting times mentioned by respondents be taken into consideration so that collection times are convenient for the community. This is in addition to raising the awareness of the community on the importance of abiding by the collection times.

2. Collection rates (number of days waste is collected)

Sixty seven percent of the sample prefers that waste collection in the proposed system to be three times a week (every other day), 21% of the sample sees that

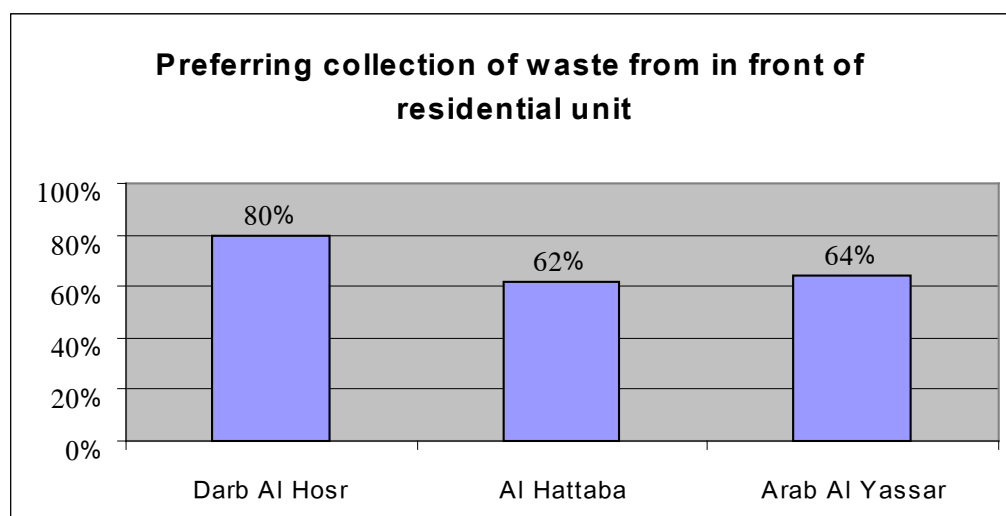
the collection service should be daily and about 12% prefer a service that is twice a week. The results show that in the absence of a permanent service the community will likely adapt to the system and abide by it.



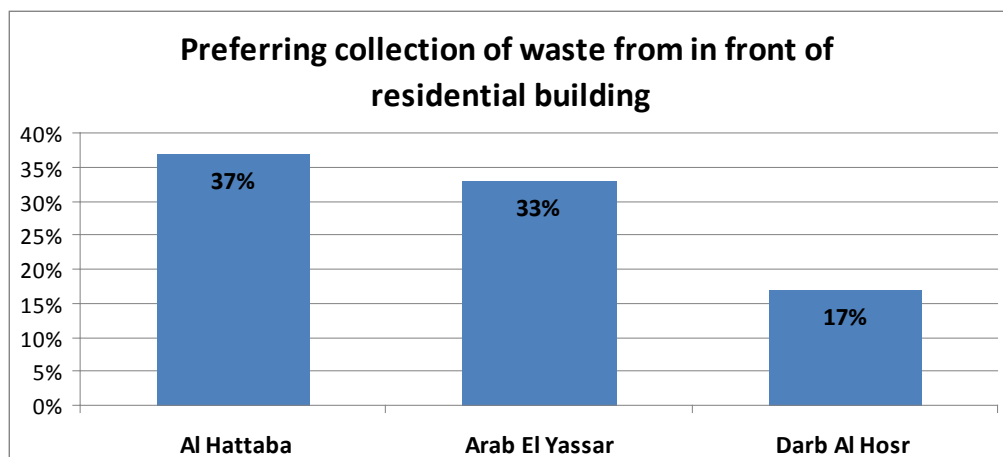
For those respondents who are not subscribers of a service, the results show that 62% of them get rid of waste on a daily basis. However, when asked about the number of times waste should be collected if a regular service exists, about two thirds of the sample said three times a week is suitable.

3. Preferred location for the collection of waste

Seventy percent of the sample prefers that waste is collected from in front of the residential unit. This varied between Shyakhnas where it reached 80% in Darb Al Hosr and decreased in Al Hattaba (62%) and Arab Al Yassar (64%).



On the other hand, 28% prefer that collection is done in front of the residential buildings (this increased in the Shyakhnas of Al Hattaba (37%) and Arab Al Yassar (33%). In Darb Al Hosr, it was 17%.



Many preferred not to change the garbage collector because familiarity increases the feeling of security especially during these days of lack of security and also because the garbage collector knows the nature and requirements of residents.

In Al Hattaba the respondents mentioned that the garbage collector does not stay more than half an hour in one place calling out to people and no one being able to hand him the waste.

4. Fees (excluding those charged on the electricity bill)

As known, the cleanliness fees are charged on the electricity bill, EGP 3 per month. However, the reality is that another fee is paid for the service whether the service is from the contractor or the District worker. This fee takes sometimes takes the form of a tip and at other times in the form of monthly fees for those who are regular with the garbage collector.

Survey results revealed that for those who deal with the garbage collector, 80% of them pay directly to the garbage collector on a monthly basis. 53% of them pay from EGP 3 to EGP 5 per month and 85% of those who subscribe to the service see this as a reasonable amount.

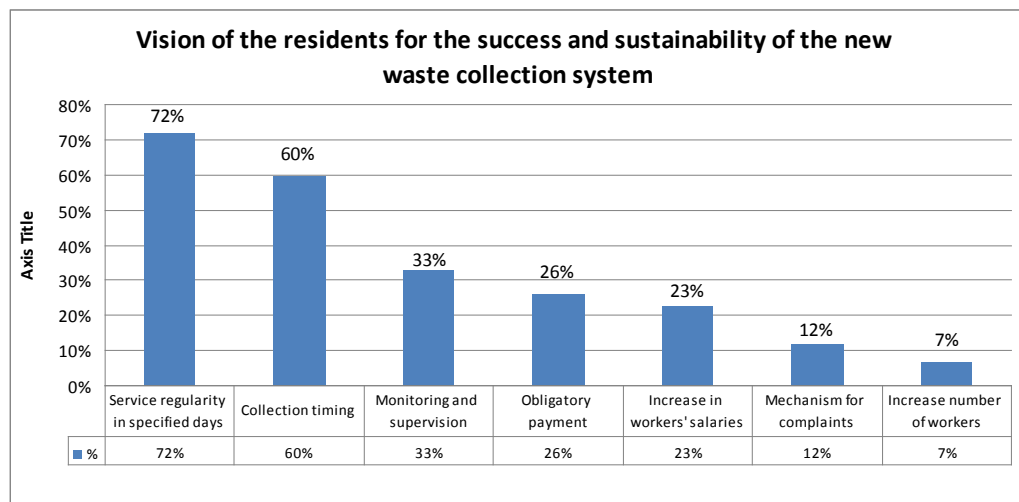
When asked about the amount that residents can afford to pay each month excluding what is paid on the electricity bill, 47% said that the suggested amount should range between EGP 3 to EGP 5 per month. This increased in the Shyakhia of Al Hattaba to 88% as opposed to 23% of respondents who see that the amount should be in the range of EGP 2 to EGP 3. This increased in the Shyakhia of Arab Al Yassar to 52% while there are about 14% who see that the fee should be between EGP 5 to EGP 10. This increased in Darb Al Hosr to 68%. Moreover, 12 % see that the fees charged on the electricity to be sufficient. Hence, the existence of a regular system for the collection of waste encourages people to pay the fees.

Many respondents prefer to pay the amount directly to the person providing the service to guarantee that the fees reach that person. In case this person is absent or is negligent, he will not receive the fees. In Darb Al Hosr the idea of a "mediator" (the electricity company) was entirely refused.

j. How residents view the success and sustainability of the waste collection system

After respondents had expressed their views on the collection service, identifying the appropriate collection rates, waste collection locations and fees, it was important to ask respondents about their views towards the success and sustainability of the proposed system.

The majority of the sample (72%) in the different Shyakhas indicated that it is important for the garbage collector to abide by the specified days for collection and not be absent. 60% said that abiding by collection times is very important (some respondents complained that the garbage collector comes too early in the morning while they are still asleep). 33% of respondents said that there is a need for monitoring and supervision on those who collect garbage. About 26% indicated that it is important to oblige residents to pay and not make it optional. On the other hand, 23% of respondents believe that salaries and wages of workers in waste collection should be increased. Another 12% see that it is necessary that there is a mechanism for receiving complaints or a hotline or regular number to express concerns and make complaints. Moreover, 7% indicated a need for increasing the number of workers so that waste collection is carried out properly in each Shyakhha.



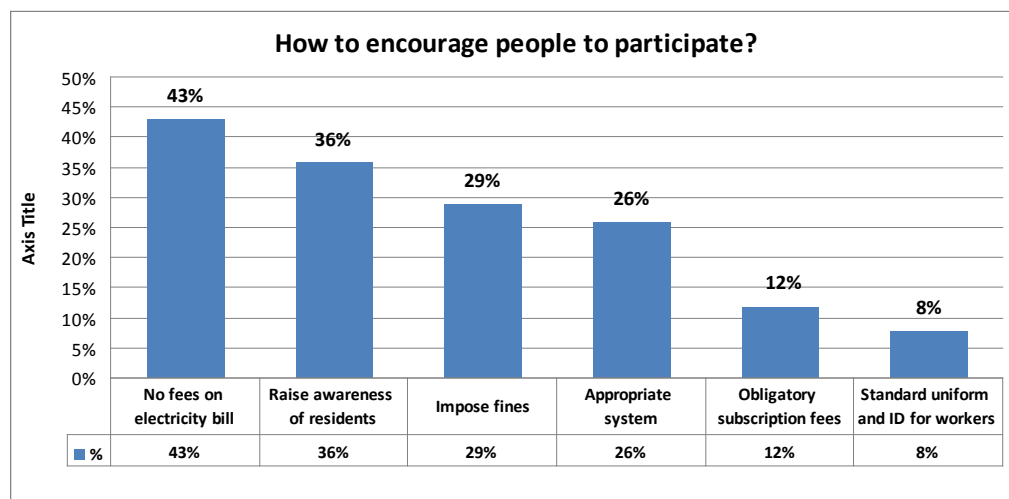
During the focus group discussions and in depth interviews respondents confirmed the need for a prompt response to complaints and solving problems. This includes removing accumulations of waste by enclosing the land on which the waste lies and building a fence around it. It is preferred that the vacant lands are made use of so that they serve the historical nature of the area and also trees can be planted on these lands.

The discussions also revealed that collection and transfer equipment as well as bins should be updated to suit the nature of the area. Respondents also expressed a concern for designating special vehicles to deal with removal of demolition waste and sweeping the circular road as in the past. Also discussions revealed they would like to see streets paved which helped in cleaning the areas. Moreover, it was mentioned that it is important for the garbage collector to avoid sorting of waste on vacant land because what is the

point of having him carry out the collection service since they dispose of waste in the same place at a time that is convenient for them without paying any fees.

k. How to encourage people to participate

Forty-three percent of respondents believe the fees charged on the electricity bill should be abolished and that fees should be paid directly to the service provider. This increased in the Shyakhnas of Al Hattaba and Arab Al Yassar (50%). Moreover, 25% expressed a need for the fee for service to be suitable. Another 12% believe that subscription fees should be obligatory and that a receipt should be given. In addition, 36% of respondents believe in the importance of raising the awareness of the community on the need for a regular service to collect waste and also to raise the awareness on the risks and dangers resulting from accumulations of waste. 29% indicated a need for a system where fines can be imposed on offenders and for those who dispose of waste in areas not designated for waste.



Twenty-six percent of respondents who are members of a service indicated that the presence of a decent and regular system that is appropriate for the nature of the community and area in terms of timing of collection, collection rates and direct collection of waste from residential units will impose itself and encourage residents to become members of the system. Furthermore, 8% of the respondents expressed a need for a standard uniform for workers and as well as an ID in order for the residents to identify them and to guarantee security aspects.

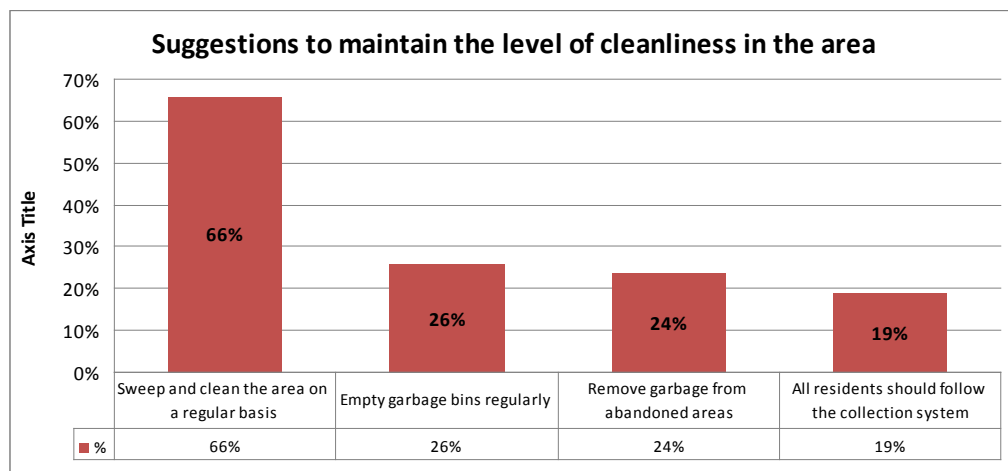
l. Factors ensuring success and sustainability of a waste collection system

It was important for the team to understand from the recipients of the service what guarantees a good quality service for the collection of waste. 68% of the sample said that this would occur by obliging residents to subscribe with the contractor or garbage collector as well as obliging the garbage collector with collection times. This they said would guarantee the success and sustainability of a waste collection system. On the other hand, 35% said that regular payment for the service is a guarantee. About 43% indicated that by not

throwing waste on the streets or in places not specified for waste to be a factor that may guarantee the success of the system.

Respondents presented a number of suggestions to maintain the level of cleanliness in the area. The following are examples:

- 66% believe that it is important to have a regular service for the sweeping of streets on a regular basis.
- 26% believe that by emptying garbage bins regularly cleanliness will be maintained in the area.
- 24% request that removal of accumulations of waste from vacant and abandoned land and demolished buildings. This increased to 30% in Arab Al Yassar.
- 10% believe that it is important to build fences around these places after cleaning them up and paving the streets which will help in maintain the cleanliness of the area. This increased to 25% in Arab Al Yassar.
- 19% confirmed that by obliging residents to participate in a collection system is important to keep the area clean.
- Others believe that getting rid of stray animals is important.
- Renovating buildings, planting trees in streets, placing garbage in plastic bags and increasing the number of garbage bins and making sure they have good lids or covers to prevent scavengers from messing around with the waste.



m. Awareness of community to the historical value of the area and impact of waste on the historical places

The majority of residents (95%) are aware that their area has a historical value. They mentioned numerous places exceeding 40 locations. The majority believe that the Citadel, Toloun mosque, Refaie mosque, Sultan Hassan mosque and Sabeel Om Abbas to be among the most important historical locations.

However, they also mentioned the negative impacts of the accumulations of waste on the historical areas where 84% of the sample sees the problems resulting from throwing waste on the streets and historical locations as due to lack of a regular service especially around the historical area which affects the

way tourists perceive the area. This is especially true when tourists take photos of sites which are surrounded by waste.

Focus group discussions in Al Khataba also revealed that accumulations of waste impacts negatively on the antiquities. Respondents indicated that tourists pass by the Shyakha as it is a short cut and they walk on piles of waste and when they see this, tourists change their path. Respondents were also keen to point out that tourists take photos of the community near the garbage piles and according to respondents are amazed at how the community could be living in such an environment, not fit for humans. Respondents were quick to point out that disposing of garbage is due to them but they said: *“What can we do when we don’t have garbage bins and no regular waste collection service.”*

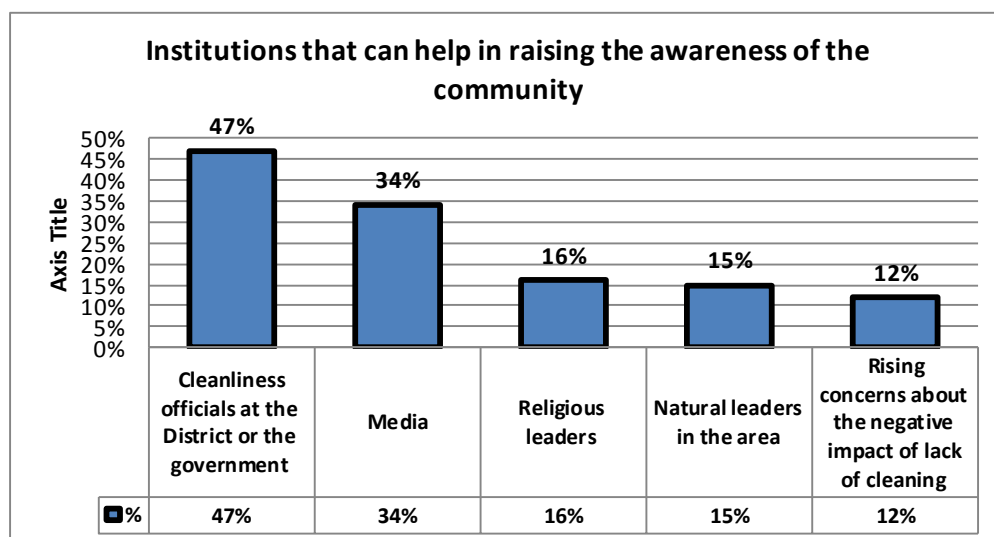
Respondents added that university students of the faculty of arts come to these areas to do drawings and there are large numbers of students who do that. Respondents claim that these students are unable to withstand the stench and some of them are unable to come back again to the area. They went on to say that they are amazed by the fact that the garbage in the mountain is 20 years old and that the District and the CCBA have been unable to remove it.

Discussions from focus group sessions in Arab Al Yassar with a group of women revealed that the areas under study were attraction points for tourists who used to frequent and roam around in the streets, entering locals’ homes, attending weddings, etc. One woman explained that tourists used to enjoy observing the life of the people in these areas as well as the artisans and the vocational workers but after the accumulations of waste tourists stopped visiting.

In the Shyakha of Darb Al Hosr respondents in the focus group discussions indicated that accumulations of waste and stray dogs has impacted the antiquities and prevents tourists from visiting. They go on to say that placing garbage bins near the antiquities and not removing the waste on a regular basis transforms these sites into pollution foci (because waste accumulates around it). This leads to the proliferation of insects and foul odors in the area.

n. Institutions that can help in raising the awareness of the community on the importance of cleanliness

The results of the survey revealed that more than a third of the sample lack awareness to the importance of cleanliness as they pointed out that the current waste collection system and disposal do not pose a problem on the cleanliness of the area. Hence, it was important to know what entities, persons that can partake in awareness raising programs on the importance of cleanliness and the hazards of waste. 47% of the sample believes that the cleanliness officials at the District or the government are the concerned party which can undertake awareness raising. 34% view that the media is more suitable for carrying out this role while 16% mentioned that religious leaders are more effective, whereas 15% see that natural leaders in the area as well as coffee shop owners will have more impact on people and in communicating awareness messages. Another 12% indicated the importance of medical caravans in portraying the negative effects of lack of cleanliness on the health of people. Others mentioned the role of youth as being instrumental in raising the awareness.



Yet, other respondents in focus group discussions in Al Hattaba point to the fact that the existence of a solid system and regular service is enough to raise the awareness of people. So it is important for people to feel and sense something tangible in order to be convinced. Respondents referred to a time when the streets were being paved (about one year ago) and the community partook in this activity. Also the trees planted along Seket Al Dohdeira were planted by “Am Sayed” who works in Al Khayamiya.

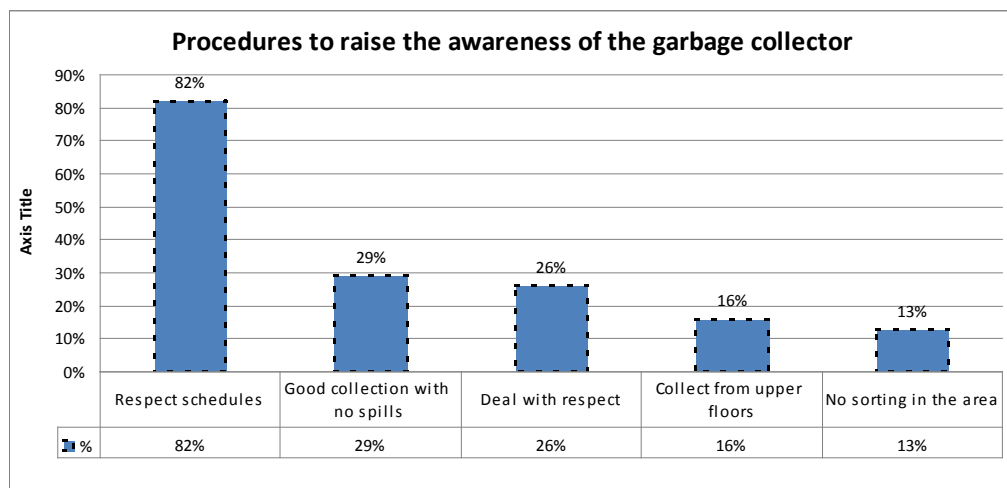
In a group meeting in Darb Al Hosr some respondents mentioned that fines and punishments is the most appropriate means to change behavior. Others indicated that a good service is a type of awareness activity to show people the importance of cleanliness. Moreover, respondents expressed the need to start with eradicating illiteracy and poverty so that is where any awareness raising programs should start. Finally, some respondents feel that it is better to start with children.

In Arab Al Yassar, respondents in the group meetings had another opinion and that is for residents to collect money to remove the accumulations of waste and that as residents, they should clean in front of their houses as well as removing accumulations of waste during occasions especially during weddings. They added that if garbage bins were placed on the condition that they are emptied regularly, there would not be a single piece of paper littered in the area and even the children will be committed. These respondents see that awareness exists but what is lacking is the waste collection system from the CCBA and the District.

o. Perception of the community on the procedures that the garbage collector worker should be made aware of

Respondents also believe that garbage collectors and workers should receive awareness raising programs. 82% of respondents see that raising the awareness of the worker on the importance of respecting schedules and times and not being absent is extremely important. 29% see that it is important to inform the garbage collector on how to carry out the task of collecting waste efficiently so that waste does not seep into the streets. Also 26% said that the

garbage collector should deal with people with respect while 16% believe that the garbage collector should be informed and made aware of collecting waste from the upper floors so that waste is collected from the source. This is in addition to integrity and honesty when entering homes. Furthermore, 13% indicated that it is extremely important to inform the garbage collector of the negative effects of sorting garbage in the streets or collecting waste and then leaving it behind for long periods of time in the streets so that stray animals and insects prevail.



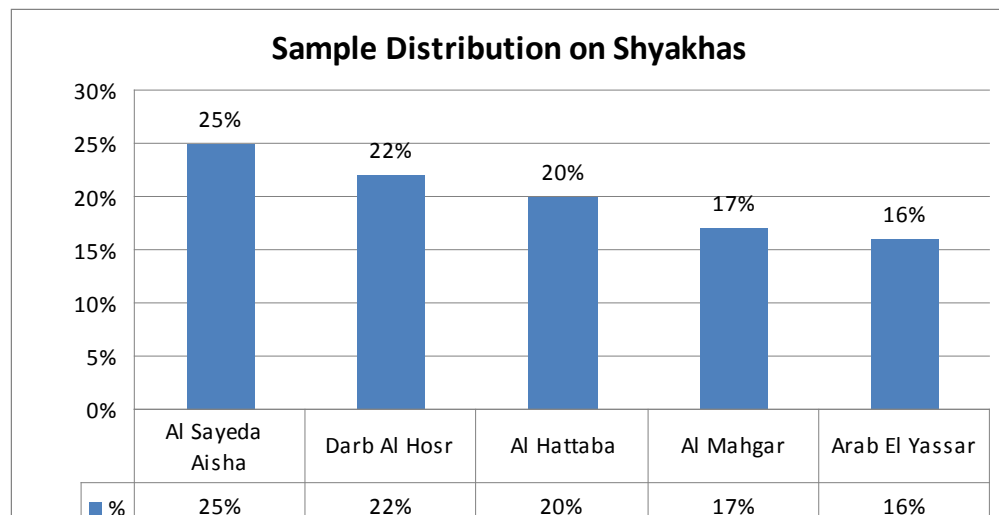
Finally, the garbage collector does not spend enough time in the area and calling out hastily for garbage to be collected does not allow all to depend on him to collect the garbage.

7.2.2 Business Owners

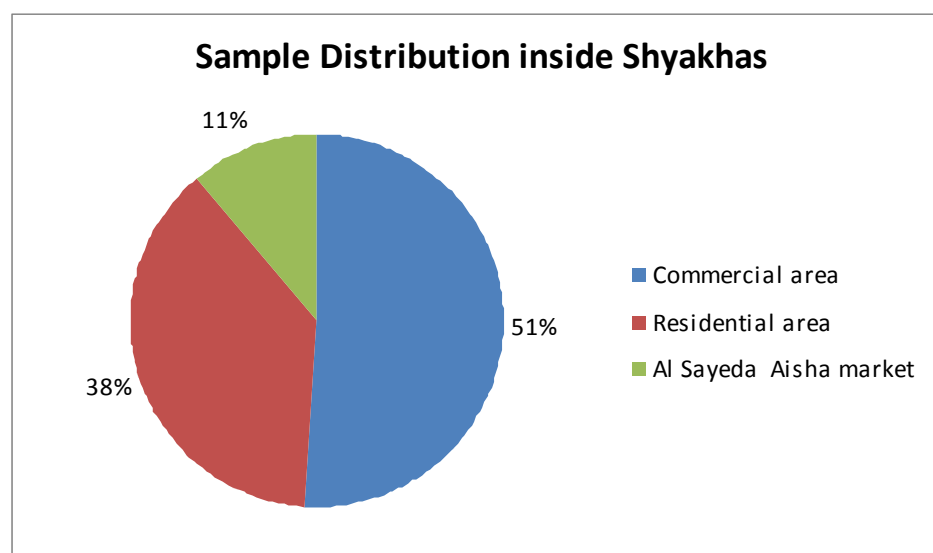
A survey was conducted for a sample of commercial, service and industrial enterprises in localities of Darb Al Hosr, Al Hattaba, Arab Al Yassar, Al Mahgar and Sayeda Aisha. This phase was important in terms of exploring the enterprises owners' direct feedback on the current situation as to how they deal with waste and their vision for a proper and regular solid waste management system.

The survey was carried out for a random sample of enterprises covered by 100 questionnaires. The sample was randomly selected from all streets, lanes and alleys in each locality. The results of the survey are presented hereafter.

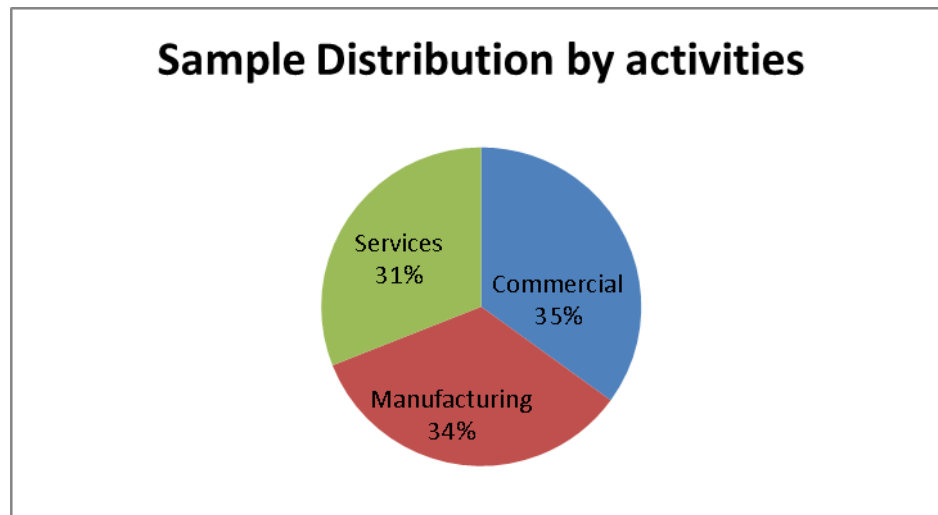
- b. Sample features (location and type of sample, location and type of business)**
 Due to the nature of the area and as activities vary, scattered but not concentrated in specific localities, the sample was distributed so as to be in five localities: 25 % in Sayeda Aisha, which has a market; 22 % in Darb Al Hosr; 20 % in Al Hattaba; 17 % in Al Mahgar and 16 % in Arab Al Yassar.



The sample covered activities in different places within localities: 51 % was located in a commercial street; 38 % of activities were in a residential street and 11 % of the sample was done within Sayeda Aisha Market.



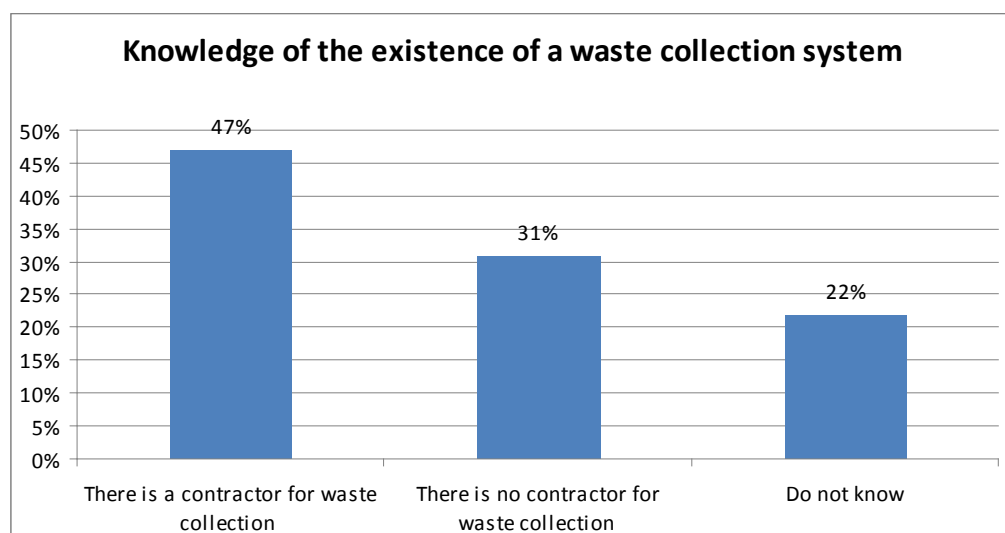
This enabled the team to assess the current situation of the service in a realistic manner. Also, the sample considered representation of different commercial, service and industrial businesses. Results of the sample indicated that 35 % of the sample was accounted for by the commercial-related business sector (amounting to 60 % of the total sample of enterprises in Sayeda Aisha Locality and to 41 % in Darb Al Hosr versus 6 % in Al Mahgar Locality). On the other hand, 34 % of the sample was accounted for by the industrial-related business sector (up to 71 % in Al Mahgar Locality and 50 % in Al Hattaba versus 4 % in Sayeda Aisha Locality). Finally, 31 % of the sample was recorded by the service sector, where localities accounted for similar percentages.



As far as the gender representation is concerned, males accounted for 90 % of owners and females accounted for 10 % of owners, according to the nature of each business.

c. Owners' awareness of the existence of waste collection system

Owners of different businesses are there on streets, which enable them to spot and judge any changes to the waste collection service and whether or not a garbage collector or a cleaner exists. As such, they were asked if there is a contractor or garbage collector to gather waste in their neighborhood. The yes answer came from 47 %, while the no answer came from 31 %. Out of the sample, 22 % does not know specifically.

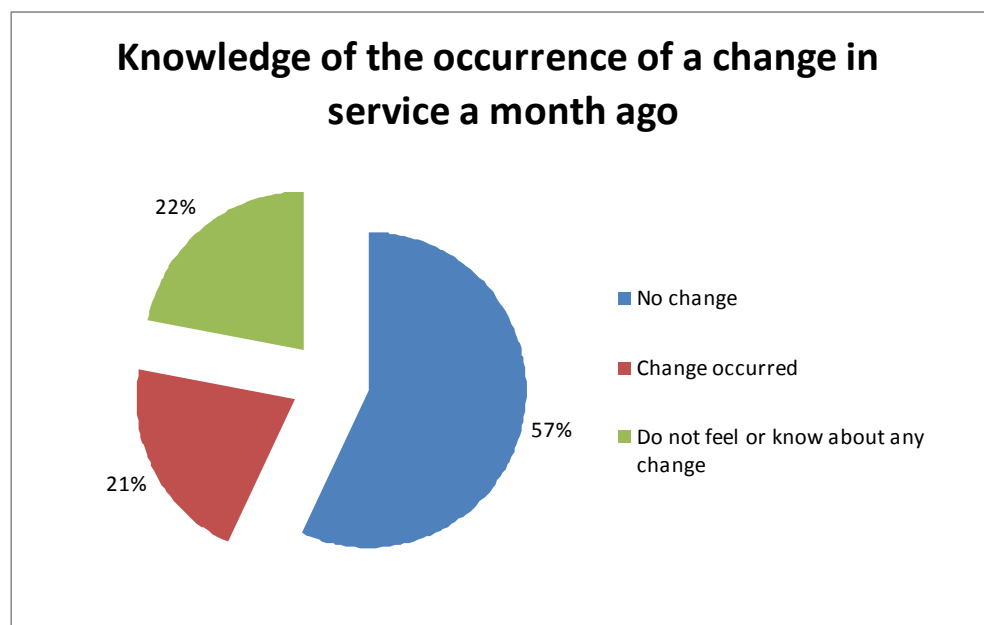


This indicates that the garbage collection service provided by collectors and cleaners are not inclusive of all neighborhood and streets. It also demonstrates that the amendment of contractors' agreements, whereby the cost was increased from EGP 1.5 to EGP 4 including the service of enterprises, neither served nor improved the collection process. It is worth mentioning that as of March 15, 2014 and following the amendments of contracts, the waste

collection service from shops has been commissioned to contractors, but not to a district worker, and has become daily.

As indicated in the household research and according to people's statements in collective interviews, they were told by officials that a garbage collector or a contractor would come three times a week. However, the situation, which started regularly in some neighborhoods, did not carry on.

Directly asking shop owners if a change took place in the approach to collection as compared to a month before, 57 % answered that no change occurred versus 21 % who said that a change occurred by having a contract to collect waste from shops. Meanwhile, 22 % did not feel or know about any change.



These results indicate the lack of communication between the service providers and recipients, together with the complete absence of supervision and follow up.

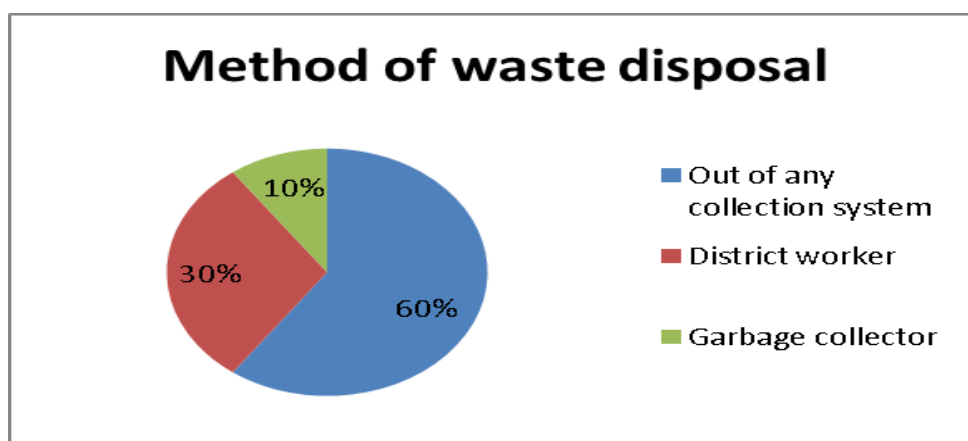
d. How enterprises dispose of waste

The sampled enterprises (owners of commercial, industrial and service businesses) were asked about how and where they dispose waste. Results indicated that some 40 % of enterprises have a consistent and regular system to dispose waste. This system ranges from 30 % dealing with the district worker (assigned to cleaning the street) to dispose waste, up to 44 % in Arab Al Yassar and 40 % in Sayeda Aisha, but inexistent in Al Hattaba. This indicates that the service provided by a district worker is limited to streets with street cleaners.

On the other hand, some 10 % of the sample disposes of waste through a garbage collector or a private company (the contractor). The percentage is higher up to 24 % in Al Mahgar and 16 % in Sayeda Aisha. The garbage collector's service is not accessed by all members of the sample in Darb Al

Hosr, Al Hattaba and Arab Al Yassar, although the waste collection from enterprises has become a responsibility of the contract following the amendment of contractors' agreements with the Cleaning Authority as of March 2014. Results showed that 75 % of the services currently provided to enterprises are rendered by a district worker versus 25 % rendered by a contract. This indicates that contractors are not committed to their obligations and that a complete system of supervision and follow up by the District and the CCBA does not exist at all.

Interestingly, 60 % of enterprises are out of any collection system and have no access to the waste collection service, be it by a contractor or a district worker, having their own means to dispose of waste. Peddlers dispose of garbage on streets, which causes permanent disputes with the shop owners who ask to prevent them.



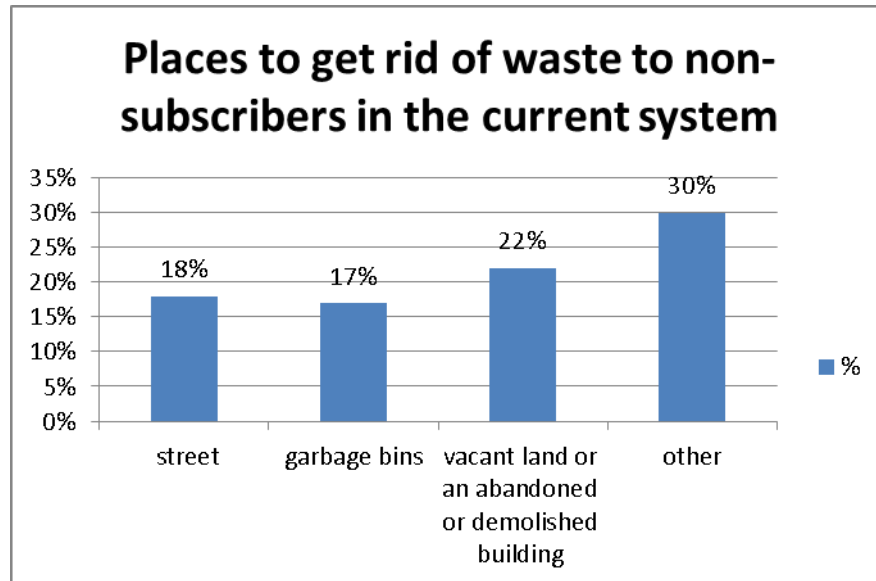
Results demonstrated that 22 % disposes of waste into a vacant plot of land or a deserted or demolished building, which reflects the clear scene of accumulated waste throughout localities, especially Al Hattaba. Also, 18 % of the sample disposes waste on the street, which is true for all localities. However, Arab Al Yassar and Al Hattaba recorded a higher level of 30 %.

Some 17 % of the enterprise owners dispose of waste into garbage bins, which are available in all localities, except for Al Hattaba. Darb Al Hosr and Arab Al Yassar recorded a higher figure in terms of the number of dustbin users, up to 46 % and 19 % respectively.

In total, 30 % of owners noted different methods to dispose of waste including assigning a worker to this task, whereby they have no idea on how and where it is disposed. Some said they threw it out over any waste accumulation in the street. Some enterprises sell such waste as cardboard and wood. Others collect waste over a certain period and then it is given to a worker to dispose of. Moreover, some enterprises, for example fish and poultry shops, sell waste to be used as a fodder. Also, juice shops agree with a private car for the same purpose.

Asking owners subscribing with a garbage collector or a district worker if they have an idea about how and where waste is eventually disposed after it is

collected from their neighborhood, 29 % answered that it is placed in street-based garbage bins; 26 % said they have no idea about that; 18 % noted that a district worker places it in a big truck; 14 % said that waste is then taken by the contractor's car and 13 % answered that waste is taken to the public dump or transfer station.

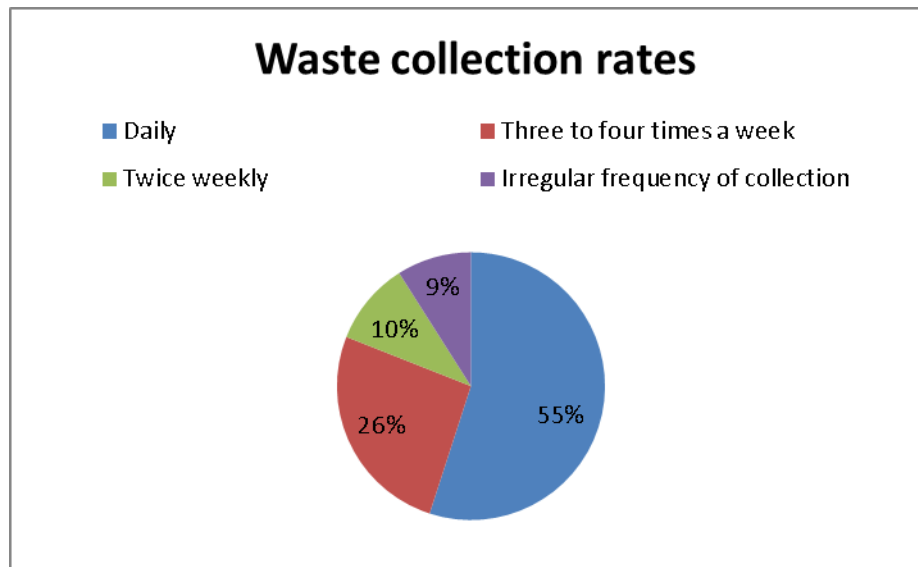


Results demonstrate the absence of a consistent system to manage waste from enterprises and the absence of follow up of contractors who are obliged, pursuant to the new contracts, to collect this waste. This causes defects in the waste collection system, which was reflected in the current situation. As such, two thirds of enterprise owners are not integrated into a system, which absorbs waste from their businesses, resulting into the accumulation of waste in different neighborhoods in the localities in the study areas.

e. Evaluation of enterprise owners on the current collection service (subscribers with a garbage collector)

1. Waste collection rates

It was important to recognize the frequency of waste collection from current subscribers, which takes places through a garbage collector(provided by a private company "contractor" contracted with the CCBA) or a district worker (according to agreements with contracts, the service should be provided to enterprises on a daily basis). Out of the sample, 55 % said that the collection process takes place on a daily basis; 26 % had access to the service from three to four times a week; 10 % got the service twice weekly and 9 % highlighted irregular frequency of collection.

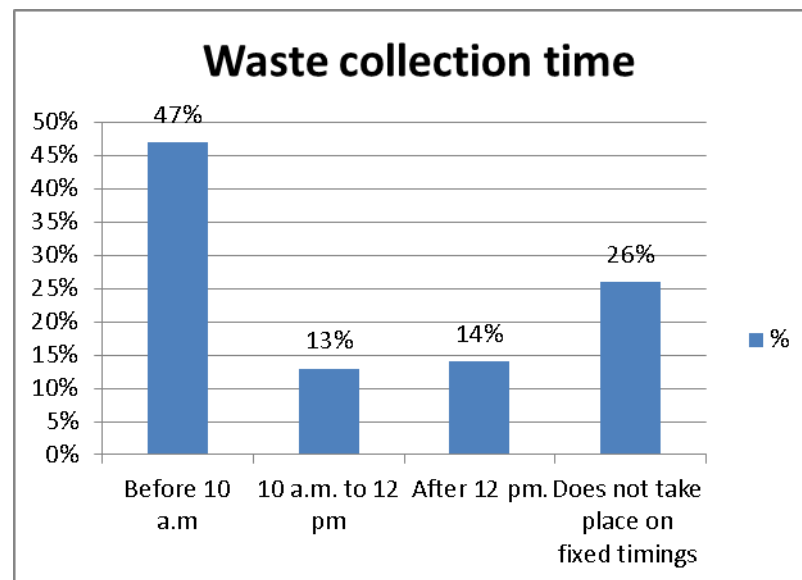


All in all, 71 % of subscribers who have access to a regular service with a contractor or a district worker think that the number of collection days is not enough. Meanwhile, 29 % of the sample said that garbage collectors do not attend on a regularly sufficient basis, which reflects an irregular service. Therefore, waste sometimes leaks even from clients of garbage collectors to streets, vacant lands and garbage bins.

Asking clients of a garbage collector about the best preferred frequency of waste collection per week, 82 % said they prefer a daily service versus 18 % who asked to have to have access to the service from three to four times a week. This indicates that the current situation does not conform with the owners' desires and needs for how to dispose waste.

2. Waste collection time

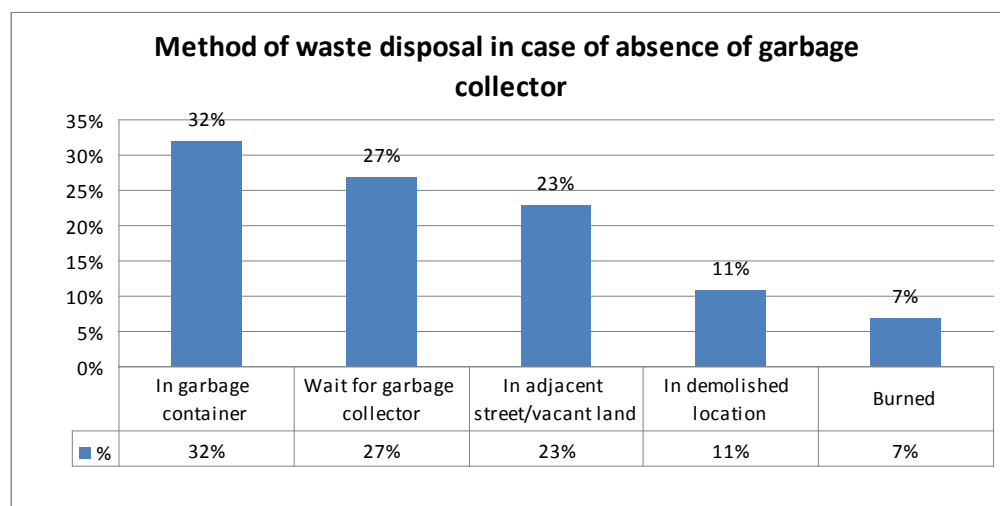
It is important for the timing of waste collection to be consistent with the circumstances and nature of each neighborhood. Asking current clients of a garbage collector or a district worker about the timing of waste collection, 47% answered that collection takes place before 10 a.m. versus 13 % who noted that collection takes place from 10 a.m. to 12 a.m. (i.e. for 60 % collection takes place before 12 p.m.). Meanwhile, 26 % said that waste collection does not take place on fixed timings (this indicates that the service is not regular for 40 % of enterprises) while 14 % said that waste collection takes place after 12 p.m.



Asking about the best timing for waste collection, 45 % of the sample preferred to have it before 10 a.m., while 34 % prefers it from 10 a.m. to 12 p.m. (compared to 13 % in the current situation). Timing from 12 to 3 p.m. is preferred by 15 % while 6 % prefer to have it anytime over the day. Results indicate that the current timing of collection is not compatible with the owners' opinions on the best timing. Accordingly, this situation requires action to define timings agreed upon by the service providers and recipients.

3. What owners do in the absence of a garbage collector

Answers varied according to the approach of disposal, which varied in turn according to the nature of business. 32 % said that they placed waste in garbage bins while 27 % of owners answered that they collect waste in a big bag, waiting for the garbage collector or the district worker to come another day. Waste is disposed on streets or any waste accumulation by 23 % of owners (waste is accumulated in streets of most localities), while 11 % places waste into deserted or demolished buildings and waste is burned by 7 %.



4. Cost of the service

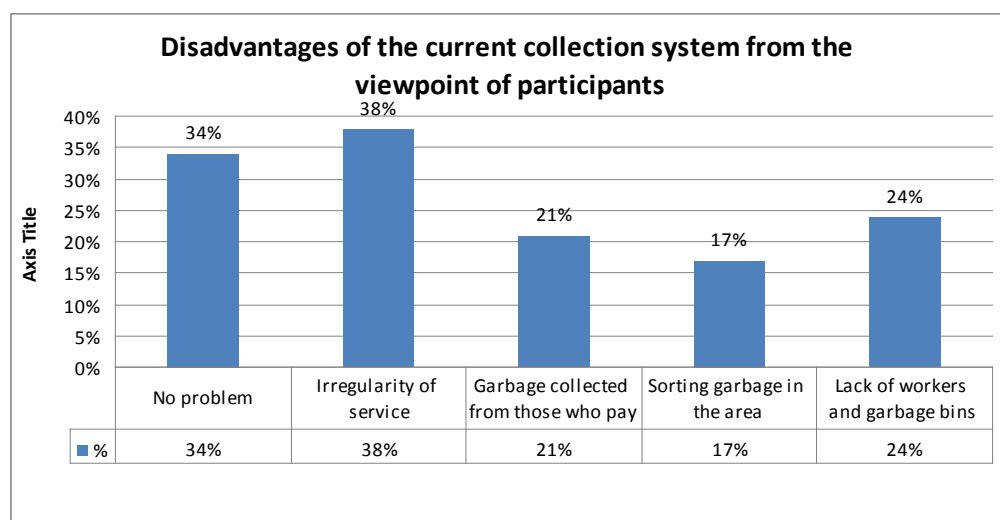
The CCBA charges the waste collection fees on the electricity bills, ranging from EGP 10 to 30 depending in the category and classification of each business. However, contractors or district workers get other amounts from clients than those fees collected on the electricity bills. Results indicate that 74 % of owners pay monthly fees of EGP 30 to 70 per month, or between EGP 1 to 3 per day to the garbage collectors. Some 26 % of the sample pays no money to the garbage collectors, with some selling waste and others collecting it for their own use.

Some 55 % of owners subscribing with a garbage collector deem this additional amount reasonable and appropriate, while 16 % deems it high and 29 % thinks the amount is little for a daily service. Therefore, results indicate that the cost of service is not a big issue for owners compared to the existence of a consistent and continuous waste collection system.

5. Drawbacks of the current collection system from the point of view of those who deal with a garbage collector

The current collection system from the point of view of those who deal with a garbage collector revealed a number of points. About 34% of the sample of those who deal with garbage collectors do not see there are any problems with the system. About 66% point to a number of problems as follows:

- 38 % indicated to an absence of the garbage collector and irregularity of the service.
- 21 % see that the garbage collector only collects garbage from those who pay.
- 17% of the sample sees the problem in the garbage collector who undertakes the process of sorting in the area and leaves the remaining waste in garbage bins or on accumulations of waste.
- 24 % highlighted the lack of labor force, insufficient number of garbage bins and consistent change in labor.



f. Views of respondents who are not members of a waste collection service on the current situation

As previously mentioned, 60 % of the surveyed sample dispose of waste using different methods outside the scope of the current system, either through a garbage collector, a company's contractor (10%) or a district worker. Therefore it was important to ask them about the frequency and timing of waste collection and about issues facing them while disposing of waste outside the currently operational system.

1. Waste collection rates

As the sample mostly disposes waste outside the current collection system with contractors, the question sought to identify their frequency of waste disposal. Answers showed that 41 % of them dispose of waste on a daily basis, versus 30 % once or twice a week, while 19 % dispose waste thrice a week and 10 % recorded no specific frequency (anytime any day).



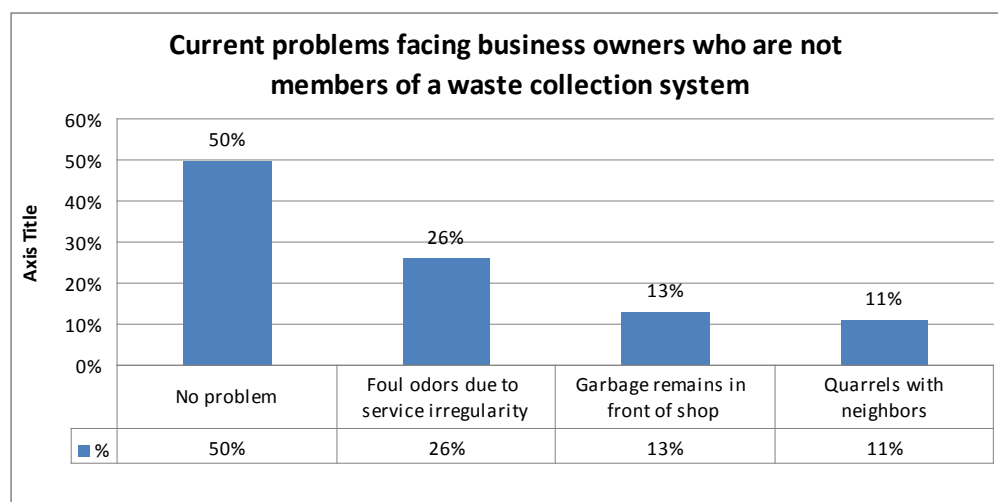
2. Waste collection time

Out of the sample, 29 % said waste is disposed anytime versus 32 % disposing their waste before 10 a.m. (against 47 % of subscribers with garbage collectors). On the other hand, 35 % noted that waste is disposed after 12 p.m. (against 14 % of subscribers with a garbage collector or a district worker). Accordingly, it is noted that the majority of the sample, which is not subscribed into the current system and has no access to the collection service, disposes of waste in different unfixed timings, affecting the level of cleanness of neighborhoods and causing almost permanent accumulations of waste.



3. Current problems that face residents who are not members of a waste collection and disposal service

Owners who are not members of waste collection service had their own responses about the current way waste is disposed of. Results revealed that 50 % of them do not see they have a problem. Another 26 % said it causes diseases and emits a foul odor because it is not disposed of regularly. Some 13 % suffered from the issue of long-lasting accumulation before shops and 11% pointed out the quibbles between neighbors because of the way waste is disposed of.



Looking into the above results, we will find that the system of waste collection from enterprises in the researched areas suffers from several issues, which caused 60 % of enterprises to get out of the current service system and deal with waste outside the scope of any collection programs or systems.

g. How owners dispose of waste

In total, 51 % of the shop owners dispose of waste in plastic bags, while 30 % of them use such other methods as sacks or cardboard. A percentage of 41 % uses a plastic bin, barrel or can, while 5 % disposes of waste using such

different means as private cars as the case of poultry or fish shops; others use a small carriage.

h. Waste components and their benefits

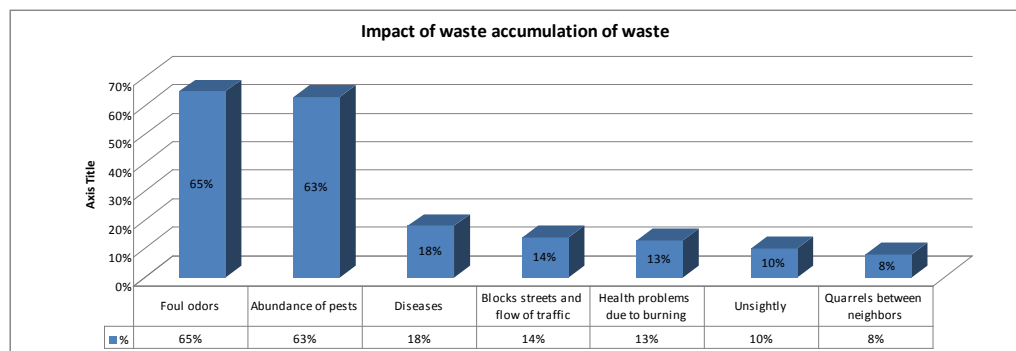
The main waste components in the study areas are organic waste, plastic bags, poultry waste, fish plastic containers, dust, and cardboard.

About 59% pointed out that paper is one of the basic components of the waste, about 58% mentioned plastic bags, 51% dust and 28% mentioned that their main waste is composed of cardboard. There are also other secondary components representing 35% of waste composition depending on the nature of each activity, such as sawdust, wood, glass and tin.

About 41% of the owners are benefiting from waste; 13% benefit from paper and cardboard, while 10% profit from tin and metal, about 5% from sawdust while 14% benefit from the sale of marble debris, leftover flour, overstocks and remnants of fish, poultry, etc.

i. Impact of waste accumulation on the study areas

When asking the sample about the most important problems and the impact of waste accumulations on the area and the consequent negative impacts, 65% said that accumulated waste causes foul odors lasting for long periods of time. In addition, 63% said that there is an abundance of flies, mosquitoes and rodents as well as an increase in the number of stray dogs because of accumulations of waste which affects the passer by. While 18% of the sample said that it causes neighbors to quarrel, another 18% said that it causes diseases while 14 % said they obstruct traffic and block streets. 13 % thought that burning or self-combustion cause problems to children and old people, 10 % thought that they cause a bad scene. Finally 8% said that waste does not cause negative impacts or problems.

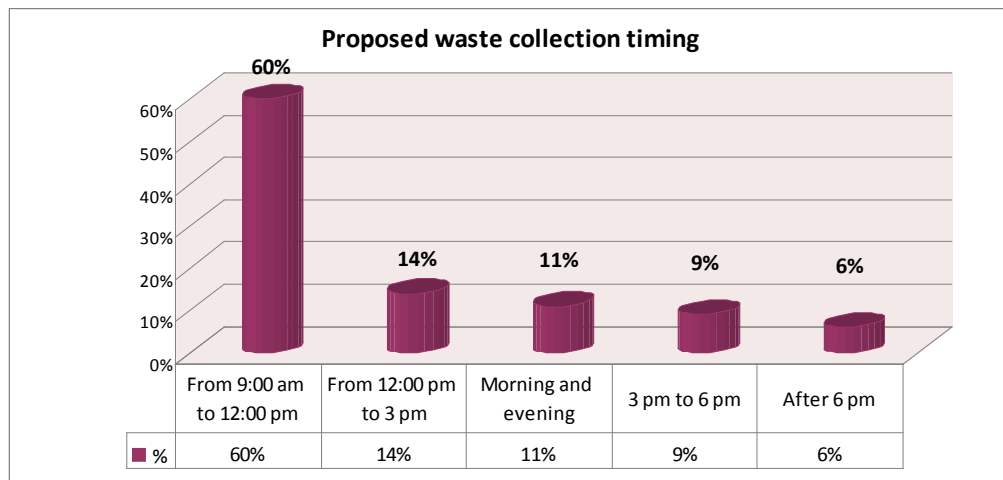


j. Most appropriate waste collection system from the enterprises' owners point of view

After becoming familiar with the current situation and how the sample deal with waste whether those who deal with a garbage collector or those who do not and the associated problems, the team tried to understand what proposed solutions that the community sees appropriate for the waste collection system. The following summarizes what they expressed.

1. Waste collection times

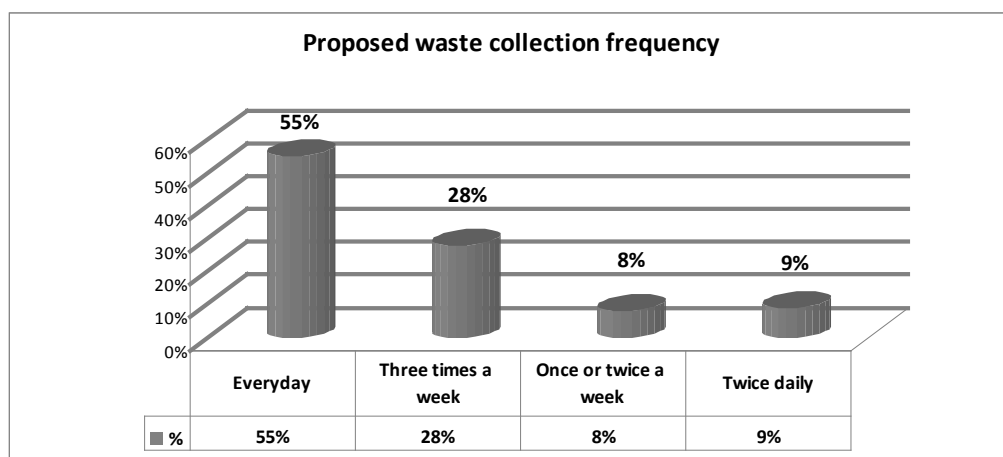
The time when waste is collected is important for the overall SWM system and plays a major role in the regularity of the collection system. The survey results revealed that about 60% of the sample sees the appropriate time to be after 9 am in the morning until 12 noon. The percentage reaches 74% when the collection time is extended to 3 pm. while 11 % asked to have a service twice daily, 9 % proposed the timing to be after 3 p.m. versus 6 % preferring to have their waste collected after 6 p.m.



Therefore, it is important before any waste collection system is to be established that these conflicting times mentioned by respondents be taken into consideration so that collection times are convenient for the community. This is in addition to raising the awareness of the community on the importance of abiding by the collection times.

2. Collection rates (number of days waste is collected)

Out of the sample, 55 % prefer to have a daily collection system, versus 28 % preferring to have it thrice a week, 8 % preferring to have it once to twice a week and 9 % preferring a twice per day system.



These results indicate that in the case of a permanent system, people can cope with and abide by it if it considers the nature and business of enterprises.

3. Preferred location for the collection of waste

Ninety-five percent of the sample prefers that waste is collected from in front of their enterprises, while 5 % prefers to have waste collected from inside their enterprises. This reflects their wish for a system of collection from the source to ensure a regular service.

4. Fees (excluding those charged on the electricity bill)

As is known, the cleanliness fees are charged on the electricity bill, for EGP 10 to 15 per month. However, the reality is that another fee is paid for the service whether the service is from the contractor or the District worker. This fee takes sometimes takes the form of a tip and at other times in the form of monthly fees for those who are regular with the garbage collector.

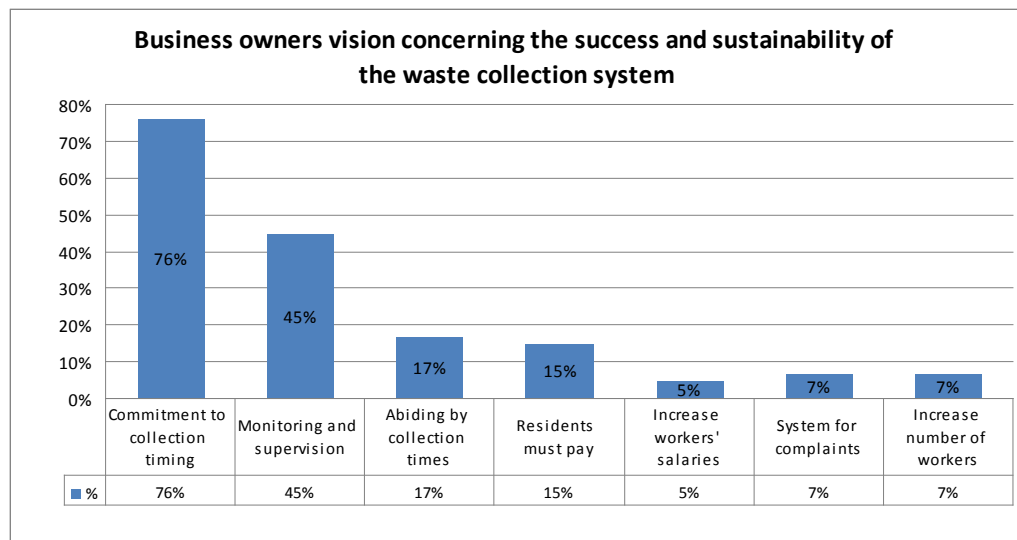
Survey results revealed that for those who deal with the garbage collector, 80% of them pay directly to the garbage collector on a monthly basis. Results of subscribers with a garbage collector indicated that 80 % of them pay monthly, while 53 % of them pay from EGP 3 to 5 and some 85 % of those subscribers deem this additional cost reasonable and appropriate.

When asked about the amount that enterprise owners can afford to pay each month excluding what is paid on the electricity bill, 47% said that the suggested amount should range between EGP 3 to EGP 5 per month.

Asking subscribers and non-subscribers about their suggestions for a monthly amount to be paid apart from the cost charged on the electricity bills, 49 % of them suggested a range of EGP 20 to 100, depending on the type and quantity of waste from each business. Meanwhile, 12 % suggests EGP 5 and 11 % suggests from EGP 5 to 10 versus 14 % suggesting a cost of EGP 10 to 20. Finally, 14 % deems the cost charged on the electricity bills as sufficient. A regular and permanent system would encourage them to bear the cost.

k. *How enterprises owners view the success and sustainability of the waste collection system*

The enterprise owners were then asked about their vision for a successful and sustainability of the waste collection system. They mostly (76 %) answered that a garbage collector must commit to the timing of collection and avoid absence, while 45 % of the sample highlighted the importance of supervising and follow up of the collection process. On the other hand, 17 % highlighted the importance of abiding by the timing of collection, while 5 % thought it is importance to increase salaries of waste collection workers. Meanwhile, 7 % asked to have a mechanism for complaints, for example a telephone number or a hotline and 7 % suggests increasing the number of workers to be able to collect waste throughout neighborhoods.



Others asked to cancel the additional cost charged on the electricity bills, intensify the service, take care of street sweeping and placing enough garbage bins in streets.

l. How to encourage owners to participate

Forty-nine percent of respondents believe the fees charged on the electricity bill should be abolished and that fees should be paid directly to the service provider (43 % of households asked for the same). Also, 43 % highlighted the importance of a prompt penalty system for those violating the system by disposing waste in non-ad hoc places. Meanwhile, 18 % of the sample underscored the importance of creating the awareness of a regular waste collection system and of risks and harms caused by the accumulation of waste. An obligatory subscription system was supported by 8 % of the sample, whereby a receipt of subscription must be issued. Finally, 7 % thought that a regular collection system will not be rejected.

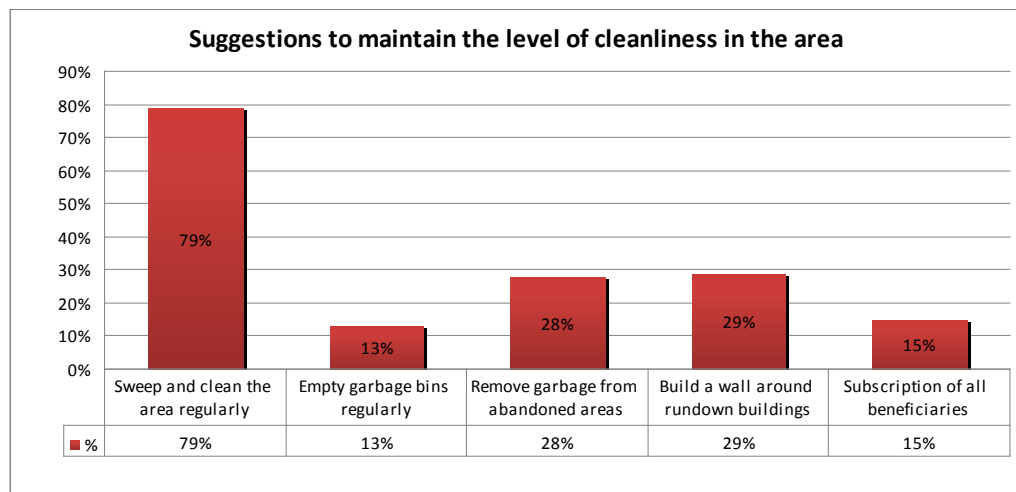


m. Factors ensuring success and sustainability of a waste collection system

It was important for the team to understand from the recipients of the service what guarantees a good quality service for the collection of waste. 64% of the

sample said that this would occur by obliging residents to subscribe with the contractor or garbage collector as well as obliging the garbage collector with collection times. This they said would guarantee the success and sustainability of a waste collection system. On the other hand, 11% said that regular payment for the service is a guarantee. About 49% indicated that by not throwing waste on the streets or in places not specified for waste to be a factor that may guarantee the success of the system.

Owners made a number of proposals to keep their neighborhoods clean; 79 % highlighted the importance of regular sweeping of streets; 13 % highlighted the importance of downloading waste off garbage bins regularly; 28 % asked to lift waste off space lands and demolished buildings; 29 % suggested cleaning and fencing these places and tiling streets; 15 % highlighted collective commitment and participation into the collection system. Some said it is important to get rid of stray dogs and cats, which spread around accumulations of waste, increase the number of workers and garbage bins and enhance supervision and follow up.



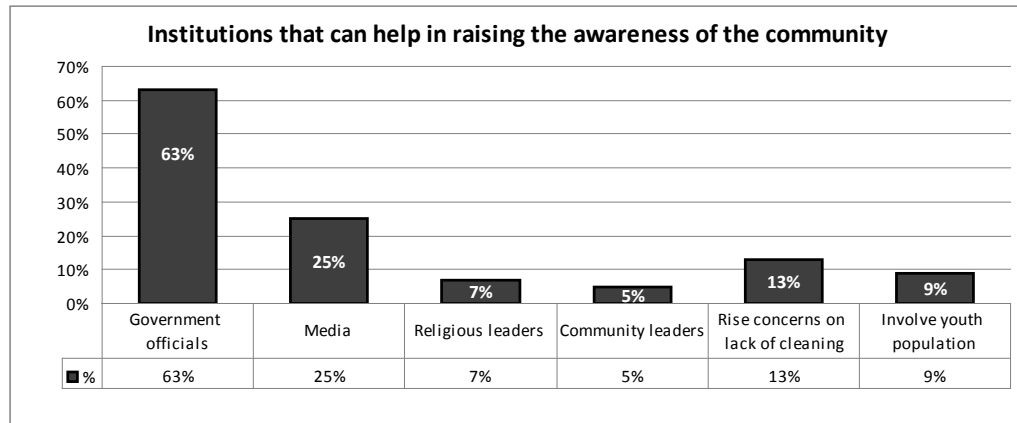
n. Awareness of the enterprises owners to the historical value of the area and impact of waste on the historical places

Most of the Enterprises owners (98 %) are familiar with the historic value of their area, referring to more than 62 locations. However, they highlighted the negative impact of the accumulation of waste on monumental places; 90 % attributed issues of disposing waste into streets and monumental places to the lack of a regular service, especially around these places, affecting buildings and causing erosion of stones. It also causes fire, which reforms monuments, apart from foul odors, which dispels tourists. Some said that tour guides never take tourists to the neighborhood.

o. Institutions that can help in raising the awareness of the community on the importance of cleanliness

Results demonstrated that one third of the sample is not aware of the importance of cleanness, pointing out that they do not think that the current waste collection and disposal system and accumulations represent an issue. Therefore, a question was asked on which persons and bodies would be

resorted to for the cleanliness awareness programs. In reply, 63 % of the sample referred to the cleaning officials in district or the government as the one to resort to for this mission. Media was proposed by 25 % and the clergy was proposed by 7 % as the most influential versus 5 % supporting the role of community leaders and owners of cafes to deliver the awareness message. Meanwhile, 13 % highlighted the importance of underscoring the negative impact of the issue on health through seminars and distribution of bags to shops and 9 % referred to other techniques as having young people from the neighborhood conduct the awareness campaigns.



p. Owners' perspective on procedures to increase collectors and workers' awareness

Complementary to the awareness support system for service providers, owners proposed a number of procedures to increase garbage collectors and workers' awareness. Most notably, 85 % of them asked to increase their workers' awareness of sharp timing and avoidance of absence. A group of 43 % said that workers should be educated about proper collection so that waste is not leaked to streets and not to drop some shops from service because they do not pay. Meanwhile, 6 % highlighted the importance of increasing workers' awareness of the negative impact of sorting waste on streets. Others asked for an effective supervision of workers and collectors who should be subject to serious penalties if they are in compliance.

7.3 Current and Potential Impacts

Based on the field visits of the team and surveyors to the study area and the meetings held with officials and residents, a number of current/potential impacts could be observed/deduced due to the degradation of the SWM system in the study area. These are:

- The absence of a regular waste collection service in most areas will lead to continuation of dumping in the streets and spaces around antiquities.
- The accumulation of waste in rundown buildings (Figure 7-3) and spaces in streets around antiquities concentrates around garbage bins such as at Sabeel Om Abbas in Shaykhoun Street.



Figure 7-3: A rundown building located near Al Sayeda Sakina School (Darb Al Hosr) used as garbage dumpsite

There the residents refused to place bins in front of their homes and instead they placed them near the antiquities which damaged the aesthetic of the surrounding area, as illustrated in Figure 7-4.



Figure 7-4: Garbage bins located in front of Sabeel Om Abbas

- The prevalence of scavengers (*nabbisha*) around accumulations of waste and garbage bins in streets and markets (Sayeda Aisha market), scattering waste in the streets (Figures 7-5, 7-6 and 7-7).



Figure 7-5: Scavengers collecting waste using a donkey-cart



Figure 7-6: Recyclable materials collected in bags by local scavengers



Figure 7-7: Bags used for recyclable waste collection and transportation

- Impact on the environmental status of the areas and historical sites as well as the general aesthetic appearance of the area.
- Rodents' and insects' proliferation as a result of the accumulation of waste which threatens public health.
- In some areas, residents live in direct contact with garbage, thus leading to serious hygiene and public health problems (Figure 7-8).



Figure 7-8: Photo taken from the window of a housing room at Hosh Sobeih (Darb Al Hosr) showing garbage accumulated on the roof in front of it

- Waste accumulation attracts stray dogs and cats which could constitute a threat to public health and people's safety (Figure 7-9).



Figure 7-9: Stray dogs feeding on accumulated garbage

7.4 Area Constraints and Sensitivities

Based on the field visits of the team and surveyors to the study area and the meetings held with officials in SWM departments, it can be noted that SWM in Historic Cairo areas and surroundings faces a number of constraints which can have an adverse impact on the archeological and aesthetic value of the area, the environmental situation and the living and health conditions of the people. The prevalence of insects and rodents is on the rise due to waste accumulation. Some of these constraints are:

- The existence of abandoned/vacant plots of land, demolished and dilapidated buildings not in use, allows for the disposal of solid waste. Knowledge about the ownership structure of these areas is also lacking (private ownership/religious endowments, etc).
- The absence of state authority and lack of security which was mentioned by all stakeholders met.
- Lack of clear information concerning historical sites of the area.
- Lack of political determination and seriousness from the state to the preservation and concern for historical sites and acknowledging it as a priority on the priorities' list.
- The absence of adequate attention from the SCA in the area as is elsewhere and lack of site management plans. The historical sites have become a burden on all concerned agencies and it is as if these sites “are without owners”.
- Although the majority of residents in the study area acknowledge the area as "historic Cairo", this is not reflected in their behavior. This is mainly due to the fact that the community was never integrated in the management of the area.
- Laws and regulations and the way the state deals with what is informal has contributed in aggravating the situation in the area.



Figure 7-10: Waste scattered around a garbage bin in Salah Al Din Street, close to Mohamed Ali Citadel



Figure 7-11: Photo taken in Al Madafen Street at Al Hattaba

7.5 Conclusion and Recommendations

According to results of the meetings with all parties concerned with the SWM in Cairo's historic areas and results of the field survey of a sample of households and shops, the waste collection service system in the study area suffers from different issues, which caused nearly two thirds of people to abandon the current service system and address waste outside the scope of any collection programs or systems.

There are companies of contractors, which have agreements with CCBA to collect waste from housing units and shops, especially following the amendments to contracts in March 2014, whereby the cost paid to a contract has been increased from EGP 1.5 to EGP 4 per housing unit. However, according to the results of the study, most of beneficiaries from the service (65% of residential units and 60% of shops) are still outside the scope of the current collection system. Moreover, the current service varies between localities; some streets in Dar Al Hosr have available a collection service, which is less efficient in Al Hattaba and least efficient in Arab Al Yassar. According to the outcomes of the survey, it seems evident that the current service is not accessed in many neighborhoods. Moreover, the service is irregular and the timing of collection is not suitable for many of them; a garbage collector comes early, pays attention to upper floors and sorts waste on streets.

This situation caused nearly two thirds of the sample to dispose of waste using different means, outside the current waste collection system; some dispose it

in dustbins, streets, vacant plots of lands, demolished buildings and close to major antiquities.

Waste flows into these places on a daily basis; 62 % of the sample stated that they dispose of waste on a daily basis (46 % of the sample pointed out that waste is disposed anytime, without fixed timing, which can be twice a day). This reflects the clear scene of accumulations in all localities in the area. It encouraged scavengers and by-passers to search into dustbins and waste accumulations to look for recyclable materials.

This situation causes foul odors and helps spread flies, mosquitoes, insects and rats. In addition, the high numbers of stray cats and dogs due to the waste accumulations was highlighted during the survey.

The study monitored the negative impact of waste accumulations on monumental areas; 84 % of the sample thinks that waste around monuments affects the area's image for tourists, especially when photos are taken for these attractions with waste. The situation compelled tour guides to change the course and movement of tourists.

Monitoring the current situation and data obtained, the study revealed the contradiction of data and information, which are not updated, whether in terms of the number of population, residential units and commercial, industrial and service enterprises. No accurate data was available on the generation of waste or quantities collected daily. Although data was available on equipment, tools and workers in branches of the CCBA Authority, no data was available on the capacities of contractors assigned to collect waste. Those in charge of the waste collection had not detailed data on locations of antiquities, especially those with a historic value.

The current operational system whereby the cleaning fees are collected but not related to the service is objected by people and shop owners. Results indicated that 80 % of the sample dealing with a garbage collector pays the cost of service on a monthly basis apart from costs charged on the electricity bills. Respondents asked to cancel the cleaning fees on the electricity bills and asked to have them paid directly for the service (a garbage collector serves only who pays).

Under this poor waste collection system, participants proposed their vision for a quality system, whereby waste is directly collected from housing units for three times a week and cause side streets, lanes and higher floors access service. Collection should take place in a timely manner, together with the cancellation of charging fees on the electricity bills so that fees are directly paid to the service provider. They highlighted the importance of an effective supervision and follow up system, which covers those in charge of the collection process. Subscription should be obligatory, together with the availability of a complaint mechanism (a telephone number or hotline) and awareness programs.

7.5.1 Main Challenges and Concerns

The study covered service providers, including officials and contractors, households and enterprise owners as beneficiaries. It revealed a difficult situation in historic Cairo and highlighted the following issues in the collection system:

- Multitude of bodies, weak coordination, lack of integration and unclear roles between parties in charge of the solid waste management (CCBA, District, supervision, follow up department, Antiquities authority and contractors' companies). This caused 60 % of the service recipients of houses and enterprises out the current solid waste management system and was reflected into the level of cleanliness in the area in general and the antiquities in particular.
- There is no reliable database. The study revealed the contradiction of data and information, which are not updated, whether in terms of the number of population, housing units and commercial industrial and service enterprises, as CAPMAS census dates back to 2006. No accurate data was available on the generation of waste or quantities collected daily. Although data was available on equipment, tools and workers in CCBA, no data was available on the capacities of contractors assigned to collect waste. Those in charge of the waste collection had not detailed data on locations of antiquities, especially those with a historic value.
- There is no integrated awareness plan, which copes with the nature of population in the area and with the importance of Historic Cairo, which caused spread and rampancy of negative behaviors of all parties of the system, including service provides and recipients.
- People have a negative view towards the waste collection workers and they do not understand their roles in the manner, which helps integrate the working system.
- Weak human resources in terms of management, supervision, follow up and implementation, whereby they are unable to manage the collection process fully and effectively. They lack awareness of the importance and nature of the area.
- The absence of an effective cost recovery system due to the unavailability of proper finance to address the issue in its different phases. The authority's revenues are not exceeding 60 % of expenses and the Ministry of Finance covers the difference. People pay the cost of service to garbage collectors, apart from fees charged on electricity bills in addition to the current non-affordability of the cleaning fees.
- The limited number of workers and drivers in branches of the Cleaning Authority (caused by the state's motion not to appoint new staff) affects the regularity of operation and therefore the frequency of removing waste from accumulations and streets.
- Garbage collectors sort waste and dispose of organic materials in streets.
- Irregular maintenance of equipment, causing long lasting shutdowns.

- Weak capabilities of contractors, including equipment and workers.
- Uncontrolled direct housing collection (upstream collection).
- Scavengers and by-passers play into dustbins and waste accumulations, looking for recyclable materials (increased with the security vacuum).
- People disposal of construction waste in streets.

All these issues and challenges facing the waste collection service are exacerbated due to the absence of plans and programs to help relevant bodies address them, under the current absence of the supervision and follow up process.

The lack of coordination between different parties in Cairo historic areas (CCBA, district, supervision and follow up department, antiquities' authority) had negative impact on the current situation, especially for monumental places.

7.5.2 Recommendations

In response to the results of the study of the current situation, issues and challenges monitored, some recommendations are proposed to address the gap between the current situation and requirements of development and achievement of an integrated system of the waste collection system in Cairo's historic areas. Therefore, some of these recommendations will be based on the current situation, while others will build on the need to level the ground for gradual and prospective development. Accordingly, recommendations will seek solutions to the current urgent issues and development of current systems. Some of the recommendations will address the development of necessary requirements, which are not available now to achieve a sustainable and integrated solid waste management.

- Enhancing the institutional setup by identifying the best institutional structure of a solid waste management department in Cairo's historic areas by having a division at the level of CCBA to be directly responsible for the management of solid waste in Cairo historic areas, so that the area is effectively considered as a World Heritage Site.
- Developing the solid waste collection and transport systems to improve the effectiveness and quality of services, this should be made available to all citizens and enterprises. This will be achieved by selecting the best technical and organizational solutions and taking into consideration the employment of technological uses appropriate for local situations, which consider the nature of the area in order to develop and ensure the sustainability of the solid waste collection and transport services. Therefore, a good collection system is needed, which considers the importance and nature of these areas, in terms of narrow streets, lands and alleys, which obstruct the waste collection process. This requires a direct service, which starts from housing units and adapts to their operational position, using special tools and equipment (small cars or carriages, etc).

- Reviewing and enhancing resolutions and provisions enshrined in laws on the solid waste management in line with the nature and uniqueness of the area by considering it a part of the global heritage.
- Creating a realistic and specific database, this includes accurate statistical data on people, enterprises and quantities and frequency of waste generation as well as monumental locations and areas in Historic Cairo. This information is necessary for planning, management, supervision and decision making in the solid waste management in the area.
- Creating an integrated awareness plan, this encourages individuals of the community, NGOs and schools to take part in the solid waste management activities. Awareness of a main pillar of the solid waste management system. This recommendation highlights the importance of creating a comprehensive institutional approach to achieving a strategic partnership between the service providers, including companies and local administration (cleaning authority/ governorate/ suburb) on the one hand and service recipients on the other hand. This seeks to deepen awareness and attribute an effective role to the Supreme Council of Antiquities, educational department, companies and NGOs in the awareness programs.
- Building the institutional capacity of human calibers to be assigned to tasks and responsibilities within the proposed solid waste management system in each area. This is the main requirement to achieve an effective solid waste management in historic locations.
- For self finance and recovery of operational expenses to be achieved, it is important to develop practical and effective systems and mechanisms to increase resources and link collection to the service. Self finance requires the development of current collection systems into effective and realistic ones, reflecting the number of housing units and commercial, service and industrial enterprises. This should consider the consumption value of investment capital and the value of other investments necessary for the improvement of services. It requires the development of innovative mechanisms for collection and for increasing revenues. These include for example fees of penalties and reconciliation with violators of the cleaning and environment laws, fees of lifting residues of buildings and dusts, private contracts and a portion on fees charged on visits to monumental locations.
- Initiating a system for upstream separation of garbage, this starts on a pilot basis within the boundaries of Historic Cairo. It would encourage people and workers to carry out the idea, via incentives. This should be preceded by an awareness campaign in cooperation with local councils, NGOs, schools, worship houses and the Ministry of Environment.
- Creating an enabling investment environment to encourage the private sector and young people to take part into the solid waste investments by providing conducive environment and incentives, including loans, facilities, tax exemptions and providing transparent information.
- To realize the above recommendations, a proposal will be developed for a strategy, including objectives, policies and interventions to put them into force.

8. Proposed Solid Waste Management Strategy

8.1 Introduction

8.1.1 Preface

The problem of dealing with municipal solid waste is considered one of the main concerns of most Egyptian governorates, as improper dealing may result in several environmental, social and economic problems. The amount of municipal solid waste generated each year in Egypt is estimated at 20 million tons, and is expected to increase up to 30 million tons by 2022. About 40% of the generated municipal solid waste is not collected and is disposed of in an unsafe way, and a very small proportion of generated waste is recycled.

8.1.2 Solid Waste Sector Overview

Solid waste represents one of the main environmental issues that have a direct effect on development in Egypt, as waste management is characterized by ineffective partial solutions, which result in economic, environmental and health effects. This is not compatible with the civilized image that Egypt is seeking, in addition to the direct and indirect effects on human health.

The problem is related to the low level of efficiency of the management system phases and the lack of integration among the various phases due to technical, managerial and financial reasons; all leading to impediments in finding solutions to this important issue. All types of waste generated are the inevitable result of daily life; including social, economic and industrial activities. In order to protect the environment in which we live, we have to dispose of the waste resulting from these activities through an accurate management system and a proper healthy way.

There is no doubt that solid waste is one of the most important environmental issues and represents a significant concern for governments and communities, as waste might accumulate and result in the spread of diseases which, in one way or another, affects the various aspects of life of individuals and society. Thus, most communities consider solid waste as one of their main problems. Solid waste in Egypt represents one of the various aspects of the different environmental challenges, especially with the general change in consumption methods, individual behaviors, development of new lifestyles and population increase.

Both the local and international communities have recognized that the projects aiming at improving the environmental and living conditions are among the main components of sustainable development.

8.1.3 National and Regional Framework

Future environmental vision in Egypt for 2030

The vision of the Ministry of State for Environmental Affairs for the year 2030 focuses on integrating the environmental dimension in economic and



This report was produced in the framework of Urban Regeneration project for Historic Cairo – UNESCO, World Heritage Centre

social policies, and in all development plans in Egypt, to ensure sustainable development through a range of programs, including:

First: The National Strategy for Solid Waste Management, 2000

The National Strategy for Solid Waste Management is considered the basic reference that sets the goals of the state in dealing with solid waste. The strategy states the importance of encouraging the recycling process of organic and inorganic solid wastes through, for example, the establishment of facilities that produce organic fertilizers from food waste. Furthermore, the strategy has highlighted the importance of community participation and awareness as one of the cornerstones of an integrated solid waste system.

Currently, the national strategy is being amended by the Ministry of State for Environmental Affairs. The amendment is expected to necessitate setting regional plans for dealing with solid waste through governorates, as well as an institutional framework at the local level. Therefore, the proposed strategy for Historic Cairo is compatible with the national plans in this regard.

Second: Environmental Development Program for Rural and Urban Areas, which encompasses:

1. **Supporting the Environmentally-friendly Egyptian Village Program:**
This program includes supporting the villages' community development associations and providing job opportunities for village youth, in order to create more stability in villages, which contributes to the decentralization of environmental management that is being implemented by the Ministry of State for Environmental Affairs throughout Egypt's governorates.
2. **The Environmentally-friendly Cities Program:**
This program is implemented through increasing investments in new industrial cities, while assessing the environmental impacts of their urban and regional plans.
3. **The Environmental Development Program for Existing Old Cities:**
This program is implemented through developing the slum areas within the cities' boundaries via a national program for recycling waste, which aims to transform recycling into an industrial activity. The objectives of the program also include planting green belts around Greater Cairo and other Egyptian cities.

Third: The Human Development and Public Participation Program:

1. Improving the environmental aspects affecting the health of Egyptian citizens, whether children, youth, women, or adults, while preventing food and water pollution.
2. Public participation of women representative units, NGOs and youth.
3. Managing the development of urban, rural and coastal areas in cooperation with their inhabitants.
4. Raising awareness and developing environmental media and environmental education through schools, universities, youth centers and media.

Fourth: Institutional Development (legislative/administrative/financial):

1. Amending and developing the Executive Regulations of Law 4/1994 for the Protection of the Environment.
2. Modifying the organizational structure of the Egyptian Environmental Affairs Agency (EEAA).
3. Increasing the resources and funding of environmental projects and activities through unconventional resources.
4. Applying the “Polluter Pays Principle” on the violators against whom environmental reports were filed (Environmental Enforcement).
5. Applying the environmental incentive principle on those who care for and protect the environment (Environmental Compliance).

Fifth: Environment Information Systems Program:

This program uses the information and communication technologies for establishing an integrated environmental management system in Egypt, and connecting it with all environmental affairs stakeholders on the national, regional and global levels, in order to exchange environmental information and data, especially in the field of environmental disasters and crisis management.

In order to meet all these challenges, the environmental work plan in Egypt seeks to support the following implementation procedures:

1. Adopting the use of economic tools and open market policies, which lead to more rapid and real changes in production and consumption, therefore achieving sustainable development.
2. Reformulating the institutional and legislative structure in such a way that leads to environmental compliance by all concerned parties, and ensures the enforcement of environmental legislations, through the following:
 - a. Developing motivation policies.
 - b. Reviewing laws and legislations to ensure their enforcement.
 - c. Developing human resources in the environmental field in Egypt.
3. Raising environmental awareness among all segments of the society by increasing and developing the activities of environmental education, training and awareness through the following:
 - a. Inclusion of environmental education in all educational stages at schools and universities.
 - b. Emphasizing environmental protection concepts, developing mechanisms for protecting socially marginalized groups, and empowering of women and youth by preparing awareness and training programs.
 - c. Developing human resources so as to cope with all advanced systems and styles.
4. Continual support for environmental statistics and building an integrated environmental information system, through:
 - a. Development of local, regional and national capacities to build the environmental information systems as well as collect, analyze and use multi-sectorial information.

- b. Improving the quality of information, for example, its validity, reliability and coverage domain.
5. Strengthening the capacities of government, businesspersons and employees to meet environmental and development challenges and to facilitate the transfer of the environmentally clean technology.
6. Emphasizing on the integrated relation between environmental issues and local environmental interests.
- The Fundamental Policies of State Strategy
Under the national environmental plan of EEAA, a number of fundamental policies were adopted, which illustrate the general framework for enforcing solid waste management systems. These policies are as follows:
 - The state will play the role of empowerment by providing technical, financial and legislative support and assistance, while the official bodies at the Governorates, municipal authorities and new cities bodies will be fully responsible for implementation.
 - Gradual transfer of public cleaning tasks and services, as well as solid waste management, to the private sector. Meanwhile, the role of governmental bodies will be confined to planning, following up and setting monitoring provisions, after developing the necessary conditions for licensing and contracting private sector companies, according to the relevant laws and legislations, as well as emphasizing the principle of "Partnership" among the government, private sector, non-governmental organizations and society.
 - Commitment to the "Polluter Pays Principle" and the producer's responsibility for his products throughout their life cycle, and up to their final disposal, especially the packaging materials, as well as full recovery of costs as a necessity to improve the service and encourage the private sector to use the system.
 - Mainstreaming the economic concept of waste as resources that can be recovered, thus decreasing its disposal costs and polluting effects. This is followed by commitment to reduction at source policies, as well as waste reduction through reuse; recycling and resources recovery as materials or energy.
 - Encouraging all kinds and levels of public participation, as well as engaging public organizations and the beneficiary communities, so as to ensure proper implementation.

8.1.4 Methodology

Establishing an integrated and successful system for solid waste management requires involving all those concerned and considering all various issues related to the system, including technical; financial; environmental and institutional issues. Therefore, the methodology for preparing the strategy is based on:

- a) The principle of involving all stakeholders of the solid waste management system, in particular, the beneficiaries from the service, such as households, facilities and local management, and

b) Conducting interviews and consultations with all partners, and encouraging interaction among them to agree on a unified vision that they can cooperate to realize.

In addition, this strategy adopts a comprehensive approach for dealing with solid waste that ensures solving the problems related to the various stages, such as collection, transportation, storage, recycling and final disposal. The approach also carefully connects all steps so that the system fulfills its objectives.

The preparation of the strategy has primarily depended on the results of studying the current situation of solid waste management in the pilot area in Historic Cairo, which pointed out the defects in the current system and suggested some recommendations to solve the present problems.

a. Strategy Preparation Steps

1. Preparation of a study of the current situation of SWM system in the pilot area in Historic Cairo

The aims of the study were to:

- Define and analyze the basic characteristics of the current SWM system, which required complete and accurate understanding of the institutional structure, legislative frameworks, organizational mechanisms, available capabilities and followed policies.
- Rely on this study results for developing an integrated strategy in order to upgrade the SWM system in the area, which will be based on the participation of local community. The strategy is to find solutions for problems' roots through strengthening the collection and transportation mechanisms. This study will also provide the initial and main information that will be used to define the strategy's success indicators.

The study covered all the relevant aspects to the SWM system, especially the technical, social, financial, institutional and legal aspects that will be summarized in the context of the strategy (Appendix: Assessment Study of the Current SWM Situation in the Pilot Area in Historic Cairo).

2. Preparatory Phase

The preparatory phase included interviews with concerned stakeholders, which aimed at identifying their viewpoints about the results of study, proposed solutions and future steps.

b. Strategy Preparation Stage

1. Assessing the current situation and identifying the main issues

The study of "The Assessment of the Current Situation of SWM in the Pilot Area" was developed at this stage. This study defined the main issues in light of its comprehensive assessment of the current situation. This was considered one of the main outputs of this stage.

2. Identifying visions and strategic goals

Visions and key objectives were identified based on the results of assessing the current situation, and the main issues indicated by the

assessment, as well as what discussions with concerned parties and community through field investigations and interviews.

3. Studying and analyzing the strategic alternatives and identifying trends and policies

This stage comprised consultations with local administration officials, cleaning sector employees of local administrations and private companies, and residents, as well as field visits to various areas in Historic Cairo.

4. Developing policies and strategic interventions

The policies and interventions were formulated based on the results of the previous stages and the outputs of several meetings, field visits and consultations with all partners.

8.2 Assessment of the Current Situation

The waste collection service system in the study area suffers from different issues, which caused nearly two thirds of people to abandon the current service system and address waste outside the scope of any collection programs or systems.

There are companies of contractors, which have agreements with CCBA to collect waste from housing units and shops; however, most of beneficiaries from the service (65 % of residential units and 60 % of shops) are still outside the scope of the current collection system. Moreover, the current service varies between localities and people say that the current service is not accessed in many neighborhoods. Moreover, the service is irregular and the timing of collection is not suitable for many of them. In addition, garbage collectors sort waste on streets.

This situation caused nearly two thirds of the sample to dispose of waste using different means outside the current waste collection system and waste is disposed of in dustbins, streets, vacant plots of lands, demolished buildings and close to major antiquities. Waste flows into these places on a daily basis; and helped scavengers and by-passers to search dustbins and waste accumulations for recyclable materials.

This situation causes foul odors and helps the of spread flies, mosquitoes, insects and rats, this is also reflected through numbers of stray cats and dogs due to the waste accumulations.

The study also monitored the negative impact of waste accumulations on monumental areas. The situation compelled tour guides to change the course and movement of tourists.

The present study also revealed the contradiction of data and information, which are not updated. No accurate data was available on the generation of waste or quantities collected daily. Although data was available on equipment, tools and workers in branches of the CCBA Authority, no data was available on the capacities of contractors assigned to collect waste. Those in charge of

the waste collection had not detailed data on locations of antiquities, especially those with a historic value.

The current operational system whereby the cleaning fees are collected but not related to the service is objected by people and shop owners. Persons dealing with a garbage collector pay the cost of service on a monthly basis apart from costs charged on the electricity bills. Respondents asked to cancel the cleaning fees on the electricity bills and asked to have them paid directly for the service.

Under this poor waste collection system, participants proposed their vision for a quality system, whereby waste is directly collected from housing units for three times a week and cause side streets, lanes and higher floors access service. Collection should take place in a timely manner, together with the cancellation of charging fees on the electricity bills so that fees are directly paid to the service provider. They highlighted the importance of an effective supervision and follow up system, which covers those in charge of the collection process. Subscription should be obligatory, together with the availability of a complaint mechanism (a telephone number or hotline) and awareness programs.

A detailed study of the current situation is presented in Section 6.

8.3 Solid Waste Management Strategy for Historic Cairo

8.3.1 General Principles Governing the Strategy

The governing general principles provide guidelines and foundations to develop and organize strategy. It is considered a reference that different concerned parties can use for guidance. The most important principles are summarized below:

- The citizen's right to live in a clean environment.
- The uniqueness of the area as a World Heritage Site
- The principle of sustainable SWM that ensures the ideal use of resources and environmental protection.
- The principle of "Partnership" based on honesty and the clarity of the roles of all parties.
- The local administration is the main body that is responsible for collecting and transporting waste, even if the service is privatized.
- The clarity of roles and responsibilities, as well as separating the organizational and regulatory tasks from the executive ones.
- The availability of information for all, and the ease and transparency of its transfer and exchange.
- The transparency of administrative, financial and regulatory institutional systems.
- Appropriate technology and equipment to local conditions and the nature and uniqueness of the area.
- Considering the vital role of the private and civil sectors as a key component of the strategy.

- Considering the vital role of the local community and the importance of citizen participation in SWM.
- Transparency in dealing with citizen complaints.
- The principle of cost recovery based on the "Polluter Pays Principle" and that "the generator of waste pays for its safe disposal."
- Initiating proactive measures to educate and raise the awareness of the local community concerning the need for recycling.

8.3.2 Sector Improvement Vision

"An integrated and sustainable community management of solid waste to improve environmental conditions, while taking into consideration the uniqueness of the area and its nature as a World Heritage Site"

The vision of improving this sector reflects the importance of developing the foundations that would pave the way for the concerned parties to implement an integrated system for SWM, which entails as many economic and social benefits as possible, and ensures the ideal use of resources in order to improve environmental conditions. This vision aims at maximizing the opportunities for upgrading SWM in Historic Cairo in six major fields during the next five years. These major fields encompass setting modern and proper foundations for institutional, organizational, economic (financial), legal and environmental frameworks; the reduction of adverse impacts on environment, public health and archaeological and historical sites; and the improvement of the efficiency and effectiveness of the services.

8.3.3 Strategic Objectives

To achieve the proposed strategy vision, based on analyzing the existing situation and its main resulting issues, which included social; institutional; organizational; technical; financial; legal, and environmental aspects, the strategy has set seven objectives, as follows:

- **First Objective:** Effective legal and organizational/institutional framework for SWM.
- **Second Objective:** A comprehensive database for SWM to be used in planning and management.
- **Third Objective:** A community that is more aware of and better involved in the SWM system.
- **Fourth Objective:** Trained cadres, who are able to manage the system in a proper and effective way.
- **Fifth Objective:** Sustainability and financial efficiency of SWM services and activities.
- **Sixth Objective:** Adequate mechanisms and basis for dealing with solid waste.
- **Seventh Objective:** Encouraging the involvement of private sector and informal sector and facilitate their participation in the system.

8.3.4 Proposed SWM Policies

The proposed policies, which will be implemented to fulfill the objectives, aim to decrease the gap between the current situation and the requirements for development. Therefore, some of these policies will be based on the current situation, while others will be based on the need to set the necessary foundations for future development. Accordingly, these policies will find solutions for the existing urgent issues and will develop current systems. Furthermore, some of these policies will develop the foundations and necessary requirements that are not currently available, in order to create a sustainable and integrated solid waste management system, given the strategy's implementation period, as well as provide opportunities for applying pilot models to promote practical practices, which may be used as basis for future models.

First Strategic Objective: Effective Legal and Organizational/Institutional Framework for SWM

The outputs of the assessment study concerning the current situation of SWM in selected areas in Historic Cairo, which included organizational/institutional framework as well as laws and regulation governing SWM, highlighted the multitude of entities, the poor coordination and lack of integration and clarity of roles and responsibilities among the involved parties in SWM in the area (CCBA branch, Monitoring and Follow-up Department, Supreme Council of Antiquities and Contractors). The result is that 60% of buildings and facilities were out of the SWM current service and was reflected on the level of the hygiene in the area in general, and at the archaeological sites in particular. Therefore, one of the required targets of the SWM strategy is the development of an effective legal and organizational/institutional framework for SWM that removes the causes of conflicts, avoids the duplication of roles and responsibilities and understands the importance and the specificity of the area.

According to the results of the study and interviews with officials, some policies were developed that ensure the achievement of this target.

Policy (1): Strengthen and Develop the Organizational/Institutional Framework within CCBA and its branches as well as its integrated role in SWM

This policy is based on strengthening the institutional structure through setting the ideal institutional structure for SWM in the Historic Cairo areas through the management of Cairo Cleaning and Beautification Authority (CCBA), who would be directly responsible for SWM in the Historic Cairo areas according to agreed limits. This would take into consideration the specificity of the region as a World Heritage Site and the integration of functional relations by setting clear roles and responsibilities to all concerned divisions and departments within the CCBA, to improve the common cooperative work and the effective coordination mechanisms with the Central Department for Monitoring and Follow-up of Cairo Governorate, Supreme Council of Antiquities and the districts with historical sites. It also aims at removing the causes of conflicts and duplication of roles and responsibilities, which were

noted during the study of the current situation, which would reduce efforts, waste of resources and promote the transparency and accountability to create a better and more effective and efficient SWM in the area.

Policy (2): Implement the legal framework to support the Integrated Management of Solid Waste

Review and implement laws, decrees and legal provisions included in the laws concerning SWM, to make them suitable for the nature and the specificity of the area as a World Heritage Site and consistent with the new directives concerning SWM in archaeological sites within Cairo Governorate. The results of the current situation study emphasized the lack of laws, regulations and provisions, whether those governing companies and contractors' activities or those dealing with violators. Accordingly, local residents and business owners requested the implementation of laws to reduce the flagrant violations concerning collection and disposal of waste. There is also a need to develop an executive plan to raise the awareness of all parties concerned with SWM (Local Administration CCBA/Districts, Supreme Council of Antiquities, companies, workers, residents, NGOs, etc) as well as the implementation and enforcement of laws and decisions on everybody.

In addition, in the design of awareness programs, it should be taken into consideration the publication of information concerning waste collecting companies, with regard to the provisions that may be issued against the violators of laws and regulations. There is a need for developing an effective system to assess, follow and monitor the SWM services and activities in a neutral and transparent manner.

Second Strategic Objective: Integrated Database for Solid Waste to be used in planning and management

The assessment study of the current situation and collected data presented discrepancies and lack of updates among data and information regarding population levels, number of residential units and number of commercial, industrial and services facilities. Also, there are no accurate data concerning waste generation and the quantities collected per day. Despite the availability of data on equipment, tools and employees at the CCBA branches, there are no accurate data concerning the potentials of contractors responsible for waste collection. Also, there are no detailed data about archaeological sites, especially those with historical value, available for those who are responsible for collecting waste in the study area.

Therefore, there is an urgent need for establishing an integrated database for solid waste that includes the characteristics and the nature of the area to be used in planning and management as one of the objectives of the development of the SWM Strategy.

Policy (3): Establish a unified database for Solid Waste and archaeological Sites and automate the monitoring system

Given the outputs of the current situation study regarding the lack of accurate and updated data, there is a need for identifying the information necessary to

establish database, which should be realistic, limited and specific, especially data concerning accurate statistical data about population, facilities, quantities and rates of generated waste as well as archaeological sites and areas. These data and information are necessary for planning, management, control and taking decisions related to SWM in the area. It should be taken into consideration, in the design of an information and control system, the identification of mechanisms and procedures for information and data exchange among concerned parties, whether those responsible for supervising on implementation such as the CCBA branches or those responsible for control and monitoring, including information exchange and submission of reports.

It is important to develop, update and automate the register system used in the Local Administration (CCBA, Governorate and Districts). Also, it is important to develop an accurate and easily applicable computer system to deal with information and data including data publication and availability for everybody.

The results of the current situation study indicated the lack of control and monitoring (33% of the research sample indicated the importance of supervision, control and monitoring the performance that is not currently available). Also, the monitoring systems shall adopt indicators for environmental, technical and financial control, performance effectiveness and measure the level of satisfaction of service beneficiaries. Control and monitoring processes should be connected to an accurate information system and related to plans to be able to measure the achievement of goals and the efficiency of SWM system through a set of indicators that should be developed. The regulatory systems shall include a meaningful analysis of data collected and analyzed, and issue periodical reports and detailed studies that provide the key information used in planning and proper decision-making. To achieve this, financial and qualified human resources should be made available.

Third Strategic Objective: A more aware society and its involvement in the SWM System

Awareness is one of the main pillars of SWM Strategy, starting from waste generation phase to its final disposal and is considered the primary stone in any integrated SWM System. As the results of the current situation study and interviews with officials indicated that awareness-raising activities are limited and scarce as well as the lack of integrated awareness plans coping with the nature of the population in the area and the importance of Historic Cairo. This has led to the prevalence and proliferation of negative behaviors by all involved parties in the SWM system, including service providers and beneficiaries.

Given the importance of awareness for the SWM system, a range of policies would be developed to achieve the goal of fulfilling the gap between the current situation of awareness and future requirements. Therefore, some policies will be developed on the basis of the current situation inputs where 36% of residents called for the need to raise the awareness of garbage collectors and citizens so as to change their behaviors in dealing with solid

waste. On the other hand, other policies will be developed on the basis of the need to develop the fundamentals necessary for interim and future development which would lead to the creation of a more conscious and involved society.

Policy (4): Strengthen the spirit of partnership and sustain alliances among service providers (Local Administration, Private Companies: Contractors/NGOs)

This policy focuses on the importance of creating a comprehensive institutional approach using the current experiences to achieve the strategic partnership among service providers and Local Administration (CCBA, Governorate, Districts) at one side, and service beneficiaries at the other side, in order to raise the awareness and maximize the partnership between all segments of the society. This was one of the requests proposed by residents and business owners to improve and optimize collection and disposal of solid waste.

Any efforts to raise the society's awareness regarding the issues of solid waste shall include a number of important issues such as: 1) the obligation of service providers and beneficiaries to respect the timing of waste collection; 2) combating the phenomenon of irregular waste disposal in public and historical sites; 3) focusing on the adverse impacts of waste on population and archaeological/historical sites; 4) environmental impacts, occupational health and safety issues; 5) the principle of waste reduction, sorting, segregation and recycling; and 6) the obligation to pay the fees for waste collection.

Policy (5): Working on changing the behavior of residents in dealing with solid waste, resulting in waste reduction and general improvement of the environment

The results of the current situation study indicated the ineffectiveness of some efforts, which are currently made in the field of raising awareness and changing the behavior of residents in dealing with solid waste. At the CCBA central level, there are efforts targeting the Governorate through the website of the CCBA and its Awareness Department. However, at the branches level or when interacting directly with residents in the different zones within Historic Cairo, there is a total lack of awareness efforts or tangible programs. Also, the Awareness Department at the Central Department for Controlling and Monitoring, suffers from the weakness of human and financial resources to conduct awareness programs covering the Historic Cairo areas. In addition, during the meetings with officials, residents and business owners, it has been pointed out to the decline of both residents' and waste collection providers' behavior. This is probably due to the poor performance of NGOs in its direct interaction with residents and its weak influence on individuals as well as to the state of social fragmentation and polarization after the 25th of January 2011 revolution and the lack of security.

As known, the changing of behavior is the most difficult issue to be faced in projects' implementation, especially when related to specific customs and traditions as well as to a high rate of illiteracy and population density. Therefore, it is important when developing awareness plans and programs, to

rely on field visits and activities, experiments and initiatives, along with focusing on students, teachers and education officials, youth centers and worship places. In addition, guidance manuals concerning the cleanliness of archaeological sites and public places should be developed and distributed in schools and among residents and business owners. Furthermore, waste reduction and recycling, along with the organization of a range of programs and workshops in schools, NGOs and youth centers would help in raising the awareness and improving behaviors.

Policy (6): Encourage the involvement of public, schools and NGOs in SWM activities

The study of the current situation and interviews held in the study area, have shown that the public, youth, schools and NGOs have no significant role in any activity related to the issues and programs of SWM. However, the results of the study show the desire of the involved residents and business owners to participate in such activities through an integrated, regular and permanent system for waste collection and disposal. Therefore, an important part of the strategic objective regarding the creation of a more aware and involved society in the SWM system, is to encourage the involvement of public, schools and NGOs in the SWM activities at their different stages. This would be developed through expanding in the creation of community committees in each area of Historic Cairo that would cooperate with the Local Administration, Supreme Council of Antiquities, Education Directorate, Companies and NGOs in the awareness programs and participate in the SWM monitoring and follow-up process at its different stages. This would be implemented after that these committees have been trained and qualified to perform this important role.

Policy (7): Change residents' view and perspective concerning the role of garbage collectors

One of the challenges facing the SWM system is the public negative perception of garbage collectors and the lack of understanding of their role that would assist in the construction of an integrated system. The results of the current situation study suggested that the involved people called for the need to respect committed garbage collectors and respect their role. This requires the organization of sessions with the public through community committees and NGOs as well as school students in the presence of dustmen and garbage collectors in order to highlight the importance of their role in the system and society and to induce the SW workers to change this negative perspective against them through providing a better service and quality of work, committing to the effectiveness of the collection process, dealing respectfully with citizens, improving his aesthetic appearance by wearing suitable uniforms and complying with health and occupational safety policies during work.

Policy (8): Incorporate environmental education in school curricula and activities

Students are the most important category to which awareness program could get a rapid positive return. However, no significant programs or activities have been detected through the present study, except for some seasonal environmental campaigns in some schools. Therefore, the strategy would adopt the target of increasing the concern in this category by expanding the

coordination with Education Directorates, school directors, teachers, parents' councils and community committees and developing plans to implement a range of awareness programs and activities (workshops, cleaning campaigns, etc) and environmental competitions (the best class, school, drawings, etc) through activity classes and field visits in order to strengthen positive behavior in dealing with solid waste and create a young generation where personal hygiene and a clean environment would be a key part of their personality.

Fourth Strategic Objective: Trained and qualified personnel able to manage the system in a proper and effective way

The current situation study included interviews with decision-makers, field implementation staff, workers at the CCBA branches, controllers at the Monitoring Department as well as CCBA contractors as well as field observations of the service system. The results of the study and the vision of residents and business owners about the performance level and the efficiency of SW employees indicated that human resources at all levels of management, supervision, follow-up and implementation need to be trained and qualified to be able to manage the collecting process in a proper and effective way, and also to be aware about the importance of the area and its historic and cultural nature, which is currently not the case. In addition there is an acute shortage of personnel and qualifications; therefore, there is a need to find trained and qualified personnel able to manage the system properly and efficiently as one of the most important goals of the integrated SWM strategy in the Historic Cairo area.

Policy (9): Create a coordinated, holistic and sustainable institutional approach to enhance the choice of cadres and capacity and experience building of SWM staff

Interviews with officials and employees confirmed that the current situation of SWM lacks qualified cadres in all specialties at the different phases of the system (collection, transport and disposal). They also confirmed the absence of monitoring standards, regular training programs, experience exchange and provision of the necessary qualification training to contractors and waste collection companies.

To achieve the goal of finding trained and qualified personnel able to manage the system, the proposed policy confirms the wider concept of capacity building, including coordination and exchange of local, regional and global expertise, particularly in relation to heritage and archaeological areas. Other proposed approaches include the documentation and publication of successful practices, networking with institutions operating in this field and building partnerships, in addition to the traditional approach consisting on providing training programs on a continuous basis.

The sustainability of the process of institutional capacity building of cadres, which aims at assuming duties and responsibilities within the SWM system in the area (for management and implementation staff), constitute a prerequisite and an important hub for the effective management of solid waste in archaeological areas. This has to be based on a systematic and continuous

evaluation to identify the needs and priorities for capacity building of human resources working in this sector, as well as the different preparations and equipment needs that would enable them to perform the assigned tasks in the process of implementation or supervision and follow-up or awareness.

Fifth Strategic Objective: Financial sustainability and efficiency for SWM services and activities

The "polluter pays principle" adopted by the EEAA, targeted the recovery of 100% of waste management expenses in 2005; however, this target was not achieved for different reasons. The subsequent procedure was based on adding the waste fees to the electricity bill to attain the full cost recovery. As Historic Cairo is considered a popular area, residents are required to pay 3 EGP for each residential unit and about 10-15 EGP for each facility. Again, the full recovery of expenses was not achieved and the collected fees currently cover less than 60% of the service cost. Moreover, the current situation study has shown that more than 70% of residents included in the service pay to the garbage collector a supplementary sum in addition to that already collected through the electricity bill. In addition, the CCBA Chairman stated that the Ministry of Finance supports the CCBA in order to fulfill the gap between the expenses and what is actually collected. In this respect, it is therefore important to include financial sustainability and efficiency for the SWM services and activities among the strategy objectives.

Policy (10): Realize cost recovery of operating expenses and promote the self-financing principle for the SWM services

To realize self-financing and cost recovery of operating expenses, it is required to develop applicable and effective systems and mechanisms so as to increase resources and link fees' collection with the service. Self-financing requires the development of the current collection system to be more effective and reflecting the real number of residential units and commercial, service and industrial facilities. It should take into account the depreciation of capital investment and other investment values to improve services. It is also requires the development of innovative mechanisms for collection and other parallel mechanisms to increase revenues, such as benefiting from fines, reconciliation fees with Cleanliness and Environmental laws violators, budgetary transfers to cover costs, charging removal of construction waste, private contracts and payment of fees for archaeological sites visits.

Policy (11): Raise the level of social awareness concerning the importance of dues' payment

The results of field research indicate that fee collection from residents and business owners, in a way that ensures the full cost recovery of the service, does not constitute a problem for them, as long as they receive a regular and sustainable service and service providers (whether CCBA or contractors) are committed to the provision of a satisfactory service. In fact, residents and business owners already pay for the service despite its current level. More than 70% of the interviewees suggested that they are willing to incur the actual cost providing the availability of distinctive and regular service. They also requested the elimination of fees added to electricity bill and suggested to link

the fees directly to the service provider. Despite, there is a need to raise the social awareness of the service beneficiaries concerning the importance of dues' payment, focusing on the environmental negative impacts that may arise due to the failure of competent authorities in providing a sustainable service adequate to the nature and specificity of the area if costs are not recovered.

Sixth Strategic Objective: Appropriate mechanisms, bases and systems for dealing with solid waste

In light of the current situation study and interviews with services providers, whether officials or contractors, residents and business owners as beneficiaries from the service, the current situation in Historic Cairo is difficult and there is a need to improve the waste collection service by adopting appropriate mechanisms, bases and systems. Therefore, one of the proposed strategic objectives includes the development of appropriate mechanisms, bases and systems to deal with solid waste taking into account the nature and specificity of the area. This goal could be achieved through a set of policies.

Policy (12): Development of management systems for SW collection and transportation to improve the service effectiveness and quality and provide it to all citizens

Historic Cairo is composed of popular areas characterized by a high population density having a significant impact on waste generation. In addition, the concentration of the population in low-income areas leads to a high generation of waste per square kilometer. Therefore, the need to a suitable collection system is the most important issue for these areas. In addition, narrow streets, lanes (*hara*) and alleys (*zoqaq*) constitute an obstacle to waste collection where specific and appropriate equipment to the nature of the area is required. In order to serve these areas in a good door-to-door manner, transport operations should be adapted to the operational conditions by using specific equipment and tools (such as small vehicles, wheelbarrows and hand carts).

In addition, strict standards should be developed for vehicles used for waste transportation and provisions should be developed in order to ensure compliance with environmental standards for dealing appropriately and safely with solid waste during collection, transportation and final disposal phases, in addition to determining the staff and equipment required in each sector.

Therefore, in order to develop and ensure the sustainability of the solid waste collection and transportation service, it is necessary to choose the most appropriate technical and organizational solutions. Consideration should be given to the use of technologies appropriate to the local conditions and the specificity of the area, taking the cost into account, to ensure the rationalization of resources, the achievement of performance efficiency and effectiveness and provide the service to all citizens.

Policy (13): Disseminate and promote the concept of waste segregation at the source among residents and employees in the SWM field

The development and implementation of systems to reduce solid waste requires the availability of information and studies that identify

implementation policies and tools as well as sufficient awareness among individuals and governmental institutions. In addition, the development of appropriate mechanisms, bases and systems to deal with solid waste in accordance with the nature of the region requires promoting the segregation of reusable and recyclable waste through the involvement of people and private sector before and after the collection phase. It also requires investigating the potential expansion of the transfer station located at Al Basateen for waste assemblage, sorting and recycling (organic material to be converted into organic fertilizer, solid materials to be used in the industry and the rest to be converted into biofuel) so as to minimize and reduce waste quantities that are disposed of in the landfill.

Besides, it is possible to start the implementation of waste segregation at the source in phases, starting with a pilot area within Historic Cairo, and encourage people and SW operators by using incentives in order to implement this activity. Furthermore, this activity must be preceded by a campaign to raise awareness in cooperation with municipalities, NGOs, schools, worship places and EEAA.

Seventh Strategic Objective: Increase and organize the involvement of private sector, informal sector and youth, and integrate them in the system

Policy (14): Creating an enabling environment for investment to encourage private sector and youth participation

The increase of private sector and youth participation requires the presence of an enabling environment and incentive systems that facilitate obtaining loans, credits and tax exemptions and provide transparent information. This would encourage the private sector and young people to invest in the field of solid waste. This would require providing support to establish cleaning companies based on proper and effective management systems capable of being contracted by the CCBA in accordance with laws and regulations. It also requires adopting policies applying standard solutions, economically feasible and environmentally friendly, to segregate and recycle waste, which can be evaluated in order to use the assessment results to expand the participation of the private sector.

On the other hand, this should coincide with the reform of the SW fee collection system to enable the competent authorities to cover the benefits of the private sector in case of its participation. In addition to this, programs should be provided to support the operators' capabilities in this field, especially with regard to the establishment of companies, preparation of tenders and operational contracts and provision of regulations governing the work of the private sector. In the meantime, control and automated informatics' systems should be developed in order to monitor the performance of the private sector.

8.3.5 Strategic Interventions and Responsibilities of Executive Bodies and Institutions

To achieve the above 14 policies identified by the SWM strategy, a number of strategic interventions were identified, elaborated and presented in Table 8-1, which in turn points out to the link between interventions and the different policies that will lead to the achievement of the strategic objectives.

Table 8-1: Strategic Interventions and Responsibilities of Executive Bodies and Institutions

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
First Objective: Effective Legal and Organizational / Institutional Framework for SWM	Strengthen and development of institutional / regulatory framework within CCBA and its branches and promote its integrated roles in SWM field in Historic Cairo.	Establish a department for solid waste in Cairo divided into a range of divisions with a regulatory framework defining the roles and responsibilities of sections that deal with CCBA and institutions related to SWM.	Governorate / CCBA
		Review and update organizational structures and job descriptions for departments related to SWM in accordance with the regulatory framework and support it with appropriate and sufficient human resources.	Governorate / CCBA
		Develop effective coordination mechanisms among SWM in Historic Cairo and the Central Department for Monitoring and Control in Cairo, its branches, Supreme Council of Antiquities and districts in historic regions.	Governorate / CCBA / Supreme Council of Antiquities/ Districts
		Develop regulations and standard for service level aiming at promoting transparency and accountability to create a more efficient and effective system for solid waste in the area.	Governorate / CCBA / Supreme Council of Antiquities/ Districts
	Activate the legal framework to support the integrated management of solid waste.	Review and determine the laws and decrees concerning SWM	Governorate / CCBA
		Develop an implementation plan on the method and mechanisms to apply these laws and decrees, and determine required human resources to be trained and qualified to carry out that task.	Governorate
		Provide awareness plans to all SWM stakeholders on these laws and decrees.	Governorate/ CCBA / Service Providers/ Private Companies/ NGOs/ Community Committees
		Develop a transparent, impartial and effective system to evaluate and follow-up the provided services.	Governorate/ Supreme Council of Antiquities/ Community Committees
Second Objective: Integrated Database for Solid Waste to be used in planning and management.	Establish a consolidated database for solid waste and computerize control and follow-up systems.	Establish a database including realistic, limited and specific data on Historic Cairo areas, especially data concerning accurate statistical data about population, facilities, quantities and rates of waste generated as well as the archaeological sites and areas.	Governorate/ CCBA / Supreme Council of Antiquities
		Apply geographic information systems (GIS) in the management of solid waste and provide computer systems and hardware and qualified personnel.	Governorate / CCBA

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
		Set up a system for information management, identifying sources of information and data, systems of collection, documentation, monitoring, updates and data analysis and develop mechanisms for coordination and exchange of information and submission of reports and determine the required human resources to be trained and qualified to be able to carry out these tasks in effective way.	Governorate – CCBA
		Set up mechanisms allowing information exchange among CCBA branches in Historic Cairo and other concerned bodies (Governorate, Supreme Council of Antiquities, transfer stations, etc)	Governorate – CCBA – Supreme Council of Antiquities
		Set up a system for control and follow-up, allowing the follow up of the different SWM phases in the area and depending on environmental, technical and financial control indicators and effective performance and measure the levels of satisfaction of the service beneficiaries.	Governorate – NGOs – Community Committees
Third Objective: A more aware society and its involvement in the SWM System	Strengthen the spirit of partnership and sustain alliances among service providers (Local Administration/ Private Companies: Contractors, NGOs) and society to raise the awareness concerning Solid waste issues.	A division for raising awareness and social communication within the SWM system and capacity building in terms of human resources and awareness programs and create partnership and communication with civil society.	Governorate – CCBA – Supreme Council of Antiquities – NGOs – Community Committees
		Implement common awareness programs and campaigns through the awareness department employees and Antiquities officials, NGOs and community committees with the participation of citizens.	Governorate – CCBA – Supreme Council of Antiquities – NGOs – Community Committees
		Affirm the need for each company to get a license, to have a person responsible for raising awareness and dealing with the department of awareness and civil society.	Governorate – CCBA – Private Companies
	Working on changing the behavior of residents in dealing with solid waste, resulting in waste reduction and general improvement of the environment.	Develop guidance manuals on how to reduce waste for NGOs, worship places, schools and community committees to raise the social awareness on solid waste issues.	Governorate – CCBA – Supreme Council of Antiquities – Educational Directorate
		Develop a plan for the Awareness Department to conduct field visits to houses and facilities in different areas to transmit awareness implications to citizens through direct interviews in coordination with NGOs and community committees.	Governorate – CCBA

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
		Organize a range of awareness workshops inside schools, worship places and civil associations targeting all sections of the society (youth, children and women) as well as personnel working in this field with particular emphasis on the economical value of waste.	Governorate – CCBA – Supreme Council of Antiquities – Educational Directorate
		Promote and support all society initiatives in the field of environment in general and in that of SWM in particular and provide practical experience on recycling.	Governorate – CCBA – Supreme Council of Antiquities – NGOs – Private Companies
		Conduct visits to youth, school students and other sectors of the society to increase awareness on recycling operations in coordination with NGOs.	Governorate – CCBA – Supreme Council of Antiquities – NGOs
	Encourage the involvement of public and civil associations in SWM activities.	The formation of community committees in each region to cooperate with the Solid Waste Department of the City Council, and its involvement in the process of designing, planning, controlling, monitoring and assessing the Solid Waste System at its different phases.	Governorate – CCBA – NGOs – Community Leaderships
		Provide training for members of committees on how to control, follow up, monitor and deal with problems and establish a hot line to facilitate communication.	GIZ – City Council
	Change residents' view and perspective concerning the role of garbage collectors.	Increase the awareness sessions among personnel in this field and citizens through the Community Committees and NGOs and underline the vital role of personnel in this field.	Governorate – CCBA – NGOs – Service Providers
		Raise the awareness of personnel on how to deal with citizens, improve their aesthetic appearance, work methods and use collection and transportation tools that take into account health and occupational safety policies during work.	Governorate – CCBA – NGOs – Service Providers
	Incorporate environmental education in school curricula and activities.	The formation of groups in the schools of Historic Cairo areas with the objective of becoming "friends of the environment" and protecting cultural, historical and religious monuments.	Governorate – CCBA – Educational Directorate – Supreme Council of Antiquities
		Organize a workshop with students concerning recycling projects.	Governorate – CCBA – Educational Directorate
		Develop Guidance manuals to reduce waste in schools.	CCBA – Educational Directorate

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
		Implement models of environmental initiatives (recycling, cleaning, beautification, etc) with the participation of Schools, NGOs, CCBA, Governorate and Community Committees.	CCBA – Governorate – Educational Directorate – Associations
		Organize competitions among schools dealing with environmental activities and cultural / archaeological sites (the cleanest class/ the best environmental drawings, etc).	CCBA – Governorate – Educational Directorate
<u>Fourth Objective:</u> Trained and qualified personnel able to manage the system in a proper and effective way	Create a coordinated, holistic and sustainable institutional approach to enhance the choice of cadres and capacity and experience building of SWM staff.	Develop standards, required qualifications, conditions and specifications for personnel working in this field and increase the percentage of personnel with intermediate and higher levels of education.	Governorate – CCBA
		Develop and implement annual plans and training programs for institutional capacity and expertise building to include all personnel in the solid waste management system.	Governorate – CCBA
		Develop guidance manuals for personnel, defining roles, responsibilities, mechanisms and models for performing their tasks	Governorate – CCBA
		Develop a program for experience exchanging and networking with bodies in this field (EEAA, etc).	CCBA – Governorate – EEAA
<u>Fifth Objective:</u> Financial sustainability and efficiency for SWM services and activities	Realize cost recovery of operating expenses and promote the self-financing principle for the SWM services.	Realize cost recovery of operating expenses by developing effective and applicable systems and mechanisms to increase the resources and re-evaluate the fee collection system (currently added to electricity bill) and link fees' collection with the service.	CCBA – Governorate – EEAA
		Increase revenues through the development and implementation of innovative, viable and effective mechanisms such as benefiting from fines, reconciliation fees law violators, budgetary transfers, charging removal of construction waste, private contracts and payment of fees for archaeological sites visits.	CCBA – Governorate – EEAA – Supreme Council of Antiquities
		Develop a Guidance Manual for appropriate technical, administrative and regulatory solutions to reduce the cost of waste collection and transportation.	CCBA – Governorate – EEAA

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
Sixth Objective: Appropriate mechanisms, bases and systems for dealing with solid waste	Raise the level of social awareness concerning the importance of dues' payment.	Develop an awareness plan to raise the social awareness of the service beneficiaries concerning the importance of dues' payment, focusing on the environmental negative impacts that may arise due to the failure of competent authorities in providing a sustainable service adequate to the nature and specificity of the area if costs are not recovered	CCBA – Governorate – EEAA – NGOs – Community Committees
		Involvement of public and civil associations in developing a list of fees for residential units and commercial, industrial and service facilities.	CCBA – Governorate – EEAA – NGOs – Community Committees
	Development of management systems for SW collection and transportation to improve the service effectiveness and quality and provide it to all citizens.	Development of a direct collection system (door-to-door) – 3 times per week for residential units and on a daily basis for stores – along with raising of the awareness of public and store owners, using suitable waste bins (for smaller and larger streets), determining the timing and points of collection and choosing the collection and transportation means and tools that are appropriate to the specificity of the area and to the environment.	CCBA – Governorate – EEAA
		Strict standards should be developed for transportation means used for transporting waste, and provisions should be developed in order to ensure their compliance with environmental standards, dealing safely with solid waste during the different phases (collection, transportation and final disposal) and determine the number of employees and equipment required in each sector.	CCBA – Governorate – EEAA
		Support the use of technologies appropriate to the local conditions and specificity of the area and taking the cost into account, to ensure the rationalization of resources, the achievement of performance efficiency and effectiveness and provide the service to all citizens.	CCBA – Governorate – EEAA
	Disseminate and promote the concept of waste segregation at the source among residents and employees in the SWM field.	Start with a pilot area, subject to criteria taking into account the social and cultural level in which the segregation at the source will be implemented and provide intensive training programs to personnel responsible for awareness and encourage citizens and personnel participation by providing incentives.	CCBA – Governorate – EEAA – Service Providers – NGOs – Educational Directorate

Strategic Objective	Proposed policies to achieve the objective	Proposed interventions and mechanisms to implement policies	Executive bodies
		Develop awareness programs to motivate and raise the awareness of citizens, schools' students and personnel on the importance of waste segregation at the source and recycling to reduce the quantities of waste.	CCBA – Governorate – EEAA – NGOs – Community Committees – Educational Directorate
<u>Seventh Objective:</u> Increase and organize the involvement of private sector, informal sector and youth, and integrate them in the system	Creating an enabling environment for investment to encourage private sector and youth participation	Provide training programs to contracting personnel aiming at the identification of proper measures to qualify private sector companies, informal sector and youth, preparation and finalization the statement of work, determining and assessment processes (technical and financial), negotiation skills and finalization of contracts.	CCBA – Governorate – EEAA
		Help youth, private sector and associations in establishing cleaning companies having proper and effective management systems, capable of being contracted by CCBA and municipalities in accordance with laws and regulations.	CCBA – Governorate – EEAA
		Provide simplified guidance manuals to assist the participation of the private sector in SWM, including models of contracts, participation approaches and alternatives and methods of performing monitoring and control.	CCBA – Governorate – EEAA
		Provide incentives to encourage the private sector and young people to invest and participate in the solid waste management.	CCBA – Governorate – EEAA
		Control and informatics systems should be developed and computerized in order to monitor the performance of the private sector.	CCBA – Governorate – EEAA

8.4 Strategy Implementation

The strategy identifies the roles and responsibilities of concerned bodies and institutions involved in implementing strategic interventions. The principal executive bodies, identified in Table 8-1, are responsible for interventions in close coordination and cooperation with other concerned stakeholders, organizations and institutions.

8.4.1 Implementation Scenarios

For the implementation of the proposed strategy three different scenarios are proposed.

a. *First scenario*

The first scenario includes establishing a special unit at the CCBA to be responsible of all solid waste management activities in Historic Cairo, including the use of trained personnel and suitable equipment appropriate for the nature of the area.

Selected workers would be trained to increase their capacities and allocated to work in Historic Cairo only. Additional workers would be hired, as necessary, and provided with the required training. The Supreme Council for Antiquities would be responsible of providing the CCBA with maps detailing all the areas of cultural and historical concern, and will follow up in cooperation with the CCBA.

This new unit will have an own budget and will be financed by governmental authorities.

Potentials of this scenario include:

- This unit would be autonomous with less regulatory and financial restrictions;
- It would have its own management system and budget;
- Suitable cadres and workforce would be selected and trained specifically to deal with Historic Cairo;
- Appropriate equipment would be made available to deal with the street typologies of the area;
- Higher salaries and incentives would attract skilled workers.

Constraints of this scenario include:

- Government will to establish such a unit that would require a dedicated budget, cooperation between different entities and a new administrative structure;
- Favoritism and nepotism might determine cadres' selection instead of qualifications;
- Weak governmental financial resources available at the present time.

b. *Second Scenario*

The Historic Cairo area would be determined accurately through GIS maps and approved by authorities. Accordingly, a tender will be prepared and issued

for local and international private companies to submit their offers for providing solid waste management services in the area. This tender would include detailed equipment and labor force needed for the project. Hence, a 5 years contract would be signed. Follow-up and evaluation would be carried out on a bi-annual basis.

Potentials of this scenario include:

- Availability of equipment and workforce;
- Better supervision of workforce;
- Administrative and financial procedures are smoother if compared to governmental entities.

Constraints of this scenario include:

- High cost to the government;
- Different interpretation of contractual articles often leads to problems with CCBA;
- Fines imposed by CCBA are often regarded by private companies as arbitrary.

c. Third Scenario

It includes upgrading the existing system by implementing an appropriate collection system using efficient technologies in the project area. Upgrading would target both workers and equipments. Training would increase the workers' capacities and this could indirectly result in increased financial benefits to these workers. The CCBA have the possibility to purchase the appropriate equipment for collection such as mini-trucks and handcarts of different sizes. The Supreme Council for Antiquities has to cooperate with CCBA by providing them with a detailed list of monument. The monitoring system at the area would be also upgraded and subsidized with equipments and transportation vehicles such as motorcycles.

Potentials of this scenario include:

- Availability of equipment and workforce;
- Existing administrative structure;
- Knowledge of the area and its constraints.

Constraints of this scenario include:

- Restricted by the current governing laws and regulations;
- Weak salaries and incentives;
- Workers' supervision is very weak;
- Low budget availability;
- Weak maintenance of equipment;
- Monitoring and control of CCBA activities is poor due to lack of resources at the Governorate's Supervision and Monitoring Department.

8.4.2 Planning and Development of Regulations

In order to make the strategy operational, implementation plans should be developed. The first plan should last for a period of three years, along with the development of annual detailed plans identifying program and activity priorities, detailed responsibilities of executive bodies and stakeholders, the

time period necessary for implementation and the necessary financial resources according to appropriate financial mechanisms that ensure the availability of required budgets.

It is also important to develop norms and determine the entity responsible for implementing the strategy in order to ensure the use of organized and systematic methods for monitoring, assessing, updating and amending the strategy and the implementation plans as required, taking into account political, economical and social changes and developments taking place in the country. This in addition to the need to keep effective coordination and cooperation mechanisms between all parties involved in implementation and to maintain a continuous participatory approach.

8.4.3 Administrative Considerations

a. Primary stakeholders' participation and raise of awareness

Pilot projects for primary stakeholders' participation and raise of awareness could be implemented. This has already started through the present study as residents and business owners were consulted about the design of the proposed SWM system through social surveys and focus group discussions.

In addition, the following activities could be implemented:

- Involve children and students in environmental contests (e.g. an art competition on the environment, environmental questionnaires);
- Educate women about proper waste handling practices through home visits by female volunteer promoters;
- NGOs and Civil Association should consult scavengers working in Historic Cairo in order to legalize their activity and integrate them in the SWM system, in order to benefit from their experience in collecting recyclable materials and, accordingly, increase the recycling of these materials instead of their disposal.
- Establish a Local Environmental Committee to meet regularly with representatives from the CCBA and Supreme Council of Antiquities.
- The Supreme Council of Antiquities could promote environmental and cultural campaigns featuring leaflets, signboards and posters, cloth banners hung over streets, and seminars in collaboration with local NGOs.
- Promote events launching neighborhood clean-ups featuring the EEAA, Supreme Council of Antiquities, CCBA, etc with the involvement of regional television channels, in addition to school visits and community meetings.

b. Selection of Contractors

An important issue for the improvement of the SWM system is the selection of suitable contractors. A guidance to select waste management contractor is herein provided.

- The contractor must be a member of the Egyptian Federation for Construction and Building (Cleaning Works).
- The contractor must submit a detailed list of equipments needed for the implementation.

- The contractor must be financially strong.
- The names, position and experience of staff must be presented.
- Experience document must present the last five years projects.
- It is necessary that the contractor pays ensures his employees against natural and environmental accidents.
- The contractor should have the ability to carry out extra works.
- Sufficient technical staff to operate and manage the work.
- The contractor has to follow all Egyptian and local legislation controlling the waste management activities.
- The contractor must collect all type of waste produced.
- The contractor must have special uniform and show his logo on vehicles and equipment.
- The contractor shall be required to safeguard public utilities (waste drainage roads, etc).
- The contractor shall obtain the permits necessary for trucks and equipments in accordance with applicable regulations in this regard.
- The contractor must have an office in the area, equipped with a phone and 24-hours working staff applying shifts.

8.4.4 Technical and Geographical Considerations

For the implementation of the proposed strategy, in particular to develop management systems for SW collection and transportation improving the service effectiveness and quality (Sixth Strategic Objective – Policy 12), the following technical aspects should be considered.

a. *Use of suitable collection equipment according to street typologies*

This equipment might include either mechanical equipment such as mini-trucks which can maneuver in narrow streets or manual equipment such as handcarts. Mini-trucks and handcarts can be emptied in larger trucks stationed in wider areas and then continue waste collection.

In general, about 50 to 70% of open spaces have a width ranging from 2 to 6 meters and this width is mainly found in Darb Al Hosr (35.2%) and Al Khalifa (34%). These streets can be managed using mini-trucks (Figure 8-1). These mini-trucks have a reasonable price and are characterized by low operation and maintenance costs.



Figure 8-1: Proposed mini-trucks for waste collection in middle-width streets

Narrower streets of less than 2 meters can be managed using handcarts which have a very low cost and can be easily provided (Figure 8-2).



Figure 8-2: Examples of proposed handcarts for waste collection in narrow streets

Streets and spaces larger than 6 meters can be serviced using the available compactor trucks.

b. *Improvement of recycling and materials' reuse*

Historic Cairo is one of the highest waste producers of Greater Cairo and waste produced in Al Khalifa and Mokattam Districts ranges from 2.5 to 3.5 kg/day per inhabitant. This important waste generation is probably due to the commercial and the hand-crafted industries present in the area (Debout,

2012)⁹. In addition, the survey has shown that huge quantities of recyclable materials are generated from households and business activities.

As mentioned in Section 7.1.1, collected waste is transported to the transfer station located at El Basateen and transported to the 15th of May landfill where a composting plant with recycling lines operates.

The plant has not the capacity to recycle all recyclable materials and the remaining waste is disposed of in the adjacent sanitary landfill. This results in the loss of a large amount of materials of significant economic value.

Therefore it is proposed to use part of the Basateen Transfer Station as a sorting area for waste segregation where scavengers (*nabbisha*) could operate. This would require an inventory of the scavengers operating in the area, their division into groups and the preparation of working schedules for each group. Moreover, scavengers would be provided with safety equipment such as helmets and gloves. This option would have several positive aspects, including:

- Reuse of recyclable materials that otherwise would be lost;
- Legalization of scavengers' activity and their integration in the SWM system;
- Avoiding informal waste segregation in the streets that leads to organic waste dispersion, which would facilitate solid waste collection by operating contractors.
- Limitation of pests and stray animals;
- Improvement in scavengers' health and safety working conditions.

In case this option is selected, the contract between the CCBA and ECARU, mentioning that waste should be delivered to the 15th of May landfill without sorting, should be modified.

8.5 Follow-up and Assessment

The monitoring and control mechanisms and procedures would be determined in accordance with the indicators developed by the strategy at the objective, policy and intervention levels. Accordingly, accomplishment of the strategy objectives as well as the level of achievement and performance at the different levels would be assessed.

On the other hand, it is of significant importance that the CCBA undertakes an effective monitoring of the contractors. The purpose of this monitoring guidance is to provide the CCBA with sample information which could assist the management in establishing a monitoring and evaluation program of solid waste management and cleaning contractors.

⁹ Although commercial and industrial facilities might produce large amounts of waste, this number seems to be overrated, as the average waste production per inhabitant in Egypt is about 0.7 kg and do not exceed 1 kg.

8.5.1 Contractors' Work Plan

The contractor should present all his equipment needed for service. The quality of equipment means the equipment durability, reliability and appropriately made. The contractor should prepare and present a work plan to meet the requirements of the scope of services including the following:

- Collection routes maps that cover all areas indicating the type of service.
- Collection route time schedule for all type of service.
- Description of personnel including adequate number of personal.
- Training plan including recruited personal and training materials.
- Containers distribution, maintenance and cleaning of rollout carts and bins.
- Drivers training and testing program.
- Complete list of equipments
- A detailed plan for administration and supervision of all operations.
- The contractor should keep recording and reporting system.
- A clear procedure of communication with customers must be presented.
- Customer service system must be developed and operated effectively.
- The sanitation and maintaining of waste collection vehicles must be included in the work plan.

8.5.2 Performance Indicators

Performance indicators would help in assessing the contractor's performance. These may include monitoring:

- The percentage of residential units and business facilities benefiting from the service.
- The number of beneficiaries' complaints in the area serviced by the contractor.
- The frequency of dual payments by beneficiaries.
- The number of scavengers in the pilot area in response to decrease in recyclables in the public domain.
- The amount of fines imposed by authorities on the contracted company.
- The equipment quality.
- The general area appearance.
- The satisfaction levels among contractors and service beneficiaries.
- The Level of recycling activities in the recycling industry.

8.6 SWM System Implementation Model

The results of the present study show that most of service beneficiaries are outside the scope of the current collection system (65% of residential units and 60% of business facilities). This means that the current SWM system is inefficient due to different reasons including:

- Poor financial resources at the governmental level;
- Lack of qualified workforce and appropriate collection equipment;
- Weak salaries and incentives;
- Weak supervision and monitoring of the system;
- Lack of detailed and up-to-date data concerning the area;

- Lack of environmental awareness among a large sector of beneficiaries;
- People's distrust and skepticism towards the current SWM operators.

To implement an effective SWM system in Historic Cairo, detailed information must be available. These data and information include, *inter alia*, the amounts of waste produced, number of residential units and business activities, widths and lengths of streets, obstacle in streets causing circulation impediments, squares and yards where larger transfer trucks could maneuver or be stationed, etc.

Availability of such information would lead to a better use of the available resources, both in terms of equipment and workforce. Moreover, it would clearly indicate where the deficiencies are, thus optimizing investments concerning equipment purchase and workforce employment.

Currently, many of these data are available or can be inferred for the Shyakha of Darb Al Hosr. Therefore, a simulation of SWM implementation for this Shyakha, based on a daily door-to-door collection system is herein presented. Illustrative maps of the proposed model are provided in Annex B-5.

8.6.1 Estimated Waste Generated in Darb Al Hosr

According to Zaghow (2011)¹⁰, there were 5904 inhabitants in Darb Al Hosr in 2011. As the average population growth in Egypt is 1.7%, a population of 6210 inhabitants can be estimated for 2014. The average waste generation rate per capita per day in Cairo and urban areas in Egypt is 0.7 kg; therefore, a total waste production of 4,347 kg/day can be estimated.

Zaghow (2011) also mentions the presence of 175 business facilities (excluding animal sheds and waste dumpsters)¹¹ as shown in Figure 8-3. If an average of 3 kg of waste per day is produced by these facilities, a total waste generation of 525 kg/day can be estimated.

Based on the above figures, a total generated waste of about 5 tons/day is estimated for Darb Al Hosr.

¹⁰ Zaghow, S. (2011) Rehabilitation of Historic Cairo: Socio-economic Survey, URHC Project, UNESCO.

¹¹ It is assumed that the number of business facilities has not changed.

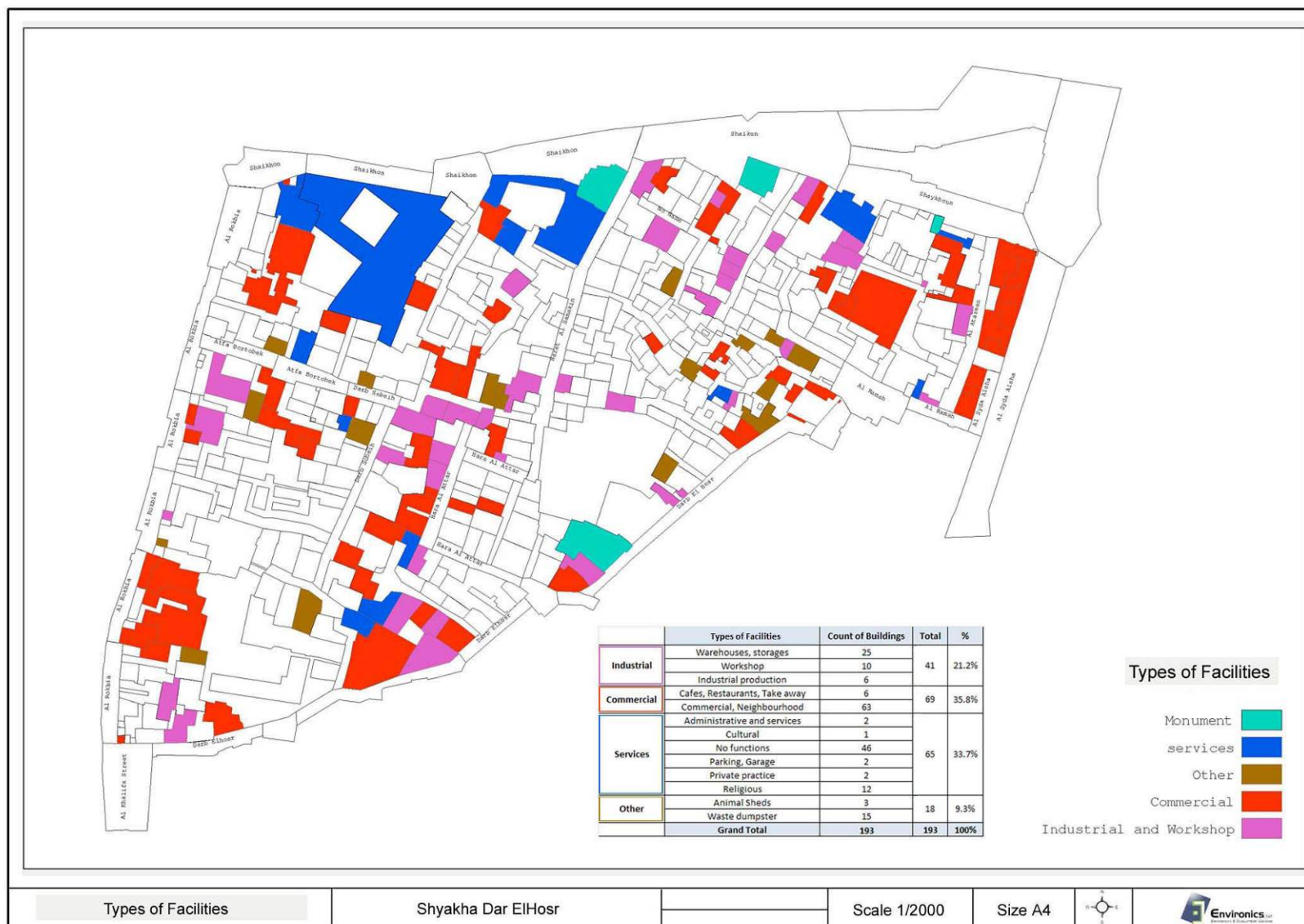


Figure 8-3: Business facilities in Darb Al Hosr

8.6.2 Geographic Distribution of Equipment and Workforce

It is proposed to undertake waste collection in narrow¹² and medium¹³ streets using handcarts. Collected garbage will be unloaded in mini-trucks (0.5 ton capacity) at designated points in medium streets. A medium truck (2 tons capacity) will pass in larger streets¹⁴ and stop at designated points to load garbage from mini-trucks. The medium trucks will then direct to El Basateen Transfer Station located at about 5 km from Darb Al Hosr to unload waste, then go back to continue the process. As the estimated waste produced per day does not exceed 5 tons, the number of daily trips to the Transfer Station performed by the medium truck would be 3 trips per day.

Figure 8-4 shows the different street widths as well as potential obstacles that could hinder trucks' circulation.

The existing street bins will be kept for improving the street services. For the moment, there will be no need for additional bins.

Although 52% of the total number of interviewees in the Pilot Area preferred collection to take place from 9 a.m. to 12 p.m., in Darb Al Hosr 83% preferred that waste collection is started before 10 a.m.

Accordingly, it is proposed to start waste collection at 8:30 a.m. using handcarts and mini-trucks for collection in narrow and middle streets. The medium truck would pass in larger streets at the borders of the Shyakh (e.g. Shaikhoun Street or Darb El Hosr Street) starting from 9:00 a.m., to load waste from mini-trucks.

Business facilities usually start their activities at 10 a.m., except groceries and popular fast-foods (foul and falafel) that start early in the morning. Waste collection from these facilities would be carried out in parallel with the household waste, using specific workers for this task. The collection process would start by collecting the available waste; the extra waste will be later on collected by the worker present in the area (garbage collector or street sweeper).

Street will be swept using brooms/sweepers and shovels and collected waste is put in the handcart plastic container. As previously mentioned, handcarts will be emptied during the halt of the mini-truck at designated points. Street sweeping would start at 9:00 a.m.

Figure 8-5 shows the proposed collection system, including handcarts, mini-trucks and medium trucks pathways.

¹² Less than 2 m width

¹³ From 2 to 6 m width

¹⁴ More than 6 m width

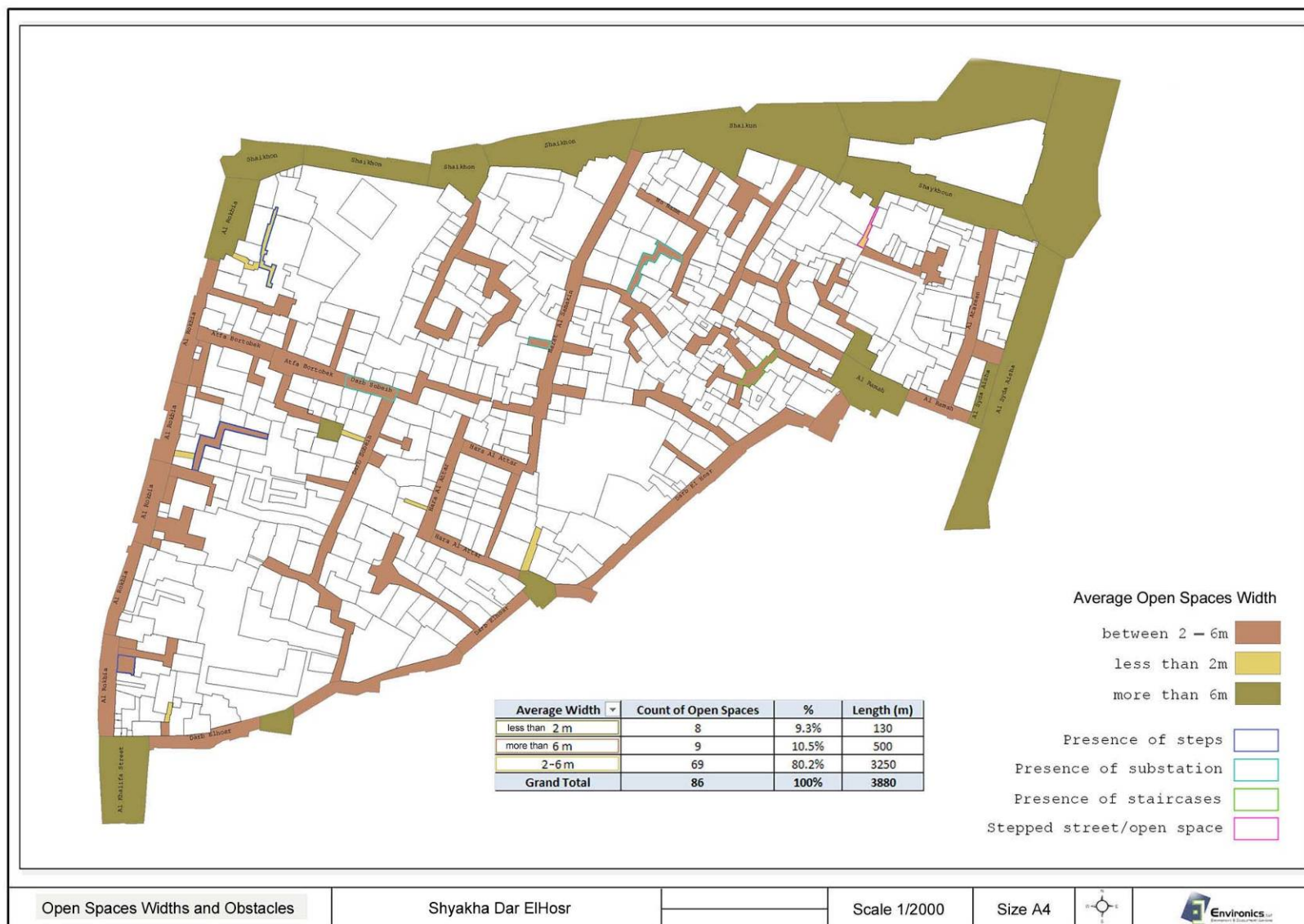


Figure 8-4: Street widths and potential obstacles to circulation in Darb Al Hosr

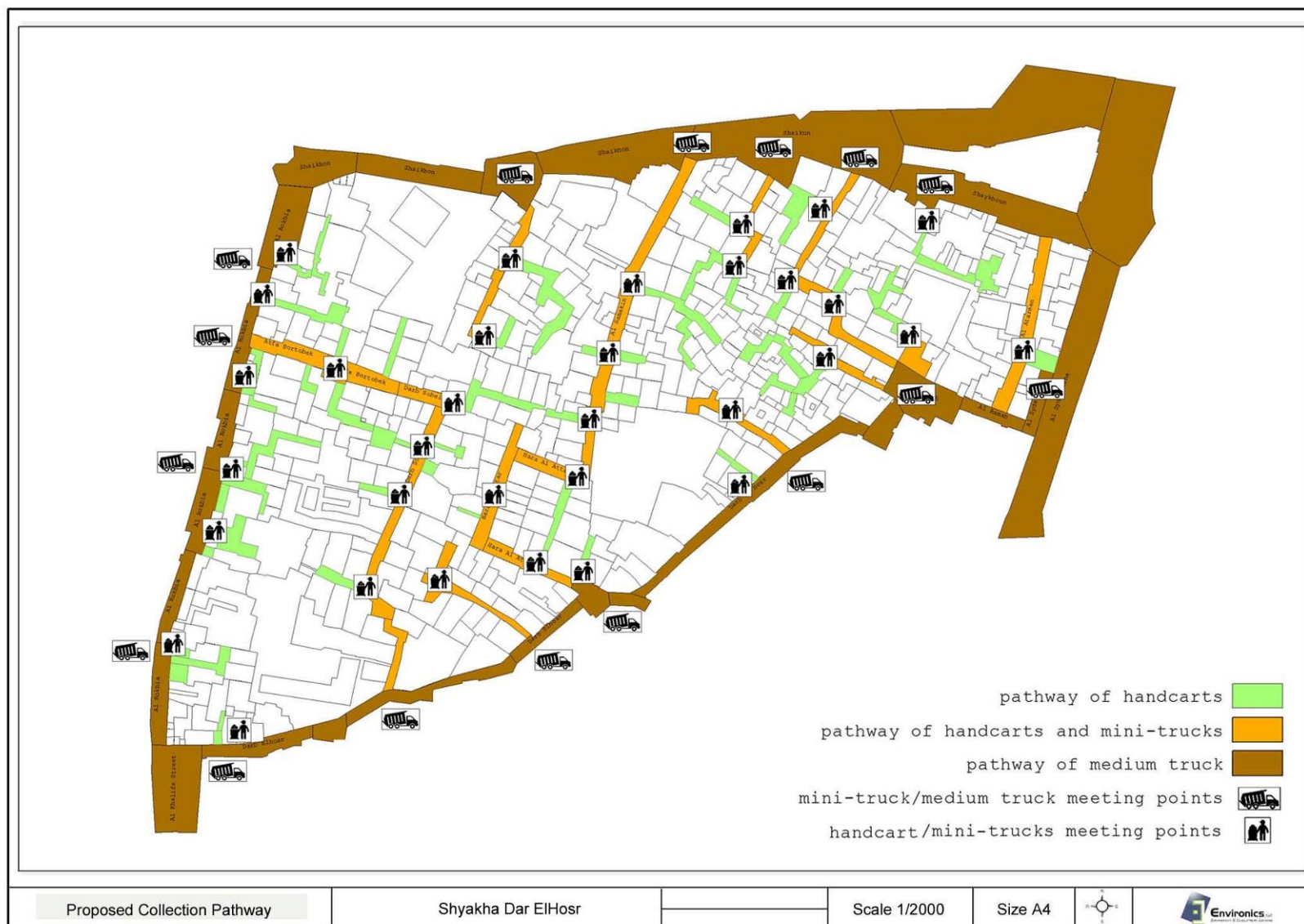


Figure 8-5: Proposed collection system for Darb Al Hosr

Haret El Samakin splits the Shyakha of Darb Al Hosr physically into two zones. Therefore, to facilitate the collection process, the Shyakha could be divided into two sectors, as shown in Figure 8-6. The boundaries of Sector 1 are Shaikhoun Street in the north, Rokbia Street in the west, part of Darb Al Hosr Street in the south and Haret El Samakin in the east. The boundaries of Sector 2 are Shaikhoun Street in the north, Haret El Samakin in the west, Haret Al Attar in the south and Darb Al Hosr, Al Ramah and Al Sayeda Aisha in the east.

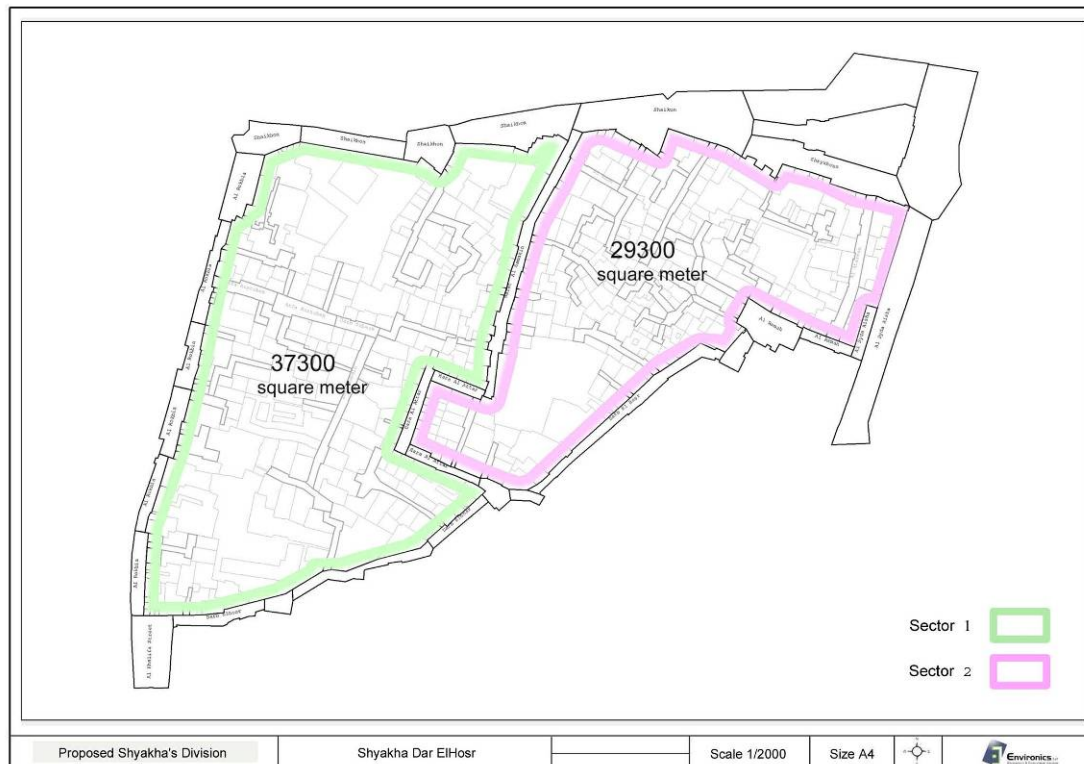


Figure 8-6: Proposed division into sectors

In this case, collection in Sector 1 would start at 8:30 am using handcarts and mini-trucks for collection in narrow and middle streets, while the medium truck would pass starting from 9:00 am in larger streets. After completing waste collection from Sector 1, all workers and mini-trucks would move at 11:00 a.m. to Sector 2 to start and repeat the collection process. Alternatively, workers and equipment could be distributed in the two sectors and start the service simultaneously, taking into account that Sector 1 (37,300 m²) is larger than Sector 2 (29,300 m²).

8.6.3 Required Workforce and Equipment

a. Required workforce

According to CCBA standards, a garbage collector is required for every 300 households. According to Zaghow (2011), there were 1,397 families in Darb

Al Hosr in 2011 and these can be estimated at 1,479 in 2014¹⁵. Therefore, 6 workers (5 workers and one substitute) are required for garbage collection from households.

Workers requirements for street sweeping are calculated on the basis of one worker for every 1.2 km. The total length of streets in Darb Al Hosr amounts at about 4 km (Figure 8-4). Therefore, 5 street sweepers (4 workers and one substitute) are proposed. In addition, 4 workers are required to collect waste from commercial and industrial facilities. Moreover, 3 drivers and one supervisor are also needed.

The following table summarizes the workforce requirements to operate the system.

Table 8-2: Workforce requirements

Required workforce	Number	Task/Responsibility
Household garbage collectors	6	Collection of waste from households
Commercial / Industrial waste collectors	4	Collection of waste from commercial and industrial facilities
Street sweepers	5	Collection of waste from streets and collection of remaining waste from in front of commercial and industrial facilities
Drivers	3	Mini-trucks and medium truck operation
Supervisors	1	Supervision of activities and reporting

b. Required equipment

For the proposed waste collection system in Darb Al Hosr, 2 mini-trucks and one medium truck (Figure 8-7) would be required.



Figure 8-7: Proposed medium truck

¹⁵ Zaghow (2011) mentions the presence of 5,094 inhabitants and 1,397 families; i.e. 4.2 persons per family. The same calculation is used to estimate the number of families in 2014 (6,210 inhabitants ÷ 4.2 ≈ 1,479 families).

Moreover, a total of 15 handcarts (one for each worker) are requested. These include 10 handcarts with a huge weaved plastic bag for garbage collection from households and business activities (Figure 8-8) and 5 handcarts with plastic bins for street sweeping (Figure 8.2). Each street sweeper would also need a sweeper (to be replaced three times a year) and a shovel.

All workers (including drivers and the supervisor) would be provided with protection equipment (gloves and caps) and two uniforms.



Figure 8-8: Handcart with weaved plastic bag

The following table summarizes the equipment requirements to operate the system.

Table 8-2: Equipment requirements

Required equipment	Number	Function
Medium trucks	1	Collection of waste from mini-trucks. Operates in larger streets
Mini-trucks	2	Collection of waste from handcarts. Operate in medium streets
Handcarts with weaved plastic bag	10	Collection of waste from households and commercial / industrial facilities. Operate in narrow and medium streets
Handcarts with plastic bins	5	Collection of waste from streets. Operate in all streets.
Sweepers	15	3 sweepers per year for each street sweeping worker
Shovels	5	One for each street sweeping worker
Uniforms	36	2 uniforms per year for all workers
Safety equipment (gloves and caps)	36	For all workers

8.6.4 Financial Requirements

To operate the system, an initial investment is required in order to purchase trucks and handcarts, in addition to the need of an annual budget for running costs, including salaries, trucks' maintenance and purchase of workers' tools and equipment.

a. *Investment costs*

An initial investment would be necessary to provide the trucks and handcarts, as shown in the following table.

Table 8-3: Investment costs

Item	Number	Unit price (EGP)	Total price (EGP)
Medium trucks	1	210,000	210,000
Mini-trucks	2	85,000	170,000
Handcarts	15	500	7,500
Total			387,500

b. *Annual operation costs*

• **Salaries**

The following table presents the proposed salaries for workers, based on the minimal salary limit in Egypt (1,200 EGP). It does not include annual increase in salaries and incentives.

Table 8-4: Proposed salaries

Position	Number	Monthly salary (EGP)	Annual salaries (EGP)
Supervisor	1	1,600	19,200
Drivers	3	1,500	54,500
Household waste collectors	6	1,200	86,400
Commercial / Industrial waste collectors	4	1,200	57,600
Street sweepers	5	1,200	72,000
Total			289,700

• **Tools and equipment**

Tools and equipment need to be replaced every year or even more (such as sweepers that need to be replaced three times a year). The running cost per year to provide tools and safety equipment to workers is shown in the following table.

Table 8-5: Annual cost of tools and equipment

Item	Number	Unit price (EGP)	Total price (EGP)
Uniforms	36	80	2,880
Sweepers	15	40	600
Shovels	5	60	300
Safety equipment (gloves and caps)	36	15	540
Total			4,320

- **Licensing, maintenance and depreciation of vehicles**
The license fees for a medium truck is about 1,800 EGP, while the fees for the two mini-trucks licenses are about 3,000 EGP (1,500 EGP each), for a total of 4,800 EGP.

The annual maintenance of trucks (including fuel and lubricants) and handcarts is estimated at 15% of the investment cost, i.e. 58,125 EGP. Vehicles depreciation over 7 years (the estimated lifespan of trucks) is also evaluated at 15% of the investment cost, i.e. 58,125 EGP.
- c. **Total annual cost for system operation**
To operate the system, a total annual cost of 415,070 EGP is required (289,700 + 4,320 + 4,800 + 58,125 + 58,125), in addition to an initial investment of 387,500 EGP; i.e. 802,570 EGP are required for start-up and system operation during the first year. This is a simplified figure as it does not take into account other aspects such as contingencies and awareness campaign costs to inform beneficiaries about the new system and its requirements.

8.6.5 Financial Resources Availability

- a. **Collection of Fees from Beneficiaries**
 - **Potentially collectable financial resources**
It is assumed that the estimated 1479 households would pay 3 EGP for garbage collection, for a total of 4,437 EGP per month. In addition, there are 175 business facilities (excluding animal sheds and waste dumpsters)¹⁶ that can be charged from 10 to 30 EGP per month. If an average of 20 EGP is considered, a total of 3,500 EGP can be collected per month from these facilities. Accordingly, an estimated 7,937 EGP can be collected monthly for garbage collection in Darb Al Hosr (\approx 95,250 EGP annually). The electricity company deduces 10% of the collected fees; therefore a net sum of about 85,725 EGP can be collected annually to be invested in SWM.
 - **Collection method**
Although 43% of residents and 49% of business owners believe that the fees charged on the electricity bill should be abolished and that fees should be paid directly to the service provider, it is proposed for the moment to maintain the current system for collection of fees. The reason is that the actual system is deemed ineffective and most beneficiaries are unsatisfied. Therefore, it is expected that garbage collection fees would not be paid if separated from the electricity bill. After the improvement of the system's efficiency, leading to a good level of satisfaction among beneficiaries, a separate bill for garbage collection could be implemented. This would avoid the 10% deduction carried out by the electricity company.
- b. **Financial sustainability of the system**
As mentioned above, to implement the proposed waste collection system in Darb Al Hosr, 802,570 EGP are required for start-up and system operation during the first year. Currently, collection of fees from beneficiaries would

¹⁶ URHC Project Database (2014)

only provide around 10% of this sum. Therefore, this amount needs to be initially provided by concerned entities, including CCBA, EEAA, local NGOs and Supreme Council for Antiquities.

Subsequently, to face the annual cost of the system, there will be a need to an additional 329,345 EGP per year, as collection of fees would only provide 85,725 EGP of the required 415,070 EGP. Therefore, fees should be gradually increased to progressively cover the operation costs. Meanwhile, funding entities would be required to persist in covering the deficit until the system reaches self-sufficiency¹⁷. It is also proposed to evaluate and implement innovative methods for revenue increase, such as direct sale of recyclable materials to concerned facilities.

The success of the system during the first year of operation and related level of satisfaction of beneficiaries is of extreme importance. In fact, it would have a direct influence on the acceptance of the potential increase in waste collection fees from the beneficiaries' side. It would also determine the prospective of implementing specific bills for waste collection.

When calculating the required waste collection fees, some important aspects should be considered such as inflation, increase in maintenance costs and spare parts price, as well as annual raise of salaries. Accordingly, a detailed budget for system operation should be annually prepared.

¹⁷ A raise of waste collection fees to 20 EGP/month for households and 50 EGP/month for business facilities would provide about 460,000 EGP per year, which could potentially cover the annual operation costs.

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Form No. ()

HOUSEHOLDS' QUESTIONNAIRE TO INVESTIGATE THE CURRENT AND PROPOSED STATUS OF SOLID WASTE MANAGEMENT

Any further information should be written in question no. 23.

Name of Researcher: _____ Day: ____ Date _____ Name of Reviewer _____

Name of Respondent: _____

- 1- Address: ☐ Street ☐ Lane ☐ Alley ☐ Drive ☐ Other
Name and Number of (Street/Lane/Alley/.....): _____ .
- 2- (Status of Street/ Lane /Alley/.....) for eg. is there a garbage dump/if it is residential or commercial street/ if there is a market , is the road/street/alley/drive paved or is it a dust road, etc? _____.
- 3- Sex: ☐ Male ☐ Female
- 4- Number of family members: ☐ Members
- 5- Number of floors including ground floor: ☐ Floors
- 6- Number of apartments ☐ Apartments
- 7- How do you get rid of the garbage?

More than one reply can be checked except when giving garbage to the garbage collector.

- 7-A: Disposed of in street ☐
- 7-B: Disposed of in adjacent street ☐
- 7-C: Dispose of in deserted land ☐
- 7-D: Give it to the garbage collector ☐
- 7-E: Dispose of in a garbage container ☐
- 7-F: Disposed of in undeveloped land ☐
- 7-G: Other ☐ Specify _____

7-D: In case of giving it to the garbage collector

(7-D-1) How many times a week does the garbage collector collect the garbage?

- D-1-a: Once/Weekly ☐
- D-1-b: Twice/Weekly ☐

- D-1-c: Three times/Weekly ☐
- D-1-d: Everyday ☐
- D-1-e: Irregularly ☐
- D-1-f: Other ☐ Specify _____

(7-D-2) Do you think this is enough?

- D-2-a: Yes ☐
- D-2-b: No ☐

(If the answer is yes, skip to 7-D-4)

(7-D-3) In your opinion how many times would be sufficient,?

- D-3-a: Once/Weekly ☐
- D-3-b: Twice/Weekly ☐
- D-3-c: Three times/Weekly ☐
- D-3-d: Everyday ☐
- D-3-e: Other ☐ Specify _____
- _____

(7-D-4) Well, what time does the garbage collector collect the garbage?

- D-4-a: Before 10 AM ☐
- D-4-b: From 10 AM to 12 PM ☐
- D-4-c: From 12 PM to 3 PM ☐
- D-4-d: After 3 PM ☐
- D-4-e: Sporadic ☐

(7-D-5) What is the appropriate time for you?

- D-5-a: Before 10 AM ☐
- D-5-b: From 10 AM to 12 PM ☐
- D-5-c: From 12 PM to 3 PM ☐
- D-5-d: After 3 PM ☐
- D-5-e: Other ☐ Specify _____

(7-D-6) What do you do when the garbage collector does not show up?

- D-6-a: Dispose of in street ☐
- D-6-b: Disposed of in adjacent street ☐
- D-6-c: Dispose of in undeveloped land ☐
- D-6-d: Dispose of in abandoned land ☐
- D-6-e: Place in a garbage container ☐
- D-6-f: Other, ☐ Specify _____

(7-D-7) How much do you pay for him excluding what you pay in the electricity bill?

- D-7-a: 1-3 EGP ☐
- D-7-b: More than 3-5 EGP ☐
- D-7-c: More than 5-7 EGP ☐
- D-7-d: More than 7-10 EGP ☐
- D-7-e: Other, ☐ Specify _____

(7-D-8) What do you think of this amount?

- D-8-a: Too Much
- D-8-b: High
- D-8-c: Reasonable
- D-8-d: Little
- D-8-e: Very Little
- D-8-f: Does not apply in case of not payment to the garbage collector

(7-D-9) Do you know where the garbage collector takes the garbage?

- D-9-a: Disposes of it in street ☐
- D-6-b: Disposed of in adjacent street ☐

(D-10) In your opinion, what are the disadvantages of the current collecting system?

- D-10-a: Garbage is not collected from upper floors. ☐
- D-10-b: Garbage is sorted in the area itself and the rest remains. ☐
- D-10-c: Garbage surrounding garbage bags is not collected. ☐
- D-10-d: Garbage is only collected from those who pay. ☐
- D-10-e: Dustmen do not show up. ☐
- D-10-f: There are not any disadvantages. ☐
- D-10-g: Other, ☐ Specify _____

(7-Except D) In case there is no garbage collector/worker to perform this service

(7 -1) How many times a week do you get rid of the garbage?

- 7-1-a: Once/Weekly ☐
- 7-1-b: Twice/Weekly ☐
- 7-1-c: Three times/Weekly ☐
- 7-1-d: Everyday ☐
- 7-1-e: Other ☐ Specify _____

(7 -2) What time do you get rid of the garbage?

- 7-2-a: Before 10 AM ☐
- 7-2-b: From 10 AM to 12 PM ☐
- 7-2-c: From 12 PM to 3 PM ☐
- 7-2-d: After 3 PM ☐
- 7-2-e: Irregularly ☐

(7 -3) Do you see getting rid of garbage a problem?

- 7-3-a: embarrassing for those who get rid of garbage (women and older children). ☐
- 7-3-b: Elderly persons do not leave their houses regularly so garbage is stored in the house. ☐
- 7-3-c: Fear for the children who leave to get rid of the garbage. ☐
- 7-3-d: Quarrels with neighbors because of disposing garbage on the streets. ☐
- 7-3-e: Inability to dispose of garbage Regularly causes foul odors and diseases. ☐
- 7-3-f: No problem ☐
- 7-3-g: Other ☐ Specify _____

8- Do you raise poultry in your home?

- A. Yes ☐
- B. No ☐

9- How you get rid of the garbage?

- A. In Plastic Bags ☐
- B. In Sack/Discharged bag ☐
- C. Plastic container/Tin container/plastic bin ☐
- D. Other ☐ Specify_____

10- What components of the garbage do you give the garbage collector/ what components of the garbage do you throw away?

Mention all choices to respondents

Type

- Plastic ☐
- Plastic bags ☐
- Cardboard ☐
- Paper ☐
- Diapers ☐
- Domesticated birds' waste ☐
- Glass ☐
- Tin ☐
- Scrap (clothes and cloth) ☐
- Organic materials (scraps of food / vegetables and fruit peel) ☐
- Dust / residues of sweeping ☐
- Demolition waste ☐
- Potato Chips bags ☐
- Others ☐ Specify_____

11- Is there anything else that could be sold or be useful instead of getting rid of it?

- A-Paper ☐ B- Metal/Tin ☐ C- Plastic ☐
- D- Bread ☐ E- Scraps of foods ☐ F- Clothes ☐
- G- Other ☐ Specify_____

12- Does garbage represent a problem for your area or street?

- A- Foul odor ☐
- B- prevalence of flies and mosquitoes ☐
- C- Blocks streets and flow of traffic ☐

- D- Upon burning, it affects our chests ☐
- Quarrels between neighbors ☐
- Other ☐, specify_____

13- In your opinion, what is the proposed successful system for collecting garbage, which is appropriate for your area?

A. Concerning collection times

- A-1 -From 5-7 ☐ A-2 - After 7-8 ☐ A-3 - After 8-9 ☐
A-4- After 9-10 ☐ A-5- After 10-12 ☐ A- 6- After 12-3 ☐
A-7- After 3-4 ☐ A-8- Other ☐, specify_____

B. Concerning collection days

- b-1 Once a week ☐ b-2 Twice a week ☐
b-3 Three times a week (every other day) ☐
b-4 Everyday ☐ b-5 Other, ☐specify_____

C. Concerning collection locations

- C-1 at the doorstep ☐
C-2 At the entrance of the building ☐
C-3 At the beginning of the adjacent road ☐
C-4 Disposed of through the window ☐
C-5 Other, ☐ Specify_____

D. Concerning what is being paid for this service.

- D-1: 2 EGP ☐ D-2: 3 EGP ☐ D-3: 5 EGP ☐
D-4: 5 EGP ☐ D-5: 7 EGP ☐ D-6 10 EGP ☐
D-7: Other, ☐ Specify_____

E: Other requirements, specify

14- You have talked about waste collection system from your point of you. So what is needed to make this system continue and succeed?

- a- Commitment of garbage collector to his specified days, regular attendance and regular timing. ☐
- b- Commitment of regular timing. ☐
- c- That there is supervision on the garbage collector. ☐
- d- A place or middleman where we can complain and suggest solutions. ☐
- e- That there are hotlines in which we can call to complain. ☐
- f- Reducing fees to facilitate the service for residents. ☐
- g- Provide garbage collector with a decent salary. ☐
- h- Ensure that all residents' sign up/subscribe with a garbage collector ☐
- i- Ensure enough dustmen to cover the area. ☐
- j- Other, ☐ Specify. _____

15- What is supposed to be done with people that refuse to subscribe with the garbage collector? In other words "how we can convince them to subscribe?"

- a- Impose a fine on those who throw garbage in the street and issue a record. ☐
- b- Raise the awareness of residents to the importance of the garbage collector and his absence. ☐
- c- The existence of a good system that is appropriate for residents which will impose itself. ☐
- d- Benefitting from the nature of the local area to exchange what is beneficial, economic and easy for residents. ☐
- e- Removal of fees from the electricity bill. ☐
- f- Signing up/subscribe to be made obligatory. ☐
- g- Appropriate fee amount. ☐
- h- Receipt for fees stamped from District office to be given to residents. ☐
- i- Issuing Professional IDs for dustmen from the district office as a means of identification for security purposes. ☐
- j- Other, ☐ specify. _____

16- What role can be played by people in order for the project to succeed and continue?

- a. Commitment to subscribe ☐
- b. Regularity of payment ☐
- c. Prohibit disposal of garbage in the street or unauthorized locations ☐
- d. Other, ☐ Specify _____

17- Do you have any suggestion to clean the area?

- a- Sweep and clean the area on a regular basis. ☐
- b- Pave the roads and alleys. ☐
- c- Remove garbage from abandoned areas. ☐
- d- Install fences around abandoned areas and plant trees instead. ☐
- e- Oblige all residents to follow the garbage collection system. ☐
- f- Empty garbage bins regularly. ☐
- g- Eradication of cats and dogs. ☐
- h- Raise the awareness of residents so as not to dispose of garbage in drains and sanitation. ☐
- i. Other ☐ Specify _____

18- Do you know whether your region is located in/near archaeological area?

- a. Yes ☐
- b. No ☐ (If the answer is no, skip to 21)

19- If yes, does garbage impact these monuments?

- a. Yes ☐ Specify how _____
- b. No ☐

20- What are the locations that have historical value, and you see that they have to be maintained?

21- If we want to raise the awareness of people about the importance of cleaning and the negative impacts of garbage on the region and monuments, who are the concerned authorities that could help us and how?

- a- Officials concerned with cleaning and officials at the government and District should raise awareness. ☐
- b- The area's youth population should be involved in awareness raising and participate in cleaning. ☐
- c- Coffee shop owners do have a say in the area. ☐
- d- Making use of the nature of local areas in the interference of neighbors. ☐
- e- Rising concerns about the negative impact of lack of cleaning ☐
- f- Making use of religious leaders ☐
- g- Media. ☐
- h- Other, ☐ Specify. _____

22- What recommendations/advice can be provided to the garbage collector in order to increase his awareness?

- a- Taking good care that garbage is collected well and does not spill from the bags and collect that is around the garbage bins as well. ☐
- b- Going to collect from upper floors. ☐
- c- Not sort garbage in the area and not discard of what is not wanted in the street. ☐
- d- Respect in carrying out duty ☐
- e- Not to leave some apartments just because garbage there cannot be made use of. ☐
- f- Commitment to time and avoid being absent ☐
- g- Integrity of garbage collector. ☐
- h- Other, ☐ specify. _____

23- Do you have any further comments?



ENTERPRISES' QUESTIONNAIRE
TO INVESTIGATE THE CURRENT AND PROPOSED STATUS OF SOLID
WASTE MANAGEMENT

Any further information beyond these questions should be written in question 35.

Name of Researcher: _____ Day: ____ Date ____ Name of Reviewer ____

Name of Respondent: _____

1- Address: ☐ Street ☐ Lane ☐ Alley ☐ Drive ☐ Other
Name and Number of (Street/Lane/Alley/.....): _____ .

2- (Status of Street/ Lane /Alley/.....) for e.g. is there a garbage dump/if it is residential or commercial street/ if there is a market, the width of the street, is the road/street/alley/drive paved or is it a dust road, etc? _____.

3- Sex: ☐ Male ☐ Female

4- Type of enterprise: ☐ Commercial ☐ Services ☐ Manufacturing

5- Description of nature of enterprise: _____

6- Location of enterprise: ☐ Residential area ☐ Commercial area ☐ Market
(specify)

7- How do you get rid of waste?

More than one reply can be checked except when giving garbage to the garbage collector.

- 7-A: Give it to the garbage collector/District worker ☐
- 7-B: Disposed of in a garbage container ☐ Go to question 18
- 7-C: Dispose of in vacant land ☐ Go to question 18
- 7-D: Disposed of in deserted/demolished location ☐ Go to question 18
- 7-E: Disposed of in same street ☐ Go to question 18
- 7-F: Other ☐ Specify _____ Go to question 18

In case garbage is given to garbage collector (from questions 8 to 17)

8- How many times a week does the garbage collector collect the garbage?

- a: Everyday ☐
- b: Three times/Week ☐
- c: Twice/Week ☐
- d: Once/Week ☐
- e: Irregularly ☐
- f: Other ☐ Specify _____

9- Do you think this is enough?

- a: Yes ☐
- b: No ☐

(If the answer is yes, skip to question 11)

10- In your opinion how many times would be sufficient,?

- a: Everyday ☐
- b: Three times/Week ☐
- c: Twice/Week ☐
- d: Once/Week ☐
- e: Other ☐ Specify _____

11- Well, what time does the garbage collector collect the garbage?

- a: Before 10 AM ☐
- b: From 10 AM to 12 PM ☐
- c: From 12 PM to 3 PM ☐
- d: After 3 PM ☐
- e: Sporadic ☐

12- What would be the appropriate time for you?

- a: Before 10 AM ☐
- b: From 10 AM to 12 PM ☐
- c: From 12 PM to 3 PM ☐
- d: After 3 PM ☐
- e: Other ☐ Specify _____

13- What do you do when the garbage collector does not show up?

- a: Dispose of in garbage container ☐
- b: Dispose of in adjacent street ☐
- c: Dispose of in vacant land ☐
- d: Dispose of in deserted/demolished location ☐
- e: Dispose of in same street ☐
- f: Other ☐ Specify _____

14- How much do you pay for him excluding what you pay in the electricity bill?

- a: EGP 5 or less ☐
- b: More than EGP 5 to EGP 10 EGP ☐
- c: More than EGP 10 to EGP 15 ☐
- d: More than EGP 15 to EGP 20 ☐
- e: More than EGP 20 ☐
- f: Other, ☐ Specify _____

15- What do you think of this amount?

- a: Reasonable ☐
- b: High ☐
- c: Too High ☐
- d: Little ☐
- e: Very Little ☐
- f: Does not apply in case of not payment to the garbage collector ☐

16- Do you know where the garbage collector/cleanliness worker takes the garbage?

- a: Don't know ☐
- b: Disposes of it in garbage container ☐
- c: Disposes of it in deserted/demolished location ☐
- d: Disposes of it in vacant land ☐
- e: Dispose of in same street ☐
- f: Disposes of it in dumpsite or waste plant ☐
- g: Other ☐ Specify _____

17- In your opinion, what are the disadvantages of the current collecting system?

a: Irregular in collecting garbage (does not show up) ☐

b: Garbage is sorted in the area itself and the rest remains. ☐

c: Garbage surrounding garbage bags is not collected ☐

d: Garbage is only collected from those who pay. ☐

e: Dustmen do not show up. ☐

f: There are not any disadvantages. ☐

g: Other, ☐ Specify _____

In case there is no garbage collector/worker to perform this service (from questions 18 to 20)

18- How many times a week do you get rid of the garbage?

a: Everyday ☐

b: Three times/Week ☐

c: Twice/Week ☐

d: Once/Week ☐

e: Other ☐ Specify _____

19- What time do you get rid of the garbage?

a: Before 10 AM ☐

b: From 10 AM to 12 PM ☐

c: From 12 PM to 3 PM ☐

d: After 3 PM ☐

e: No fixed time ☐

20- What problems do you see happening due to the disposal of waste?

a: No problems happen. ☐

b: Remains in front of shop for long periods of time. ☐

c: Foul odor and insects. ☐

d: Quarrels with neighbors because of throwing waste on streets. ☐

e: Other. ☐ Specify _____

21- How you get rid of the garbage?

A. In Plastic Bags ☐

B. In Sack/cardboard ☐

C. Plastic container/Tin container/plastic bin ☐

D. Other ☐ Specify _____

21- According to the nature of your enterprise what are the waste components you give to the garbage collector/ or what are the components that you get rid of? (List options for the respondent).

Component:

- | | |
|--------------------------------------|--|
| A: Plastic..... | <input type="checkbox"/> |
| B: Plastic bags..... | <input type="checkbox"/> |
| C: Cardboard..... | <input type="checkbox"/> |
| D: Paper..... | <input type="checkbox"/> |
| E: Wood/wood dust..... | <input type="checkbox"/> |
| F: Tin/metals..... | <input type="checkbox"/> |
| G: Glass..... | <input type="checkbox"/> |
| H: Cloth/materials..... | <input type="checkbox"/> |
| I: Organic waste (food remains)..... | <input type="checkbox"/> |
| J: Dust (waste from sweeping)..... | <input type="checkbox"/> |
| K: Other..... | <input type="checkbox"/> Specify _____ |

22- In case other than what was previously said, rather than dispose of waste could you sell it or make use of it? Identify which component.

- | | |
|---|--|
| A: paper/cardboard <input type="checkbox"/> | b: metals/tin <input type="checkbox"/> |
| c: plastic <input type="checkbox"/> | d: glass <input type="checkbox"/> |
| e: wood/wood dust <input type="checkbox"/> | f: food remains <input type="checkbox"/> |
| g: Other <input type="checkbox"/> | Specify _____ |

23- Does garbage represent a problem for your area or street?

- | | |
|--|--|
| - A- Foul odor | <input type="checkbox"/> |
| - B- prevalence of insects and stray animals | <input type="checkbox"/> |
| - C- Blocks streets and flow of traffic | <input type="checkbox"/> |
| - D- Upon burning, it affects our chests | <input type="checkbox"/> |
| - Quarrels between neighbors | <input type="checkbox"/> |
| - Other | <input type="checkbox"/> Specify _____ |

24- In your opinion, what is the proposed successful system for collecting garbage, which is appropriate for your shop?

A. Concerning collection times

- | | |
|--|---|
| A-1 -From 9 am-12 noon <input type="checkbox"/> | A-2 – From 12 noon to 3 pm <input type="checkbox"/> |
| A-3 – From 3 pm to 6 pm <input type="checkbox"/> | A-4- After 6 pm <input type="checkbox"/> |
| A-5- Other <input type="checkbox"/> | Specify _____ |

B. Concerning collection days

b-1 Everyday

☐

b-2 Three times a week(every other day)

☐

b-3 Twice a week

☐

b-4 Once a week

☐

b-5 other,

☐

Specify_____

C. Concerning collection locations

C-1 At the doorstep

☐

C-2 From inside the shop.

☐

C-3 From the street.

☐

C-4 Other.

☐

Specify_____

D. Concerning what is being paid for this service.

D-1: EGP 5 or less

☐

D-2: More than EGP 5 to EGP 10

☐

D-3: More than EGP 10 to EGP 15

☐

D-4: More than EGP 15 to EGP 20

☐

D-5: More than EGP 20

☐

D-6 Other

☐

Specify_____

E: Other requirements, specify _____

25- You have talked about waste collection system from your point of you. So what would be needed to make this system **continue and succeed?**

a- Commitment of garbage collector to his specified days, regular attendance and regular timing.

☐

b- Commitment of regular timing

☐

c- That there is supervision on the garbage collector/worker

☐

d- That there are ways in which we can make complaints (hotlines).

☐

e- Reducing fees to facilitate the service for residents.

☐

f- Provide garbage collector with a decent salary.

☐

g- Ensure that all residents' and shops sign up/subscribe with a garbage collector

☐

h- Other ☐ specify._____

26- What should be done with shops/enterprises that refuse to subscribe with the garbage collector? In other words "how we can convince them to subscribe?"

- a- Impose a fine on those who throw garbage in the street and issue a record. ☐
- b- Raise the awareness of residents to the importance of the garbage collector and his absence ☐
- c- Removal of fees from the electricity bill ☐
- d- Signing up/subscribing to be made obligatory ☐
- e- Other, ☐ Specify. _____

27- What role can be played by people in order for the project to succeed and continue?

- a. Commitment to subscribe ☐
- b. Regularity of payment ☐
- c. Prohibit disposal of garbage in streets or unauthorized locations ☐
- d. Other ☐ Specify _____

28- Do you have any suggestion to clean the area permanently?

- a- Sweep and clean the area on a regular basis. ☐
- b- Pave the roads and alleys. ☐
- c- Remove garbage from abandoned areas and demolished buildings. ☐
- d- Install fences around abandoned areas and plant trees instead. ☐
- e- Oblige all shop owners to follow the garbage collection system. ☐
- f- Empty garbage bins regularly. ☐
- g- Eradication of stray cats and dogs and insects. ☐
- h- Raise the awareness of residents so as not to dispose of garbage in unspecified locations. ☐
- i- Other ☐ Specify _____

29- Do you know that your area is considered an archeological area (located in historic Cairo)?

- a. Yes ☐
- a. No ☐ (If the answer is no, skip to question 33).

30- If yes, does garbage impact these monuments?

- b. Yes ☐ Specify how _____
- c. No ☐

31- What are the locations that have historical value, and that you see should be preserved/well maintained?

32- If we want to raise the awareness of shop owners and residents about the importance of cleaning and the negative impacts of garbage on the region and monuments, who are the concerned authorities that could help us and how?

a- Officials concerned with cleaning and officials at the government and District should be involved in awareness raising. ☐

b- The area's youth population should be involved in awareness raising and participate in cleaning. ☐

c- Coffee shop owners do have a say in the area. ☐

d- Making use of the nature of local areas in the involvement of neighbors. ☐

e- Rising concerns about the negative impact of lack of cleaning. ☐

f- Making use of religious leaders . ☐

g- Media ☐

h- Other ☐ Specify _____

33- What recommendations/advice can be provided to the garbage collector in order to increase his awareness?

a- Commitment to time and avoid being absent ☐

b- Taking good care that garbage is collected well and does not spill from the bags and collect that is around the garbage bins as well. ☐

c- No sorting of garbage in the area or street ☐

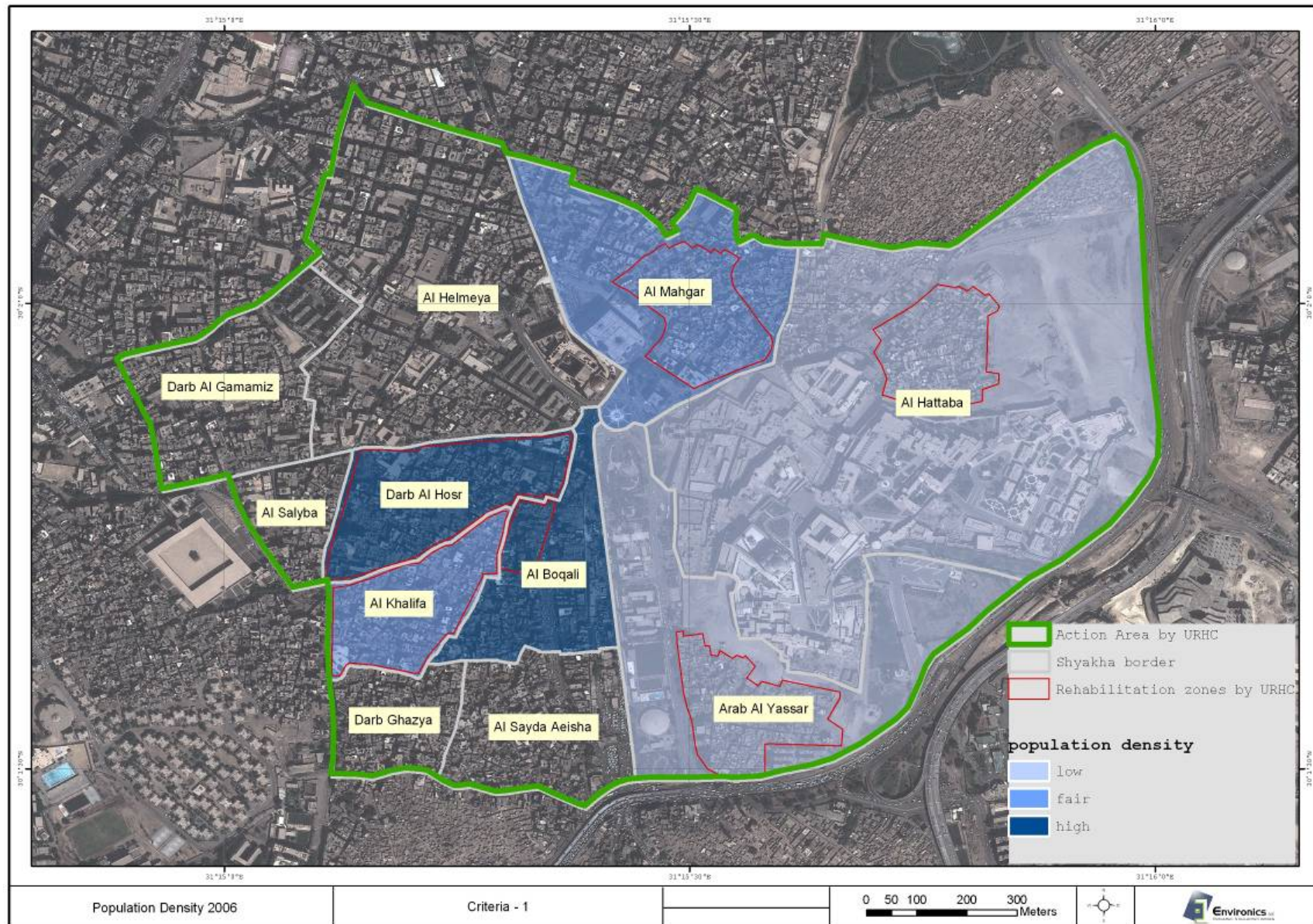
d- Not leaving any shops without the service because garbage there cannot be made use of ☐

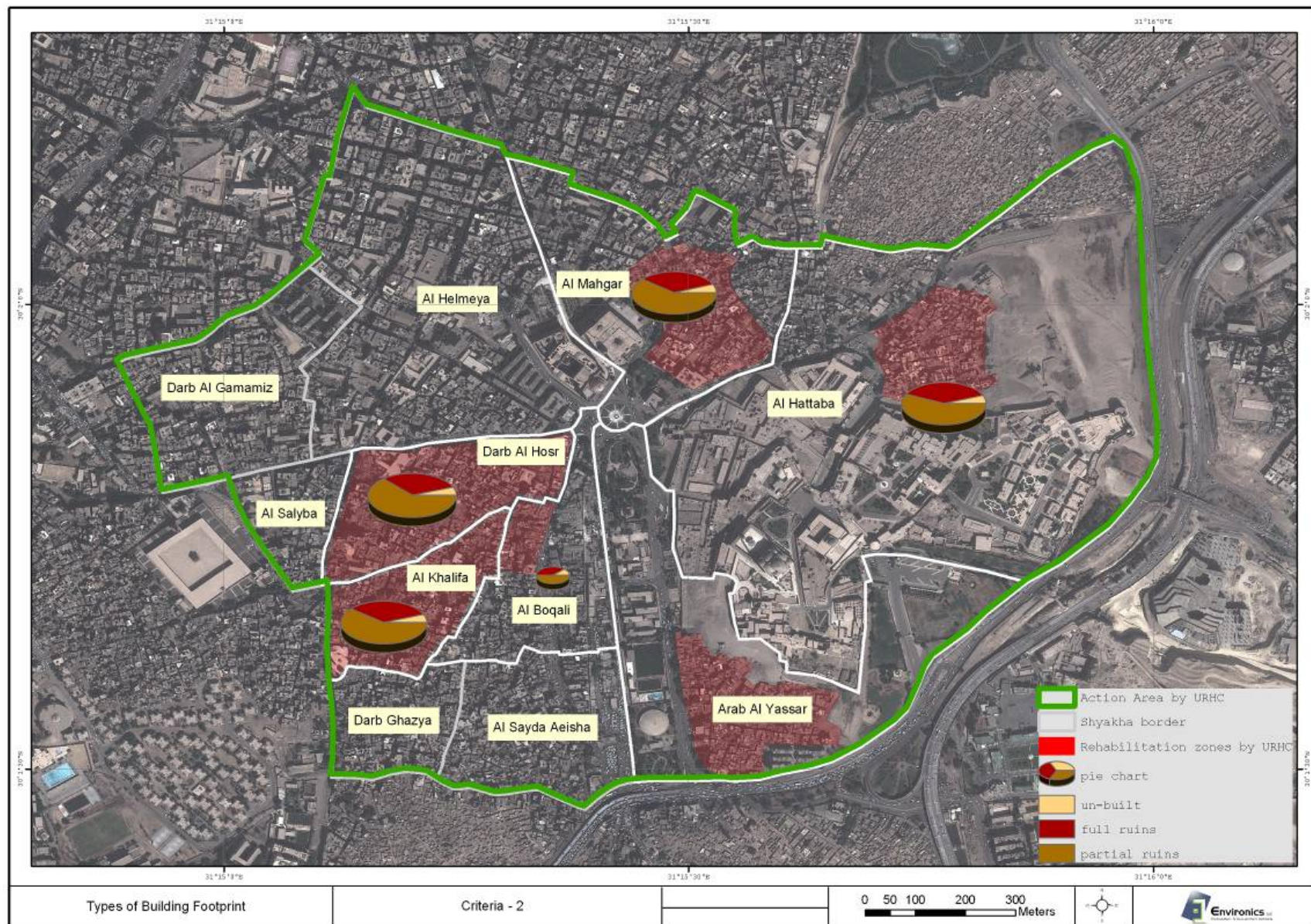
e- Other, ☐ Specify. _____

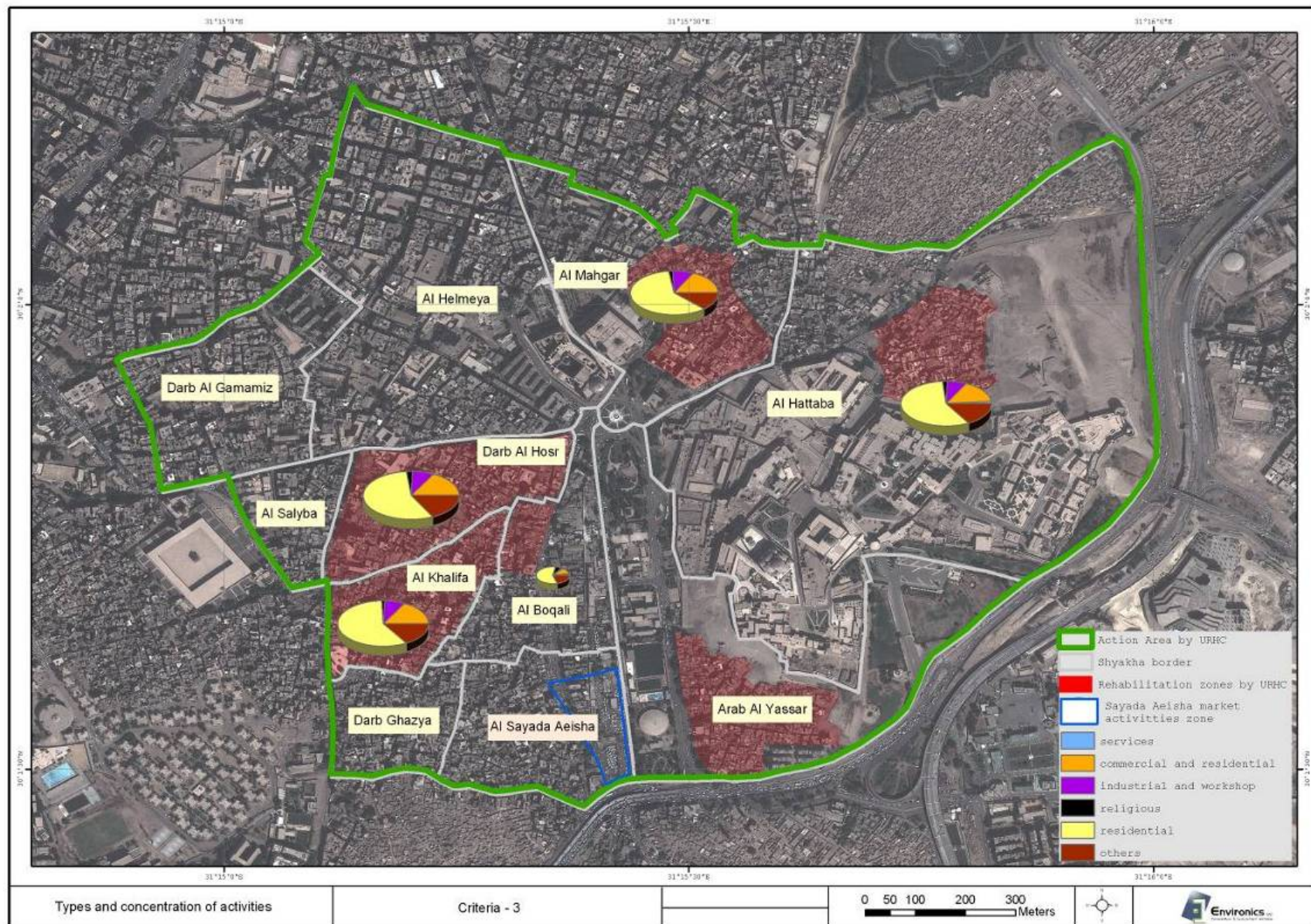
34- Do you have any further comments that you would like to add?

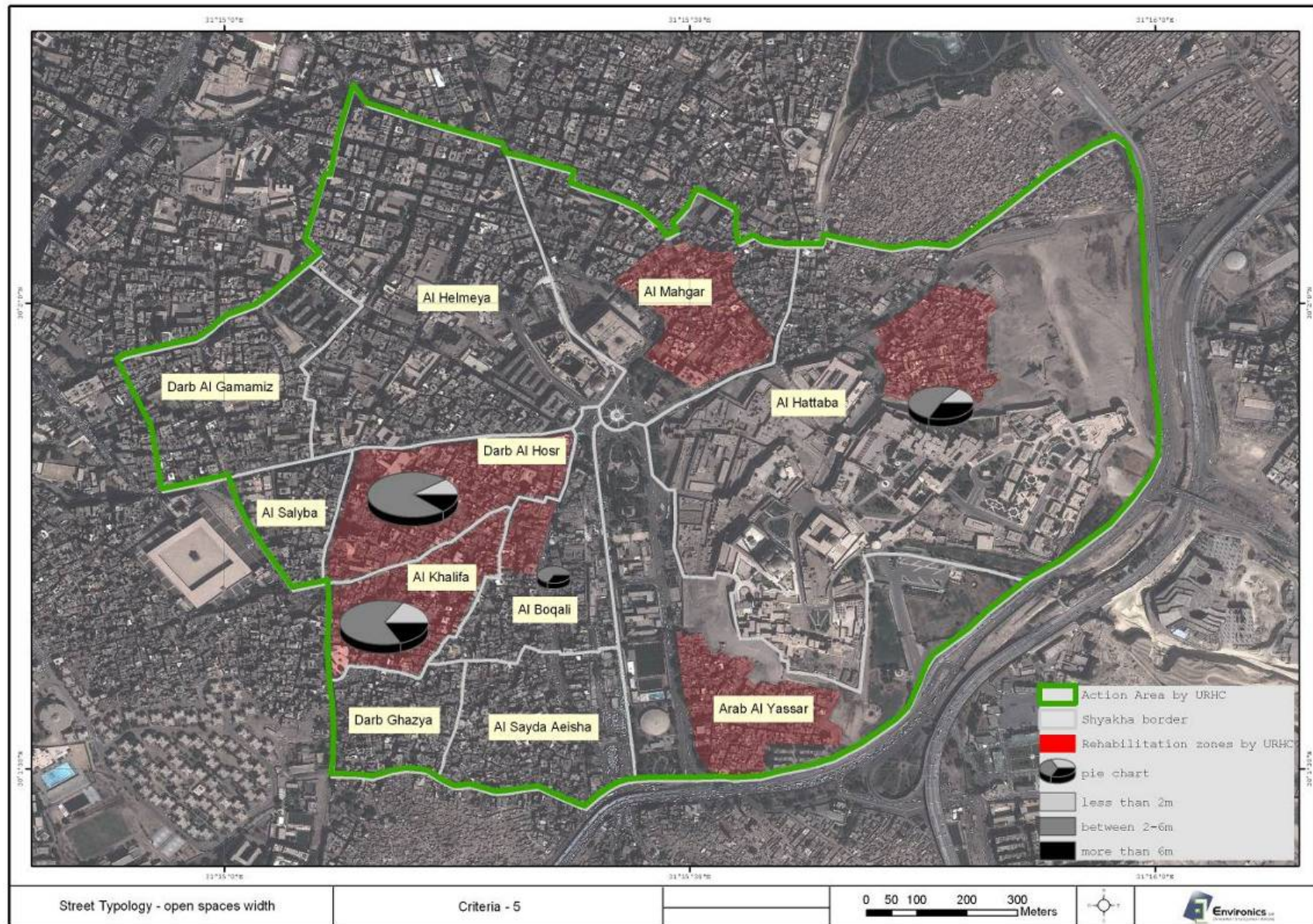
Annex B: Maps

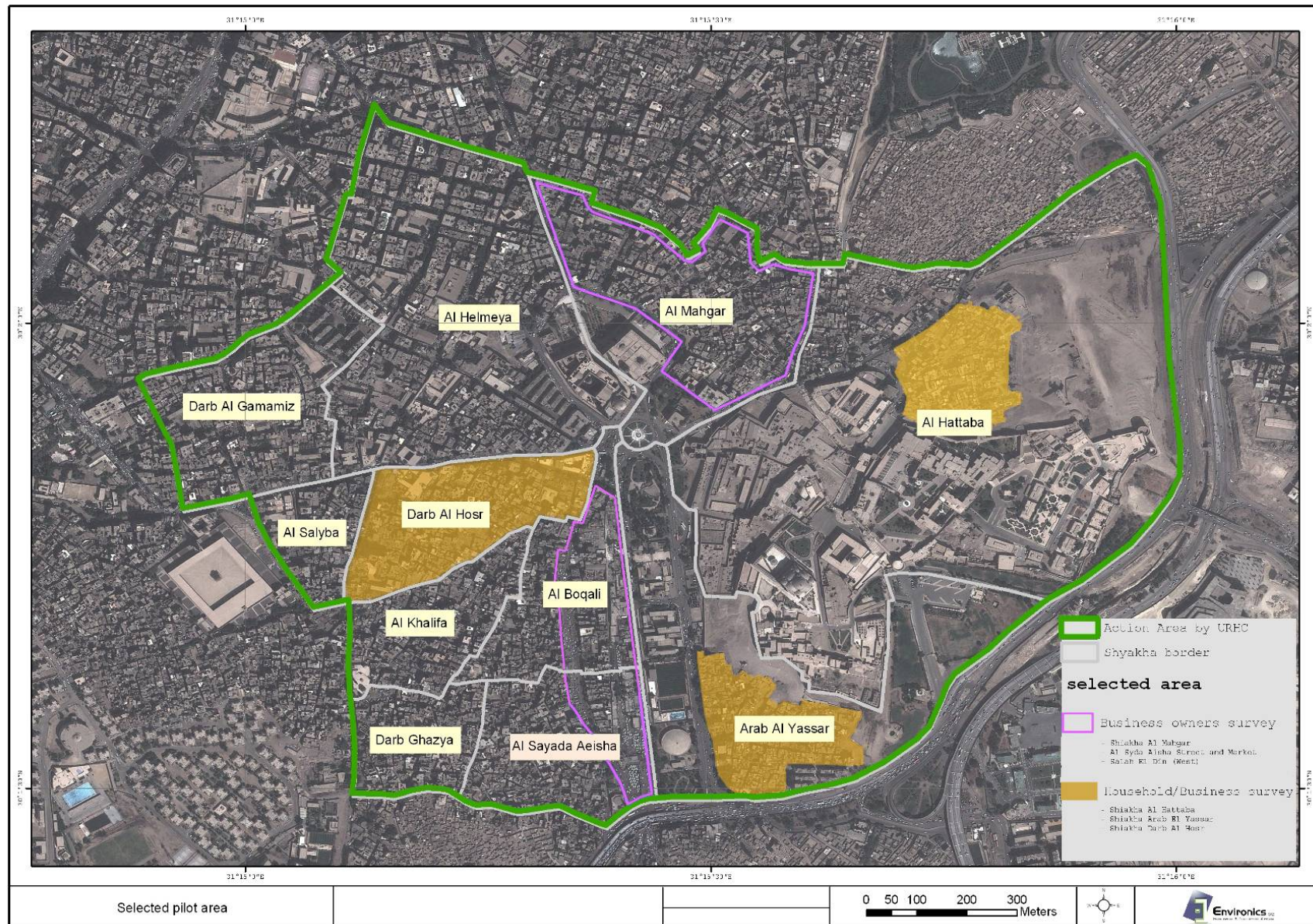
1. Pilot Area Maps



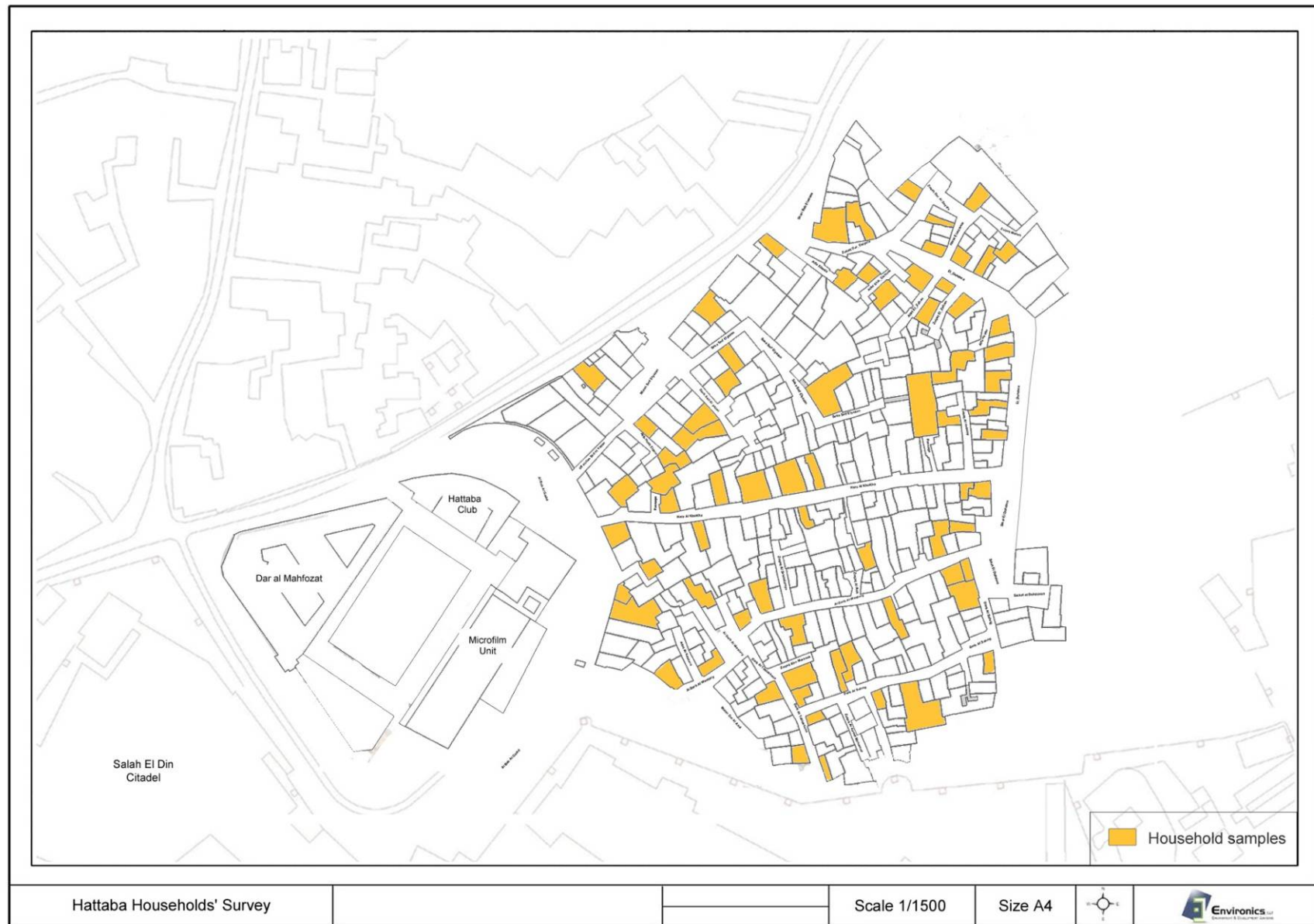


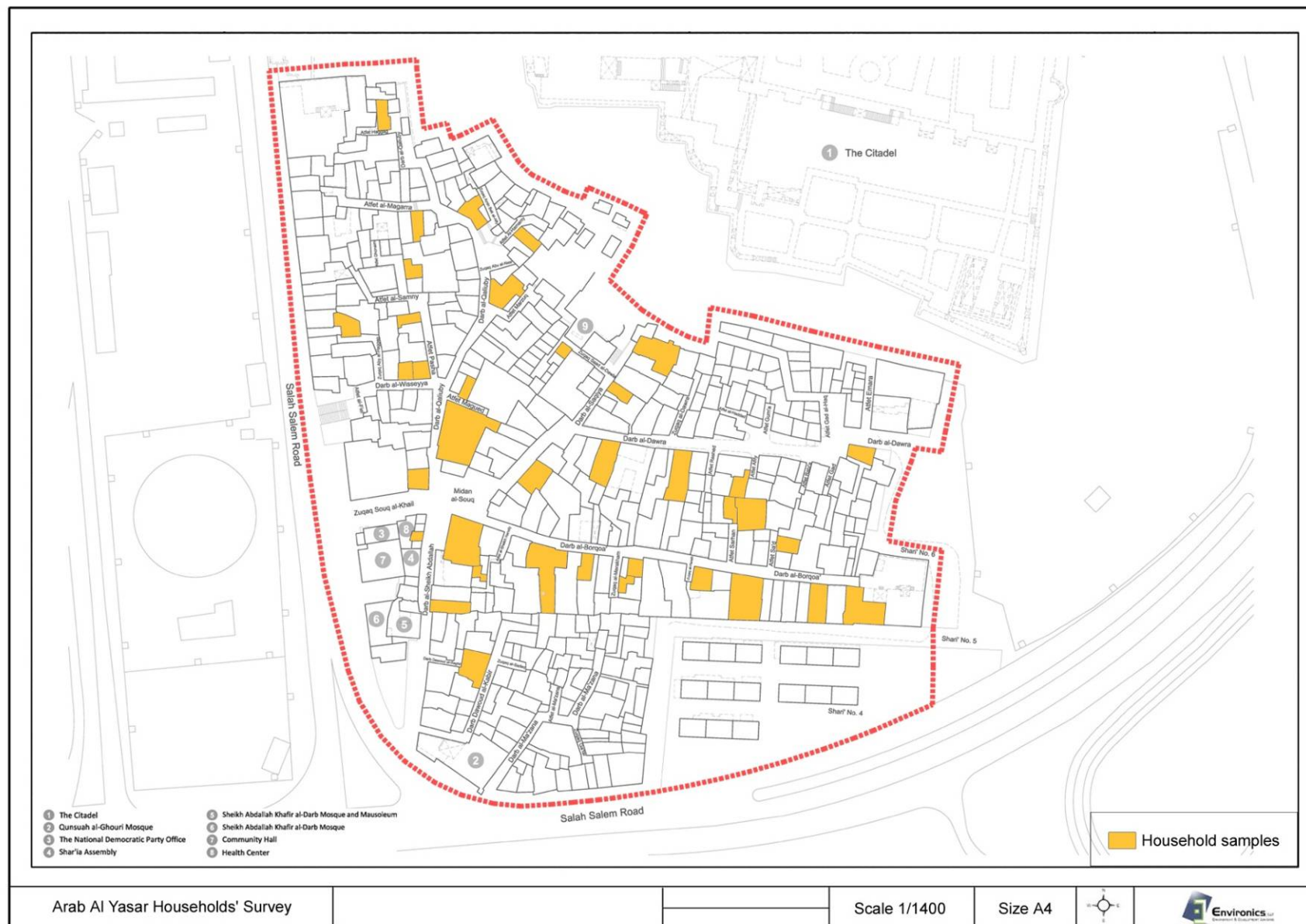






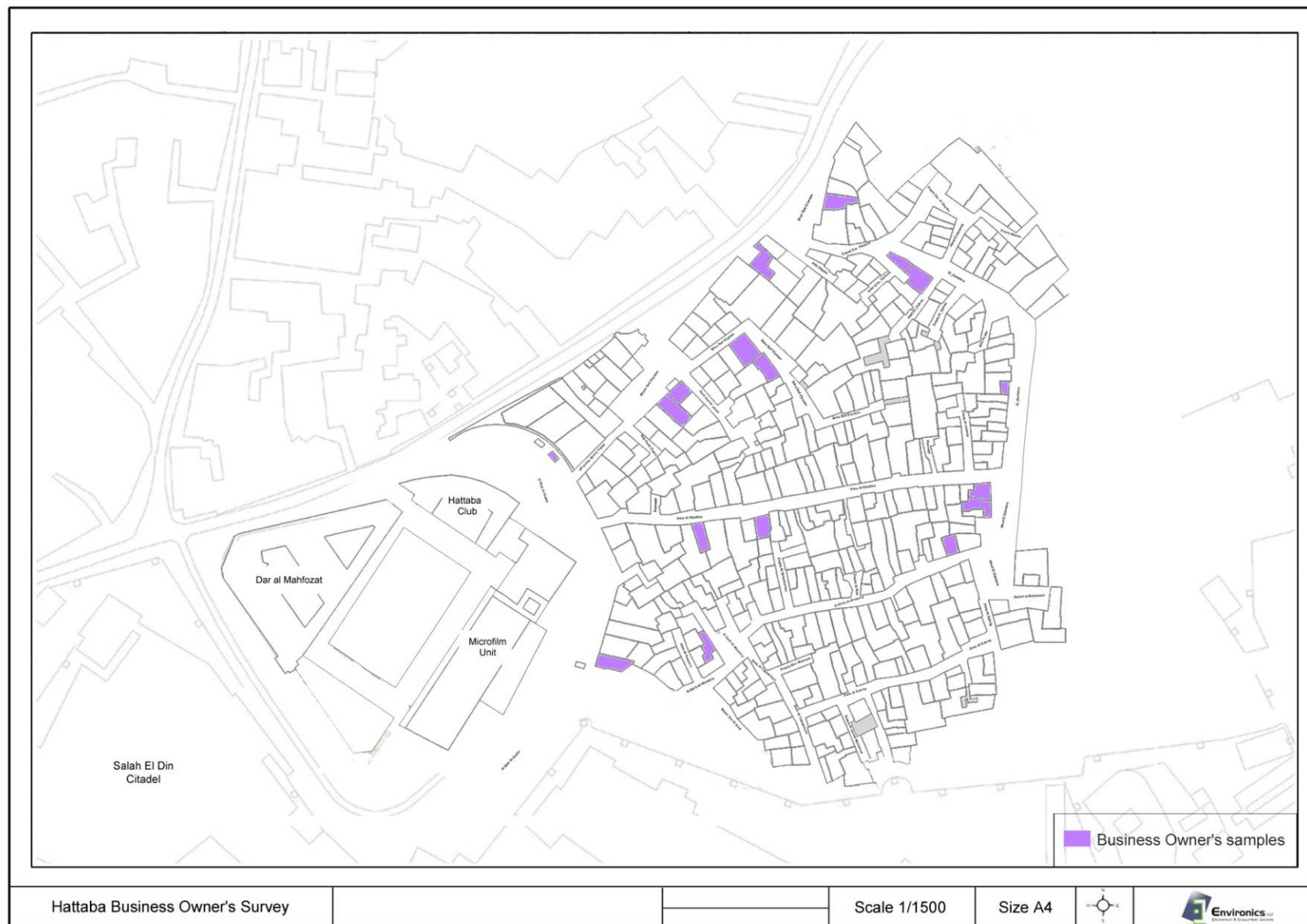
2. Households' Survey

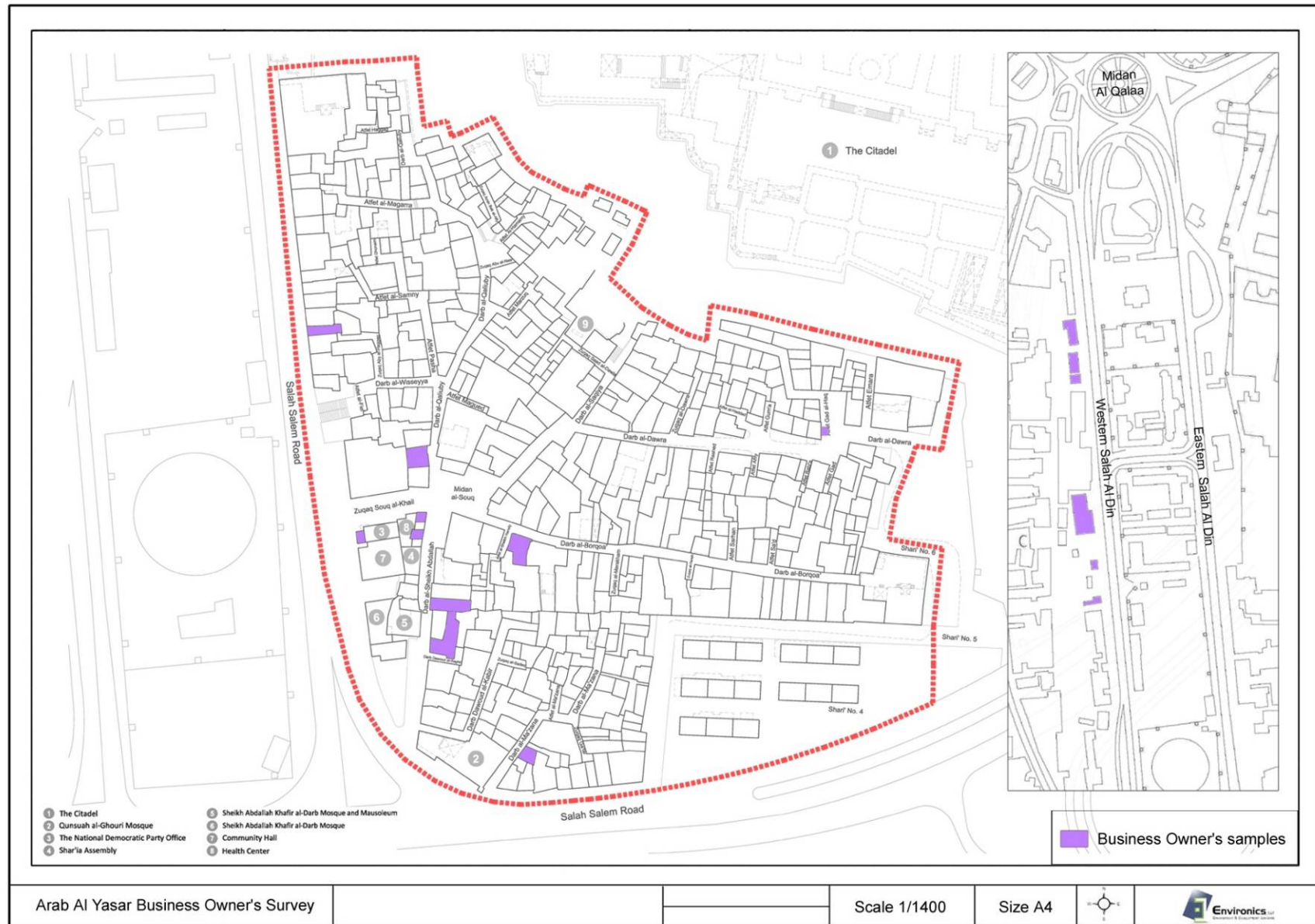


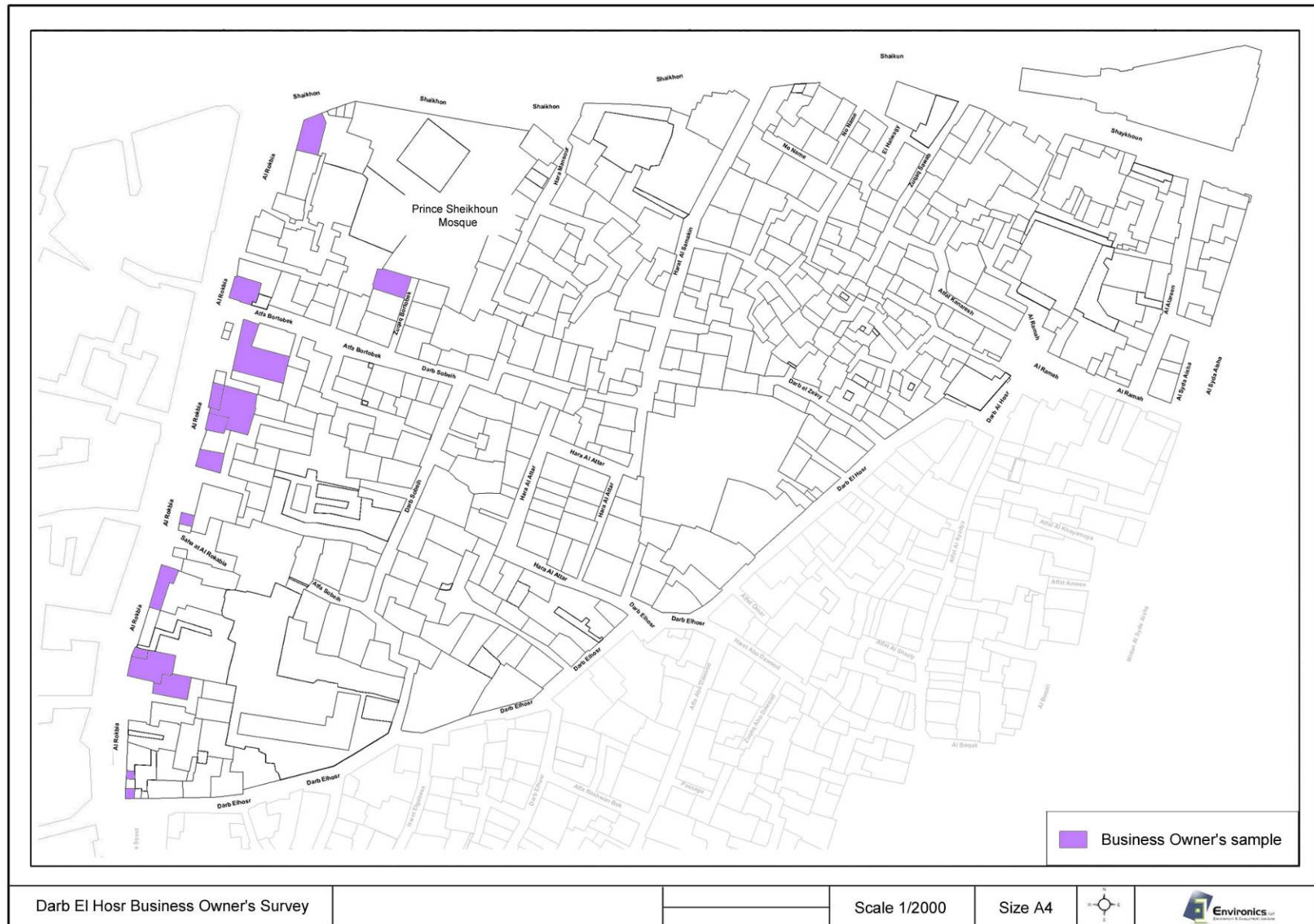


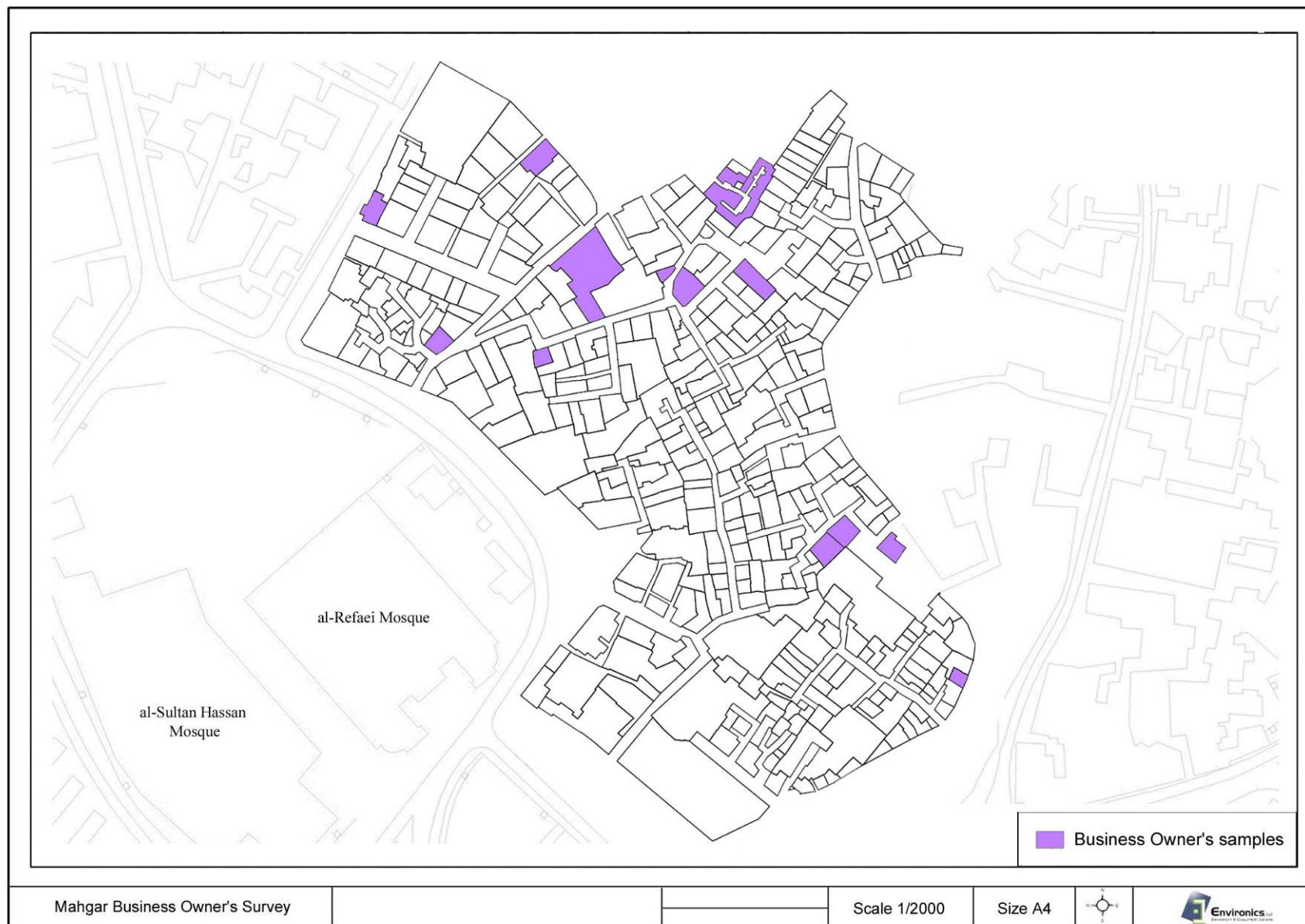


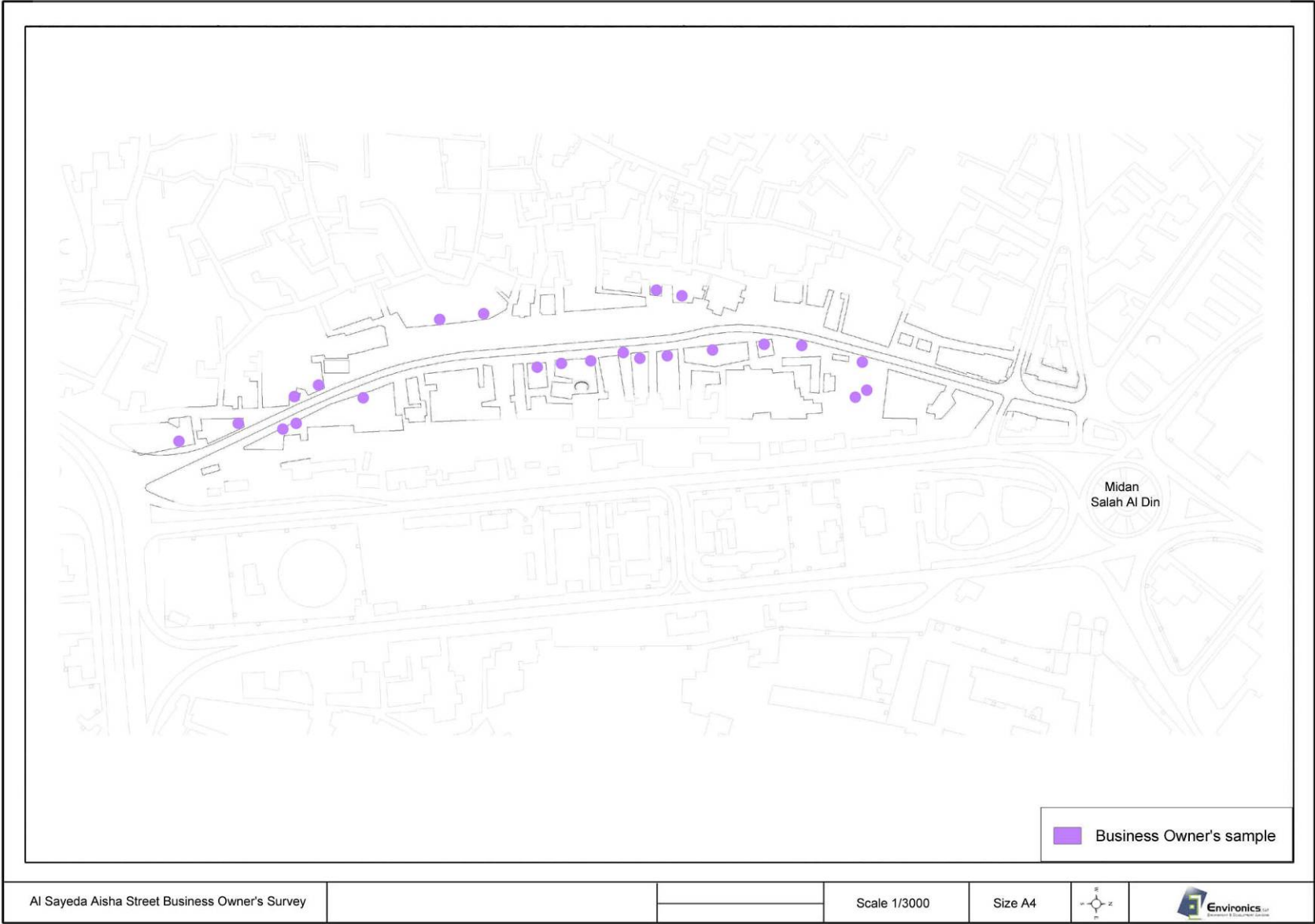
3. Business Owners' Survey



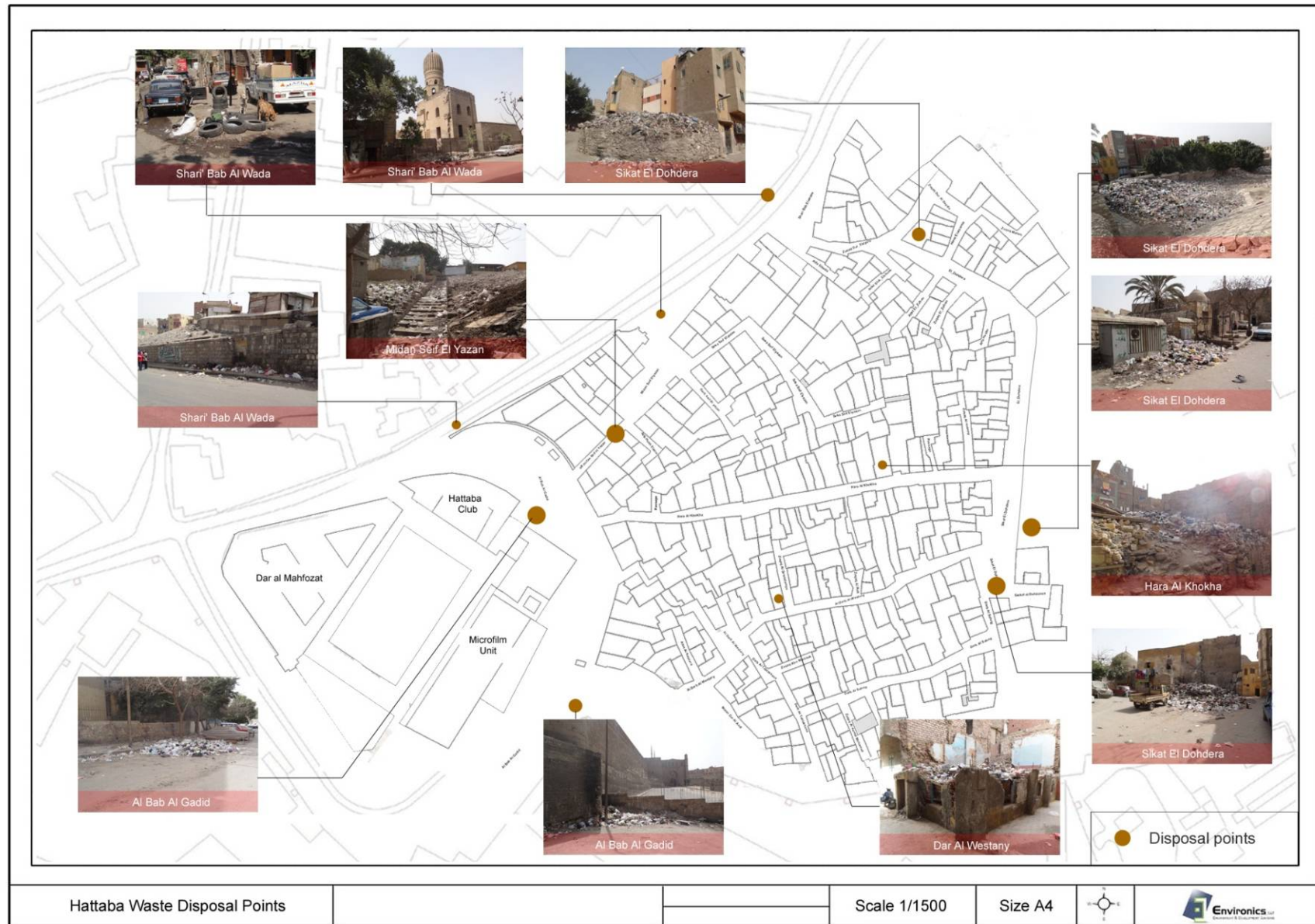








4. Waste Disposal Locations









5. Darb Al Hosr Model Maps

