**Methods**

**Grant number:** ES/T008121

**Sponsor:** UKRI

**Project title:** Water & Waste: Expanding safe water and waste management services access to off-grid urban populations in Africa

**Data set:** Increasing Recycling of Water Sachet Plastic Among Ghana’s Off-Grid Urban Populations: A Qualitative Study Among Informal Waste Collectors in Accra, Ghana

## ****Objectives****

This qualitative study of informal waste collectors aims to:

* Compare and contrast the business models, contributions and challenges facing plastic waste collectors versus general waste collectors at different stages of the business life cycle and across different business operations in the Greater Accra Region, Ghana
* Compare and contrast the business models, contributions and challenges facing general waste collectors in the Greater Accra Region, Ghana
* Assess the implications of scaling up informal waste collection to recycle or reuse plastic waste in cities with contrasting policy regimes.

## ****Study site****

Fieldwork took place in Greater Accra in Ghana. Ghana has an extensive sachet (bagged) water industry (Stoler et al., 2012) and raises excise duty on semi-finished and raw plastics but has not banned single-use plastics (Adam et al., 2020). Urban Greater Accra region's population was 5.0 million in 2021 (Ghana Statistical Service, 2021), with 51% of its households having solid waste collected in 2010(Ghana Statistical Service, 2013). Slum mapping identified 78 slum communities within the city in 2000, though their distribution has subsequently changed (Engstrom et al., 2015). The city of Accra, within the Greater Accra region, generates an estimated 0.74kg/person/day of solid domestic waste or 1552 tonnes/day in total (Miezah et al., 2015).

## Study design

Overall, the study followed a convergent parallel mixed method (Creswell & Clark, 2017) comprising a cross-sectional questionnaire survey of waste collectors and focus group discussions. The qualitative component of the study is presented in this documentation. The qualitative approach explored the business operations, contributions of informal waste collectors to waste recycling as well as barriers experienced by informal waste collectors in Ghana.

## Sample size and participant selection

## The sample size for the qualitative study was 60 participants. This comprised twenty-four (24) Main collectors, twenty-four (24) Sub-collectors and twelve (12) General waste collectors. Waste collectors who operate in the target area of the Water and Waste project (i.e., 30 Enumeration Areas) located in 14 districts of Urban Accra were considered as the target population for the study. Eligible EAs constituted those classified as urban by the Ghana Statistical Service.  Within Greater Accra, they also met one or more of the UN-Habitat criteria for a slum (UN-Habitat, 2016) or lacked waste management services, given the project's focus on waste.  Specifically, most households in eligible EAs lived in over-crowded or non-durable housing and lacked improved sanitation or water sources, secure tenure, or waste services. 9 out of the 14 districts encompassing 18 Enumeration areas were randomly selected.

## For general collectors, selected district names were passed to the nine metropolitan authorities within the Greater Accra region that contained those areas. The environmental health teams within each metropolitan authority then identified eligible general waste collectors as those working in selected districts based on their knowledge and records of registered waste collectors from which a random sample was obtained.

## For sampling plastic main collectors, the sampling frame relied on the registration records of an Accra-based trade association, the Plastic Waste Collectors’ Association (PWCA). The PWCA secretary asked for membership groups in the selected metropolitan assembles to identify members to participate in the study, who worked in the selected district and a random sample was obtained from the list provided by the PWCA. Referral sampling was used to identify sub-collectors: each selected main collector participant was asked to bring at least one sub-collector from whom they purchased plastic waste to a church building in central Accra for an interview. For all groups, only waste collectors aged 18 years or older were eligible for the study.

**Data collection**

Six (6) Focus Group Discussions (FGDs) [2 Main collectors FGDs, 2 Sub-collectors FGDs and 2 General collectors FGDs], were organized to contextualize and explore the contributions of informal waste collectors to waste management and waste recycling in Ghana as well as barriers to waste management business among informal waste collectors in Ghana using the FGD guide. The FGD guide consisted of questions on business establishment, business history, waste collection operations, and enablers and barriers to waste collection. Each FGD comprised 6-12 participants. The FGD guide was pre-tested prior to data collection among informal waste collectors at Zoom Park (a waste transfer site) in Alogboshie, a suburb of the Greater Accra region.

An ethical approval letter obtained from the Ethics Committee of Noguchi Memorial Institute for Medical Research, University of Ghana was submitted to stakeholders of the informal waste management association through in-person visits led by AQT and permission was granted for the study to be conducted. The leaders of the informal waste collectors’ association led the project team to initiate community entry and familiarize themselves with members of the association.

Eligible participants for the FGDs were recruited, and invited via phone to a church community centre close to the recycling plant where the PWCA operates. Trained qualitative research assistants (Table 1) conducted the FGDs. In addition to seeking informed consent, permission was sought from participants for the discussions to be audio-recorded. Field notes were also taken by RH, EB and GS, to document any observations that may not have been captured in the audio recording. FGDs were conducted in English, Ga, Twi and Ewe. The data collection exercise was conducted over 8 days from 26th September – 5th October 2022. Each FGD lasted for about 2hours.

**Field team recruitment, training, and organisation**

The School of Public Health (SPH) project team in Ghana comprised 6 enumerators, a Project Administrator, a Field manager and two Research Officers (RO). During the primary fieldwork, the Administrator and project research officers also served as enumerators. SPH made sure that those chosen for the study had previous expertise in collecting qualitative data (Table 1). Team members were randomly assigned to one of two groups, with pairs to conduct FGDs among the group of study respondents.

Once the enrollment and matching process was complete, an effective three-day training session was organized in-person, guaranteeing that all the COVID-19 protocols were observed. The training ensured that the SPH data collection team understood the study protocol, and the data collection instrument and was well-equipped to collect the data from the field.

***Table 1: C****haracteristics of field staff for Ghana*

|  |  |  |  |
| --- | --- | --- | --- |
| Groups | Role | Qualification | Experience in field data collection in related fields |
| Both | Field Manager/ Data Manager | B.A. Economics and Computer Science | 15 yrs |
| 1 | Research officer/Enumerator | Masters-Public Health | 3yrs |
| 1 | Enumerator | Masters - Communication studies | 2 yrs |
| 1 | Enumerator | Masters – Public Health | 3 yrs |
| 1 | Enumerator | Bsc. Info Tech Management | 4 yrs |
| 1 | Enumerator | B-Tech Accounting | 4 yrs |
| 2 | Enumerator | HND Accounting | 4 yrs |
| 2 | Enumerator | MPhil – Health management | 10 yrs |
| 2 | Administrator/ Coordinator/ Enumerator | EMBA | 6 yrs |
| 2 | Research officer/Enumerator | Masters-Public Health | 12 yrs |

**Qualitative Data Management, processing, quality control, and anonymization**

**Data management*:***All data is co-owned by the University of Ghana, School of Public Health (UG-SPH), and the grant holders of the Water and Waste project. All audio-recorded files were transcribed by trained Research Assistants who complied with all ethical considerations, by ensuring the confidentiality of all audio-recorded data. The data was managed, cleaned and stored by the water and waste team in box (an online data storage and management platform) with access to limited project staff who play key roles in the project. Data analysis for the main study outcomes was conducted by the Project Qualitative Analysts, Project PI, and Co-PIs.

The archived dataset was made available at the end of the study to be used for further analysis after anonymising any potential disclosive participants’ information.

**Quality control:**

* Training: Field research assistants were trained in accordance with the study protocol to effectively collect qualitative data to achieve the study objectives. Research assistants were also trained on how best to interpret the questions in the various local languages (Ewe, Twi and Ga) without losing the meaning/understanding of the questions. Research assistants were also trained to observe all ethical considerations during data collection.
* Pre-testing of FGD guide: The data collection tool (FGD guide) was also pre-tested as a quality control measure. The pre-test was carried out at Zoom Park (a waste transfer site) in Alogboshie, a suburb of the Greater Accra region. Pre-testing the guide was also helpful in refining different components of the study including, fieldwork measures and data collection tools. Questions that were challenging to understand were further refined and additional probe questions were added to enhance the quality of data to be collected.
* Supervision: The PI of the University of Ghana, School of Public Health (UG-SPH) team was present on the field and supervised the data collection activities. Ensuring the data collection was efficiently and ethically carried out.
* To ensure qualitative study trustworthiness (credibility, applicability, consistency and neutrality), a number of approaches were employed. This include a prolonged interaction between research assistants and study respondents to ensure that only appropriate questions were asked and the appropriate responses collected. Participants were also later contacted to ensure the responses given earlier were consistent. The transcripts were also proofread to ensure all audio recordings were transcribed verbatim as well as ensure data completeness. Moreover, data triangulation was employed by transcribing the interviews verbatim taking into consideration field notes taken during data collection.

**Anonymisation:**The archived qualitative dataset (transcripts) has been anonymised by replacing the identities of the respondents, organisations and locations with pseudonyms. As noted above, transcripts were also reviewed for any potentially disclosive remarks and such remarks were then redacted.

**Ethical considerations**

* ***Ethical approval***

The study was approved by the Faculty of Environmental and Life Sciences Ethical Review Committee, University of Southampton, UK (reference: 55755; approval date 19th August 2020) and by the Institutional Review Board of the Noguchi Memorial Institute for Medical Research, University of Ghana (Ref: 003/20-21; approval date: 2nd September 2020).

* ***Informed consent***

All study participants provided written informed consent before partaking in the study. Participants were informed about the aim and objectives of the study, the data collection procedures, plans for data sharing, and any possible potential risks and benefits of the study as well as their rights as participants were explained. The information and consent documents for participants were written in simple English; however, for better understanding, research assistants explained in the local languages (Ewe, Twi and Ga) as well as explained any questions that the participants did not understand. Those consenting to participate in the study signed (or placed a thumbprint on) an informed consent form, before participating in the data collection process.

* ***Confidentiality***

All participants were assured that the information they provided would be handled confidentially and that findings were reported with complete anonymity. However, participants were informed that because others would be listening to discussions and could repeat what was said, so full anonymity could not be guaranteed.

The dataset obtained was kept encrypted in the database (Box-storage) of the water and waste project, safe from any unauthorized access and any accidental loss or destruction. Also, data was analyzed and presented without compromising the anonymity and confidentiality of the study participants by using pseudonyms.

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List of Pseudonyms

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|  | **Identifier** | **Pseudonym Used** |
|  | Name of Respondent one | R1 |
|  | Name of Respondent two | R2 |
|  | Name of Respondent three | R3 |
|  | Name of Respondent four | R4 |
|  | Name of Respondent five | R5 |
|  | Name of Respondent six | R6 |
|  | Name of Respondent seven | R7 |
|  | Name of Respondent eight | R8 |
|  | Name of Respondent nine | R9 |
|  | Name of Respondent ten | R10 |
|  | Name of Respondent eleven | R11 |
|  | Name of Respondent twelve | R12 |
|  | Name of Company 1 | Company 1 |
|  | Name of Company 2 | Company 2 |
|  | Name of Company 3 | Company 3 |
|  | Name of Company 4 | Company 4 |
|  | Name of Company 5 | Company 5 |
|  | Name of Company 6 | Company 6 |
|  | Name of Company 7 | Company 7 |
|  | Name of Company 8 | Company 8 |
|  | Name of dumpsite one | Dumpsite 1 |
|  | Name of town 1 | Town 1 |
|  | Name of town 2 | Town 2 |
|  | Name of neigbourhood | Area 1 |
|  | Name of country 1 | Country 1 |
|  | Name of country 2 | Country 2 |
|  | Name of country 3 | Country 3 |
|  | Name of town 1 | Town 1 |
|  | Other person’s identity | Name A |
|  | Other person’s identity | Name B |
|  | Other person’s identity | Name C |
|  | Name of Tribe | Tribe 1 |