**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:** Experiences and challenges of plastic waste Collectors in Kenya; A Qualitative Study Among Informal Waste Collectors in Kisumu City, Kenya.

## Objectives:

The broad objectives of this qualitative study were 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 City of Kisumu in Kenya.
* Compare and contrast the business models, contributions and challenges facing general waste collectors in the City of Kisumu in Kenya.
* Assess the implications of scaling up informal waste collection to recycle or reuse plastic waste in cities with contrasting policy regimes in Kenya and Ghana (through combination with a related data set in Greater Accra).

## Study site:

The field work for this qualitative study was carried out in the City of Kisumu which is located on the shores of Lake Victoria in western Kenya. Kisumu is the 3rd largest City in Kenya and has a population size of over 500,000 people. More than 60% of this population live in informal settlements, typically densely populated and lacking adequate access to electricity, water and sanitation services (Sibanda et al. 2017). It is estimated that the city generates approximately 400 tonnes of solid waste per day. Out of the solid wastes generated, a paltry 20%-45% (estimates vary) of the waste generated is recycled, reused or transformed into a form which can yield an economic or ecological benefit. This is far from the 80% target set by the National Environment Management Authority (NEMA) as the norm to be achieved within the Country (NEMA, 2015; Oloko et al., 2019; The World Bank, 2021). The remaining 65%-80% accumulates, mainly, in city council skips, on vacant land and along passageways as evidenced by the numerous garbage heaps scattered around the City (Munala and Moirongo 2011). Much of it is either carelessly dumped in illegal open dumps or precariously scattered in the environment heightening the risks of environmental degradation in the city. Further estimates indicate that, of the total solid waste that is collected, 65% is organic and another 27% is recyclable. The collection and handling of solid waste therefore poses a significant challenge in the City (Awuor et al., 2028; Oloko et al., 2019). The city is grappling with increasing waste generation, overflowing dumpsites and pollution from uncontrolled discarding of waste in the environment (Sibanda, et al., 2017), most of which enters and leaves public spaces through an intricate web of connected, largely, informal actions (Gutberlet, 2017).

As in many other cities of sub-Saharan Africa, informal waste pickers are the backbone of the collection and recycling systems that addresses solid waste pollution, in particular, plastic pollution in Kisumu City. The waste picker enterprises collect, transport and process waste to earn their living but represent a widely excluded, marginalized and impoverished segment of society (Kain et al., 2022). They also face many challenges in their operations, often unrecognized, unprotected and discriminated against. In Kisumu city, they operate within the framework of a policy ban on the use of some single use plastics, particularly carrier bags (CAP 387 of the Environmental Management and Coordination Act, 2017), which contrasts with the Ghanaian (the second study site) situation where the water sachet industry is thriving with no policy ban. In order to address some of the challenges, the waste pickers in Kisumu are organized under the umbrella of a grassroots organization known as Kisumu Waste Actors Network (KIWAN). This network includes both formal and informal actors involved in the handling of waste within the City.

## Study design

Overall, the study followed a convergent parallel mixed method (Creswell & Clark, 2017) comprising a cross-sectional questionnaire survey of waste collectors (in Ghana only) and focus group discussions (FGDs). During the study, only the FGD aspects of the qualitative component of the study was carried out in Kenya, using the same protocol as in Ghana, to give a framework for contrasting the situation in two cities with contrasting policy environments. The documentation presented herein is for the Kenyan FGD component. The FGDs provide context within which these enterprises operate (Ritchie & Lewis, 2000) and explored the business operations, contributions of informal waste collectors to waste recycling as well as barriers experienced by informal waste collectors in in the City of Kisumu.

## Sample frame, size and participant selection

The sample frame encompassed all the waste handling enterprises/organizations operating within the city. Fortunately, most of them had already been registered as members of KIWAN. Because Kisumu lacked specialist plastic waste collection enterprises, focus group discussions were organised with general waste collection businesses at different points along the waste collection chain. A total sample of 27 waste handling enterprises (registered with KIWAN) and 5 (not fully registered with KIWAN), making a grand total of 32, were identified as operating within Kisumu City. These were further segregated into three broad groups based on the level at which they operate and the ccommonality of interests to achieve some level of group homogeneity (Basnet, 2018) as follows; a) Waste Pickers, b) Intermediate Traders and finally, c) Apex Traders. The Waste Pickers were defined as those informal enterprises that mostly pick wastes directly from the waste generation sites such as households, streets, or waste dumps at the grassroots for some economic gain. The intermediate Traders were defined as the relatively more formal enterprises collecting waste from the pickers, carrying out some level of processing and selling the processed waste to the apex traders. The Apex traders, which were only 3 in the entire city, were then defined as the more formal enterprises purchasing the wastes from the intermediate enterprises and then selling the waste to recycling industries, mostly located in Nairobi.

To select participants from this sample frame, a list of waste handling enterprises falling within each of these categories were generated per category and assigned numbers. The study team depended on the overall list secured from KIWAN which had all the necessary information for this exercise. Additional information, especially on those not registered, was secured from other field reconnaissance activities. The assigned numbers were randomized and used to randomly select the enterprises whose representatives participated in the focus group discussions for each category. A total of 27 participants organized into four focus groups and one small group discussion participated in the study. These comprised 13 Waste pickers, twelve 12 Intermediary Waste Collectors and two Apex Traders. In each category, a total of 2 FGDs were held, except in the apex group, where the numbers were below the minimum of five participants for a successful FGD. The number of participants in each FGD ranged from six to seven (Basnet, 2018; Morgan (2002).

The selected enterprises were contacted via an official letter of request from the project team through KIWAN (for those registered with the organization) and site visits (for those not registered with KIWAN). They were asked to nominate the head of the enterprise or where the head was not available, an employer who would fit the role of an operations manager, with extensive knowledge and experience on the history and operations of the enterprise. Follow-up efforts were carried out through telephone calls to assure their commitment to attend the meetings. During these telephone calls, discussions were held with the selected participants and their opinions were sought on the convenience of the time when, and locations where the FGDs were to be held and this information was used to firmly set the date and time for the meetings. Once the commitments were secured, a final reminder call was made a day to the meeting. For all groups, only respondents aged 18 years or older were eligible for recruitment and participation in the FGDs.

## Data collection

Four Focus Group Discussions [2 for Waste Pickers and 2 for the Intermediary Waste Collectors and one small group discussion were organized and carried out between the 3rd October and 14th October, 2023. These were held at strategically convenient locations in Kosawo hall in Manyatta, and KUAP vocational training centre in Nyalenda. The FGDs were structured to contextualize and explore the contributions of informal waste collectors to waste management and waste recycling in the City of Kisumu as well as barriers to waste management business among the waste collectors using a semi-structure FGD guide. The guide consisted of questions on business establishment, business history, waste collection operations, and enablers and barriers to waste collection. The FGD guide was pre-tested prior to data collection among the Waste Pickers who were not selected to participate in the final 4 FGDs. Both the nominal and Delphi techniques were applied to the FGD Guide to generate the desired information from participants during the FGD sessions (Basnet, 2018).

Each of the FGD sessions was opened by the lead facilitator who undertook a climate-setting exercise by making some opening remarks to make all of the participants feel welcomed and relaxed with a view to setting a friendly and informal environment conducive for a free and easily flowing discussion (Neville, 2007). Consent was sort from the participants for concurrent audio recordings to capture everything participants were saying and all the participants were pseudonyms (Table:2), for use during the session to conceal their identity in the audio-recording. Two ICD-UX570 Digital Voice Recorders were concurrently used to record the discussions during all the sessions. The ground rules were set together in a participatory manner and the agenda was read in the hearing of participants. They were then skillfully taken through the semi-structured guide questions, giving participants an opportunity to respond to each of the questions, occasionally asking for clarifications when needed and gently probing to get full answers. Participants who remained quiet were often asked if they had anything to add to what the others had said (Neville, 2007). English was the dominant language used during all the discussions although both Kiswahili and Luo languages were also used based on participants’ preference.

Throughout the session, 2-3 experienced note takers also took notes of the discussions to be later compared with the transcripts of the recordings during analysis. Length of the discussions sessions ranged were between fifty-eight minutes and one hour and forty-four minutes. At the end of each FGD, the facilitator gave a closing remark reassuring participants of the use to which the data will be put and the security of the information they have given during the session (Klagge, 2018; Krueger & Casey, 2000; Meyer, 2001). She explained that the notes taken and audiotapes will be kept completely confidential and that pseudonyms will be used in place of real names (Patton, 2002) and stressed that no other personally identifying information will be used or stored.

## Field team recruitment, training, and organization

A qualitative data analyst with experience in conducting qualitative research particularly FGDs had responsibility for the study and was hired as a Qualitative Research Officer, overseeing a team of four note-takers. The QRO and the Note Takers were taken through the FGD guide by the two Co-Principal investigators (Co-PI) based in Kenya, to familiarize the team with the guide, the purpose for the research and their respective roles during the FGD sessions. Each guide question was discussed at length to enable them to clearly understand and contextualize the expectations of the project team. Once this was achieved, the entire team, including the Co-PI, selected one FGD outside the groups that were selected for the study, to test the FGD guide and also test the probity and understanding of the tool by the team. This served as a form of experiential training in the field.

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

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| --- | --- | --- | --- |
| **NAME** | **QUALIFICATION** | **EXPERIENCE IN QUALITAIVE DATA COLLECTION** | **ROLE IN THE TEAM** |
| 1. Caroline Omom | * BSc. in Community Health * Pursuing an MPH degree in Epidemiology and Disease Control. * Strength in qualitative data gathering and analysis | 6 years | Qualitative Research Officer / lead Facilitator |
| 1. Dr. Alvin Lucy Onditi | * PhD. in Business Administration * Strength in quantitative and qualitative data gathering and analysis | 10 years | Note Taker |
| 1. Hellen Akinyi Aketch | * BA in Community health with strength in qualitative data analysis | 11 years | Note Taker |
| 1. Brillian Beatrice Carlos | * Diploma In Social Work and Community Development | 3 years | Note Taker |
| 1. Dan Abuto | * Diploma in Environment and Community Development | 15 years | Logistics/mobilization of participants / alternate Note Taker |
| The two Co-PIs, Prof. Lorna Grace Okotto and Joseph Okotto-Okotto oversighted the entire activity and sat through the discussions | | | |

**Protocol variations and known data issues**

There were minor variations in the FGD guide questions which was occasioned by sensitivity of some of the demographic information the field team had intended to collect from participants such as age, level of education etc. Even though these were included in the guide to be collected at the outset of the meeting by the lead facilitator, participants were uncomfortable giving this information publicly in the group. This was noted during the pre-test and the FGD guide was according adjusted. A new confidential form was designed and used to gather this information individually. There were no other known data issues during the study.

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

***Data management:*** At the end of each FGD session, the Note Takers submitted all their meeting notes to the lead facilitator (QRO) for safe keeping together the Digital Voices Recorders. The notes taken during the session were compiled into one document, typed, saved as digital files by the QRO and reviewed by the Co-PIs. The audio recordings were also transcribed and the transcripts, reviewed by the CO-PI, digitalized and saved as digital files. These two digital files were compared and the digital file from the Note Takers was used to enrich the transcriptions from Audio files to generate a final transcript and assure quality and accuracy in capturing the key issues raised during the FGD session. The transcripts were also reviewed to remove information that could relate to an identified or identifiable natural person to render personal data anonymous in such a manner that the data subject is not or no longer directly identifiable by future uses of the data in the transcripts. The QRO kept an anonymization log of all replacements, aggregations or removals made during this process and stored it separately from anonymized data files, with the Co-PIs (Haaker & 2021; UK Data Service, 2024). The final transcripts for each FGD, (giving a total of 5 transcripts), were imported into the NVivo 14 software platform for further analysis.

**Quality control:**

* ***Training*** ***and Briefing***: Field research teams were briefed and trained in accordance with the study protocol to effectively collect qualitative data to achieve the study objectives. They were trained on how best to interpret the questions in the various local languages (mainly Luo, Kiswahili) without losing the meaning/understanding of the questions. The team was 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 among a group that was note selected to participate in the main study. Pre-testing the guide was also helpful in refining different components of the study including, fieldwork measures and data collection processes. 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 Co-PIs of Jaramogi Oginga Odinga University and Victoria Institute of Research on Environment and Development always accompanied Field team to the Field and supervised the data collection activities. Their main role on these occasions was to ensure that the data collection process was firmly on course, questions and probes carefully implemented and the measurement processes correctly carried out in and efficient, effective and ethically sound way.
* ***Qualitative trustworthiness:*** To ensure qualitative study trustworthiness (credibility, applicability, consistency and neutrality), a number of approaches were employed. These include a prolonged interaction between research teams 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 to ensure data completeness. Moreover, data triangulation was employed by transcribing the interviews verbatim taking into consideration field notes taken by at least 3 different Note Takers during data collection process.

***Anonymization:*** As earlier alluded to, the project team held the principle of anonymization as key to upholding the participants right to privacy and gaining their confidence in interacting with the project team and volunteering credible information for the study. Consequently, the archived qualitative dataset (mainly contained in the transcripts) has been anonymised by replacing the identities of the respondents, organisations and locations with pseudonyms. The transcripts were also reviewed for any potentially disclosive remarks and such remarks were then redacted.

## Ethical considerations

***Ethical approval:*** The Study was approved and authorized by the JOOUST Ethics Approval Committee approval number ERC/23/6/20-4; approval date 17th August 2020 and the National Commission for Science and Technology (NACOSTI) of Kenya, via its research License number; NACOSTI/P/20/6583; approval date 20th September 2021. Other international approvals include that by the Faculty of Environmental and Life Sciences Ethical Review Committee, University of Southampton, UK (reference: 55755; approval date 19th August 2020).

***Informed consent:*** All study participants signed 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. Their rights as participants were explained as well. The information and consent documents for participants were written in simple English; however, for better understanding, the project team explained in the local languages whenever this was necessary. They also explained any questions that the participants did not understand well.

***Confidentiality:*** All participants were assured that the information they provided would be handled confidentially and that findings were reported with complete anonymity. They were, however, informed that because fellow participants and others within the project could listen to discussions and could repeat what was said somehow, full anonymity could not be guaranteed. To mitigate this, they were informed that the dataset would be kept securely and analyzed and presented without compromising the anonymity and confidentiality of the study participants by using pseudonyms.

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***Table 2:*** *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 |