**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:** Focus Group Discussion Data for evaluating the sustainability and transferability of the Delegated Management Model of Urban Water Services in Kenya, Kisumu.

## Objectives:

The overall aim of this qualitative component of a mixed methods study of Kisumu’s Delegated Management Model (DMM) was to assess the scheme’s sustainability and transferability/scalability by answering the following research questions:

* To what extent has the sustainability of Kisumu’s DMM programme been affected since its inception in 2008?
* What potential and barriers exists for scalability of delegated management model?
* What are the implications for the transferability of DMM?

These questions emerged from an earlier questionnaire survey implemented among households and kiosk owners in DMM and non-DMM areas, which identified some evidence of higher water prices for consumers and greater supply interruptions in DMM areas.

## Study site:

## Fieldwork took place in the informal settlements of Kisumu City in Kenya. Kisumu is Kenya's third largest city, with a population of over 500,000 people and is located on the shores of Lake Victoria. Over 60% of the population of the City’s population lives in informal settlements, typically densely populated and lacking adequate access to electricity, water and sanitation services (Sibanda et al. 2017). The City Authorities have been exploring various technical and management approaches for providing safe and affordable water to these informal or off-grid populations. One such approach is known as the Delegated Management Model (DMM), in which a utility delegates management of infrastructure and water service delivery to micro-enterprises or community-based organisations (WSP, 2009). In Kisumu, the main water service provider in the City, known as Kisumu Water and Sanitation Company (KIWASCO), works in partnership with individual or groups, termed ‘Master Operators’ (MOs). KIWASCO offers the MOs water at a bulk supply tariff, who then sell it to households or kiosk water vendors. The MOs are also in turn responsible for minor maintenance, such as the repair of small leaks, and the management of customer interfaces assuring the quality of water supplied (Anand, 2003; Schwartz and Sanga 2010). Kisumu was one of the first cities to implement, on a large-scale, a water intervention initiative that targets informal settlements using a DMM approach in this part of the world (Nzengya, 2015).

## This form of outsourcing of distribution and customer care to private operators or community-based organizations is meant to allow the utility to focus on supplying high quality potable water as its core business, and thus improve the technical and financial performance of water utility (World Bank, 2009). For informal settlement residents where there are difficulties in the laying out of water supply infrastructure, the key benefit of this approach is to bring quality water closer to their homes or households and make it more affordable (World Bank, 2009).

## Study design

## Kisumu city is administratively divided into Locations and Sub-locations. Within the sub locations, there are further subdivisions into villages and Area Enumeration Units (EAs). The EAs are areal delineations for population census purposes, normally carried out by the Kenya National Bureau of Statistics (KNBS). These areal Units (EAs) were used as initial stage sampling units. Eligible EAS constituted those classified as urban by national statistical Agency, KNBS. EAs dominated by communal establishments were excluded. Specifically, most households in eligible EAs lived in over-crowded or non-durable housing, lacked improved sanitation or water sources, secure tenure, or waste services.

## The characteristics of urban EAs (including whether or not water was delivered via DMM; metered water connections per household; kiosks per capita; population density; proximity to sewerage lines; and probability of built-up land cover measured via Sentinel-2 satellite imagery) were collated within a GIS. To minimize differences between EAs under delegated management and control EAs, a balanced sample of EAs was selected using coarsened exact matching based on these characteristics. This enabled the selection of a set of DMM and matched control non-DMM EAs with comparable characteristics. Given that EA boundaries were delineated a decade or more before planned fieldwork, to allow for the replacement of EAs that no longer met the inclusion criteria, 50 EAs in Kisumu were selected at random from the eligible EAs.

## Project field teams carried out an intensive one-month reconnaissance exercise in all selected EAs, firstly to verify whether they still met one or more of the slum criteria described above, and secondly to enable the teams to overcome the navigational difficulties of identifying EA boundaries in the field. During this exercise, the survey team was accompanied by community guides in each EA. After the introductions, the field teams with the assistance of these community guides visited the community to conduct the reconnaissance visit. Following field reconnaissance, six EAs in Kisumu were excluded as lacking slum characteristics and random replacements were selected.

This FGD component of the study followed a sequential explanatory mixed methods approach (Creswell & Clark, 2017). After an initial cross-sectional questionnaire survey of households, MOs and water kiosk owners, as well as water quality testing, this qualitative component entailing focus group discussions (FGDs) (Ritchie & Lewis, 2000) was carried out to explore further the sustainability of Kisumu’s DMM programme. In particular, it explored the role of water tariffs in the implementation of DMM to triangulate emerging results. There was evidence from the questionnaire survey of higher water prices and greater interruptions in DMM areas, which led to sustainability and transferability emerging as themes for this subsequent qualitative component of the study. The FGDs further explored the potential and barriers for scalability and transferability of DMM. The FGDs thus provide the context to understanding the potential to scale up DMM including the likely ingredients for successful water service delivery through DMM and the possible key barriers and challenges - an area not studied before. It further explores the potential for transferability of DMM tor other types of services such as waste management which are also poorly provided in these off grid settlements. This is the documentation presented herein.

## Sample frame, size and participant selection

The sample frame encompassed all the households, MOs and kiosk owners living in the 50 EAs earlier sampled for the questionnaire survey. During the questionnaire survey (implemented in DMM EAs and matched control EAs without DMM as described above), telephone contacts for participating households and kiosk owners had been recorded and stored. A list of all the contacts for each group formed the sampling frame for picking respondents for FGD. The sampling frame for households contained 251 records and kiosks owners 102 records. For MOs a list provided by the pro poor unit of KIWASCO was used as the sampling frame. The list comprised 49 MOs registered with the utility with all their contact numbers. However, only 40 MOs were active and thus formed the sampling frame for MOs.

To select participants from each sample frame, a list of telephone numbers falling within each of these categories were generated per category and assigned numbers. The assigned numbers were randomized and used to randomly select the phone numbers whose owners participated in the FGD for each category. From the telephone numbers picked at random, a call was made to those numbers to request the owners to be part of the FGD. On acceptance a follow up visit was done by two field supervisors who also handed them an official invitation letter. During these follow-up efforts, opinions of the selected participants 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, where informed consenting took place. For all groups, only respondents aged 18 years or older were eligible for recruitment and participation in the FGDs.

Those who accepted formed the Focus Groups. A total of ten FGDs were conducted, which comprised six FGDs in DMM and four in Non DMM areas. For DMM areas, two FGDs were conducted with each of households, water kiosk owners and MOs. For Non DMM areas, two were conducted with both households and water kiosk owners since MOs were only found in DMM areas. A total of 100 participants organized into 10 focus groups thus participated in the study. These comprised 18 master operators from DMM EAs, 19 and 22 kiosk owners from DMM and Non DMM areas respectively as well as 19 and 22 household representatives from DMM and Non DMM areas respectively. The number of participants in each FGD thus ranged from nine to twelve (Basnet, 2018; Morgan (2002).

## Data collection

Ten Group Discussions [2 for master operators, 4 for kiosk owners and 4 for households] were organized and carried out between the 13th July to 21st September, 2023. These were held at strategically convenient locations in KUAP vocational training centre in Nyalenda. Obunga community training hall and Obunga CCA Church Hall in Obunga, and Kosawo hall in Manyatta. The FGDs were structured to contextualize and explore the role of water tariffs in delegated scheme implementation, scalability/transferability of delegated management including requirements for successful water service delivery through delegated management. It also looked at the main hurdles to the delegated management scheme being adopted more widely across Kisumu and for other types of services such as waste management.

.

The FGD guide was pre-tested prior to data collection among selected households, water kiosk owners and MOs who were not selected to participate in the final 10 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 given 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*

|  |  |  |  |
| --- | --- | --- | --- |
| **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 |
| Two Co-PIs, Prof. Lorna-Grace Okotto (JOOUST) and Joseph Okotto-Okotto (VIRED) 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 confidentiality 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 (Harker & 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 the 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: 77654; approval date 27/10/2022).

***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.

**References**

Anand, P.B. (2003) From conflict to co-operation: some design issues for local collective action institutions in cities. Journal of International Development 15(2), 231-243

Basnet, H. B., (2018): Focus Group Discussion: A Tool for Qualitative Inquiry. Researcher. A Research Journal of Culture and Society. 3(3): 81.DOI: 10.3126/researcher.v3i3.21553.

Creswell, J. W., & Clark, V. L. P. (2017). Designing and Conducting Mixed Methods Research. Thousand Oaks, CA: Sage Publications.

Gutberlet, J., Kain, J.-H., Nyakinya, B., Oloko, M., Zapata, P., & Campos, M. J. Z. (2017). Bridging Weak Links of Solid Waste Management in Informal Settlements. The Journal of Environment & Development, 26(1), 106–131. https://www.jstor.org/stable/26197990

Harker, M., & Vlad, A., (2021); How to anonymize Quantitative and qualitative data. UK Data Service. Conference presentation.

Klagge, J. (2018): Guidelines for Conducting Focus Groups. DO: 10.13140/RG.2.2.33817.47201

Krueger, R. A., & Casey, M. A. (2000). Focus groups: A practical guide for applied research (3rd ed.). Thousand Oaks, CA: Sage.

Latin American and East African countries. PLoS ONE 17(7): e0265889. https://doi.org/10.1371/journal.pone.0265889

Management Authority (NEMA).

Meyer, J. (2001). Guidelines for conducting a focus group. Retrieved 01/22/03 from http://www.uwm.edu/Dept/CUTS/focus.htm.

Morgan, D.L. (2002). Focus group interviewing. In J.F. Gubrium & J.A. Holstein (eds.), Handbook of interviewing research: Context & method (pp. 141–159). Thousand Oaks, CA: Sage.

Neville, C. (2007). Introduction to research and research methods. United Kingdom: University of Bradford School of Management.

Nzengya, D.M. (2015) Exploring the challenges and opportunities for master operators and water kiosks under Delegated Management Model (DMM): A study in Lake Victoria region, Kenya. Cities 46, 35-43.

Okotto, L.G.O. (2010) Independent and small scale urban water providers in Kenya and Ethiopia.

Patton, M. Q. (2002). Qualitative research and evaluation methods. London: Sage Publication.

Ritchie, J. and Lewis, J. (2000). Qualitative research practice: a guide for social science students and researchers. London: Sage Publications

Sibanda, L.K., Obange, N. & Awuor, F.O. (2017). Challenges of Solid Waste Management in Kisumu, Kenya. Urban Forum 28, 387–402 (2017). https://doi.org/10.1007/s12132-017-9316-1

Schwartz, K. and Sanga, A. (2010) Partnerships between utilities and small-scale providers: Delegated management in Kisumu, Kenya. Physics and Chemistry of the Earth 35(13-14), 765-771.

The World Bank, (2021): https://www.worldbank.org/en/news/feature/2021/03/11/battling-kenya-plastic-waste-young-kenyan-woman-transforming-waste-into-sustainable-and-affordable-building-materials

UK Data Service (2024): https://ukdataservice.ac.uk/learning-hub/research-data-management/ Date Accessed 2/2/2024

Water and Sanitation Program (WSP (2009) Improving Water Utility Services through Delegated Management: Lessons from the utility and small scale providers in Kisumu Kenya. Nairobi, Water and Sanitation Program-Africa

World Bank (2009) Improving water utility services through delegated management: lessons from the utility and small-scale providers in Kisumu, Kenya, p. 16, Nairobi.

***Table 2:*** *List of Pseudonyms*

|  |  |  |
| --- | --- | --- |
|  | **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 |