

Waste material recycling: the horrors of informal waste material picking in Zimbabwe

Paul Mukucha and Divaries Cosmas Jaravaza
*Department of Marketing, Bindura University of Science Education,
Bindura, Zimbabwe*

Abstract

Purpose – The transition from a linear to a circular economy has created unintended employment opportunities for marginalised communities in various developing countries. Informal waste picking, a prevalent occupation among recent migrants and individuals with limited education, highlights the complexities of informal employment. The phenomenon underscores the challenges faced by socioeconomically disadvantaged individuals in securing formal employment. Such individuals are confronted with a multiplicity of challenges that are delved into in the current study. Therefore, this study aims to examine the challenges faced by informal waste material pickers beyond what is already documented in the extant literature.

Design/methodology/approach – The study used a sample of 42 (42) informal waste material pickers. The participants were drawn from several dumpsites in the city of Harare. Semi-structured interviews were conducted on the respondents within their workplace. The data was analysed thematically.

Findings – The results revealed that informal waste material pickers are faced with ritualistic sexual abuses, scary encounters, territorial fights and are subjected to being sanctuaries for criminals.

Research limitations/implications – The study highlights the challenges faced by informal waste pickers that need to be addressed by policymakers to bring sanity to the recycling efforts and municipal waste management systems. The study recommends that the public policymakers should look after the welfare of the informal waste material pickers, considering that they have a crucial role in sustaining the circular economy.

Originality/value – The study reveals the horrors faced by informal waste material pickers as the key contributors to the circular economy through providing secondary material for recycling.

Keywords Circular economy, Linear economy, Informal waste pickers, Urban waste management, Occupational hazards

Paper type Research paper

1. Introduction

Traditionally, most economies were configured in a linear fashion that involved the extraction, consumption and disposal of materials that have turned into waste (Debrah *et al.*, 2022; Mihai and Minea, 2021). This type of configuration is associated with



© Paul Mukucha and Divaries Cosmas Jaravaza. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at <http://creativecommons.org/licenses/by/4.0/legalcode>

The authors are gratefully indebted to the editor and two anonymous reviewers whose comments have vastly improved the quality of this study.

innumerable negative externalities such as the depletion of natural resources (Xu and Zhao, 2023), destruction of the natural ecosystems (Chen, 2021) and the indiscriminate disposal of waste materials (Montalvo-Romero *et al.*, 2022). The indiscriminate disposal of waste material has led to the mushrooming of many illegal dumpsites with irritating litter across city centres (Mukucha *et al.*, 2023a, 2023b; Mukucha *et al.*, 2021), residential areas and industrial zones (Shabani *et al.*, 2023). Litter across the streets has led to the clogging of drainage systems, sewer lines and water pipes (Aetekhai and Kalu, 2023). This resulted in an unintended overflow of raw sewage (Weideman *et al.*, 2020) that has been attributed to recurring waterborne disease outbreaks such as cholera and typhoid (Rusca *et al.*, 2022). The illegal dumpsites also produced unpleasant odours (Etea *et al.*, 2021), as well as becoming breeding grounds for rodents, cockroaches, flies and mosquitos (Roy *et al.*, 2023).

More recently, most of the waste material that found its way to the dumpsites is beginning to get recycled (Bayar *et al.*, 2021). Recycling is a key industrial activity of the circular economy (Sanchez *et al.*, 2020), which is a successor to the linear economy (Debrah *et al.*, 2022). In its original conceptualisation, the circular economy comprises the 3Rs, namely reducing, reusing and recycling (Smol *et al.*, 2020). It is the latter that proves to require some investments in terms of material capital and human effort than the other two constituent elements (Mukucha *et al.*, 2023a, 2023b). Recycling relies heavily on the availability of recyclable waste material (Zisopoulos *et al.*, 2023). Zimbabwe produces an estimated amount between 1.65 and 1.9 million tonnes of waste material per annum (Zela, 2023). It has been reported in the mainstream media that Zimbabwe recycles at least 10% of the waste generated in urban areas through 75 registered recycling firms. The recycling firms recycle aluminium, paper, plastic, glass and metal waste material (Barford and Ahmad, 2021). In support of the recycling efforts, the relevant government ministry established around 150 waste transfer stations across the country.

The recycling process follows some basic procedures such as waste material picking and separation at source (Samson *et al.*, 2022). Waste material picking is one of the crucial initial stages of the recycling supply chain that ensures a smooth velocity of material in the circular economy (Zisopoulos *et al.*, 2023). However, there are fewer formal waste material pickers in the country, leaving the bulk of waste material picking to the informal sector. Informal waste material picking, which is pertinent in urban waste management (Zolnikov *et al.*, 2021), has increasingly become the source of employment for most of the less privileged people (Harfadli *et al.*, 2024), such as school dropouts, single mothers, widows and unskilled individuals (Singh *et al.*, 2023). Often, these people independently pick waste material for selling to recycling businesses (Nawazi *et al.*, 2021). However, informal waste material pickers face a lot of challenges that are well documented in the extant literature. Previous research has already revealed that informal waste material pickers inherently face the threat of occupational health hazards as a result of lacking protective clothing and equipment for handling toxic, poisonous and contaminated waste material (Ola *et al.*, 2023; Nuripuh *et al.*, 2022), economic and social exclusion (Nzeadibe and Ejike-Alieji, 2020), stigmatisation (Morais *et al.*, 2022) and lack of legal recognition (Porrás-Bulla *et al.*, 2021).

The challenges faced by the informal waste material pickers documented in the extant literature are not exhaustive. Zisopoulos *et al.* (2023) warned that, as a drive towards the circular economy gathers momentum, there is a risk that some stakeholders may be overlooked, leading to an inverse relationship between environmental sustainability and social sustainability. It is therefore the thrust of the current study to document some of the horrors that informal waste material pickers in Zimbabwe face. A significant knowledge gap exists in the literature on informal waste-picking, as most empirical studies have concentrated on Asia and bigger African economies such as Nigeria and South Africa,

overlooking the importance of broader regional investigations. For instance, while most of the challenges faced by informal waste pickers documented in the extant literature are valid in the Zimbabwean context, the unique cultural environment in Zimbabwe suggests that there could be more challenges faced by the Zimbabwean informal waste material pickers.

Researching on more challenges faced by informal waste material pickers is useful for assisting policymakers, both at the levels of local government and central government, to make relevant policies that spur the growth of the recycling industry. This is particularly necessary considering that informal waste pickers are the essential actors in the recycling industry, and in turn, the recycling industry plays a crucial role in achieving environmental sustainable goals. Henceforth, this section is followed by a literature review, methodology, data analysis and discussion of results and conclusions and implications of the study.

2. Literature review

2.1 Informal waste picking and recycling practices

Recycling is the process of turning waste material into raw materials for making new products (Bayar *et al.*, 2021). The process of recycling is dependent on the availability of waste material. Through recycling, the costly processes of incineration, composting and landfilling are avoided (Istrate *et al.*, 2021). Moreover, recycling reduces the extraction of virgin input materials, leading to environmental preservation (Bayar *et al.*, 2021). The waste materials that are usually amenable to recycling are scrap metal, aluminium, plastic, paper and glass (Tutton *et al.*, 2022).

Waste material is made available for recycling purposes by the waste material pickers who operate on both a formal and informal basis (Singh *et al.*, 2023; Porras-Bulla *et al.*, 2021; Zolnikov *et al.*, 2021). Informal waste material picking is one of the key activities in the entire recycling process (Ma *et al.*, 2023). Waste is picked from both illegal and legal dumpsites (Zisopoulos *et al.*, 2023), although most of the informal waste material picking by individuals takes place at illegal dumpsites (Zisopoulos *et al.*, 2023), which by far receive most of the municipal waste in developing countries (Ogwueleka and Naveen, 2021). Dumpsites receive waste of various forms from households, commerce and industry (Zisopoulos *et al.*, 2023).

While informal waste material picking is a source of livelihoods for some of the people in developing countries, these informal waste material pickers face numerous challenges. The challenges faced by the informal waste material pickers have been studied in many countries in the Global South, such as South Africa (Senekane and Mngomezulu, 2024), India (Singh *et al.*, 2023), Nigeria (Ogwueleka and Naveen, 2021) and Sri Lanka (Gunarathne *et al.*, 2020). These challenges are largely related to general economic problems that are associated with many countries in the Global South that are designated as either developing, less developed or underdeveloped. According to the United Nations Conference on Trade and Development (UNCTAD), the Global South is made up of countries in Africa, Asia, Oceania and Latin America. However, this categorisation excludes developed countries such as Australia, Japan, South Korea and New Zealand.

Waste material picking in developing countries is dominated by individual informal waste material pickers (Morais *et al.*, 2022) who, through stigmatisation, are sometimes referred to using derogatory names such as scavengers (Morais *et al.*, 2022). The informal waste material pickers are usually the underprivileged members of the community who are associated with extreme poverty (Harfadli *et al.*, 2024), are driven by lack of proper employment in the formal sector (Morais *et al.*, 2022), and lack the necessary capital to venture into decent self-employment initiatives (Zisopoulos *et al.*, 2023). They are also most

likely to be recent rural migrants who failed to realise the much-anticipated greener pastures in urban areas (Morais *et al.*, 2022).

Informal waste material pickers are the service providers in the circular economy whose contribution leads to the reduction of land, water and air pollution (Marais *et al.*, 2022). In addition, the informal waste material pickers are a source of primary materials for many recycling businesses in the first tier of supply chains (Zisopoulos *et al.*, 2023) and secondary materials for the manufacturing industry in the second tier of supply chain networks (Barford and Ahmad, 2021). However, informal waste material picking is prescribed as an illegal activity in several by-laws of many local authorities (Zisopoulos *et al.*, 2023). Consequently, informal waste material pickers are often chased away by municipal police officers. The banning of informal waste material picking is necessitated by the fact that waste material pickers often spill the contents of sanitary bins (Morais *et al.*, 2022). The rummaging of sanitary bins leads to pollution of all kinds, ranging from land, water and air (Al-Khatib *et al.*, 2020).

2.2 Challenges involved in informal waste picking

The challenges associated with informal waste material picking can be explained on the basis of several theoretical frameworks as well as empirical evidence. The main theoretical foundation for informal waste material picking is anchored in the stigma theory, which was conceptualised by Goffman (1963) in describing a phenomenon where individuals are discredited on the basis of their gender, disability, ethnicity or occupation. The stigma theory is considered to be part of the structuralism paradigm. Structuralism is a paradigm that underscores the relevance of shaping individual experiences and behaviours through social systems, norms, institutions and structures (Inglis, 2024). Structuralism has its roots in anthropology, but its application has extended to various disciplines such as sociology and psychology (Harlak, 2022). The challenges faced by informal waste material pickers are multidimensional and profoundly rooted in structural issues. The application of structuralism theory to informal waste material picking suggests that the stigma associated with that practice relegates the activity to the marginalised communities mostly associated with migrants and low-income individuals (Marais *et al.*, 2022).

The stigma theory can be used to explain the societal views as well as the challenges associated with informal waste material picking as an occupation. The major challenge faced by waste material pickers is social exclusion, as can be explained by the stigma theory (Dada *et al.*, 2023). Goffman (1963) delineates stigma into discredited individuals and discreditable individuals, with the former being more visible while the latter are discreet. Concealable stigma includes health conditions such as mental illness (Lewis *et al.*, 2023), human immunodeficiency virus (HIV) infection (Akaturkwa *et al.*, 2021), promiscuity (Tan *et al.*, 2020) and sexual orientation (Marti-Pastor *et al.*, 2020). The stigmatisation of certain conditions is culturally or socially specific and has a net effect of identity spoiling (Cain, 2022).

Stigma can also be categorised as anticipated and enacted (Goffman, 1963). Anticipated stigma refers to expected discrimination that culminates in the internalisation of societal prejudices by individuals with specific attributes (Benz *et al.*, 2021). Anticipated stigma often leads to self-stigma, resulting in reduced self-esteem and social withdrawal (Dubreucq *et al.*, 2021). Enacted stigma, on the other hand, is a kind of discrimination that refers to experienced social rejection (Porras-Bulla *et al.*, 2021). It also manifests in prejudicial attitudes (Nguyen and Li, 2020) that are focused on individuals with a particular characteristic or feature, such as social distancing (Tawfik *et al.*, 2023) and unfair treatment in social settings (Uddin *et al.*, 2020).

Marginalisation is one of the consequences of the stigmatisation (Morais *et al.*, 2022). The stigma theory helps to understand the social processes that contribute towards marginalisation and the outcomes of stigma for informal waste material pickers (Porrás-Bulla *et al.*, 2021). The stigma for informal waste pickers emanates from a variety of sources, such as their lack of formal education (Shah *et al.*, 2020), poor working conditions (Kumar, 2020), dealing with toxic materials (Dada *et al.*, 2023), association with illegal activities (Trang *et al.*, 2022), prostitution (Sibanda and Erwin, 2023), territorial fights and settling in dilapidated neighbourhoods (Vázquez *et al.*, 2020). Moreover, as marginalised community members, informal waste material pickers earn poor returns for their efforts (Schenck *et al.*, 2022).

The other theory that can be used to account for the working conditions of the informal waste material pickers is the informalization theory. Informalization theory from an economics perspective is an idea that describes the growing pervasiveness of informal economic undertakings within formal economies (Chen, 2023; Huang *et al.*, 2020). It posits that with the passage of time, some formal institutions and structures gradually disintegrate into informal elements, creating blurred boundaries between what is designated as formal and informal (Šipulová & Kosar, 2023). This theory underscores the increasing significance of informal sectors in social lives for most developing economies (Tellado *et al.*, 2020). The informalization process has extended to waste material picking practices where the marginalised communities are the major players (Neville and Tovar Cortés, 2023).

The dualism theory also accounts for the existence of informal waste-picking activities. This theory posits that most economies, particularly in developing countries, are divided into formal and informal sectors (Metinsoy, 2024). The dualism theory, if applied to informal waste material picking, denotes the philosophical concept that points out the existence of two different entities within the waste material picking system. This is represented by a dichotomy that depicts a formal waste-picking system run by private entities and government departments and one dominated by informal waste material pickers whose operations are largely unregulated (Zolnikov *et al.*, 2021). The formal waste material picking sector is characterised by structured regulation associated with efficient and sustainable waste management, while the informal sector is highly disorganised and driven by economic necessity (Morais *et al.*, 2022).

Previous research reveals that the stigma faced by informal waste material pickers results in a lot of physical and psychological consequences (Yousafzai *et al.*, 2020). Informal waste material pickers function within a greatly unstable economic environment (Morais *et al.*, 2022; Hartmann *et al.*, 2022). Their reliance on the gathering and selling of recyclable waste materials for livelihoods exposes them to fluctuating market prices (Chertow *et al.*, 2024). This is worsened by turbulent global commodity markets of virgin material that affect the demand for recycling materials. These economic shocks tend to severely impact their livelihoods, leaving them wallowing in perpetual poverty (Nogueira, 2023; Samson, 2020).

Furthermore, many informal waste pickers have no access to formal employment benefits such as retirement grants, health insurance and life assurance coverage (Morais *et al.*, 2022). The absence of employment benefits implies that the livelihoods of the informal waste pickers are highly dependent on them being able to work every day (Malak *et al.*, 2022). Furthermore, without formal recognition, waste material pickers tend to be deemed ineligible to access funding from financial institutions (Hartmann *et al.*, 2022). Lack of access to finances implies the stagnation of their operations.

Waste material picking is generally regarded as illegal (Misra and Tewari, 2022; Barford and Ahmad, 2021). This renders informal workers as an unrecognised entity within formal waste material management systems (Solaja *et al.*, 2024; Chawla and Kumar, 2022). The

absence of legal recognition of informal waste material pickers leads to harassment from law enforcement (Parra, 2020). This harassment may take the form of inconvenient detention and sometimes short-term imprisonment, which inadvertently affects the waste material recycling supply chain.

The working environments for most informal waste material pickers are archetypally dangerous and unsafe (Harfadli *et al.*, 2024; Porras-Bulla *et al.*, 2021; Made *et al.*, 2020). They sometimes handle contaminated materials without using appropriate protective equipment (Zolnikov *et al.*, 2021; Carenbauer, 2021). This exposes them to injuries of varying severities and infections from different pathogens (Norman *et al.*, 2024; Zolnikov *et al.*, 2021). Eventually, the contracting of diseases may temporarily disrupt their operations, further leading to waste material supply chain disruptions.

Finally, the challenges faced by informal waste material pickers that are documented in the extant literature and grounded in several theoretical frameworks are not exhaustive. Due to stigmatisation, informal waste material pickers are likely to face horrific experiences that are largely ignored or neglected by the formal authorities as well as the mainstream media. Therefore, the current study seeks to reveal some of the horrific experiences of the informal waste material pickers, other than the ones already profiled in the extant literature. This is achieved through the research methodology outlined in the next section.

3. Methodology

3.1 Research philosophy

An interpretivist research philosophy was adopted for this study. The interpretivist research approach holds a belief that people's attitudes and behaviours are a function of their personal experiences, cultural background and social context (Saunders *et al.*, 2023). This research approach further provides an understanding of the meanings from human behaviour as well as the related interpretations (Pervin and Mokhtar, 2022). The interpretivist research is naturally aligned to a descriptive research design and qualitative research approach. The collection of qualitative data pertained to the uniqueness of a context under consideration (Junjie and Yingxin, 2022). Indeed, the study of municipal waste material picking is unique in the sense that what informal waste material pickers encounter does not resonate with the challenges faced by ordinary urban residents (Kain *et al.*, 2022).

3.2 Participants

The population of this study is informal waste material pickers in the metropolitan city of Harare. Harare is the capital city of Zimbabwe and home to almost 16% (2,487,209 people) of the entire Zimbabwean population (Zimbabwe National Statistics Agency, 2023). There are numerous illegal and legal dumpsites that turn out to be workplaces for a sizable number of the underprivileged societies in Harare. The participants were recruited for interviewing at their regular dumpsites. After interviewing 42 (42) participants, the researchers decided they had achieved the saturation point and ended the recruitment process. The sample was evenly split between males and females, and the majority of these participants (80%) were single. The women who were single were either never married or had been married but later divorced or widowed. The females, being 50% of the total population, are 21. Approximately 70% of those 21 women were single mothers. The participants' background comprised youth (40%) and the mature aged (60%). The length of service was split as follows: 0–5 (30%), 6–10 (50%) and 11 and above (20%). Ninety percent of the participants lack formal education, and 92% practice an African religion that believes in appeasing ancestral spirits.

3.3 Sampling

Sampling is the process of selecting the respondents for a data collection process (Saunders *et al.*, 2023). Convenience and purposive sampling methods were used to select the respondents since these two sampling methods are amenable to qualitative studies (Obilor, 2023). Convenience sampling was favoured on the basis that some of the potential respondents could not be part of the study due to their work commitments as well as scepticism towards strangers who did not look like them. Purposive sampling was also used, targeting those respondents that had the potential to provide relevant information. The inclusion criteria inclined towards recruiting the respondents that are coherent enough to provide the required information. This selection criteria is necessary for dealing with informal waste material pickers since some of them have higher levels of illiteracy to the extent that they could not clearly articulate the issues under discussion.

3.4 Data collection procedures

Data was collected in the city of Harare, where most of the litter is generated and the recycling firms are domiciled. In the city of Harare, there are illegal dumpsites in almost every suburb, and the number of illegal dumpsites is estimated by the Environmental Management Agency (EMA) to be over 2000. A mapping exercise conducted by the EMA indicated that most of the illegal dumpsites are located at major bus terminuses in the central business district, such as Copacabana, Market Square, Charge Office and 4th Street bus terminuses, along major highways such as the Beatrice Road, and major shopping centres such as the Montague Mall. These dumpsites can go for longer periods without getting cleared by the municipality, leading to permanent workplaces for informal waste material pickers.

Data was collected through semi-structured interviews. Interviews are used to collect detailed primary data that cannot be obtained through other research methods (Nii Laryeafio and Ogbewe, 2023). The interviews also allowed the researchers to obtain data in the form of the participants' own words with the opportunity to assess the respondents' feelings as well as being able to seek clarifications where the responses submitted were too technical (Jain, 2021). The interview questions sought to find out the demographic information of the informal waste material pickers and the scary encounters they face in their daily routines. As the participants were responding to the interviewers' questions, some probing was done to seek clarifications and gain new knowledge. The interviews were audio recorded and later transcribed *verbatim*.

3.5 Data analysis procedures

The data was analysed thematically. Thematic analysis involves identifying, coding and categorising themes that emerged from the data so as to gain some insights into the topic of interest (Saunders *et al.*, 2023). After discovering the themes, the researchers named the extracted themes. The trustworthiness of the analysis process was guaranteed through assigning the two researchers to independently code the data and then comparing the inferred themes (O'Connor and Joffe, 2020). The independent coding of data elicited matching themes. The deduced themes are presented under the results section.

3.6 Trustworthiness

The trustworthiness of the data was ensured through maintaining reflexivity, peer debriefing and ensuring the consistency between the participants' views and the findings (Saunders *et al.*, 2023). More specifically, the data was assessed for trustworthiness through ensuring that it meets the credibility, transferability and dependability criteria (Haq *et al.*, 2023).

Credibility was demonstrated through participant validation that involved taking the analysed data back to the respondents to assess whether the findings reflect what they had submitted (Ivey, 2023; Slettebø, 2021; Johnson *et al.*, 2020). The respondents agreed with the findings emanating from the analysed data. Transferability was ensured through providing a thick description of the research settings as well as the entire research process. Finally, dependability was confirmed through some blind peer reviews, which led to some improvement in quality.

3.7 Ethical considerations

The ethical considerations observed in this study included informed consent, the right to withdraw from the study, confidentiality, anonymity and respondent validation (Goodwin *et al.*, 2020). Participants were informed of the purpose as well as the potential risks and benefits of participating in the study. The research participants were also informed of their rights, such as withdrawing from the study at any stage of the data collection process without facing any backlash. Confidentiality and anonymity were verbally assured at the initial stages of the data collection process, and this was implemented through leaving out the respondents' personal details. The exclusion of the respondents' personal details improved the participants' level of cooperation.

4. Results

The results from the study are presented in accordance with the themes that were generated during the data analysis process. These themes are ritualistic sexual abuses, scary encounters, territorial fights and sanctuary for criminals.

4.1 Ritualistic sexual abuses

Informal waste material pickers of both sexes revealed that they face several sexual abuses by perpetrators who make nocturnal visits to the dumpsites where they operate. Women are usually abused by sex perverts who pretend to be buyers of their wares. One female respondent indicated that:

[...] men who pretend to be buyers usually take us to secluded places pretending to be negotiating for buying our materials. On some of the occasions, they end up raping us.

The other form of sex abuse was experienced by vulnerable men through being perpetrated by female ritualists who harvest sperm for business enhancement. They kidnap men for harvesting their sperm for ritual purposes on the promise that they will pay them well. One respondent emotionally stated that:

They approached me at a certain dumpsite and kidnapped me in a red sedan car. Inside the car, they drugged me with a certain substance that made my manhood get involuntarily erect. Then they forced me to get intimate with a certain lady using a condom. After I had ejaculated, they emptied my sperm into a certain container stored in a cooler box.

The other form of abuse was also performed by the ritualists who believe that sleeping with a mentally challenged man can lead to wealth. This practice may be based on superstition or misinformation, and it can perpetuate harmful stereotypes and stigma against people with mental disabilities. Furthermore, some societies believe that all informal waste material pickers are mentally challenged. A certain respondent revealed that:

We normally get nocturnal visits by well-to-do women from the affluent suburbs who pay us handsomely for sex on the belief that we are madmen. These people would have been advised by witch doctors that if they slept with madmen, they would get rich.

4.2 Scary encounters

Some of the informal waste material pickers revealed that sometimes they have encounters with scary disposed objects from ritual practices and decomposing fetuses from illegal abortions. One respondent stated that:

I recently came across a leather bag full of scary objects used in conducting rituals, and immediately I experienced a general body weakness, which only ended after I had gone to my rural home for a spiritual cleansing ceremony.

The other respondent remarked that:

As I was rummaging through the fresh litter, I dipped my hands in a paper bag and fished out some pieces of flesh that seemingly looked like a recently aborted foetus. I was so traumatised to the extent that I had to seek some counselling services from my family elders.

The other scary encounter reported by one of the respondents related to the discovery of the paraphilia normally associated with witchcraft. The respondent said:

I once came across some paraphilia usually associated with the practices of witch doctors when attending to their clients. That encounter traumatised me for some days since, in our culture, coming across such material may attract some curses.

4.3 Territorial fights

There is infighting or territorial fighting among informal waste material pickers, especially upon the discovery of a fresh dumpsite. Usually, these fights would be meant to exclude the rival informal waste pickers from the other neighbourhoods. One respondent explained that, “We usually fight with invaders from the other dumpsites, and these fights can sometimes result in serious injuries or even death”.

Besides fighting one another, the informal waste material pickers also fight with the wild animals scavenging for food. These animals range from stray dogs to snakes and other dangerous reptiles. A certain respondent revealed that:

[...] these dumpsites are breeding grounds for rodents of different types, and these rodents tend to attract snakes. As we will be foraging through the dumpsites, we face a severe risk of snake bites.

The other respondent explained the fights they normally encounter with wild dogs. This respondent remarked that:

The dumpsites that we usually frequent are the playground for the wild dogs that scavenge for food. We normally fight with these wild dogs, and on some occasions we tend to get bitten. Being bitten by wild and stray dogs leads to seeking expensive medical treatment for rabies.

4.4 Sanctuary for criminals

Most violent criminals involved in robbing citizens during the night use the dumpsites as their temporary hideouts for evading arrests and hiding their loot. These criminals tend to tarnish the image of informal waste material pickers as they sometimes get accused of providing sanctuary to the criminals. One respondent indicated that:

We are often mistrusted by the general public, as most of the stolen properties are recovered from the dumpsites, and the criminals tend to shelter around the most popular dumpsites in the city.

The other respondent explained how they are sometimes forced by the fugitives from the law enforcement agents to shelter them. They normally do this against their conscience. This

respondent stated that, “Criminals running away from the police sometimes force us to shelter them. When these criminals eventually get caught, we normally get charged as accomplices”.

In summary, the findings reveal that ritualistic sexual abuses, scary encounters, territorial fights and sanctuary for criminals are the common forms of the scary encounters that informal waste material pickers face.

5. Discussion

The study revealed that waste material pickers face some challenges that are more horrific than the ones already documented in the extant literature. More specifically, the study revealed that informal waste material pickers usually come across scary objects that are typically disposed of from ritual practices by witch doctors. These scary objects sometimes turn some of them into becoming mentally challenged. Mental challenge is a disease that the society should acknowledge and whose patients must be treated with utmost care and appreciation (Busfield, 2020). However, mental illness is stigmatised in most developing countries (Javed *et al.*, 2021). This is mainly based on the fact that in countries such as Zimbabwe, mentally challenged people are believed to be haunted by the avenging spirits after they have murdered someone or someone in their family has killed a stranger.

Informal waste material pickers are also often at loggerheads with the law enforcement agents for their perceived association with the criminals. These findings also echo the situation of waste reclaimers in Johannesburg, where they are criminalised (Samson, 2020). The dumpsites are frequent hideouts for criminals, and as a result, it is believed that informal waste material pickers often provide them with some sanctuary (Porrás-Bulla *et al.*, 2021). This normally leads to the harassment of informal waste material pickers as they are adjudicated by association to be criminals (Muindi *et al.*, 2022). Worse still, there are some criminals domiciled at most dumpsites that are associated with the occasional robbing of the passing-by pedestrians (Muindi *et al.*, 2022). Therefore, the harassment of these informal waste material pickers is normally motivated by the fact that their informal status tends to be associated with diminished civil rights.

The items that are thrown to the dumpsites are of various types, and most of them have no utility in the recycling business. These irrelevant materials have been found in this study to include decomposing flesh suspected to be from the aborted foetus (Dini, 2020). The practice of illegal abortion is known to be prevalent in developing countries (Baguiya *et al.*, 2022), where the use of family planning and birth control measures is still primitive (Jaravaza and Saruchera, 2022). The failure to use birth control measures results in unwanted teenage pregnancies that tend to be stigmatised in most African cultures. The stigmatisation of teenage pregnancies and unwanted pregnancies, mostly from infidelity cases, usually motivates the need for abortion (Anjur-Dietrich *et al.*, 2022). Abortions, being illegal in most African societies, push women to dump the aborted foetus at dumpsites as part of the illegal burials (Keatley and O'Donnell, 2023; Keatley *et al.*, 2021). The presence of aborted foetuses at some dumpsites is a scary encounter for the innocent informal waste material pickers going about in their usual business.

Informal waste material pickers also face severe forms of cruelty, such as ritualistic sexual abuse. This trend has been noted in other studies on waste-picking activities (e.g. Nuripuoh *et al.*, 2022). It is likely that sex predators take advantage of the waste pickers' vulnerability (Singh *et al.*, 2023; Marques *et al.*, 2021; Muringa, 2021) and less legal protection (Windi *et al.*, 2023; Porrás-Bulla *et al.*, 2021; Parra, 2020). It has already been alluded to the fact that informal waste material pickers are stigmatised and face social

exclusion. It is this social exclusion that sex predators seek to exploit through sexually abusing vulnerable waste material pickers.

The nature of sexual abuse faced by informal waste material pickers is unique and almost exclusive to African societies where sperm harvesting is conducted for ritual purposes (Sanders, 2021). Traditionally, ritualistic sexual abuses are conducted on women (McCallum, 2021), but the raping of men by women is a new phenomenon. The belief that men's sperm represents life that can be applied in rituals for boosting businesses is novel in nature in the general practices of running businesses. This is premised on the observation that some African people often seek superstitious ways of boosting their business performances (Obeten, 2024).

The findings in this study, however, contrast with those of waste pickers in the global north. It has been noted in a study by Porras-Bulla *et al.* (2021) that although the waste pickers in the Global North face the same fate as their counterparts in the Global South, the severity of their predicament is a bit better. This is particularly accounted for by the developed circular economy infrastructure and civilised governance systems in the Global North (Haswell *et al.*, 2024).

6. Implications

The study highlights informal waste pickers' challenges in developing countries by underscoring significant socio-economic and ecological implications that warrant urgent consideration. Informal waste pickers, who play an essential role in the circular economy, typically operate under conditions that are scary. The findings of this study reveal that these individuals encounter bizarre situations such as gathering waste material for recycling from dumpsites that have decomposing dead animals, dumped witchcraft paraphernalia and territorial fights with scavenging wild animals. Moreover, the lack of official incorporation into municipal waste management systems undermines their livelihoods and hinders effective waste reduction efforts. This leads to amplified environmental degradation. Therefore, policymakers at both central and local government levels are thus urged to embrace the contributions of informal waste pickers through instituting inclusive policies related to safe working conditions. This approach is likely to bring stability and efficiency to the circular economy operations in general and to municipal waste management systems in particular.

The study underscored the importance of informal waste pickers in transitioning to the circular economy. The implications resonate well with the World Bank (2020) report that advocated for an integrated waste management system. The practical implications of this study are that informal waste pickers should be trained on proper methods of waste picking. This move aligns well with the training of informal waste pickers in Jordan. The USAID (2023) reported that the Jordan training of waste pickers enhanced capacity building for the most vulnerable communities. Furthermore, this study has indicated that informal waste pickers should be given some official recognition. This can be operationalised through the insights from the United Nations Development Programme (2023) report that suggested the four empowerment principles. These principles relate to recognising informal waste pickers and improving their working conditions.

7. Conclusion and recommendations

The study concluded that informal waste material pickers, despite being an important constituency in the circular economy in general and recycling businesses in particular, face horrific experiences in executing their activities. More specifically, informal waste material pickers face the threat of ritualistic sexual abuses, scary encounters, territorial fights and

being forced to provide sanctuary to the criminals and justice system fugitives. Therefore, there is a need for integrated environmental policies that encompass the welfare of the informal waste material pickers (Zisopoulos *et al.*, 2023; Ma *et al.*, 2023). This is based on the fact that the activities of the informal waste material pickers reduce the extraction of virgin resources through deploying waste as secondary materials for several industries (Zisopoulos *et al.*, 2023). Thus, there is a great need for taking care of their welfare at a policy level (Rosaldó, 2024). This can be achieved through the formalisation of the informal waste material-picking industry. The formalisation process can be achieved through overcoming the barriers profiled by Rosaldó (2024), such as legal and financial challenges as well as a lack of proper leadership and transparent systems. If not properly done, the formalisation process may take away the informal waste material pickers' meagre source of income. A similar situation happened when formalisation efforts by the city of Johannesburg's 'Pikitup Reclaimers' integration scheme ended up dispossessing the much-attended beneficiaries of the program (Samson, 2020).

Finally, the responsible authorities must also provide some counselling services to the traumatised informal waste material pickers who may have come across scary and superstitious objects such as witchcraft items and aborted fetuses. Informal waste material pickers must also be provided with physical protection afforded to all the citizens by the police. Such a protection enables them to conduct their crucial economic activities that sustain the circular economy without disruptions from the harassment by the criminals and sex predators. Moreover, as Morais *et al.* (2022) previously observed, waste material picking as a profession can improve the conditions of informal waste material pickers through forging unity and stopping intra-fights. Finally, on the basis of Samson's (2020) suggestion, informal waste material pickers must be integrated into the municipality's waste material disposal management systems.

References

- Aetekhai, A.O. and Kalu, J.I. (2023), "Effects of poor drainage system to built environment: a case study of auchi metropolis", *The Journal of Industrial Education and Training (JIET)*, Vol. 5 No. 1, pp. 220-235.
- Akatukwasa, C., Getahun, M., El Ayadi, A.M., Namanya, J., Maeri, I., Itiakorit, H. and Camlin, C.S. (2021), "Dimensions of HIV-related stigma in rural communities in Kenya and Uganda at the start of a large HIV 'test and treat' trial", *Plos One*, Vol. 16 No. 5, p. e0249462.
- Al-Khatib, I.A., Al-Sari, M.I. and Kontogianni, S. (2020), "Assessment of occupational health and safety among scavengers in Gaza Strip, Palestine", *Journal of Environmental and Public Health*, Vol. 2020 No. 1, p. 3780431.
- Anjur-Dietrich, S., Omoluabi, E., OlaOlorun, F.M., Mosso, R., Wood, S.N., Moreau, C. and Bell, S.O. (2022), "Partner involvement in abortion trajectories and subsequent abortion safety in Nigeria and côte d'Ivoire", *BMC Women's Health*, Vol. 22 No. 1, p. 530.
- Baguiya, A., Mehrtash, H., Bonet, M., Adu-Bonsaffoh, K., Compaoré, R., Bello, F.A. and Kouanda, S. (2022), "Abortion-related infections across 11 countries in Sub-saharan Africa: prevalence, severity, and management", *International Journal of Gynecology and Obstetrics*, Vol. 156 No. S1, pp. 36-43.
- Barford, A. and Ahmad, S.R. (2021), "A call for a socially restorative circular economy: waste pickers in the recycled plastics supply chain", *Circular Economy and Sustainability*, Vol. 1 No. 2, pp. 761-782.
- Bayar, Y., Gavriletea, M.D., Sauer, S. and Paun, D. (2021), "Impact of municipal waste recycling and renewable energy consumption on CO₂ emissions across the European Union (EU) member countries", *Sustainability*, Vol. 13 No. 2, p. 656.

- Benz, M.B., Cabrera, K.B., Kline, N., Bishop, L.S. and Palm Reed, K. (2021), "Fear of stigma mediates the relationship between internalized stigma and treatment-seeking among individuals with substance use problems", *Substance Use and Misuse*, Vol. 56 No. 6, pp. 808-818.
- Busfield, J. (2020), "Mental illness", *Medicine in the Twentieth Century*, Taylor and Francis, pp. 633-651.
- Cain, K. (2022), "Spoiled identity? Exploring the impact of wrongful conviction on" self," status, and stigma", Doctoral dissertation, University of Toronto (Canada).
- Carenbauer, M.G. (2021), "Essential or dismissible? Exploring the challenges of waste pickers in relation to COVID-19", *Geoforum*, Vol. 120, pp. 79-81.
- Chawla, R. and Kumar, A. (2022), "The informal sector—an essential but often unrecognised component of solid waste management", *Applied Ecology and Environmental Sciences*, Vol. 10 No. 3, pp. 154-164.
- Chen, Y. (2021), "Addressing environmental challenges through circular economy models", *Journal of Energy and Environmental Policy Options*, Vol. 4 No. 3, pp. 9-15.
- Chen, M.A. (2023), "The informal economy in comparative perspective: theory, policy and reality", *The Indian Journal of Labour Economics*, Vol. 66 No. 2, pp. 395-420.
- Chertow, M., Reck, B.K., Wrzesniewski, A. and Calli, B. (2024), "Outlook on the future role of robots and AI in material recovery facilities: implications for US recycling and the workforce", *Journal of Cleaner Production*, Vol. 470, p. 143234.
- Dada, O.T., Faniran, G.B., Ojo, D.B. and Taiwo, A.O. (2023), "Waste pickers' perception of occupational hazards and well-being in a Nigerian megacity", *International Journal of Environmental Studies*, Vol. 80 No. 4, pp. 933-947.
- Debrah, J.K., Teye, G.K. and Dinis, M.A.P. (2022), "Barriers and challenges to waste management hindering the circular economy in Sub-Saharan Africa", *Urban Science*, Vol. 6 No. 3, p. 57.
- Dini, R. (2020), "The house was a garbage dump': waste, mess and aesthetic reclamation in 1960s and 70s 'mad housewife' fiction", *Textual Practice*, Vol. 34 No. 3, pp. 479-505.
- Dubreucq, J., Plasse, J. and Franck, N. (2021), "Self-stigma in serious mental illness: a systematic review of frequency, correlates, and consequences", *Schizophrenia Bulletin*, Vol. 47 No. 5, pp. 1261-1287.
- Etea, T., Girma, E. and Mamo, K. (2021), "Risk perceptions and experiences of residents living nearby municipal solid waste open dumpsite in Ginchi town, Ethiopia: a qualitative study", *Risk Management and Healthcare Policy*, Vol. 14, pp. 2035-2044.
- Goffman, E. (1963), *Stigma: Notes on the Management of Spoiled Identity*, Simon and Schuster.
- Goodwin, D., Mays, N. and Pope, C. (2020), "Ethical issues in qualitative research", *Qualitative Research in Health Care*, pp. 27-41.
- Gunaratne, N., de Alwis, A. and Alahakoon, Y. (2020), "Challenges facing sustainable urban mining in the e-waste recycling industry in Sri Lanka", *Journal of Cleaner Production*, Vol. 251, p. 119641.
- Haq, Z.U., Rasheed, R., Rashid, A. and Akhter, S. (2023), "Criteria for assessing and ensuring the trustworthiness in qualitative research", *International Journal of Business Reflections*, Vol. 4 No. 2.
- Harfadli, M.M.A., Ramadan, B.S., Rachman, I. and Matsumoto, T. (2024), "Challenges and characteristics of the informal waste sector in developing countries: an overview", *Journal of Material Cycles and Waste Management*, Vol. 26 No. 3, pp. 1294-1309.
- Harlak, H. (2022), "Psychology, sociology, and social psychology", *Routledge Handbook of Social Psychology of Tourism*, Routledge, pp. 1-20.
- Hartmann, C., Hegel, C. and Boampong, O. (2022), "The forgotten essential workers in the circular economy? Waste picker precarity and resilience amidst the COVID-19 pandemic", *Local Environment*, Vol. 27 Nos 10/11, pp. 1272-1286.

- Haswell, F., Edelenbosch, O.Y., Piscicelli, L. and van Vuuren, D.P. (2024), "The geography of circularity missions: a cross-country comparison of circular economy policy approaches in the global North and global South", *Environmental Innovation and Societal Transitions*, Vol. 52, p. 100883.
- Huang, G., Xue, D. and Wang, B. (2020), "Integrating theories on informal economies: an examination of causes of urban informal economies in China", *Sustainability*, Vol. 12 No. 7, p. 2738.
- Inglis, D. (2024), *An Invitation to Social Theory*, John Wiley and Sons.
- Istrate, I.R., Galvez-Martos, J.L. and Dufour, J. (2021), "The impact of incineration phase-out on municipal solid waste landfilling and life cycle environmental performance: case study of Madrid, Spain", *Science of The Total Environment*, Vol. 755, p. 142537.
- Ivey, G. (2023), "Interpreting hidden meaning in qualitative research interview data: opportunities and challenges", *Qualitative Research in Psychology*, Vol. 20 No. 1, pp. 21-51.
- Jain, N. (2021), "Survey versus interviews: comparing data collection tools for exploratory research", *The Qualitative Report*, Vol. 26 No. 2, pp. 541-554.
- Jaravaza, D.C. and Saruchera, F. (2022), "Culture and attitudes towards contraception of women in subsistence markets: the role of values and social axioms", *International Journal of Pharmaceutical and Healthcare Marketing*, Vol. 16 No. 1, pp. 1-21.
- Javed, A., Lee, C., Zakaria, H., Buenaventura, R.D., Cetkovich-Bakmas, M., Duailibi, K. and Azeem, M.W. (2021), "Reducing the stigma of mental health disorders with a focus on low-and Middle-income countries", *Asian Journal of Psychiatry*, Vol. 58, p. 102601.
- Johnson, J.L., Adkins, D. and Chauvin, S. (2020), "A review of the quality indicators of rigor in qualitative research", *American Journal of Pharmaceutical Education*, Vol. 84 No. 1, p. 7120.
- Junjie, M. and Yingxin, M. (2022), "The discussions of positivism and interpretivism", *Global Academic Journal of Humanities and Social Sciences*, Vol. 4 No. 1, pp. 10-14.
- Kain, J.H., Zapata, P., Mantovani Martiniano de Azevedo, A., Carenzo, S., Charles, G., Gutberlet, J. and Zapata Campos, M.J. (2022), "Characteristics, challenges and innovations of waste picker organizations: a comparative perspective between Latin American and east African countries", *Plos One*, Vol. 17 No. 7, p. e0265889.
- Keatley, D. and O'Donnell, C. (2023), "Winthroping as an investigative tool in clandestine grave discovery and psychological profiling", *Journal of Police and Criminal Psychology*, Vol. 38 No. 4, pp. 1-13.
- Keatley, D., O'Donnell, C., Chapman, B. and Clarke, D.D. (2021), "The psycho-criminology of burial sites: developing the winthroping method for locating clandestine burial sites", *Journal of Police and Criminal Psychology*, Vol. 37 No. 1, pp. 1-10.
- Kumar, A. (2020), "Dalit, labour and stigma against waste work: a question of dignity and self-respect", *PalArch's Journal of Archaeology of Egypt/Egyptology*, Vol. 17 No. 9, pp. 10228-10237.
- Lewis, K.A., Jadwin-Cakmak, L., Walimbwa, J., Ogunbajo, A., Jauregui, J.C., Onyango, D.P. and Harper, G.W. (2023), "You'll be chased away": sources, experiences, and effects of violence and stigma among gay and bisexual men in Kenya", *International Journal of Environmental Research and Public Health*, Vol. 20 No. 4, p. 2825.
- McCallum, C. (2021), "Ritual and the origin of sexuality in the alto Xingu", *Sex and Violence*, Routledge, pp. 90-114.
- Ma, W., de Jong, M., Zisopoulos, F.K. and Hoppe, T. (2023), "Introducing a classification framework to urban waste policy: an analysis of sixteen zero-waste cities in China", *Waste Management*, Vol. 165, pp. 94-107.
- Made, F., Ntlebi, V., Kootbodien, T., Wilson, K., Tlotleng, N., Mathee, A. and Naicker, N. (2020), "Illness, self-rated health and access to medical care among waste pickers in landfill sites in Johannesburg, South Africa", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 7, p. 2252.

- Malak, M.A., Prema, S.F., Sajib, A.M. and Hossain, N.J. (2022), "Livelihood of independent waste pickers (Tokai) at Dhaka city in Bangladesh: does it incidental choice of them", *Indonesian Journal of Geography*, Vol. 54 No. 1, pp. 92-104.
- Marques, C.P., Zolnikov, T.R., Noronha, J.M.D., Angulo-Tuesta, A., Bashashi, M. and Cruvinel, V.R.N. (2021), "Social vulnerabilities of female waste pickers in Brasília, Brazil", *Archives of Environmental and Occupational Health*, Vol. 76 No. 3, pp. 173-180.
- Marti-Pastor, M., Ferrer, M., Alonso, J., Garin, O., Pont, A., Flynn, C. and German, D. (2020), "Association of enacted stigma with depressive symptoms among gay and bisexual men who have sex with men: Baltimore, 2011 and 2014", *LGBT Health*, Vol. 7 No. 1, pp. 47-59.
- Metinsoy, S. (2024), "What does neo-classic economics get wrong? Social policy, labour market dualisation, and labour reallocation", *Global Political Economy*, pp. 1-21.
- Mihai, F.-C. and Minea, I. (2021), "Sustainable alternative routes versus linear economy and resources degradation in Eastern Romania", *Sustainability*, Vol. 13 No. 19, p. 10574.
- Misra, R. and Tewari, N. (2022), "Gender, migration, and precarity: a case study of migrant women waste pickers from Assam", *The Indian Journal of Labour Economics*, Vol. 65 No. 4, pp. 1179-1192.
- Montalvo-Romero, N., Montiel-Rosales, A., Fernández-Lambert, G. and Fernández-Echeverría, E. (2022), "Development of an adhesive based on waste management as a mechanism towards sustainability", *Sustainability*, Vol. 14 No. 20, p. 13225.
- Morais, J., Corder, G., Golev, A., Lawson, L. and Ali, S. (2022), "Global review of human waste-picking and its contribution to poverty alleviation and a circular economy", *Environmental Research Letters*, Vol. 17 No. 6, p. 063002.
- Muindi, K., Mberu, B., Aboderin, I. and Amugsi, D. (2022), "Conflict and crime in municipal solid waste management: evidence from Mombasa and Nairobi, Kenya", *Cities and Health*, Vol. 6 No. 1, pp. 159-167.
- Mukucha, P., Mushanyuri, B.E. and Jaravaza, D.C. (2021), "Green sourcing: effects on supplier performance metrics in fast food restaurants in frontier markets", *Logistics, Supply Chain, Sustainability and Global Challenges*, Vol. 12 No. 1, pp. 47-59.
- Mukucha, P., Jaravaza, D.C. and Nyengerai, S. (2023a), "Circular economy of shopping bags in emerging markets: a demographic comparative analysis of propensity to reuse plastic bags versus cotton bags and paper bags", *Cogent Engineering*, Vol. 10 No. 1, p. 2176582.
- Mukucha, P., Sixpence, S., Muzanhenamo, L., Muskwe, N. and Ukpere, W.I. (2023b), "Green supply chain management: the role of sustainable packaging on corporate image and patronage intentions", *Annals of Spiru Haret University. Economic Series*, Vol. 23 No. 4, pp. 553-572.
- Muringa, T.P. (2021), "Challenges and survival strategies of vulnerable groups under COVID-19 induced lockdown: the case of Durban waste pickers", *Journal of Inclusive Cities and Built Environment*, Vol. 1 No. 2, pp. 79-88.
- Nawazi, M., Yousafzai, M.T., Khan, S., Ahmad, W., Saman, M., Han, H., Ariza-Montes, A. and Vega-Munoz, A. (2021), "Assessing the formal and informal waste recycling business processes through a stakeholder's lens in Pakistan", *Sustainability*, Vol. 13 No. 21, p. 11717.
- Neville, L. and Tovar Cortés, L.F. (2023), "Waste pickers' formalisation from bogotá to cartagena de indias: dispossession and socio-economic enclosures in two Colombian cities", *Sustainability*, Vol. 15 No. 11, p. 9047.
- Nguyen, T. and Li, X. (2020), "Understanding public-stigma and self-stigma in the context of dementia: a systematic review of the global literature", *Dementia*, Vol. 19 No. 2, pp. 148-181.
- Nii Laryeafio, M. and Ogbewe, O.C. (2023), "Ethical consideration dilemma: systematic review of ethics in qualitative data collection through interviews", *Journal of Ethics in Entrepreneurship and Technology*, Vol. 3 No. 2, pp. 94-110.

- Nogueira, L.A. (2023), "Exploring the industrial dynamics of waste management and recycling: a call for research and a proposed agenda", *Waste Management*, Vol. 170, pp. 33-39.
- Norman, G., Samkeliso, N. and Taremba, C. (2024), "Determination of the association between health risks of waste picking activities and health conditions at a landfill in Zimbabwe", *African Journal of Nursing, Social Work and Traditional Healing Systems*, Vol. 1 No. 1, pp. 95-111.
- Nuripuoah, J.G., Duwiejuah, A.B. and Bakobie, N. (2022), "Awareness and health risk protection behaviours of scavengers in the gbalahi landfill site, Ghana, in the era of sustainable development", *Discover Sustainability*, Vol. 3 No. 1, p. 1.
- Nzeadibe, T.C. and Ejike-Alieji, A.U. (2020), "Solid waste management during COVID-19 pandemic: policy gaps and prospects for inclusive waste governance in Nigeria", *Local Environment*, Vol. 25 No. 7, pp. 527-535.
- O'Connor, C. and Joffe, H. (2020), "Intercoder reliability in qualitative research: debates and practical guidelines", *International Journal of Qualitative Methods*, Vol. 19, p. 1609406919899220.
- Obeten, U.B. (2024), "Indigenous rituals, panacea for peace building, conflict management and national development in Africa", *Indigenous People-Traditional Practices and Modern Development*, IntechOpen.
- Obilor, E.I. (2023), "Convenience and purposive sampling techniques: are they the same", *International Journal of Innovative Social and Science Education Research*, Vol. 11 No. 1, pp. 1-7.
- Ogwueleka, T.C. and Naveen, B.P. (2021), "Activities of informal recycling sector in North-Central, Nigeria", *Energy Nexus*, Vol. 1, p. 100003.
- Ola, A.B., Wahab, B. and Suleiman, R.A. (2023), "Health risks awareness of E-waste scavengers in Lagos, Nigeria", *International Journal of Community Well-Being*, Vol. 6 No. 4, pp. 1-15.
- Parra, F. (2020), "The struggle of waste pickers in Colombia: from being considered trash, to being recognised as workers", *Anti-Trafficking Review*, No. 15, pp. 122-136.
- Pervin, N. and Mokhtar, M. (2022), "The interpretivist research paradigm: a subjective notion of a social context", *International Journal of Academic Research in Progressive Education and Development*, Vol. 11 No. 2, pp. 419-428.
- Porras-Bulla, J., Rendon, M. and Espluga Trenc, J. (2021), "Policing the stigma in our waste: what we know about informal waste pickers in the global North", *Local Environment*, Vol. 26 No. 10, pp. 1299-1312.
- Rosaldo, M. (2024), "Top-Down and Bottom-Up formalization: Waste pickers' struggles for labor rights in São Paulo and Bogotá", *ILR Review*, Vol. 77 No. 1, pp. 32-61.
- Roy, S., Bose, A., Basak, D. and Chowdhury, I.R. (2023), "Open landfill site and threat to the proximity resident's: Addressing perceived consequences of unscientific solid waste dumping using GIS techniques", *Urban Environment and Smart Cities in Asian Countries: Insights for Social, Ecological, and Technological Sustainability*, Springer International Publishing, Cham, pp. 237-261.
- Rusca, M., Gulamussen, N.J., Weststrate, J., Nguluve, E.I., Salvador, E.M., Paron, P. and Ferrero, G. (2022), "The urban metabolism of waterborne diseases: variegated citizenship, (waste) water flows, and climatic variability in Maputo, Mozambique", *Annals of the American Association of Geographers*, Vol. 112 No. 4, pp. 1159-1178.
- Samson, M. (2020), "The political work of waste picker integration", *The Informal Economy Revisited*, Routledge, pp. 195-200.
- Samson, M., Kadyamadare, G., Ndlovu, L. and Kalina, M. (2022), "Wasters, agnostics, enforcers, competitors, and community integrators': reclaimers, S@ S, and the five types of residents in Johannesburg, South Africa", *World Development*, Vol. 150, p. 105733.
- Sanchez, F.A.C., Boudaoud, H., Camargo, M. and Pearce, J.M. (2020), "Plastic recycling in additive manufacturing: a systematic literature review and opportunities for the circular economy", *Journal of Cleaner Production*, Vol. 264, p. 121602.

- Sanders, T. (2021), "(En) gendering the weather: Rainmaking and reproduction in Tanzania", *Weather, Climate, Culture*, Routledge, pp. 83-102.
- Saunders, M., Lewis, P. and Thornhill, A. (2023), *Research Methods for Business Students*, 9th ed., Pearson Education Limited, Essex: England.
- Schenck, R., Blaauw, D. and Nell, C. (2022), "Waste management in rural South Africa-perspectives from Manfred Max-Neef's human scale development framework", *International Journal of Sustainable Development*, Vol. 25 Nos 1/2, pp. 30-52.
- Senekane, M.F. and Mngomezulu, N.P. (2024), "An investigation of the work challenges faced by solid waste pickers in the city of Ekurhuleni metropolitan municipality, Gauteng South Africa", *OIDA International Journal of Sustainable Development*, Vol. 17 No. 2, pp. 11-24.
- Shabani, T., Jerie, S. and Shabani, T. (2023), "Applicability of the life cycle assessment model in solid waste management in Zimbabwe", *Circular Economy and Sustainability*, pp. 1-21.
- Shah, R., Jafeer, Q.U.A., Saeed, S., Aslam, S. and Ali, I. (2020), "Unemployment and social stigma: naming, blaming and shaming of educated youth in rural Khyber Pakhtunkhwa province of Pakistan", *International Journal of Sociology and Social Policy*, Vol. 40 Nos 7/8, pp. 543-558.
- Sibanda, P.A. and Erwin, K. (2023), "Women's stories of waste picking in the city: 'people look at Us like We are mad, but I don't care'", *Social and Health Sciences*, p. 20.
- Singh, K., Singla, N., Sharma, M. and Singh, J. (2023), "Urban informal economy and vulnerabilities of domestic waste-pickers: a case of Chandigarh, India", *Waste Management and Research: The Journal for a Sustainable Circular Economy*, Vol. 41 No. 8, pp. 1360-1371.
- Šipulová, K. and Kosař, D. (2023), "Decay or erosion? The role of informal institutions in challenges faced by democratic judiciaries", *German Law Journal*, Vol. 24 No. 8, pp. 1577-1595.
- Slettebø, T. (2021), "Participant validation: exploring a contested tool in qualitative research", *Qualitative Social Work*, Vol. 20 No. 5, pp. 1223-1238.
- Smol, M., Adam, C. and Preisner, M. (2020), "Circular economy model framework in the European water and wastewater sector", *Journal of Material Cycles and Waste Management*, Vol. 22 No. 3, pp. 682-697.
- Solaja, O.M., Osifo, O.K. and Amoo, O.F. (2024), "Empowering informal plastic recyclers: addressing socio-economic challenges and human rights awareness in Ogun state, Nigeria", *BMC Environmental Science*, Vol. 1 No. 1, p. 10.
- Tan, R.K.J., Kaur, N., Kumar, P.A., Tay, E., Leong, A., Chen, M.I.C. and Wong, C.S. (2020), "Clinics as spaces of costly disclosure: HIV/STI testing and anticipated stigma among gay, bisexual and queer men", *Culture, Health and Sexuality*, Vol. 22 No. 3, pp. 307-320.
- Tawfik, A.M., Hayek, N., Mahdy, S.S.E., Elsherbiny, N.M., Salem, M.R. and Taie, A.F.H. (2023), "Social and self-stigma during COVID-19 pandemic: Egyptians' perspectives", *Plos One*, Vol. 18 No. 4, p. e0284582.
- Tellado, I., Lepori, B. and Morla-Folch, T. (2020), "WIEGO: Communicative daily life stories to assess social impact in the lives of informal workers", *Qualitative Inquiry*, Vol. 26 Nos 8/9, pp. 962-969.
- The World Bank (2020), "Municipal solid waste management", World Bank Group, available at: <https://ieg.worldbankgroup.org/sites/default/files/Data/Evaluation/files/MunicipalSolidWasteManagement.pdf>
- Trang, N.T., Jauffret-Roustide, M., Giang, L.M. and Visier, L. (2022), "I'm not like others": stigma navigation by people who inject drugs in Vietnam", *Drugs: Education, Prevention and Policy*, Vol. 29 No. 1, pp. 85-94.
- Tutton, C.G., Young, S.B. and Habib, K. (2022), "Pre-processing of e-waste in Canada: case of a facility responding to changing material composition", *Resources, Environment and Sustainability*, Vol. 9, p. 100069.
- Uddin, S.M.N., Gutberlet, J., Ramezani, A. and Nasiruddin, S.M. (2020), "Experiencing the everyday of waste pickers: a sustainable livelihoods and health assessment in Dhaka city, Bangladesh", *Journal of International Development*, Vol. 32 No. 6, pp. 833-853.

- United Nations Development Programme (2023), “Unsung heroes: Four things policymakers can do to empower informal waste workers”, United Nations Development Programme, available at: www.undp.org/blog/unsung-heroes-four-things-policymakers-can-do-empower-informal-waste-workers
- Vázquez, J.J., Suarez, A. and Berríos, A. (2020), “Stigma, extreme poverty and residential situation: residential segregation, household conditions and social relationship satisfaction among trash pickers in León, Nicaragua”, *International Social Work*, Vol. 63 No. 3, pp. 351-363.
- Weideman, E.A., Perold, V., Arnold, G. and Ryan, P.G. (2020), “Quantifying changes in litter loads in urban stormwater run-off from Cape Town, South Africa, over the last two decades”, *Science of The Total Environment*, Vol. 724, p. 138310.
- Windi, Y.K., Livingstone, C. and Whittaker, A. (2023), “Does national health protection cover the vulnerable groups in Indonesia? A case study of waste pickers in Surabaya”, *Asia Pacific Journal of Public Health*, Vol. 35 No. 8, pp. 479-485.
- Xu, Y. and Zhao, F. (2023), “Impact of energy depletion, human development, and income distribution on natural resource sustainability”, *Resources Policy*, Vol. 83, p. 103531.
- Yousafzai, M.T., Nawaz, M., Xin, C., Tsai, S.B. and Lee, C.H. (2020), “Sustainability of waste picker sustainopreneurs in Pakistan’s informal solid waste management system for cleaner production”, *Journal of Cleaner Production*, Vol. 267, p. 121913.
- Zela (2023), “Proper plastic waste management is critical”, Zela, available at: <https://zela.org/proper-plastic-waste-management-is-critical/>
- Zimbabwe National Statistics Agency (2023), “2022 Population and housing census: National report”, available at: www.zimstat.co.zw/wp-content/uploads/Demography/Census/2022_PHC_Report_27012023_Final.pdf
- Zisopoulos, F.K., Steuer, B., Abussafy, R., Toboso-Chavero, S., Liu, Z., Tong, X. and Schraven, D. (2023), “Informal recyclers as stakeholders in a circular economy”, *Journal of Cleaner Production*, Vol. 415, p. 137894.
- Zolnikov, T.R., Furio, F., Cruvinel, V. and Richards, J. (2021), “A systematic review on informal waste picking: Occupational hazards and health outcomes”, *Waste Management*, Vol. 126, pp. 291-308.

Further reading

- Aguilera-Alcalá, N., Morales-Reyes, Z., Martín-López, B., Moleón, M. and Sánchez-Zapata, J.A. (2020), “Role of scavengers in providing non-material contributions to people”, *Ecological Indicators*, Vol. 117, p. 106643.
- Cunningham, C.X., Johnson, C.N., Barmuta, L.A., Hollings, T., Woehler, E.J. and Jones, M.E. (2018), “Top carnivore decline has cascading effects on scavengers and carrion persistence”, *Proceedings of the Royal Society B*, Vol. 285 No. 1892, p. 20181582.
- Focardi, S., Materassi, M., Innocenti, G. and Berzi, D. (2017), “Kleptoparasitism and scavenging can stabilize ecosystem dynamics”, *The American Naturalist*, Vol. 190 No. 3, pp. 398-409.
- Haas, R., Watson, J., Buonasera, T., Southon, J., Chen, J.C., Noe, S., Smith, K., Viviano Llave, C., Eerkens, J. and Parker, G. (2020), “Female hunters of the early Americas”, *Science Advances*, Vol. 6 No. 45, p. eabd0310.
- Hames, R. (2019), “Pacifying hunter-gatherers”, *Human Nature*, Vol. 30 No. 2, pp. 155-175.
- Lupo, K.D. (2019), “Hounds follow those who feed them: what can the ethnographic record of hunter-gatherers reveal about early human-canid partnerships?”, *Journal of Anthropological Archaeology*, Vol. 55, p. 101081.
- Malik, N.K.A. and Manaf, L.A. (2018), “Potential recyclable materials derived from riverine litter at log boom Sungai Batu in Kuala Lumpur”, *Journal of Material Cycles and Waste Management*, Vol. 20 No. 2, pp. 1063-1072.

- Medina, G.N., Segundo, F.D.S., Stenfeldt, C., Arzt, J. and De Los Santos, T. (2018), "The different tactics of foot-and-mouth disease virus to evade innate immunity", *Frontiers in Microbiology*, Vol. 9, p. 2644.
- Monadjem, A., Kane, A., Botha, A., Kelly, C. and Murn, C. (2018), "Spatially explicit poisoning risk affects survival rates of an obligate scavenger", *Scientific Reports*, Vol. 8 No. 1, p. 4364.
- Norsa'adah, B., Salinah, O., Naing, N.N. and Sarimah, A. (2020), "Community health survey of residents living near a solid waste open dumpsite in Sabak, Kelantan, Malaysia", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 311, pp. 1-14.
- Perrig, P.L., Lambertucci, S.A., Donadio, E., Smith, J.A., Middleton, A.D. and Pauli, J.N. (2023), "Risk effects Cascade up to an obligate scavenger".
- Saldanha, S., Kirchhelle, C., Webster, E., Vanderslott, S. and Vaz, M. (2022), "Between paternalism and illegality: a longitudinal analysis of the role and condition of manual scavengers in India", *BMJ Global Health*, Vol. 7 No. 7.
- USAID Learning Lab (2025), "Waste pickers training program: building capacity for the most vulnerable", USAID Learning Lab, available at: <https://usaidlearninglab.org/resources/waste-pickers-training-program-building-capacity-most-vulnerable>

Corresponding author

Paul Mukucha can be contacted at: paulmukucha@gmail.com