

Evaluating the Efficacy of Social Capital in Facilitating Sustainable Municipal Waste Management: Reflections from Harare, Zimbabwe

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RESEARCH ARTICLE

Abstract

The volumes of waste in urban areas around the globe continue to increase due to the upsurge in disposals from exponentially growing urban populations. Ideally, the waste must be regularly collected by responsible councils, but in some countries, the collection has been erratic due to operational challenges. Unfortunately, this is the current and perpetually unresolved problem in Zimbabwe. A lack of garbage collection vehicles, as well as a lack of fuel for the available refuse collection trucks, has resulted in sporadic refuse collection in urban areas. The accumulation of uncollected waste in Zimbabwe's urban areas pollutes the environment and exposes the inhabitants to health risks, leaving waste management responsibilities to the community. This research adopts the mixed-methods approach to evaluate the efficacy of using community social capital in waste management in urban Zimbabwe. Data was collected through a survey, observations, and key informant interviews. The study revealed that due to poor refuse collection by the Harare City Council, residents had taken the initiative to use their social capital to manage waste in their communities through mechanisms like clean-up exercises, environmental cleanliness training workshops, and forming collaborations with community-based organizations. However, these social capital initiatives are backtracked by some errant residents who continue to dump waste in undesigned areas. Measures such as introducing waste recycling income generation projects, incentivizing community clean-up participants, and enforcing penalties for dumping waste in illegal places are recommended to support social capital initiatives in municipal waste management in Harare.

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1 INTRODUCTION

Urban waste management is a global concern as large volumes of waste are disposed of in urban environments (Liu & Dong, 2021). The majority of the global population now resides in urban areas, increasing the amount of waste generated at the household level (Zhou et al., 2022). The global trend, particularly in developing countries, is that the volume of household waste surpasses the capacity of governing institutions to collect it regularly (Handoyo et al., 2020). Collecting urban

waste often involves local authorities, including councils or municipal administrations (Pichtel, 2005). However, due to a cocktail of contextual and operational limitations, these local authorities often fail to collect refuse regularly, which results in residents dumping waste in undesignated areas (Rahnama & Sharifzadeh Aghdam, 2018). The illegal dumping of waste may be a sign of desperation on the part of residents. However, it negatively impacts environmental safety and the health and well-being of the community. Illegal dump sites can be a source of diseases such as tuberculosis, pneumonia, whooping cough, lung cancer, and respiratory diseases, as well as some vector-borne diseases such as malaria (Fazzo et al., 2023; Zhong & Hwang, 2018). Given these views, it is arguable that there is a need to rethink and redesign the sustainable mechanisms for appropriately managing waste and mitigating the health hazards that emerge from poor waste management in urban areas. Waste management is a mammoth task for governing authorities in developing countries (Nedziwe & Murairwa, 2022; Momodu et al., 2011).

The failure of local authorities to provide sustainable waste management solutions has created opportunities for residents in different communities to play an integral role in managing the waste generated from their households. Local governance scholars recommend a shift from local government-driven waste management approaches to community-based waste management models (Kwenda et al., 2023; Iraguha et al., 2022; Maharani et al., 2019). Collaboration through social capital and community networks is one of the main strategies urbanites use to manage household waste in their communities (Rahnama & Sharifzadeh Aghdam, 2018). In Zimbabwe, using social capital and community networks in urban waste management is still nascent, and its success depends on the residents' commitment to keeping their environment clean. This article evaluates the different social capital methods and community networks used by residents in different urban environments in Zimbabwe to manage household waste. The objective outlined in this article is to broaden the understanding of the utility of social capital and community networks' innovative strategies for organizing collaborative efforts in urban waste management in developing countries. This study draws insights from the classical social capital theory, which Putnam developed. This theory explains how norms, values, and relationships embedded in societal connections can be used to achieve common goals by enabling collaborative action (Putnam, 1994). Social capital describes the fundamental social and cultural logic, rules, moral principles, and rules that govern interactions between individuals in society. Social capital creates networks of trust and reliance that can hold society together (Beausaert et al., 2023; Putnam, 2002). This article evaluates how the social capital model has influenced the establishment of community-based waste management strategies and the efficacy thereof in Harare, Zimbabwe.

The social capital theory is useful in this study as it helps analyze how established community networks and relationships in sampled residential areas of Harare have been used to manage waste in these communities. In his social capital theory, Putnam developed two types of social networks: vertical relationships and horizontal relationships (Putnam, 1994; Coleman, 1998). Vertical relationships are collaborations between and amongst people at different levels of authority and status in society, as with residents and their local government leaders (Halpern, 2005). Horizontal relationships are associations between and among people of equal social standing, as is the case with alliances, associations, and cooperatives formed by residents with other residents of the same community (Bernstad, 2014; Cleaver, 2005). Guided by the social capital theory, this article evaluates the efficacy of social capital and community networks for waste management in Zimbabwe, drawing insights from selected residential areas in the City of Harare. The next sections of the article will cover the review of the current literature, the theoretical framework, the research methodology, the results and discussion, and the conclusions and recommendations.

1.1 A Synopsis Review of Existing Literature on Waste Management

Urban waste growth is a global concern, threatening human health and environmental safety (Lamichhane et al., 2023; Knickmeyer, 2020). Sustainable urban waste management is a global problem, and strategies to address this challenge have been proposed in extant literature. However, finding a waste management framework that is universally applicable is a difficult task due to contextual differences because most of the strategies proposed in current literature are

restricted to local or national relevancy. For example, in a study on waste management methods in Mojokerto City in Indonesia, strategies such as community participation and increased cooperation with residents, developing a system of rewards and sanctions, as well as reuse, recycling, and environmentally safe disposal were recommended (Rizani et al., 2016). Mutual coordination among community members and stakeholders has also been proposed as a useful strategy for managing municipal waste (Aslam et al., 2020).

Past research proposed developing and applying a decision support system (DSS) that allows planning for the optimal number of landfills and determining the optimal quantities and characteristics of the refuse to be sent to treatment plants and recycled (Fiorucci et al., 2003). Some studies have also proposed pre-sorting household waste before it is collected or disposed of as another municipal waste management strategy (Knickmeyer, 2020). The development of incineration and recycling programs has also been proposed in cities such as Genova in Italy (Fiorucci et al., 2003). In some cases, 'waste management consciousness' has led to the development of waste control technologies to minimize its environmental impact (Maiurova et al., 2022). Developing local integrated waste management schemes that prioritize prevention, reduction, and recovery has also been proposed (Mutemani et al., 2022).

Past studies have also shown that in industrialized countries such as Japan, strategies such as the Waste Management Hierarchy (WMH), which emphasizes methods such as prevention/minimization, recovery, and incineration, have been adopted to manage municipal waste (Sakai et al., 1996). In developed cities such as Barcelona in Spain and Berlin in Germany, strategies such as waste separation are used wherein residents leave their refuse at special collection areas where different types of waste such as glass, paper, plastic, or organic material are stored in special refuse bins (Dornack, 2017; Bautista & Pereira, 2006). Depending on the type, the collected waste is recycled or disposed of in landfills. In the extant literature, strategies such as using a material recovery facility (MRF) have also been proposed in cities such as Chittagong and Dhaka in Bangladesh (Islam, 2017). A material recovery facility is a plant that separates or sorts a wide array of recyclable materials to be sold to end buyers (Lubongo & Alexandridis, 2022). The use of smart technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT) for sustainable waste management has also been proposed in past studies (Nižetić et al., 2019). Some waste management strategies in literature are linked to specific types of waste, such as squeezing and pulverizing plastic waste and bio-methanation for converting organic solid waste into methane and manure (Rajmohan et al., 2019). In India, strategies such as refuse-derived fuel, composting, anaerobic digestion, and sanitary landfilling have been proposed to manage the increase in municipal waste (Pujara et al., 2019). Other waste management strategies, such as the zero-waste approach, have been proposed (Awasthi et al., 2021). A zero-waste approach is a holistic waste management model that entails responsible waste production, consumption, and disposal in a closed circular system (Aslam et al., 2020).

Previous studies have also focused on the need for participatory processes and community-based waste management initiatives to promote community members' environmental sustainability, health, and safety within their neighborhoods (Karimah et al., 2022; Manning & Sun, 2015). In addition, previous studies have also shown that if waste management is conducted collaboratively, the entire community can benefit without additional costs to anyone (Cleaver, 2005). Research in countries such as India has shown notable developments in communities where there is a cooperation between households to solve environmental problems such as littering the streets (Anna et al., 2015). Past scholarly contributions on municipal waste management in Zimbabwe have focused on other dimensions such as challenges to solid waste management (Nyarai et al., 2016), challenges to effective participation in community-based solid waste management (Sinthumule & Mkumbuzi, 2019); household solid waste handling practices in urban areas (Zikali et al., 2022; Kwenda et al., 2022); least impactful solid waste management practices (Nhubu & Muzenda, 2019); the institutional framework for solid waste management (Jerie, 2006); solid waste management during the Covid-19 pandemic lockdowns (Dzawanda & Moyo, 2022; Jerie, 2006) as well as the contribution of municipal solid waste management options to life cycle (Nhubu & Muzenda, 2019).

However, there has not been an analytical focus on how social capital can facilitate sustainable municipal waste management in Zimbabwe, and this presents a gap in the current literature. This research addresses a contextual gap in applying strategies to municipal waste management. The study observes that the efficacy of social capital in facilitating sustainable waste management in Zimbabwe has not been explored. This research, therefore, contributes to the extant literature on municipal waste management by evaluating the efficacy of social capital models in municipal waste management, drawing experiences from the City of Harare in Zimbabwe. The current study observes that while municipal waste management scholarship acknowledges the role of communities and stakeholders, there is limited analytical focus on context-specific social capital models for improving municipal waste management. This research takes up the task of exposing and evaluating the social capital models for managing waste sustainably in a complex urban environment.

2 METHODOLOGY

2.1 Research Approach

The research adopts the mixed-methods research approach as the strategy of inquiry. The mixed-methods research approach combines quantitative and qualitative research techniques in one inquiry (Johnson et al., 2007). This study enabled the researchers to use statistical and non-statistical epistemologies, such as key informant interviews and a survey, to investigate the forms of social capital linked to waste management in selected residential areas in Harare, Zimbabwe. The research philosophy guiding the use of the mixed-methods research approach in this study is pragmatism, which states that researchers should use a methodological approach that best meets their data needs (Kaushik & Walsh, 2019). This research required numerical and non-numerical data, making pragmatism and the mixed-methods research approach important. For example, the research sought numerical data (quantitative) on the number of households practicing waste separation for recycling purposes while also pursuing non-numerical data (qualitative) on why some urban residents dump waste in undesignated areas.

2.2 Research Design and Study Area

The research uses the case study research design, which is both descriptive and explanatory. In this regard, four (4) sampled high-density residential areas in the City of Harare are used as social laboratories or cases to describe and explain how social capital has been integrated into waste management in urban environments in Zimbabwe. The reason for selecting high-density residential locations is only because these areas have a higher prevalence of illegal dump sites. They often experience irregular refuse collection by the council, leading to rudimentary waste disposal, as exposed by Dzawanda and Moyo (2022). As a result, illegal dump sites in these areas constitute an eyesore and relevant case for the inquiry in this research.

2.3 Population and Sampling

The targeted units of analysis in this research were various residents from four (4) different high-density neighborhoods in Harare. Sampling was done to select both the residential areas to be part of the study and to recruit residents from the selected residential areas. The four (4) high-density residential suburbs were selected using cluster sampling. Four clusters were used based on the location of the residential area using the four cardinal directions: North, East, South, and West. The direction of the location was determined from the Harare Central Business District. Two high-density residential locations were then randomly selected from each cardinal direction. Hatcliffe Extension was selected from Harare, while Southlea Park was selected from Harare South. From Harare East, Mabvuku was selected, while from Harare West, Budiriro was the selected residential location. Convenience sampling was then used to select available residents in the four residential locations based on their willingness to participate in the survey and interview sessions. A total of 20 participants were interviewed. Of these, 19 participated in face-to-face

interviews, while one interview was conducted telephonically. All interviews were held in a safer place for 15 to 20 minutes. In total, 120 closed questionnaires were disseminated in the four residential areas, 30 in each residential area sampled. Of these questionnaires, 112 were returned, and six were not returned. Two returned questionnaires were spoilt.

2.4 Data Collection and Analysis

Both primary and secondary data were collected in this study. Primary data were collected through the survey, in-depth interviews, and direct observations. In-depth interviews were conducted with residents to gain insights into how they have integrated their community networks or social capital base into waste management in their respective communities. Closed-ended questionnaires were also distributed in the selected residential areas to collect data on the waste management practices in the sampled areas. Direct observations were also used to gather data on the proliferation of unauthorized waste disposal sites in the sampled residential locations. Secondary data was also collected through systematic literature reviews in the form of books, research papers, and newspaper articles. The qualitative data collected were analyzed using thematic and content analysis, while quantitative data collected were analyzed through statistical compilations aided by Microsoft Excel.

3 RESULTS AND DISCUSSION

Waste Management in Zimbabwe is guided by the Environmental Management Act (EMA Act) [Chapter 20:27]. In particular, section 70(1) of the EMA Act states that it is illegal to dispose of any waste in a manner that causes environmental harm or poses health threats to another person. Section 81 (1) of the EMA Act also prohibits waste disposal in authorized areas, stating that litter must be discarded in any place except in a container designated for that purpose. All these provisions emphasize the need to either dispose of waste in proper areas or to recycle it (Takunda & Steven, 2023; Chatira-Muchopa et al., 2019). However, illegal waste dumping in urban communities remains a major concern in Zimbabwe's urban environments due to erratic refuse collection by the responsible local authorities (Zikali et al., 2022). The following section briefly characterizes the main forms of waste found in residential areas in Harare.

3.1 The main forms of waste and trends in refuse collection by the Harare City Council

The study revealed that the main forms of household waste in Harare include plastics, metal objects, old and torn clothes and shoes, old electrical gadgets, meat bones, food waste, rotten vegetables, used diapers, empty food cans, rotten fruits, as well as empty plastic and glass bottles. These were observed from some dump sites and landfills in the studied residential areas. The study revealed that waste in the sampled residential areas is usually collected once a week, but sometimes, the council can go up to two months without collecting the refuse. The interviewed residents lamented that the council continues to bill them for refuse collection, even if they can go for months before the waste in their area is collected. The research sought to explore the destination of uncollected waste, and the responses captured in Figure 1 were obtained from 112 questionnaire responses.



Figure 1. Options used by Harare residents to manage uncollected waste

Further interactions with some residents revealed that the type of waste they have determines what they do with it if the council does not collect it in time. A resident in Southlea Park revealed that it is possible to use all four options for household waste. The resident stated:

“The type of waste determines what I do with it in case the council fails to collect it. All four options apply to me. If the waste can be burnt, as with papers, I can burn it; if it decomposes, I develop a compost. Waste that cannot be burnt or recycled into compost, I keep for some time and wait for the council to collect. If councils take more than two months without collecting the waste, I will dump it at the local dump site.”

In Mabvuku, residents indicated that since the council has been slacking in collecting waste, some residents have resorted to dumping as their first option for getting rid of the waste. Dumping is easier for residents as they move bins from their homes to nearby dumping spots. Residents who dump waste in undesignated areas demonstrate a lack of awareness of the environmental and health scares created by such practice. The observed dump sites show that some residents dump waste in undesignated areas if the council does not collect it in time. Such a dumpsite is a health and environmental hazard. In addition to being an eyesore, the decomposing waste in the dump site can create health scares for nearby households. While some residents may consider burning waste on the dump site, such a practice can also cause air pollution, which is also an environmental pollution scare. As such, residents must create social capital networks to educate each other on the appropriate and sustainable ways to manage uncollected waste.

3.2 The level of awareness of separation of waste before disposal

The study sought to establish if residents in the four residential locations sampled practice waste separation before disposal. The study revealed that most residents in the sampled residential areas do not separate waste before disposal. Of the 112 questionnaire responses on whether the respondents separate waste before disposal, 18 confirmed that they practice waste separation. The other 90 residents indicated that they did not separate waste before disposal. The remaining four respondents did not answer this question, and the output of this variable is illustrated in the pie chart shown in Figure 2.

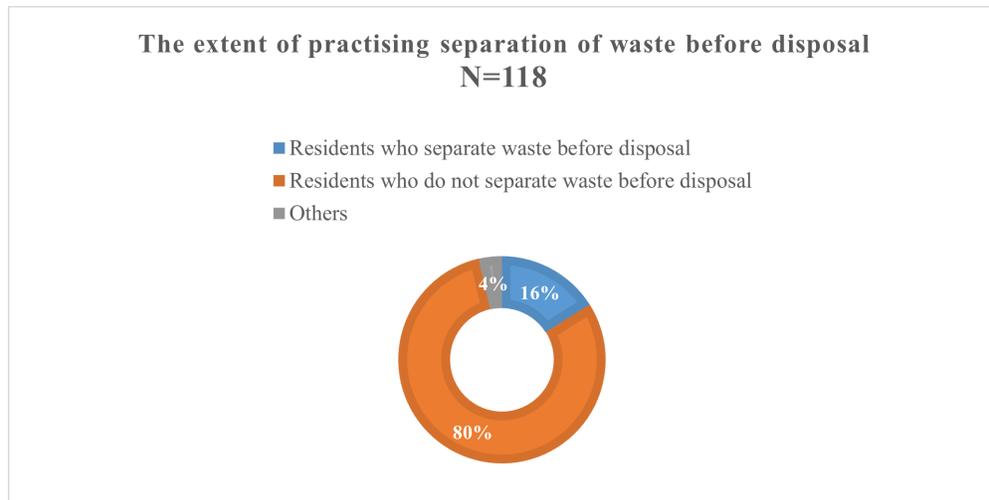


Figure 2. The level of practicing waste separation before disposal in Harare

Separating waste is noble, allowing the council to identify recycled waste material. However, in the interactions with the residents through interviews, some revealed that they did not separate waste because they did not see the purpose of doing so. One resident stated:

“All the garbage goes to the same place, after all. Yes, I know what waste separation is, but it is labor-intensive. I cannot use my time to separate waste when it is eventually in the same place.”

It is encouraging that some residents already practice waste separation, and they can use their networks and relationships with others in the community to educate them on the benefits of doing so. The next section focuses on the different forms of social capital networks useful for waste management in the sampled residential areas in the City of Harare.

3.3 Existent social capital networks for waste management in urban areas in Zimbabwe

The research findings revealed that the Urban Councils Act of Zimbabwe [Chapter 29:15] designates the primary responsibility for waste management to local authorities or municipal governments. However, residents and other community stakeholders also have a role in ensuring that waste is properly disposed of. Waste management is a collaborative effort amongst local government institutions, Civil Society Organizations (CSOs), residents, and other stakeholders. Local authorities are responsible for providing waste collection services through regular refuse collection in the areas of jurisdiction. Local authorities encourage proper waste management in different communities through by-laws and enforcing penalties for those violating these regulations. Local authorities also conduct awareness campaigns and build networks with communities to ensure that residents in different localities comply with municipal waste management regulations. However, the rate at which municipal regulations are violated in urban areas is worrying, as reflected by the continuous proliferation of illegal dump sites in residential locations. The next section presents some forms of networks or social capital for waste management in Harare.

3.3.1 Partnerships and Collaborations in Communities

Partnerships and collaborations between local authorities and CSOs are a form of social capital for managing waste in urban environments in Zimbabwe. Urban residents also play a part in ensuring that their communities are clean. One of the CBOs actively engaged in waste management processes in the City of Harare is the Miracle Mission Trust. Miracle Missions Trust is a non-profit organization whose chief function is nation-building. This CBO has partnered with the City of

Harare, Waste Management, the Environment and Tourism Minister, and the Environmental Management Agency to manage waste in the capital city. The study revealed that Miracle Mission Trust has a network of over 2000 stakeholders who share a common interest in the environment in Zimbabwe and how it is being affected by illegal dumping and littering. Regarding their involvement in community waste management, a representative of Miracle Mission Trust who was interviewed telephonically stated:

“Our role is to build a strong collaboration network between various partners in the urban waste management chain. We organize communities to be accountable and act towards waste management in different parts of the country. If there is dependency or if we wait for someone else to pick up the garbage without anyone taking ownership of our problems, communities will experience health and environmental hazards.”

The primary function of Miracle Missions Trust is nation-building by bringing people together as a proactive community in the sustainable management of municipal waste. This CBO facilitates networking meetings, creates relationships between councils and residents, and coordinates efforts to solve critical community needs, including ensuring that all refuse is properly disposed of. However, the effectiveness of the Miracle Missions Trust is curtailed by the economic slump currently prevailing in Zimbabwe as the authority is struggling to manage neighborhood waste under restricted budgets and highly inadequate malfunctioning equipment. Nevertheless, social capital is still important in creating community bonds and relationships to pursue a common goal. The study revealed that apart from the tripartite partnership and collaboration of residents, local authorities, and CBOs, residents in the sampled areas use different forms of social capital to work together to manage community waste. Some of these forms of social capital are discussed below.

3.3.2 Community Bonds and social ties

The basic form of social capital that has helped in efforts towards managing waste in Harare comes from social relations within communities. These relations include living close to each other in the same street, going to the same church, sharing the same borehole, and sharing the same community facilities such as shopping centers. Ties developed from being in the same community are used as stepping stones to create platforms for encouraging each other to practice safe waste disposal. In Putnam’s social capital model, this is the bonding social capital type, in which teams of the same level with shared values forge relationships to achieve the common good together. In Mabvuku, residents bond easily as their houses are close to each other, making it easy to communicate on community developmental issues. Regarding waste management, the proximity of houses in this area makes it easy for them to share ideas on the best methods to manage household waste without dumping it in illegal cities. The residents also use their bonds to reprimand each other in a friendly manner when they engage in improper waste disposal. This has helped ensure that everyone in the community does not engage in illegal waste disposal because of the respect for shared community values. This was revealed by a resident in Mabvuku who averred:

“Illegal dumping of waste is never tolerated in this community. Those who violate agreed principles for proper waste management are sanctioned. As residents, we have the responsibility to keep our environment clean. The council has failed us through the irregular refuse collection, but we cannot fail ourselves.”

In Budiriro, residents revealed that they conduct social gatherings to teach each other safer and more sustainable ways of managing waste. These residents acknowledged that even if the refuse collection schedule by the council is erratic, their communities are clean because they educate each other on how to ‘deal with’ uncollected refuse instead of dumping it in undesignated areas. Residents admitted, however, that despite their attempts to reduce unlawful garbage dumping practices, some few wayward members of the community continue to display the opposite behavior. For instance, in an interview, a resident of Budiriro lamented this saying:

“Our best shots at managing waste in this community are often dented by some members who ignore calls for maintaining a clean environment. Such members continue to dump waste in undesignated areas. Sometimes, the same people vocal in community meetings

are seen violating waste disposal. Some community members also know there are no direct punishments for disposing of waste in undesignated areas, so they continue dumping waste at street corners and drainage systems. This often discourages other members from practicing safer waste disposal."

The residents also indicated that they have Community WhatsApp groups where they educate each other on the best ways to manage waste. Families and churches are also pivotal in sustainable waste management advocacy and education. The study revealed that when community gatherings are held, each family's elders are encouraged to teach and nurture their children on the best ways to manage waste so they can be sensitive to proper waste management. An interviewed resident in Budiriro stated:

"Waste management is a sustainable process, and the future generation should be oriented to best practices for managing waste. Parents and guardians are responsible for ensuring that the children in their care know the dangers of inappropriate waste management. Parents should not fail their children in this regard because doing so will mean failing the community at large."

The above observation places the family as the primary form of social capital for nurturing expected societal behaviors. The study also revealed that apart from the family, churches also play an important role in ensuring that the message for proper waste management reaches the community. Thus, church leaders teach their congregants about the benefits of proper waste disposal and the health or environmental hazards associated with improper disposal. Therefore, while it is understood that this is not their core business, church leaders are expected to go beyond evangelical teachings and play a waste management advocacy role to ensure the community remains clean. These efforts are, however, undermined by some errant community members who continue to dump waste in undesignated places against the community value systems and best practices for managing waste.

3.3.3 Teamwork in clean-up campaigns

Interviews with residents in Hatcliffe Extension also revealed how social capital had been used to organize clean-up campaigns to keep the community clean from waste. The residents who participated in this research indicated they had formed community teams to clean the shopping centers and street corners where some people illegally dump waste. The study participants indicated they do not wait for the council to collect refuse because the schedule is misleading. According to the interviewed residents, sometimes the council does not collect refuse for a month, which subjects them to health risks associated with decomposing waste in their communities. As such, the residents have taken the initiative to 'do it for themselves' through regular clean-up exercises. In this regard, the residents have appointed 'street supervisors' to coordinate the community clean-up processes, demonstrating how community networks can be useful in urban waste management. These arrangements are consonant with the principles of the social capital model, which states that assigning responsibilities for attaining a common goal is essential in boosting collaboration and creativity in addressing a common challenge. The study also indicated that residents' participation in clean-up campaigns is compulsory, as every household is expected to send a representative at least once monthly. The residents indicated that each household must demonstrate commitment to managing waste in the community by voluntarily participating in the community clean-up exercise. Emphasizing this, one resident interviewed in Hatcliffe Extension indicated that a household's failure to participate in these clean-up campaigns is a sign of negligence. The resident further enthused:

"The community clean-up exercises are done every Monday to ensure that every week starts on a clean slate. Shopping centers are targeted because they are the hub of local economic activities during the weekends and thus prone to dumping waste by some community members. So, cleaning the environment on a Monday cleans the community of the litter dumped by some errant members on weekends."

In Southlea Park, residents indicated that they have set up a team on every street to act as community watchdogs against members who dump litter in unauthorized places. The study also

revealed that WhatsApp groups have also been formed to alert community members of areas where litter is being dumped. The use of social media demonstrates how residents are taking advantage of technological advances to propagate the message of appropriate waste management practices in their communities. In these WhatsApp groups, messages for avoiding dumping waste are shared. Commenting on this issue, in one interview, a senior resident noted:

“The teams set up to watch over the community do not penalize those caught engaging in illegally dumping material. Rather, these members only alert the community elders and street supervisors, who then summon the culprits and show them the light. The idea is to help them be part of the fight against the illegal dumping of waste and not to punish them. Sometimes, we engage the councilor to talk to these people so that they can see the importance of the issue.”

While at the time of data collection, there were no specific penalties for the people who are caught dumping refuse in undesignated areas, the interviewed members indicated that the objectives of community watchdogs were not to punish culprits but to identify them and educate them in the benefits of disposing of waste in its designated areas. Thus, the residents allow the culprits to reform and join others in achieving a waste-free community. The objective is to ensure these culprits change behavior and assume important future waste management roles.

3.3.4 Alliance Building for Waste Management Training Workshops

The study revealed that alliance and community networks in the sampled residential areas enable them to organize training workshops for waste management. For example, residents in Mabvuku indicated that they conduct training sessions on managing waste generated in households and separating waste before disposal. In some cases, these training sessions are facilitated by environmental specialists from the Environmental Management Agency (EMA) at the invitation of the community through their councilors. The community first engages their councilor, who will then request EMA to send a representative to train the community members on the various environmentally friendly options for managing waste in the respective community. Regarding the social capital theory developed by Putnam, this approach represents the linking type of social capital, as it reinforces relationships between people at different levels in the community. This demonstrates how the bond between various groups in this area plays a role in waste management. The residents also indicated that sometimes officers from the Harare City Council are invited to facilitate workshops on waste management. The officers teach residents the safer methods of disposing of some uncollected refuse, such as developing a compost. In an interview with a resident in Southlea Park, it was revealed that in some instances, council waste management officers train residents on how to separate waste before disposal, as this will quicken the recycling process. The study further revealed that training workshops also educate community members on the penalties for dumping waste in undesignated areas. The overall aim of these workshops is to ensure that there is community cooperation in waste management. However, the major challenges in organizing these workshops include limited financial resources and a shortage of venues that will accommodate many participants.

4 CONCLUSIONS AND RECOMMENDATIONS

Urban areas in Zimbabwe are faced with rapid demand for effective and efficient ways of managing waste, which continues to mount because of the increase in urban populations. Urban local authorities in Zimbabwe seem to be grappling with a regular collection of refuse, particularly in high-density residential locations with higher populations. As a result, the current waste management system in most urban areas in Zimbabwe has become community-driven, based on the social networks among residents. In Harare, the City council's erratic waste collection schedules have forced residents to design community-based waste management strategies to ensure they live in a safe environment. The idea was that sustainable waste management would be achieved with community involvement and producer responsibility. However, the major concern amongst residents is that the council continues to bill them monthly for refuse despite its irregular schedules for refuse collection in their areas. Residents in different locations use their social ties to ensure they live in a litter-free environment. Nonetheless, many challenges

are faced in achieving this goal. For example, some errant community members dump waste in undesignated areas. In addition, some community members do not comply with calls to participate in community-arranged clean-up initiatives because there are no enforcing penalties attached to non-compliance. On a positive note, some residents have taken it upon themselves to manage waste by recycling organic matter as compost to be used as manure for their domestic gardens. This research establishes that it is encouraging that these responsible community members are trying to educate others about safer and sustainable ways to manage waste through the social capital approach. In light of these views, this paper recommends the following as measures to strengthen the waste management system in addition to the social capital platforms currently in place in urban environments:

- Schools must introduce community clean-up groups to educate children on their obligations in community waste management processes and inculcate a sense of responsibility for environmental safety. With obligations comes responsibility; thus, children will eventually be responsible for managing their environment as future generations.
- There is a need to introduce income-generating community recycling projects to give residents a financial incentive for proper waste management. With proper planning, such projects will also generate employment in different communities.
- The council should work with community leaders to punish residents who violate by-laws by dumping waste in undesignated areas. Hefty fines can force people to be disciplined towards proper community waste management.
- The council should incentivize households to participate in community clean-up exercises. For example, giving participants rate discounts or introducing rate amnesty to clean-up campaign participants.

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