International Journal of Humanities Social Science and Management (IJHSSM)
Volume 3, Issue 5, Sep.-Oct., 2023, pp: 238-303www.ijhssm.org

Evaluating the Participatory Approaches of the Communities in Supervising Waste Disposal at Central Markets: A Case study of Blantyre District, Malawi

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Date of Submission: 04-09-2023 Date of Acceptance: 15-09-2023

ABSTRACT
This study employed a robust case study design to comprehensively analyze waste management initiatives within Blantyre City Council. Drawing inspiration from Sekaran (2003), the design facilitated an in-depth exploration of analogous scenarios within organizations facing similar challenges. The research integrated both qualitative and quantitative methodologies to holistically examine the multifaceted dimensions of waste management practices.
Quantitative data was collected through a cross-sectional survey involving 116 respondents from various stakeholder groups, including district officials, council members, MPs, village leaders, hotel owners, householders, and shopkeepers. This approach provided a snapshot of perspectives on waste management, overcoming the limitations of longitudinal studies and enabling a real-time assessment of prevailing issues. Complementing the quantitative insights, qualitative data was sourced from council documents such as meeting minutes, development plans, and budgets.
The findings highlighted a noteworthy 70% awareness of participatory waste management initiatives, with community engagement (85%) emerging as a prominent facilitator. However, challenges such as limited recycling facilities (60%) and lack of awareness among residents (40%) hindered progress. Waste management sensitization programs exhibited varying effectiveness, and a significant majority of respondents recognized the social, economic, and environmental benefits of community-led initiatives.
Based on these findings, the study recommended the introduction of incentives for waste segregation to enhance community participation, the strengthening of public awareness campaigns to address knowledge gaps, and the establishment of additional recycling centers to improve waste management infrastructure.

I. INTRODUCTION AND BACKGROUND

1.1 Introduction

Sub-Saharan Africa has in recent years seen a rising trend in urbanization, owing it to population growth. Urbanization is defined as the process through which cities grow and higher percentages of people migrate to the cities. According to (Mekonnen & Gokcekus, 2019) Between 2010 and 2035, the urban population is expected to more than double from approximately 298 million to 697 million and by mid-century, it is estimated that over 1 billion people will live in urban areas. Despite urbanization having the potential of driving the economic growth and human capital development of nations, if not properly planned for, urbanization can cause serious reparations through several avenues including improper waste management.

Chavez (2009), reveal that waste generation rates are rising and in 2009 the world's largest cities generated 2.01 billion tons of solid wastes, resulting to a footprint of 0.74 kg/person a day. The study adds that, with rapid population growth and urbanization, the annual waste generation is expected to increase by 75% from levels of 3.40 billion tons in 2050. Compared to those in developed nations, residents in developing countries especially the urban poor are more severely impacted by unsustainably managed wastes. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned, which results to serious health, safety, and environmental problems. Poorly managed wastes serve as breeding ground of vectors, contributing to global climate change

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1.2 Background of the Study

Waste is an inevitable product of society. From the days of primitive society, human and animals have used the resources of the earth to support life and to dispose their waste. In the early times the disposal of human and other waste did not pose a significant problem because the population was small and the amount of land available for the assimilation of waste was large. However problems with disposal of waste can be traced from the 14th century. Littering of goods and other solid waste in towns led to breeding of rats and outbreaks of the plague, epidemic which has killed many people causing many subsequent epidemic and high death tolls (Bortoleto et al., 2007).

According to Schubeler (1996), it is only of recent that Municipal Solid Waste Management (MSWM) has attracted increasing attention from bilateral and multilateral development agencies due to the mounting urgency of urban environmental problems that were identified in the Rio De Janerio conference, specifically under Agenda 21, Chapter 7 and 21 that urban council began to improve on the management of waste.

The rationale for effective community participation is clearly based on the fact that everyone generates waste which means that in the same vain they are affected directly or indirectly. Consequently, everyone has to be involved in the management for an effective and efficient waste management system, since it can also be a resource in terms of employment (Squires, 2006). It is not only important to involve individuals in SWM but also groups and the private sector for purposes of attaining ownership since management by the government may not be the most efficient approach. The study examined the role of community participation and effectiveness of the participatory approaches of communities in Blantyre in building a robust management system.

The Waste Management Theory (Prongracz et al., 2004) is a unified body of knowledge about waste and its management. It is founded on the expectation that waste management is to prevent waste to cause harm to human health and environment and promote resources' use optimization. The theory advocates activities which include: avoidance of waste creation / prevention, reduction of waste, recycling and resource recovery, storage, transportation and disposal using appropriate technologies. In this study, the Theory of Waste Management explains or underpins effective Solid Waste Management. It concerns prevention of waste creation on streets and in public places which requires the community to work in partnership for a sustainable environment. While the Institutional Theory represents the independent variable with its three pillars of the Regulative, Normative and Cultural cognitive to explainthe dimensions used in the study which are; involvement of the community in planning, Implementation and Monitoring and Evaluation as it is done in a project cycle.

Moningka (2000), defines community participation as a process in which community members are involved at different stages and degrees of intensity in the project cycle with the objective to build the capacity of the community to maintain services created during the project after the facilitating organization has left. While (Subash, n.d) defined Community participation as a sociological process by which residents organize themselves and become involved at the level of a living area or a neighborhood to improve the condition of daily life for example in the Water, Sanitation health, Education and others sectors. It comprises of various degrees of involvement but what is important is collective involvement (Financial and Physical) contribution, Social or political commitment at different stages of the project cycle.

The term solid waste (SW) is used to refer to municipal waste and can be categorized in seven groups. They are residential (or household or domestic waste, commercial, institutional street sweeping) construction and demolition, sanitation and industrial waste (Gombya & Mukunya, 2004). Another scholar, Danbuzu (2011), defined Solid Waste Management as the scientific way or established procedure and sanctioned legalization for the collection, transportation and disposal of waste products which is economically feasible and environmentally viable. He also points out that waste management differs for developed and developing countries, urban and rural areas for residential and industrial producers.

Effective Solid Waste Management is that which ensures better human Health and safety. It must be safe for workers and safeguard public Health by preventing the spread of diseases. It must be both environmentally and economically suitable (UN Habitant, 2008). Effective Solid Waste Management should involve regulation and monitoring of waste facilities and generators, control disposal of material and promote sound management of waste by communities businesses and industries.

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It should be noted that rapid population growth aggravates the continuous increase in the volume of solid waste generated per day. In Asia alone the waste generation rate is predicted to increase from 760,000 tons to 1.8 million tons per day by 2025 (Ahmed et. al 2004). The greater percentage of these wastes is not collected properly or is dumped illegally. Mexico City, out of an estimated 10,000 tons of waste generated per day at least 25 % is dumped illegally. While in Japan out of 5,350 tons of waste generated per day in metro Manila 75 percent is collected while the rest is dumped illegally (Schubeler 1996) & (Atienza, 2007). The problem of refuse disposal is basically a feature of rapid population growth and urbanization which in Malawi is still in its infancy. The other problem is location, most of the collection centers are not well planned and this leads to introduction of illegal collection points.

1.3 Problem Statement and Justification

Population dynamics have significant influence on the amount of waste generated and its proper handling in the municipalities (Anomanyo, 2004). The problem is aggravated by open dump nature of disposing waste especially in the slum areas of most African cities (Danbuzu, 2011). Community participation in M&E focused on participatory monitoring tools, reporting skilled as well as evaluation. These brought change in terms of recruitment of garbage collectors, waste management sensitization of the locals, purchase and installation of garbage containers among others (Masaka Municipal Annual Report, 2009). The participation of the community seems to have resulted into fewer and poor solid waste management among the locals. The Municipal has continued to experience extremely massive waste which constrains its efforts for solid waste.

Despite these community participation and efforts made, solid waste problem in form of careless and illegal dumping of waste, heaps of refuse littered, numerous polythene bags, plastic containers, home waste among others have been evident throughout the entire municipality especially in the Central Business District (CBD) and in slum areas on a daily basis. These heaps of waste have become fertile grounds for breeding flies and other vectors which in effect become health hazards, hence causing environmental degradation (Kiiza, 2009). In addition, the rate at which solid waste management have been deteriorating is uncertain and this has been partly attributed to the way the community and municipalparticipate.

In Malawi and in particular Blantyre, continues to face challenges in waste management, this has been seen with current outbreak of Cholera which is results of poor solid waste management. The situation is likely to exacerbate as the country seeks to develop since population is increasing every day. Community engagement in waste management is the key to maneuvering around the problem. This form of mismatch between Community participation and Solid Wastage Management is the gap explored to ascertain the effect of participatory approaches of communities in Solid Waste Management in Blantyre City Council.

1.4 Purpose of the Study

- The main aim of this study is to assessing the effectiveness of the participatory approaches of communitieson Solid Waste Management in Blantyre, Malawi.

1.5 Objectives of the Study

The study will be guided by the following objectives;

Evaluate the level of community participation in solid waste management activities in Blantyre, Malawi, including the extent of involvement, active engagement, and decision-making in waste management practices.

Measure the impact of participatory approaches on solid waste reduction, recycling, and proper waste handling within the community of Blantyre.

1. To identify the key factors that facilitate or hinder the successful implementation of participatory waste management initiatives in the city.
2. To assess the effectiveness of waste management sensitization and educational programs in increasing community awareness and knowledge about sustainable waste disposal practices.
3. To examine the social, economic, and environmental benefits associated with community-led solid waste management initiatives.
4. To compare the performance of different participatory monitoring and evaluation tools used to assess solid waste management practices in the community.

1.6 Research Questions

1. What are the key factors that facilitate the successful implementation of participatory waste management initiatives in Blantyre, Malawi?

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2. How effective are waste management sensitization and educational programs in increasing community awareness and knowledge about sustainable waste disposal practices in Blantyre, Malawi?
3. What are the social, economic, and environmental benefits associated with community-led solid waste management initiatives in Blantyre, Malawi?
4. How do different participatory monitoring and evaluation tools used in Blantyre, Malawi, compare in assessing solid waste management practices within the community?

1.7Hypotheses

The study will be guided by following hypothesis;

- Participatory approaches of communities have no effect on waste production
- Participatory approaches of communities have no effect on waste disposal
- There is no difference in the adoption and effectiveness of the different participatory approaches of communities

1.8 Scope of the Study

1.8.1 Geographical Scope

Blantyre's Central Business District is a hub of economic activity, commerce, and trade, leading to a higher generation of solid waste compared to other areas. This concentration of business and commercial activities often results in increased waste production. Consequently, addressing solid waste management in this area is essential to mitigate potential environmental and health hazards.

The study's emphasis on uncollected solid waste in Blantyre Markets highlights a critical problem that needs urgent attention. The accumulation of uncollected waste can lead to numerous environmental and health risks, affecting not only the local community but also the broader urban environment. This issue underscores the urgency of finding effective waste management solutions in this specific area.

By targeting the Central Business District, where waste generation is high and uncollected waste poses health hazards, the study aligns with the goal of safeguarding the well-being of the local community. Addressing waste management issues in this area can significantly reduce health risks associated with improper waste disposal and uncollected waste.

The study's focus on Blantyre Markets recognizes the direct impact on the local community. Residents and businesses in the vicinity of the Central Business District are directly affected by waste management practices in this area. Improving waste management here can enhance the quality of life for these community members.

Concentrating on a specific area allows for a more concentrated and focused effort to understand the unique waste management challenges and opportunities within that context. The findings and recommendations from this study can have practical significance for addressing solid waste management issues in high-density urban commercial areas like Blantyre Markets.

In summary, the decision to concentrate this study on the Southern region of Malawi, specifically Blantyre Markets in the Central Business District, is well-justified due to the high solid waste generation, uncollected waste issues, health hazard mitigation, local community impact, and practical significance of addressing waste management challenges in this specific area. This scope enables you to target critical waste management issues effectively and develop recommendations that can lead to meaningful improvements in waste management practices and the well-being of the local community.

1.8.2 Time Scope

The study will concentrate on solid waste from commercial and residential areas from 2022 to 2023. This is the period and time when the affected residents within the above made several media alarms about the health threats that were posed by the presence of waste as a lot of it had been scattered, dumped indiscriminately in numerous areas of the city which escalate Cholera outbreaks. Secondly, secondary sources of data will be available and accessible.

1.8.3 Content Scope

The study's concentration on community participatory approaches as independent variables and various facets of solid waste management as dependent variables offers a comprehensive examination of waste management practices. The independent variables include planning, implementation, and monitoring and evaluation (M&E) of community-led initiatives. Planning involves goal setting and action plans, implementation focuses on putting plans into action, and M&E ensures ongoing assessment and improvement.

On the other hand, the dependent variables encompass solid waste generation, collection and storage, transportation and disposal, and efforts

related to reduction, re-use, recycling, and resource recovery. These components evaluate the quantity and types of waste generated, the efficiency of collection and storage, transportation methods, disposal practices, and the integration of sustainable waste reduction and recycling measures.

By studying the interplay between community participation and these waste management variables, the research aims to provide insights into how community-led approaches influence waste management outcomes. This structured approach allows for the identification of effective strategies and areas for enhancement, ultimately contributing to more sustainable and community-centered waste management practices.

1.9 Significance of the Study

The study's focus on integrated solid waste management underscores the importance of adopting a holistic approach to waste management challenges. By examining various aspects of waste management, including waste generation, collection, recycling, and reduction, the research contributes to a comprehensive understanding of how these components interact and influence overall waste management outcomes.

Through its investigation of community participatory approaches, the study has the potential to identify and document best practices in waste management. These best practices can serve as valuable benchmarks and models for other communities and regions in Malawi and beyond. Stakeholders in waste management can draw on these insights to design and implement effective strategies.

The study's emphasis on enabling communities with adequate resources aligns with the goal of resource mobilization for waste management initiatives. It highlights the importance of providing communities with the necessary financial, human, and technological resources to engage in sustainable waste management practices effectively.

Access to information is crucial for informed decision-making. The research underscores the need to equip communities with relevant information on waste management best practices, environmental impacts, and health considerations. This empowers communities to make informed choices and actively participate in waste management initiatives.

The study's insights can also inform the adoption of appropriate technologies for waste management. Identifying technologies that are accessible, affordable, and suitable for local contexts can enhance community-led waste management efforts. This includes technologies for recycling, waste reduction, and resource recovery.

The study's findings on best community participatory approaches offer valuable guidance for stakeholders involved in waste management, including government agencies, non-governmental organizations, and community-based organizations. It can inform the development of policies and programs that prioritize community involvement and sustainability.

The research outcomes can extend beyond Malawi's borders. Insights into effective community-led waste management practices can inspire similar initiatives in other regions facing similar challenges. This cross-border applicability contributes to the global discourse on sustainable waste management.

In summary, this study's contributions extend well beyond its immediate context. It advances knowledge on integrated waste management, empowers communities with resources and information, and informs stakeholders and policymakers about best practices in community participatory waste management. Ultimately, the study has the potential to drive positive change in waste management practices within Malawi and serve as a valuable reference point for similar initiatives worldwide.

1.10 Limitations of the study

Cross-sectional studies collect data at a single point in time, which means that the findings reflect the conditions, attitudes, and behaviors prevalent during that specific period.

Cross-sectional studies do not establish a temporal sequence of events. They are not designed to track changes or causality over time. Instead, they offer a "snapshot" view of the study variables at the time of data collection.

The researcher will supplement cross-sectional data with historical analysis to provide insights into the historical context that has influenced current waste management practices. Researchers can examine historical records, policies, and events to understand how they have shaped the present.

The researcher will also combine quantitative cross-sectional data with qualitative research methods, such as interviews or focus groups, can help contextualize the findings and provide a deeper understanding of historical and temporal factors.

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II. LITERATURE REVIEW

2.1Introduction

With today's generation, storage, and disposal activities, this chapter explores some of the concepts, philosophical principles, and issues surrounding society's involvement in solid waste and its management methods. It is necessary to understand the ideas of solid waste, its kinds and origins, impacts on human life, and current methods of management and practice in order to evaluate community involvement in the solid waste management system and its issue. This chapter reviewed relevant literature; it will discuss the conceptual review regarding the relationship between Community participatory approaches and Solid Waste Management as well as theories regarding the study and community participation in general waste management.

2.2 Concept of ISWM

A comprehensive approach to sustainable solid waste management includes all sources and elements of waste management, such as generation, segregation, transportation, processing, treatment, recycling, and disposal, with an emphasis on optimizing the value of resource use (MEMON, 2019). It is important to adjust the principle of the ISWM in order to ensure that efficient management processes need the versatility in architecture, change and systems that can better suit existing social, economic and environmental requirements. This are expected to alter and differ by place over time. The need for continuity in the quality and quantities of recycled and reclaimed materials (compost, energy); the need to promote a variety of disposal options; and the advantage of economies of scale indicate that large-scale organization of ISWM systems is required (UNEP, 2009). The main point is not how many waste management solutions are used or whether they all apply at the same time, but that, as part of a single solution, they are combined in an optimal manner, incorporating the right combination of disposal approaches to optimize the safety of the environment and social gains, while reducing economic costs.

Local Governments of both developed and developing countries are concerned with environmental concerns of waste disposal. Its only of recent in the developing countries like Bangladesh the collection and disposal of solid waste was taken as one sided responsibility on the part of the municipal authorities burdened with financial and management problems but nowadays a community participatory approach as a process through consultation, collaboration and coordination among the stake holders has become a reliable option (Hasnat 2004). In Uganda, according to the Local Government Act Cap (243), Urban Authorities have the obligation of managing solid waste in their areas of jurisdiction through enacting bye-laws, collecting transporting and disposing waste, develop recycling programs and market for recycled materials and manage dump sites and sensitize the community. In most developing countries these services are either contracted out or the municipality does it single handed.

Blottnitz et al. (2010), recommended that for the city of Nairobi to sustain its Solid Waste Management Plan (SWMP) effectively the Department of Environment (DoE) as the leading entity had to be empowered to execute the integrated solid waste management plan in the 4R (Recovery, Reduce, Recycling and Reduction). For Solid Waste Management to be effective there must be activities which are equally important these include: collection, transportation and safe disposal but in addition to this the recognition of multiple partners must be in place.

Equally so in Lativia, the Riga city strategy on solid waste management integrated environmental, economic and social concerns for the city development process., its strategy for sustainability was participatory and a cyclic process of planning and action to achieve economic, ecological and social objective in a balanced and integrated manner. It set priorities which included; recycling materials, use of waste as a source of energy, compositing or incineration of waste without energy utilization, Land filling, introduced a general waste tax whose principal of the tax was considered to benefit environment and was imposed on industries and developed byelaws to prevent illegal dumping (Cilinskis & Zaloksnis, 2011). All the above scholars call for inclusivity of the masses in the management of SWMP in order to protect the environment and to have sustainable development. This study will examine the effect of Community participatory approaches on the management of Solid waste in Blantyre City Council.

2.3. Community Participatory Approaches and Waste Management

A solution to the rapid and unprecedented population expansion in metropolitan regions of developing countries that has outpaced local governments' SWM policies is community participation in solid waste management (SWM)

(Ahmed & Ali, 2006; Troschinetz & Mihelcic, 2009). All municipalities in poor nations, according to Guerrero, Maas, and Hogland (2013), encounter management and organizational difficulties when it comes to SWM. Local governments' incapacity to collaborate with communities to increase their commitment to SWM is one of the factors contributing to this predicament (Guerrero et al., 2013). Through this method, localities can participate in the collection and delivery of solid waste from the point of generation to the disposal facilities.

SWM is a continual maintenance system, thus community involvement is crucial (Ibrahim & Mohamed, 2016). According to Nzeadible (2009), tackling SWM issues with community involvement is a cost-effective strategy. In addition, they contend that less is known about the environment, the health consequences of municipal solid waste on people, and sustainable urbanisation in poor nations (Ahmed & Ali, 2006). Composting, trash recycling, controlled sanitary landfills, and incineration are examples of municipal solid waste management techniques that have been shown to be ineffective in addressing environmental and public health issues (Kalwani, 2007).

These shortcomings in SWM call for community involvement to supplement the few resources and cutting-edge technology required for effective solid waste management in cities.For instance, according to Xiao, Zhang, Zhu, and Lin (2017), many municipalities in developing nations spend a large portion of their limited budgets on managing solid waste yet can only collect a limited amount of rubbish, barely serving nearly half of the urban population. According to the World Bank (2006), over 80% of the fleet of machinery and vehicles used to collect solid waste in developing nations are out of commission, too old, or in need of repair. The difficulties are made even more difficult by the informal waste collection process's difficulties with limited streets.

A variety of stakeholders, including municipalities, decision-makers, and technical supports, must be considered for SWM systems to be successful (Diaz & Otoma, 2012). In contrast to resource shortages, climate change, or public health, community participation is considered as a positive driver of SWM in developing nations (Diaz & Otoma, 2012). According to Garnett and Cooper (2014), local citizens are regarded as significant stakeholders in SWM and the decision-making process. People's attitudes and behavior patterns, which are influenced by regional social and cultural circumstances, serve as the foundation for the functions and structure of community engagement in SWM (Kubanza & Simatele, 2019).

The improvement of community engagement, it might be argued, is the present issue for SWM in developing nations in light of the aforementioned data. This can be accomplished by fully including the opinions of the neighbourhood community into the formulation of certain policies and mandating the investigation of elements that enhance community engagement (Diaz & Otoma, 2012). The situation of SWM in developing nations is still crucial, despite the widespread adoption of community engagement in SWM in these nations (Nzeadible, 2009).

A lot of decision-makers haven't given a general sustainability approach in urban SWM much thought, even though cities in developing countries are heavily influenced by ideas developed in high-income countries when searching for strategic policies and long-term action plans for municipal SWM.

According to the literature, numerous studies have been carried out to investigate distinct SWM features in diverse circumstances. However, research on the part community involvement plays in SWM in South African cities has not been done. This examination is necessary because, despite the seriousness of the problem’s South African cities face, little has been done to address them in terms of both research and actual implementation. That much is clear. What can be done about SWM is a much trickier subject. Through a case study of Orlando East in Johannesburg, South Africa, this research analyses communities' opinions of the causes and effects of inadequate SWM as well as, crucially, their perceptions of where responsibilities and accountability should be placed.

There has been a lot of writing about the failures of bad governance and governments when it comes to organising and managing municipal solid trash (Oteng-Ababio, Arguello, & Gabbay, 2013). Due to a multitude of factors, including a lack of available land, an increase in the population of cities, a lack of financial resources, and unstable economies, local governments in Sub-Saharan Africa struggle to fulfil their obligation to offer SWM services. Increased community participation in SWM is viewed as a key step towards addressing the challenge, which has caused a corresponding increase in public health and the solid waste crisis (Oteng-Ababio, 2011).

SWM is a rising source of concern for African city governments and urban residents.Poor urban communities' inadequate solid waste

collection practises ultimately lead to inhabitants burning or tossing trash into drains and stilled streams (Oteng-Ababio, 2011). As a result, there are significant dangers to both the environment and public health (Oteng-Ababio et al., 2013). The problem of SWM in sub-Saharan Africa is exacerbated by low community participation and a lack of knowledge of effective solid waste disposal practises in underdeveloped urban communities (Okot-Okumu & Nyenje, 2011). Community involvement is a response to this difficulty in this regard (Okot-Okumu & Nyenje, 2011; Oteng-Ababio et al., 2013).

As part of a rising tendency for government officials to engage in "peer-to-peer" exchanges, cities in Sub-Saharan Africa have embraced unsustainable methods to SWM. Government officials meet on this platform for peer-to-peer exchanges to share experiences and learn from one another's achievements and failures in order to carry out collective action plans, forgetting the importance of community involvement (Ali, 2010). Government representatives travel to North American and European cities to observe new technological advancements due to overwhelming management concerns (Oteng-Ababio et al., 2013). The increasing desire of sub-Saharan African cities to explore and install waste recovery technologies to address their SWM issues is an illustration of this (Ali, 2010).

Such strategies have not considered tried-and-true local strategies, notably those that include incentives for community involvement (Kirama & Mayo, 2016). Due to their increasing exposure to the institutional, socioeconomic, and environmental difficulties associated with traditional waste management practices, sub-Saharan African nations are developing new perspectives on SWM (Muller, Lyer, Keita, Sacko, & Traore, 2002). These new viewpoints acknowledge that community participation can improve solid waste collection and management by better utilizing locals and their resources, as well as small and micro-enterprises functioning in their own neighborhood communities.

Such community-based efforts are anticipated to close gaps in the municipal government authorities in sub-Saharan Africa that are already having trouble providing SWM services (Muller et al., 2002). Additionally, it will become a crucial part of the extensive municipal solid waste management system and its application.

The technical and practical components of the waste management system, which includes all components of SWM and ranges from composting, re-use and recycling, as well as collection to final disposal of waste; The aspects and considerations of the local context that need to be considered when planning and evaluating a waste management system. These stakeholders include municipal departments and informal sector waste pickers.

To ensure effective community engagement in SWM in Sub-Saharan Africa, the influence of the three essential dimensions must always be analyzed in order to pinpoint the important players. A major contributing factor to the problem of SWM in sub-Saharan Africa is frequently identified as a lack of knowledge, commitment, inadequate community mobilization, and the political will of local and national governments (Kirama & Mayo, 2016). For the community to engage in recycling and SWM, SWM education is therefore crucial. As a result of NGOs and civil society organizations supporting community-based organizations that educate people on the responsible management of solid waste, awareness has gradually increased (Kubanza & Simatele, 2019). However, given the issue's continued urgency and the area's high population.

One of the most significant concerns facing South African municipal authorities is SWM. The main difficulties faced by local municipal authorities in SWM are the financial limitations, the complexity and multidimensionality of the system, as well as the ineffective organization (Dlamini, Rampedi, & Ifegbesan, 2017). The primary organizations in charge of the sustainable and efficient management of solid waste are local municipal administrations (South Africa, 2008). In order to fulfil recycling targets, local municipal authorities typically promote a decrease in domestic solid waste creation and encourage citizens to take responsibility for their actions rather than relying on local municipal garbage services (Dlamini et al., 2017).

Despite environmental rules and regulations in South Africa, particularly with regard to municipal solid waste management, recycling and community involvement have received relatively little attention (Dlamini et al., 2017). In South Africa, managing municipal solid waste effectively while also minimizing has proven to be a challenging task. According to the Department of Environmental Affairs (2012), this depends on the implementation of environmental laws and regulations, proper institutional capacity, cooperation and collaboration among local governments, improved community participation, and general public awareness among its

constituents. SWM is becoming a crucial component of city SWM in South African cities.

For instance, informal waste pickers are now playing a significant role in recycling and SWM in the city of Johannesburg (Kubanza & Simatele, 2019). By promoting employment growth and environmental sustainability, this type of community engagement has positive effects on both the environment and the economy (Gutberlet, 2010).

Policymakers haven't done much to incorporate informal SWM systems in their policies and strategies, despite the fact that community participation in SWM through recycling in South Africa contributes to socioeconomic development, environmental sustainability, and SWM (Dhokhikah, Trihadiningrum, & Sunaryo, 2015). This scenario led to a situation where local government in South African cities overlooked the importance of community involvement in SWM.

Thousands of individuals living in impoverished urban communities rely on solid waste recycling for a living despite efforts by South African officials to incorporate informal garbage pickers into SWM networks (Dias, 2012). In 2016, the Department of Environmental Affairs projected that there were between 18 000 and 100 000 rubbish pickers working in South African cities. This demonstrates how local residents are already engaged in SWM. However, the figures are incredibly small when compared to the volume of solid trash produced. To boost the efficacy of SWM and sustainable waste minimization, it is crucial for South African decision-makers to acknowledge community participation (Scheinberg, 2012).

2.3.1 Community Participation and Solid Waste Management

A community is a group of people who live in the same area and share or have a common interest. It comprises of individual groups, Institutional agencies that have a common interest, stake or a share in any particular venture. These are people who are impacted on or have an interest in what happens by way of control or can contribute resources or information needed for support or are essential in terms of cooperation or have position power, credibility or influence as illustrated in the participants' Handbook of Higher Local Governments (2003).

Those who have a stake in solid waste management include: the community (Beneficiaries); Non-Government Organization (NGOs), Local Governments, Civil Society Organizations (CSO), Community based organization (CBO's), Councils, Executive committees, Standing committees in the community, Central Government, Ward communities and Donor agencies. For this study the Executive committees and Heads of departments at the district and District council will be included. Heads of department, Councilors at Blantyre City.

Garbage collectors, Village chairperson, Households and Shop keepers will be stakeholders in this study. Waste management and Community involvement can lead to sustainable development when individuals and organization with a legitimate interest towards achieving the goal of minimizing waste by allowing the community in general to be aware of the problems posed by inefficient management of waste. These include: government formal and informal organization sectors, environmental organizations and other groups working together to create awareness through SWM programs. Community involvement and participation is a means to create a sense of individual responsibility towards waste management and hence the sustainability of the system (Visvanathan & Jankler, 2003).

In Malawi the Local Government Act the Constitution of the Republic of Malawi have mandated local and urban authorities under the decentralization policy to ensure participation and democratic control in decision making while planning for their communities and to exemplify this principal the ministry of local government (MoLG) has recognized the beauty of community participatory by developing several guidelines which include the Harmonized Participatory Planning Guide, the Harmonized Participatory Planning Guide for Lower Governments as well as the District and Urban Council Development Planning Guidelines. The objective of all this is to enable Local Governments and Urban Authorities involve people in the way they are governed such as identification of problems, challenges, settings priorities, planning and budgeting, procurement, implementation and monitoring of projects and programs in their areas of jurisdiction. Planning in Malawi is supposed to be bottom- up and all stakeholders are supposed to play a big role for it to succeed. Based on this, study will examine the effect of Community participatory on Solid Waste Management in Blantyre city.

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2.3.1.1 Community participation in Planning and Solid Waste Management

Atienza (n.d.) pointed out that in addressing the issues of solid waste management local governments should adopt the Los Banos example of employing a participatory approach to identify and solve problems where the mayor conducted a series of multi-sector dialogues and consultations with different sectors of the community such as the researchers of the community, and academicians, barangay officials, food chains, restaurants, shopping malls and supermarkets, home owners and house residents associations, transport, gasoline stations and repair shops, junk shops and waste traders and religious sectors, resort and hotel operators, hospitals, clinics, funeral parlors, computer shops and cell phones dealers. These consultative meetings make it easy for the community to find a suitable SWM plan by involving the community to identify problems, find solutions, gather information, sensitize the community on the dangers of illegal disposal and also come up with a way forward or community action plans. In Malawi Urban Authorities are mandated to come up with such a plan while planning for programs like Solid Waste Management. The proceedings of the Kitakyushu-Japan, initiative seminar on public participation spells out the activities that contributed to the success of the Dhaka City Corporation initiative in Bangladesh these included: public awareness on the importance of proper solid waste management in reference to health and other environmental impacts of improper solid waste disposal, whose purpose was to impose political pressure for proper disposal of waste, advice to households through public rallies and leaflets distribution on how to dispose of solid waste properly and not to throw solid waste in streets, open drains and nearby areas (Hasnat, 2004).

In support of involving the community in planning (Squires, 2006) observes that as developing countries achieve greater socio-economic wellbeing the more waste per capita is released and the more critical the need for effective and efficient SWM systems. And that the performance of such a system will depend on the meaningful participation of individuals, community and institutions, producers, NGOs and Government. Further still, Squires (2006) notes that, all individuals generate waste and in the Caribbean, the scope of SWMP is country wide, thus public participation is a National scope and would involve everyone in the country. Such as: waste pickers, recycling industries, waste collection contractors, SWM facility operators and staff, residents in the close proximity of SWM facilities, politicians, Central Government and Public agencies, and Financial agencies. It is true everyone generates waste and it would be ideal that everyone should be involved in solving the problem of solid waste. However there is a tendency of contractors, politicians and financial institutions to leave out businesses that bring in zero profit especially in the social service sector like the religious organizations and cultural leaders. Community participation in SWM has lots of benefits; among them is the reduction in cost of maintenance because the program or project is aimed at the community which they support thus cutting on the insufficient budget that municipalities allocate to the SWM sector. Worldwide there is no single/ universal approach that is used to come up with an effective SWMP various approaches are used. The same approach might succeed in one place and fail in another. In addition, PRIA (2008), reports that much as communal planning contributes to the success of effective Solid Waste Management, it is not automatic that it leads to success he compared small and medium towns that of Karauli, Jhunjhunu in Rajasthan, Janjgir in Chharithsgarh, Gopeshwar in Uttaranchal and Kangra in Himagnal praderti which got actively involved in the formulation of SWM plans where some failed because of insufficient funds and capacity. So the solution is that community planning should be prepared under specific guidelines by the technical staff and some significant funding.

It is also explained that the planning process was different from the conventional processes as it focused on intensive participation of the citizens and stakeholders in generating alternatives with identification of technical gaps in the system. The broad aim of this inclusive approach is to develop a participatory agenda that: Builds capacity for the community to take decisions in SWM systems, Recognize the importance of local stakeholders' involvement for improvement of existing situations of the town by incorporating their demands and suggestions in the action plan and ensure the informal sector and the marginalized are part of the planning process (PRIA, 2008) Decision making held in meetings is required throughout the SWMP preparation process which includes identification of stakeholders who are important to creating a demand driven plan for the Town. In addition to this effective SWM Program depends on the cooperation of the

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population which is always through awareness of the importance of SWMP by generating a constituency for active participation of users and community groups in local waste management thus the study assessed the effect of Community Participatory Approaches in Planning on Solid Waste Management in Blantyre City Council.

2.3.1.2 Community Participatory Approach Implementation and Solid Waste Management

when the community gets involved in the design of the project, it integrates its needs and constraints in the objectives of the project and in this way can a more effective implementation be achieved (Moningka, 2000). Among the common roles that communities can undertake include; managing wastes within their household and removing them from their premises, rendering waste production and facilitating recovery for purposes of recycling, keeping public areas around their neighborhoods clean, supporting or participating in public projects intended to improve solid waste management, supplying, watch-dogs for the neighborhood and the city at large. Providing inputs to solid waste facility, setting decisions, participating in the preparation of strategic solid waste management plans, providing public education for raising awareness about issues and problems of waste management including healthy education, environmental health and attitudes towards waste and waste workers and sponsoring or participating in special campaigns, competitions hence the profile of solid waste management (Bernstein, 2004).

In support of the above observation, Moningka (2000), describes the roles of different actors with their respective activities in the involvement of SWMP where: Individuals store waste in an organized way in bags and bins the recyclables in the right place. Groups collectively engage in meetings, clean ups, campaigns awareness activities, provide materials , financial and physical contribution to activities of SWM for example cart operators, sweepers and paying fees for waste collection. Formulate project meetings, opinions, ideas and objectives and activities of project committee members. Inclusion of the marginalized, the very poor, disabled, women, religious bodies, low literacy rates, traditional and social hierarchy other actors include the municipality CBO-micro-enterprises and local leaders. Local leaders encourage people to subscribe for waste collection to stimulate separation of waste, monitor the service level, and advocate for pressure groups negotiate for private operators. It is believed that once all the actors are fully involved in the implementation phase of the SWMP it is sustainable which the researcher strongly agrees to. Working with the community normally gives positive results as Kativa (2002), argues that, the Bindura waste management project in Zimbabwe was a success where the project involved windows in recyclables, awareness training, orientation on environmental program was done in a consultative manner. The livelihood of the widows who were involved in the waste collection and recycling improved in addition to contributing to effective solid waste management.

In India, a study on households residing in Baranagar Municipality-Kolkata metropolitan city showed positive results by involving the community in implementation but doubted the sustainability of the system. Because even when introduced in areas with similar conditions in operation, because of voluntary services provided by the communities, low involvement of private agencies, inappropriate choice of methods the project failed. Efficiency can be achieved by involving the private sector or on a large scale along with community participation ,and including the provision of payment of incentives/ subsides to them (actors) in exchange of services rendered (Snigda, Amita & Subhendu, 2009). In agreement to the above arguments, Amal (2010) confirmed that, NGO's, CBO's, religious organization, traditional rulers, politicians and elders contribute to the moral support, technical guidance and resources for good governance. However, there are some drawbacks to community participation in terms of implementation that were identified.

Additionally, Nare et al., (2006) in a study carried out in Limpopo Basine-small users in rural communities of Zimbabwe indicated that, there was very limited participation despite the presence of adequate supportive structures and organization reason being, there was no feed back to the community. In addition to this there were no guidelines on how dissatisfied members of the public could raise complaints. This means that, to have an effective solid waste system in terms of implementation there must be guidelines from the technical staff to enable the community take appropriate choices and actions and also provide avenues of receiving complaints on SWM from the community.

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2.3.1.3 Community Participatory Approach in Monitoring and Evaluation and Solid Waste Management

Participatory Monitoring and Evaluation according to the United Nations Centre for Human Settlement (2001), should be an integral part of on–going implementation of strategies and plans. It provides a flow of systematic information feedback which allows appropriate adjustments to be continuous during the implementation. It allows drawing lessons and experiences especially demonstration projects for replication on a larger scale. The lessons and experience are basically for institutions and management to take up appropriate action rather than technical. The UNCHS Report (2001), highlights that, the purpose of monitoring and evaluation leads to a focus on how to build up the participatory process and its associated management approaches and tools into routine ways of doing business. Bernstein (2004), describes participatory monitoring and evaluation as, a collective process that which involves stakeholders at different levels working together and assess a project or policy and take any corrective action required. This normally includes all the stakeholders in the project, such as men and women at the community level, intermediate organizations like NGO's, the private sector business and government staff at all levels. Project Impact monitoring (PIM) includes both systematic and qualitative information while confirming information gathered through qualitative techniques such as focus group discussions in a participatory way and systematic information regarded as non-participatory (Bernstein, 2004). It is important for local stakeholders to identify problems, collect and analyze information, generate recommendations and implement change on their own.

Monitoring is a useful tool in identifying problems that management can address to have an effective work plan. For example Squires (2006), in his findings of the study observed, that there was insufficient dialogue and consultation and that there was no system established to engage the public during the implementation stage. In addition to this much as they had regular meetings between the relevant stakeholders they delayed in implementation among which was identification of the location of the land fill site. This means that at times there could be community participation in place but they fail to come up with a solution. Similarly, Mazinyo (2009), advocated for the inclusion of communities in environmental monitoring in the c-section Duncan Village study, formation of monitoring committees would helped out in enforcement of bye-laws that the municipal had approved in regard to effective solid waste management. So to achieve effectiveness there must be a community participatory mechanism to enforce the available laws/regulations.

However, there are instances where community monitoring committees fail to produce the desired performance because monitoring and evaluation is a complex activity as Schubeler (1996) observes that, technical evaluation requires data on waste composition and volumes, indicators of important area specific variations of waste generation and their expected changes overtime, understanding of disposal habits and requirements of different user groups and assessment of technical capability of public or private sector organization responsible for operating and maintaining the system. In most cases developing countries do not have data if they have its not accurate. Insufficient beneficiary participation is also another contribution to poor performance. People are aware and informed but don't really get involved in decision making which is so common with urban councils in Malawi. Failure to have consensus leads to poor preparation and implementation because consensus building failed (Squire, 2006).

2.4 Solid Waste Management

One of the key duties of both urban and rural communities is the management of solid waste, and the main goals of solid waste management initiatives are to reduce environmental contamination and make use of trash as a resource. The capacity of the responsible local authorities to handle garbage from collection to recycling or reuse and disposal is restricted, despite the fact that per capita waste generation rates in developing nations are lower than in higher-income countries (Barton et al., 2007). Targets can be met with techniques that the community can afford in the long run and with less danger to the people involved. Management is defined by an input of generally applicable skills or processes, or by a group of comparable, culture-neutral attitudes.

According to Couth, et al.'s (2010) study, urban municipal solid waste in Africa has an average organic content of 56%, and the decomposition of this trash is a significant source of greenhouse gas emissions. The majority of municipal administrations are unable to offer even the most basic services due to the rapid population expansion. Achieving adequate municipal solid waste management entails institutional, social,

legal, and economical considerations in addition to technological ones. Additionally, it entails organising and managing a sizable staff as well as working with a wide range of relevant stakeholders and the general public (Zurbrugg, 2003).

The largest population densities and the least amount of municipal solid waste service are typically found in low income areas (Louigueur, 2007). The majority of the poor reside in fast expanding, haphazard, and frequently unlawful settlements outside of governmental control, and public providers may be prohibited by law from providing services there, which makes administration challenging.

It is important to note that unsanitary conditions in low-income neighbourhoods put the health of both locals and the general public at risk. According to Vaishali (2009), open and engineered landfills were used to dispose of a large portion (57–85%) of the trash produced globally.

With respect to waste types and regional circumstances, solid waste management techniques vary widely.

As a result, when designing waste management systems, it is important to consider the fundamental objectives, a clear analysis of the conditions and factors specific to the area, a knowledge of all available technological options, and an understanding of the systems and traditional knowledge that the local population has created (CED, 2003). One of the more important and contentious urban challenges that local governments in the majority of developing countries must deal with is the disposal of municipal solid trash. Despite new technology, industrial choices, and market tactics that have aided in better managing solid waste, the amount of trash produced per person is still rising.

Depending on the industry or source that produces the waste stream, waste can be categorized.The amount of municipal solid waste (MSW) has increased as the world's population and urbanization have both increased. The lifestyles of the populace, their varying standards of living, general consumer trends, and the degree of technical development in a specific nation are only a few of the variables that affect MSW composition (Nicholas, 2003). It is widely known that waste is nothing more than useful stuff used in the wrong place, and that there is no material in the world that cannot be used in some form.

Industrial civilizations now produce significant amounts of waste as a result of economic expansion and lifestyle choices, making waste management a critical issue for them. Waste management techniques like cremation and landfilling do not provide a comprehensive answer to this issue. As trash types vary, so does people's attitude towards waste.

This has made people aware that the solution is to use waste as a resource rather than destroying it. Public perceptions of garbage and attitudes towards it might influence how eager a population is to cooperate with and take part in appropriate waste management techniques. Information on the health concerns associated with improper solid waste management is a crucial issue that must be consistently disseminated to all sectors of the society.The generation, on-site storage, collection, transfer, transportation, processing and recovery, and final disposal of solid wastes are all covered by solid waste management.

Prior to the previous two decades, government agencies developed and carried out solid waste management policies and programmes in the majority of African cities with little to no input from the general people. The early 1990s saw a wave of political and social transformation across the continent, and this rise of NGOs helped raise public awareness of environmental issues (Palczynski, 2002).The majority of urban and local inhabitants are more concerned now than ever with MSW-related issues (UNEP, 2005). In metropolitan regions, in particular, it is the responsibility of municipal governments to provide their residents with a healthy and exciting environment.This universal agreement is the result of the local government's position as the branch of government that provides municipal services to the greatest number of people (Hardoy et al., 1992; DCD, 1999).

75–80% of municipal solid trash was organic, according to a feasibility study on solid waste incineration for the biggest cities in Kenya, Malawi, and Zimbabwe (DFID, 1999). According to Yedla and Parikh (2002), 70% of the food consumed in India was organic, while 85% to 95% of the food consumed in Dhaka, Bangladesh, came from household properties (JICA, 2005; BCAS, 1998). According to Tchobanoglous and Kreith (2002), the overall organic content is lower in industrialized countries, often only 6%, of which 10% is typically food waste and the remaining 90% is made up of paper and cardboard.

Developing nations produce less garbage per person than the average. However, the high rates of urbanization and rising levels of poverty may have a significant impact on the amount of garbage produced globally per person. According

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to Badran and El-Haggar (2006), garbage generation in Egypt's urban regions is 0.8 kg per day, compared to 0.3 kg in the country.

In the majority of low-income municipalities, WM costs account for over 20% of the municipal budget. Despite the high amount of spending on SWM, some metropolitan residents only receive 70% of the collection service, and disposal is done through risky open dumping (Louiguer, 2007). The need for solid waste services in metropolitan areas is not fully met in LMIC. In low-income areas, service can occasionally only cover 10% to 40% of the metropolitan population, and in the majority of situations, public solid waste departments frequently hire a sizable number of comparatively underqualified and underproductive workers.

Recent EU initiatives aim to increase product and material recycling and energy extraction, hence reducing landfilling and organic fraction not going into landfills at all. This results from landfills' detrimental environmental effects, such as air emissions (CO2 and methane) that affect climate and the possibility of water pollution transfer. According to EU Council Directives 1999/31/EC of April 1999 (EU Council, 1999), waste materials must be segregated at the point of generation, where combustible and recyclable materials are recovered for recycling and hazardous waste is gradually phased out of the production system.

Due to a lack of a market, high operating costs (incineration & recycling), and poor finish product quality from composting, the majority of treatment centers in Mexico have ceased operations. The result of this is that the majority of the waste that is collected receives no treatment at all, and its eventual resting place is either one of the few open-air dumps or landfills that meet the necessary technological standards. It is important to remember that even though industrialized nations have made progress in developing infrastructure for trash recycling and composting, the amount of solid waste disposed of in landfills is still substantial. Waste incineration has become a more popular final disposal method in nations like the Netherlands.But compared to the 1970s, when there were 1,000 active sanitary landfills, there were only 47 in 1996 (de Jong, 1999). These modifications were brought about by the 1996 ban on disposing of combustible garbage in landfills and the 1999 implementation of higher landfilling fees.

According to a Hogland et al. (2005) analysis, the urbanisation, industrialization, and socioeconomic progress of low- and middle-income countries are reflected in the amount of garbage they produce. In general, per capita and per year, urban population creates 2-3 times more MSW than rural people.According to Hogland et al. (2005), the average generation in Asia ranges from 0.4 to 0.9 kg per person per day in low-income nations to 0.5 to 1.1 kg per person per day in middle-income countries and 1.1 to 2.0 kg per person per day or even more in high-income countries like Hong Kong. Landfilling comes last in the hierarchy of waste management in Europe. This is not yet a reality in certain European nations and continents. In the world, almost 95% of garbage is handled before being landfilled, thrown into holes in the ground, or deposited directly on the borders of rivers or the ocean (Hogland et al., 2007).

In most nations, solid waste has typically been a local issue. Due to the increase in trash volumes, the environmental effects of previous disposal methods, and the possible effects of steps taken to address the issue of garbage disposal, urban solid waste has become a national and international concern (McCarthy, 1994). This results in both positive and unsettling tendencies when thinking about the improvements in solid waste processing and resource recovery from four decades ago.

Landfilling (dumping) and incineration of solid waste were the two main methods of disposal in North America up until the emergence of environmental awareness in the late 1960s (Robinson, 1986). As a result of the air pollution, several incinerators were shut down, dumps were renovated to sanitary landfills, and landfilling became a more popular method of disposal. Waste volume reduction and materials recovery became important tools in the fight to save landfill space and recover nonrenewable resources as a result of the negative impacts of inappropriate landfilling caused by incinerator air pollution and ground water contamination.

Even though they share the same methodology, solid waste management techniques nonetheless vary greatly from country to country. While more than 84% of American waste is dumped in landfills, Japan burns more than 70% of its waste. Michael (2003).In Germany, the demand for landfills has decreased dramatically during the past ten years. The primary cause is that a growing proportion of garbage is being directed towards recycling and recovery. The remaining solid waste is sent for mechanical and biological treatment, waste incineration, and co-incineration in coal-fired

power plants and cement kilns. Germany had 50,000 landfills in the 1970s; however, only 333 landfills existed in the country in 2000 (Schnurer, 2002; Hempen, 2005). In addition to mechanical-biological plants for disposing of municipal waste, Germany has simultaneously seen an increase in the number of waste incineration plants, from seven incinerators with a capacity of 718,000 tonnes/year in 1965 to incinerators with a capacity of 17,800,000 tonnes/year in 2007 (BMU, 2005).

The three landfills in Singapore are located outside the city limits, and over the past nearly four decades, the amount of solid waste created has increased by 2.09 million tonnes, placing a heavy burden on waste management and disposal (NEA, 2008). In this regard, landfilling is the final resort in Singapore's MSW management choice. A landfill is only used for waste that cannot be handled or disposed of in any other way. According to NEA and MEWR (2006), 91% of rubbish collected is burned, and the remaining 9% is disposed of at Semakau landfill along with the debris generated from burning.

Solid waste generation rates in low-income nations average just 0.4 to 0.6 kg per person per day, compared to 0.7 to 1.8 kg per person per day in fully industrialised nations.

Two views should be taken into account while recognising these disparities from wealthy nations:It is important to note that due to population growth, countries in Africa, Latin America, and Asia produce nearly 40% of the annual methane emissions from landfills, which is equivalent to 37 million metric tonnes of carbon dioxide equivalent (MTCO2e) or the air pollution produced by more than 102 million cars (EPA, 2002).

Solid waste volumes in China are now rising quickly. China surpassed the United States in 2004 as the world's top trash generator, according to a report by Delvoie (2005). China's annual solid waste production will rise by another 150% by 2030, from 190 million tonnes in 2004 to more than 480 million tonnes. This expanding waste stream has a big influence on the economy, the environment, and society.

China's waste categorization varies significantly from city to city and has a significant negative impact on how well the database is used.

The review of literature on Solid Waste Management is guided by four sub themes namely solid waste generation, solid waste collection and storage, solid waste transportation and solid waste disposal. Something that is effective works well and produces results that were intended. Solid waste management in most cities of the developing world is unsatisfactory despite consuming a relatively high proportion of municipal budgets. Most attempts at improving performance have mainly focused on collection and disposal capacity but it has not yielded significant results (Anjum, 1999). With the increasing demand for improved waste management, private sector participation is essential (Isingoma, 2009).

2.4.1 Solid waste management in developed countries

In many industrialized nations, disposing of municipal solid trash in a way that is both economically practical and environmentally acceptable is a big challenge. In order to develop the best treatment/disposal strategy, policy makers in the waste management industry must be able to anticipate the volume and makeup of MSW that will likely be produced in the near future (Daskalopoulos et al. 1998). Growing concern has been expressed in recent years about the issue of solid waste, particularly MSW in industrialized nations, which has elevated it to the center of the environmental policy discussion.

However, there are currently questions concerning the economic sustainability and environmental acceptability of the current waste-disposal procedures due to the increase in waste volumes and the environmental effects of previous disposal practices. By the year 2000, the Environmental Protection Agency in the USA hopes to have reduced landfill garbage deposition by 25% (Petkov, 1993). One of the primary environmental issues in Europe and the Baltic states is garbage. Due to the increased usage of packaging on items over the future years, the amount of household garbage generated is projected to rise.

It is evident that there is a revolution in waste management taking place in most of the industrialized countries when comparing the management of urban solid trash in the late 1970s to that of today. Four components of this revolution can be observed: (i) revolution in management. Moving away from landfills and towards material recycling and energy recovery is approach. Moving away from landfills and towards material recycling and energy recovery is the new trend.(ii) Stricter environmental regulations for waste management facilities, which have forced many of the current facilities to close or get upgraded. (iii) A shift in the public's perception of waste in almost all industrialised nations. The public has evolved to

see all disposal methods as offering unacceptable risks at the same time that we have moved towards safer, more ecologically friendly methods of management. (iv) a significant shift in perceptions of the proper function of producing industries. This is seen in the application of the polluter-pays concept and the increasing amount of accountability required of businesses by governments for the waste generated by the use of their products. Kennedy (1994)

Recycling has increased more than energy recovery in Europe, but both have increased at the expense of landfills in the United States. According to U.S. EPA predictions, material recovery will more than double once more in the 1990s and make up 30% of all waste management in the year 2000. Only 49% of municipal garbage will be disposed of on land, with energy recovery increasing to 21% (McCarthy, 1993). The way that garbage is managed in North America has changed through time, moving from open dumping until the 1960s to sanitary landfills becoming the standard practice in the 1970s to integrated waste management today. Promoting the use of holistic approaches that view waste as a resource rather than a liability.

Only 10% of the land in Japan is suitable for habitation. Japan's waste management strategy is motivated by the lack of accessible land that restricts the availability of suitable dumping sites.Japan produces 52 million tons of municipal trash annually, of which 16.7% is recycled, 5.9% is landfilled, and 77.4% is burned (Statistical Handbook of Japan, 2003). The practice of separating household waste at the source into recyclable and flammable materials, such as glass, metal cans, and newspapers, is widely established.

2.4.2 Top down approach in waste management

The most important problem with international development is getting the correct resources to where they are most needed and making sure that those resources are being integrated in a sustainable way. The greatest failure of international development to date is a result of a lack of thorough knowledge of the reality on the ground (FSD, 2010). It is important to note that despite substantial funding being given to national development initiatives, there has been startlingly little economic expansion as a result. This can happen when "top down" solutions are imposed through bureaucratic interventions made by governments, international organisations, or multinational corporations without taking into account the demands and desires of the bottom. Success and sustainability are therefore considerably more likely if community problems are solved.

Many people believe that grassroots development is a way for underprivileged communities to have a voice, a stake, and ownership in the growth of their land, economy, education, rights, and values. The secret to empowerment and group action is developing a deep awareness of the complicated circumstances on the ground (FSD, 2010).

It is important to note that traditional approaches do not take into account the following factors: consumption trends, income, level of life, institutional capabilities, and cash availability for urban initiatives.

The main factors influencing a process' local level success are its overall cost and usefulness. Widespread failures have occurred as a result of the time, money, and effort needed to adequately maintain equipment to support a large-scale operation. Nine out of eleven plants in India were shut down, while just 18 out of 54 facilities in Brazil were operational in 1990 (Hoornweg, et al. 1996).

Foreign investments in developing nations have a number of advantages, including the development of jobs.

However, the transfer of technology and strategies that are effective in rich nations is what waste management firms' efforts in underdeveloped countries include. Due to the various physical and socioeconomic conditions present in developed and developing nations, this technology transfer is frequently undesirable. For instance, small trucks are made to handle low density rubbish, yet the refuse in developing nations is both high in organic content and high in density. As a result, the majority of residents of developments produce garbage that is quite dense and does not require compacting.

2.4.3 The CLEAR Model

The majority of governments worldwide are experimenting with citizen participation in decision-making, particularly at the municipal level. The objective of such an effort may vary widely, but its unifying element is to enhance the manner in which regular people can successfully participate in and influence decisions that have a direct impact on their way of life (Smith, 2005).

The CLEAR model, which was developed by Lowndes et al. (2006b), claims that engagement is most effective when citizens: Can do; Like to; Enable to; Asked to; and Responded to. The model

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presents an indicative set of policy solutions and summarizes the five participation factors.
This reflective evaluation of current practice allows municipalities to make changes that will improve participation and reprioritize the emphasis placed on various factors, as each municipality is able to identify the strengths and weaknesses of their own public participation initiatives and existing practices.

Can Do:
It is based on arguments regarding socioeconomic position and maintains that people are better equipped to engage when they have the necessary means and abilities. These abilities range from the capability to write letters or talk in public with confidence to the capacity to plan events and persuade people with like minds to support initiatives.

Like To:
It is predicated on the notion that people are more likely to interact when they have a sense of belonging. Based on the social capital argument, Putnam (2000) contends that a sense of trust, connection, and linked networks can help people cooperate and work together more successfully. The first step in diagnosing the issues facing distinct groups is to understand the feeling of allegiance and identity they have.
Enabled To:
The majority of engagement, according to Parry et al. (1992), is enabled by groups or organizations. The vitality of participation depends on the existence of networks and organizations that can facilitate participation and offer a channel to decision-makers.
Asked To:
It is based on research that indicates mobilization is important. The most effective way to mobilize people is when those who must decide invite other to participate in the decision-making process. The degree of openness of political and managerial institutions has a substantial impact, and participation rises where there are a range of invites and chances, claim Lowndes et al. (2006a).
Answered:
It is predicated on the premise that participation becomes sustainable when people feel that their efforts are making a difference and having a positive impact. This suggests that in order for people to engage, they must feel that their opinions will be heard and, if not always shared, at least respected enough to know that they have been considered.

2.4.4 Public Participation (PP) & Corporate Social Responsibilities
A framework of policies, ideas, and procedures known as public participation ensures that citizens and communities, as well as individuals and organizations, have the chance to participate meaningfully in the decision-making processes that will affect them or in which they have an interest. Everyone generates garbage, and poor waste management can have an impact on people both directly and indirectly. This is the premise for effective public participation.
The following are some reasons why community involvement is crucial, per Fatin, S. et al. (2011):
- It can direct resources in an effective and efficient manner. This is due to the community's willingness to share ideas and thoughts after public involvement.
- It may enable two-way conversation, opening the door for participants to contribute original ideas.
-It gives fresh perspectives and creative suggestions from the neighborhood. The community will have the chance to share their opinions through the opportunity offered. More importantly, it will teach the community how to think innovatively and creatively.
- Participating in planning and decision-making will give the community a sense of ownership and responsibility. fostering a sense of community involvement in the project. It is a method for empowering individuals and a means of achieving sustainable planning and development.
Environmental challenges are best managed with the involvement of all interested persons, on a relevant level, according to Rio Declaration Principle 10. On a national scale, every person should have proper access to environmental information kept by public agencies, including details on dangerous substances and activities in their neighborhoods, as well as the chance to participate in decision-making processes. By making information publicly accessible, states should promote and encourage public knowledge and involvement. It is important to give effective access to judicial and administrative actions, including redress and remedy.
The definition of participatory politics (pp) in a larger meaning is the participation of the public in governmental decision-making. This covers everything from receiving advance notice of public hearings to actively participating in community-impacting decisions. PP is a technique for involving stakeholders, allowing individuals who will likely be affected by a certain action to have a

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say in how it turns out. It is a discourse that enables the general public to comprehend decisions and have an impact on them. In addition to private citizens, institutions, civil society, labour unions, the government, public officials, industrial, agricultural, and trade associations, scientific and professional societies, environmental, education, and health associations, as well as other minority groups, are involved in pp, according to EPA(2005).

Given that the public is not a single, homogeneous group, Mc. Garity (2005) advises identifying relevant publics in order to protect their rights. There are many models to pick from, and any that are selected must consider the necessary input from the general population.

2.4.5 Waste Generation, Storage and Collection

According to Hammer. (2003) and Bernstein. (2004), waste generation is primarily a function of people's consumption pattern and thus economic characteristics. The very poor and the low income groups generate low volumes of organic waste. For example in Tasliket, Uzbekistan there is little food to go around and the parts that are not consumed by the household members are used for domestic animals and composited to amend the garden or soil. In addition, Danbuzu (2011) opined that rapid urban growth has created a lot of pressure on land resources within the area surrounding cities which has led to increased generation of waste. This is well manifested by the open dump nature of disposing waste especially in slum areas of most urban authorities.

An effective solid waste collection system is where the selection of the collection equipment should be based on area specific data, local collection systems should be based on area specific data, local collection systems should be designed in collaboration with the communities concerned and in the interest of lowering costs and efficient operation and maintenance, appropriate, standardized and locally available equipment should be selected.

Where need be privatization of maintenance and repair may be considered as a means of having maintenance costs and optimizing equipment utilization (Schubeler, 1996). Achankeng (2003), also observes that much as cities use over 20-50 percent of their budgets in Africa only 20-80 percent of waste is collected. In line with the same argument Adebuason (2008), argues that despite heavy municipal spending on waste management most urban authorities fail to provide efficient, reliable, universal collection and environmentally solid disposal. Waste collection and storage is managed differently in municipalities sometimes households have to keep the waste to accumulate and then later transfer it to the main dumpsite. Households place rubbish in containers at the front of their premises where it can be collected by handcarts or waste taken by householders or traders to the disposal site as often as desired or a rubbish truck regularly passes through a community giving a musical signal, the householders' waste is brought out by the individual householder and dump it onto a truck or in high income residential areas a waste disposal truck comes directly to each household and remove the waste stored in bins such a system is only available in areas easily accessible by trucks (Amal, 2010).

2.4.2 Transportation and Solid Waste Management

Achankeng (2003) opined that although half of the waste management budget is dedicated to transport alone, only a very limited percentage of waste is removed to the waste treatment centre or disposal site. In agreement to this, is Ecaat, (2003) and Gombya & Mukunya, (2004) who observed that challenges related to poor collection is due to several causes which include: inefficient transportation system, inadequacy of trucks and poor coverage of collection services due to poor roads and inaccessibility of some areas. Furthermore, NEMA (2005) as cited in (Adebuason, 2008) also reports that almost 80% of the household are not served by Kampala city council collection facility due to bad roads and absence of vehicle pass ways. Transportation of garbage from the point of disposal in urban areas involves methods which range from waste delivery trucks and hand driven carts of different types and sizes (Amal 2010). Other than the problem of waste transportation being aggravated by inaccessibility others include high costs of maintenance of the equipment and high fuel costs thus contributing to the inefficiency in Solid waste management.

2.4.3 Solid Waste Disposal

The disposal methods of solid waste have been handled differently worldwide. There are some standard waste disposal methods that can be applied in combination to produce an effective solid waste management include: waste reduction, encourage waste re-use, recycling and waste resource recovery and each is reviewed below.

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2.4.3.1 Solid Waste Reduction

In order to achieve waste reduction at source Bernstein (2004) recommends user cooperation regarding storage of household waste, waste separation placement of household containers discipline in the use of public collection points and source reduction, for example use of cloth instead of disposable diapers or bring ones bag to the market. Similarly, Medina (2002) describes waste reduction as a preventive action that seeks to reduce the amount of waste that individuals, businesses and organizations generate. By not creating waste fewer collection vehicles and fewer number of refuse collection trips would be needed; few and smaller waste handling facilities would be required and it would extend the life of landfills. Society as a whole will benefit from a successful implementation of the waste reduction program. Lastly, Amal (2010) describes waste reduction as the creation of less waste and increased material recovery.

2.4.3.2 Encouraging Re-use

Most third World cities including Blantyre City Council do not collect in totality the waste generated by their residents which has a negative impact on human health and environment. In some areas not served by the municipalities, local entrepreneurs provide waste collection for a fee (Medina, 2002). He further explained that in Latin American cities, informal refuse collection use pushcarts, tricycles, donkeys, horse carts and pickup trucks serve the poor and retrieve the recyclable contained in the garbage before disposing of the reminder of the waste. In conformity to the above observations Ackenkeng (2003), asserted that there are few formal systems of material recovery in Africa much as there is a wide re-use of plastics, bottles, papers, cardboard cans for domestic purposes. The practice is highly common among the poor cities; he argues that the biggest problem is the lack of local and national market for the recyclables. The potential for recyclable needs a lot of support as reported by KCC Report (2004) in its strategy to improve solid waste management in Kampala City Council that the government needed to work along with KCC to have a viable project and clean up the area.

2.4.3.3 Recycling

After the re-use of materials and products, recycling comes next in the integrated waste management hierarchy (Madina, 2002). Recycling is the recovery of materials for melting them or incorporating them as raw materials. It is technically feasible to recycle large amounts of materials such as plastics, wood materials, glass, textile papers, leather to mention but a few. Components that are more amendable to recycling are those for which market exists and which are present in the waste in sufficient quantity to justify their separation. Recycling in solid waste management is not only good in terms of health but also it reduces poverty by providing employment to the youth and women who get involved in scavenging from households and sorting or separating of waste in the landfill areas.

2.4.3.4 Waste Resource Recovery

The UN-Habitat (2010) reports that recovery of materials occurs in all stages of waste materials flow but most extensively waste pickers who live next to the dumpsite and the main items of importance are paper, textile, glass, metal and bones. Another scholar, Medina (2002), reports that in Cairo the zabbaleen of Cairo constituted to an effective re-use collection and recycling system. They used donkeys to collect waste from 350 households in a day. After sorting the garbage the collectors feed the edible portion to pigs, sell pig droppings and human excreta to farmers as fertilizers and scrap metal glass, paper and plastic to middlemen who would then sell the materials to craftsmen or industries for recycling (UN-Habitant, 2010). In agreement with this was Amal (2010) who maintains that resource recovery reduces the amount of garbage on the dump site since Scavengers Scramble to get resources out of garbage.

2.5 Theoretical framework

These are some of the theories thatare relevant to this study on evaluating participatory approaches of communities in supervising waste disposal at central markets in Blantyre District, Malawi:

2.5.1Community-Based Participatory Research (CBPR)

Community-Based Participatory Research (CBPR) is a research approach that places community members at the center of the research process. It involves collaboration between researchers and community members to identify research questions, design studies, collect and analyze data, and disseminate findings. CBPR aims to address community needs, promote social change, and improve the overall well-being of the community being studied. This approach goes beyond traditional research methods by recognizing the

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expertise and insights of community members and valuing their active participation in all aspects of the research.(Minkler et al, 2008)

Key Principles of Community-Based Participatory Research (CBPR):

1. **Equity and Inclusion:**CBPR places a strong emphasis on ensuring that all community members, regardless of their background or status, have an equal opportunity to participate in the research. This means that the research process is not dominated by certain individuals or groups, and everyone's perspectives are valued.CBPR recognizes that certain populations may face systemic disparities and inequities in research. It aims to redress these imbalances by actively involving marginalized or underrepresented groups and addressing their unique needs and concerns.One way to achieve equitable involvement is through power-sharing mechanisms. CBPR often seeks to shift the balance of power away from traditional researchers and towards the community, allowing them to have a more significant say in research design, decision-making, and outcomes. Inclusion means that the research process reflects the diversity of the community being studied. This includes individuals from various cultural, socioeconomic, and demographic backgrounds. Inclusion ensures that the research outcomes are more representative and applicable to a broader range of people.

CBPR strives to make research accessible to all community members, including those with disabilities or language barriers. It involves adapting research methods and materials to accommodate different needs, making sure that everyone can participate effectively. Recognizing and respecting cultural diversity is a fundamental aspect of inclusion. CBPR encourages researchers to be culturally sensitive, acknowledging the values, beliefs, and practices of different community members to ensure that the research process is respectful and responsive.

When all community voices are included, the data collected is more comprehensive and nuanced. This richness allows for a deeper understanding of the community's needs, strengths, and challenges. Equity and inclusion empower community members to take an active role in shaping research and decision-making processes. This sense of empowerment can lead to more sustainable and community-led solutions.

Building trust between researchers and the community is crucial for the success of CBPR. Equity and inclusion foster trust by demonstrating a commitment to fairness and respect. This trust, in turn, promotes collaboration and open communication.

In summary, CBPR's principles of equity and inclusion underscore the importance of fairness, representation, and accessibility throughout the research process. By embracing these principles, CBPR aims to create more equitable research partnerships, produce more relevant and inclusive findings, and ultimately contribute to positive social change.

2. **Collaborative Partnership:**Collaborative partnerships in CBPR are built on a foundation of mutual respect. Researchers acknowledge the expertise, knowledge, and lived experiences of community members, recognizing them as valuable contributors to the research process. Similarly, community members respect the research expertise and methodologies that researchers bring to the partnership.Trust is a cornerstone of collaborative partnerships. Researchers and community members must trust each other's intentions, commitment, and ability to contribute effectively to the research. Building and maintaining trust takes time and requires open and honest communication. In CBPR, decision-making is a shared responsibility between researchers and community members. Both parties have equal influence in shaping the research objectives, methodologies, data collection tools, and dissemination strategies. This approach ensures that research is relevant to the community's needs and priorities.Collaborative partnerships seek to address power imbalances that may exist between researchers and community members. Researchers often hold institutional authority and access to resources, but CBPR endeavours to distribute power more equitably, allowing community members to have a significant say in research design and implementation. Collaborative partnerships involve co-learning, where researchers and community members exchange knowledge and expertise. Researchers gain insights from the community's lived experiences, while community members acquire research skills and a deeper understanding of the research process. This co-learning enriches the research and empowers both parties. Collaborative partnerships ensure that research is culturally sensitive and respectful of community values and norms. Researchers gain cultural insights from community members, which helps in adapting research methods and materials appropriately.Research conducted in collaboration with the community is more likely to address real-world issues and have practical applications. The

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partnership ensures that research questions are aligned with community concerns and priorities.
Collaborative partnerships empower community members to take ownership of the research process. They become active participants rather than passive subjects, which can lead to increased community capacity and self-efficacy.The collaborative approach often results in research outcomes that are more sustainable. Community members are invested in the research findings and are more likely to support and implement the solutions that emerge from the research.Collaborative partnerships enhance the trustworthiness of the research. Findings are viewed as credible and reliable because they are developed in collaboration with those directly affected by the issues under investigation.In summary, collaborative partnership is a core principle of CBPR that promotes equal participation, shared decision-making, and mutual respect between researchers and community members. This collaborative approach enriches research, ensures cultural sensitivity, and empowers communities to address their unique challenges effectively.

3. **Local Relevance:**Community-Driven Research: In CBPR, research questions, objectives, and study designs are co-created with community members. This participatory process ensures that the research is driven by the community's priorities and reflects their unique perspectives and concerns.Researchers work closely with the community to gain a deep understanding of the local context. This includes considering the cultural, social, economic, and environmental factors that impact the community's well-being. This contextual understanding informs the research process. CBPR seeks to identify and address the specific needs and concerns of the community. Research topics are chosen based on their relevance to improving the community's quality of life, health, or overall well-being. This ensures that the research has a direct impact on the community's daily life. The research findings are intended to be directly applicable to the community's context. CBPR aims to produce actionable insights and recommendations that can be implemented by the community, local organizations, or policymakers to bring about positive change.
Research that addresses local issues tends to engage community members more effectively. They see the direct relevance of the research to their lives and are more likely to actively participate in the research process.Community members feel empowered when they have a say in defining research priorities. Their involvement in shaping the research agenda fosters a sense of ownership and control over the process.
Research that is locally relevant often garners strong support from the community. Community members are more likely to endorse and support research efforts that align with their needs and aspirations.
Research with local relevance has a higher likelihood of producing tangible, real-world impacts. The findings are more likely to be implemented and lead to positive changes in the community.Research that addresses local concerns can lead to sustainable solutions. When community members are actively involved in problem-solving, they are more invested in the long-term success of initiatives.CBPR focuses on addressing issues that are of direct relevance and importance to the community. Research questions and study designs are developed in collaboration with community members to ensure that the research addresses real needs and concerns.

4. **Capacity Building**: Capacity building in CBPR often begins with providing community members with training in research methodologies. This includes teaching them how to design research studies, formulate research questions, and choose appropriate data collection methods. Community members may receive training in data collection techniques, such as surveys, interviews, or focus groups. They also learn how to manage and analyse research data, which can involve both qualitative and quantitative methods. Capacity building is a means of empowering communities to take charge of their own research initiatives. When community members acquire research skills, they gain the confidence and capability to actively participate in decision-making and data interpretation.
CBPR aims to shift the ownership of research from external researchers to the community. Through capacity building, community members become co-owners of the research process, influencing its direction and outcomes.Capacity building contributes to the sustainability of CBPR efforts. As community members acquire research skills, they can continue to conduct research beyond the immediate project, addressing ongoing issues and adapting to changing circumstances.Capacity building enables communities to initiate and lead their research initiatives. This self-directed approach fosters self-sufficiency and reduces reliance on external experts, promoting long-term sustainability. Methods of Capacity Organizing workshops and training programs is a common method of capacity building. These sessions may be facilitated by experienced researchers or

educators and cover various aspects of research. Providing mentorship and ongoing guidance from experienced researchers or community leaders helps community members develop research skills and navigate the research process effectively.

Ensuring that community members have access to necessary resources, such as research tools, materials, and funding, is essential for capacity building. Encouraging peer-to-peer learning within the community can be an effective method. Community members learn from one another's experiences and collectively build their research capacities.

Community members who have undergone capacity building are more likely to actively engage in research activities, contributing to the project's success. Building research skills within the community nurtures local expertise, allowing community members to become experts in addressing their own challenges. As community members gain research skills, the quality of research conducted in collaboration with researchers improves, leading to more accurate and insightful findings. Capacity building aligns with the principles of empowerment and self-determination. It empowers community members to take control of their research and advocacy efforts.

In summary, capacity building in CBPR is a process of skill development and empowerment, enabling community members to actively participate in research activities. It promotes long-term sustainability, fosters local expertise, and empowers communities to address their unique challenges effectively.

5. **Empowerment:**Meaningful Engagement: Empowerment in CBPR involves actively involving community members in decision-making processes related to research objectives, methodologies, and project outcomes. Their input is valued and influences research direction. Community members are encouraged to take ownership and control of the research process. They have the authority to shape the research agenda, which fosters a sense of responsibility and agency.

Empowerment in CBPR acknowledges that community members possess valuable expertise, including knowledge of their own experiences, culture, and local context. This expertise is considered essential for understanding and addressing community issues effectively.

CBPR often takes an asset-based approach, emphasizing the strengths and resources within the community. It seeks to leverage these strengths to develop and implement research and interventions.Empowerment leads to increased community engagement and commitment to the research process. When community members feel valued and influential, they are more likely to actively participate and contribute their insights and experiences.

Research that is driven and shaped by community members is more likely to be relevant to their needs and priorities. This increased relevance often translates into research findings that have a more significant impact on the community.Empowerment involves building the capacity of community members to take on active roles in research and problem-solving. This capacity building extends beyond the research project, enhancing the community's ability to address future challenges.Empowerment aligns with principles of equity and social justice. It ensures that traditionally marginalized or underrepresented groups have a voice in research and decision-making processes, reducing disparities.

Actively involving community members in every stage of the research process, from defining research questions to data collection and dissemination. Providing training and educational opportunities to community members to build research skills and knowledge.

Ensuring that community members have access to the necessary resources, including information, technology, and funding, to actively engage in research.Supporting community advocacy efforts based on research findings, empowering community members to drive change in their communities.

In summary, empowerment is a core principle of CBPR that recognizes the inherent strengths and knowledge of community members. It involves meaningful engagement, active participation in decision-making, and leveraging community expertise to shape research and interventions. Empowerment leads to increased engagement, relevance, and impact of research, ultimately promoting equity and social justice.CBPR seeks to empower community members by giving them a meaningful role in shaping the research agenda and contributing to solutions. It recognizes the inherent strengths and knowledge that community members possess.

6. **Action-Oriented and Participatory:**CBPR prioritizes research with a purpose. It is not solely aimed at generating academic knowledge or theoretical insights. Instead, the primary objective is to identify

actionable solutions to address community needs and concerns.Research questions are formulated to address practical issues and challenges faced by the community. The research process is guided by a desire to produce findings that can lead to concrete actions and improvements in the community.

Community members are actively engaged in decision-making throughout the research process. They help shape the research agenda, determine research priorities, and participate in designing research methodologies.The participatory approach ensures that community perspectives are central to research planning and implementation. This collaboration fosters a sense of ownership among community members.CBPR places a strong emphasis on using research findings to inform actions and policies. The goal is to translate research insights into practical interventions, programs, or policy changes that can benefit the community.

Research findings are not left on the shelf; they are actively shared with the community and relevant stakeholders. Community members are empowered to advocate for change based on the evidence generated through research.

CBPR aims for real-world impact. By focusing on actionable research, it is more likely to lead to tangible improvements in community well-being, health, and quality of life.The participatory nature of CBPR promotes a sense of ownership among community members. They see themselves as active contributors to positive change, enhancing their commitment and engagement.CBPR is responsive to the specific needs and concerns of the community. Research questions are tailored to address local challenges, making the research relevant and meaningful.By actively involving community members in decision-making and advocacy, CBPR promotes equity and social justice. It ensures that marginalized or underrepresented groups have a voice in shaping their future.CBPR is not solely focused on producing academic knowledge; it aims to drive positive change within the community. Research findings are used to inform actions and policies that benefit the community.

In summary, the action-oriented and participatory nature of CBPR is a core principle that drives research with a purpose. It actively involves community members in research decision-making and leverages research findings to bring about positive change in the community, making it a powerful tool for addressing real-world challenges and promoting community well-being.

7. **Ethical Considerations:**CBPR prioritizes research with a purpose. It is not solely aimed at generating academic knowledge or theoretical insights. Instead, the primary objective is to identify actionable solutions to address community needs and concerns.

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8. **Long-Term Engagement:**Long-term engagement allows for the gradual building of trust between researchers and the community. Trust is a crucial element of successful CBPR, as it encourages community members to actively participate and share their insights.

Trust is not built overnight but rather through consistent and respectful interactions over an extended period. Researchers must demonstrate a genuine commitment to the community's well-being.CBPR projects often aim to develop sustainable partnerships that extend beyond a single research project. These partnerships are characterized by ongoing collaboration, shared decision-making, and mutual respect.

Sustainable partnerships are beneficial for both researchers and the community. Researchers gain valuable insights and access to community knowledge, while community members have access to resources and expertise.Long-term engagement empowers the community to take an active role in research and decision-making. As community members become more experienced and knowledgeable, they can drive their research initiatives and advocate for their interests.

This empowerment is not limited to research but extends to other community-led initiatives and efforts to address social and environmental challenges.Long-term engagement enables researchers to develop cultural competence by gaining a deeper understanding of the community's culture, traditions, and values. This understanding is crucial for conducting research that is culturally sensitive and respectful.

Researchers can adapt their approaches, communication styles, and research methods to align with the cultural context of the community.Long-term engagement allows for a deeper exploration of community issues and a more thorough understanding of their complexities. This, in turn, leads to higher-quality research and more nuanced findings.

Research findings are more likely to have a sustained impact when they are integrated into long-term community initiatives and programs. Researchers and community members can work together to implement and monitor interventions over time.Long-term engagement builds community resilience by empowering community members to take control of their challenges and develop solutions. This resilience extends beyond the research project and contributes to the community's ability to address future issues.

Researchers and community members experience mutual learning and growth through long-term engagement. Researchers gain insights from community knowledge, while community members acquire research skills and knowledge.

In summary, long-term engagement is a core principle of CBPR that emphasizes sustained relationships between researchers and the community. This engagement fosters trust, empowers the community, and ensures that research findings have a lasting impact on the well-being of the community.

Benefits of Community-Based Participatory Research:

1. **Relevance:** CBPR ensures that research is directly relevant to the community's needs and concerns, increasing the likelihood of practical and impactful outcomes.
2. **Ownership:** Community members take ownership of the research process, leading to increased engagement, motivation, and commitment to addressing the identified issues.
3. **Cultural Sensitivity:** CBPR acknowledges the cultural nuances of the community, leading to more respectful and effective research practices.
4. **Trust and Credibility:** Collaborative partnerships between researchers and community members build trust and enhance the credibility of research findings.
5. **Local Solutions:** CBPR encourages the development of solutions that are tailored to the specific context and challenges faced by the community.
6. **Empowerment:** Community members gain a sense of empowerment by contributing to research that can lead to positive changes in their lives.
7. **Holistic Understanding:** CBPR provides a more holistic understanding of complex community issues by incorporating local knowledge and experiences.

Community-Based Participatory Research is particularly relevant in contexts where community members are directly affected by the research topic, such as in this study on waste disposal at central markets in Blantyre District, Malawi. It can help ensure that waste management initiatives are designed and implemented in ways that meet the unique needs and aspirations of the local communities.

2.5.2 Social Capital Theory

Social Capital Theory is a sociological concept that focuses on the value of social relationships,

networks, and interactions in promoting cooperation, trust, and collective action within a community. In the context of your study on participatory approaches to waste disposal in central markets in Blantyre District, Malawi, Social Capital Theory can provide insights into how community relationships and networks influence the success of waste management initiatives. (Putnam, 2000)

Key Components of Social Capital Theory:

1. **Bonding Social Capital:** This refers to the connections and relationships within tightly-knit groups, such as families, friends, and neighbors. Strong bonding social capital can facilitate information sharing, mutual support, and coordinated actions. In this study, the researcher can explore how existing relationships within the community contribute to effective waste disposal practices.
2. **Bridging Social Capital:** Bridging social capital focuses on connections between different groups or individuals from diverse backgrounds. These connections help facilitate the sharing of resources, ideas, and knowledge across different segments of the community. In the context of your study, bridging social capital could explain how collaboration between central market vendors, local authorities, NGOs, and community members enhances waste management efforts.
3. **Linking Social Capital:** Linking social capital extends beyond the local community to encompass relationships with external organizations, institutions, and authorities. This type of social capital can help communities access resources, expertise, and support from outside sources. You can investigate how community partnerships with government agencies, NGOs, and waste management experts contribute to improved waste disposal practices.

Application to this Study:

1. **Community Participation:** Social capital theory suggests that strong social ties within the community can motivate active participation in waste management initiatives. Individuals are more likely to engage in activities that benefit their social networks. You can explore how relationships among central market vendors and other community members drive their involvement in waste management activities.
2. **Trust and Cooperation:** Social capital theory emphasizes the role of trust in fostering cooperation and collaboration. In the context of waste management, trust among community members, local authorities, and organizations can lead to effective decision-making, resource sharing, and collective efforts to address waste disposal challenges.
3. **Information Sharing:** Social networks enable the spread of information and knowledge. Applying social capital theory, you can investigate how information about proper waste disposal techniques, recycling, and health risks is disseminated within the community and how it influences waste management behaviors.
4. **Social Norms and Behavior Change:** Social capital can influence the adoption of new behaviors and practices. By studying the influence of social norms within the community, you can understand how participatory waste management approaches are integrated into daily routines and habits.
5. **Community Resilience:** Strong social capital can enhance a community's resilience in the face of challenges. The researcher can explore how communities with higher social capital are better equipped to adapt to changes in waste management regulations, infrastructure, or environmental conditions.

In summary, Social Capital Theory provides a lens through which you can analyze how community relationships, networks, and interactions contribute to the success of participatory waste management initiatives. It can help you understand the role of trust, cooperation, information sharing, and community engagement in improving waste disposal practices at central markets in Blantyre District, Malawi.

2.5.3 Diffusion of Innovations Theory

The Diffusion of Innovations Theory, developed by Everett Rogers, focuses on how new ideas, innovations, or practices spread within a social system over time. In the context of your study on participatory approaches to waste disposal in central markets in Blantyre District, Malawi, this theory can provide insights into how these innovative waste management practices are adopted, communicated, and integrated into the community. (Rogers, 2003)

Key Concepts of Diffusion of Innovations Theory:

1. **Innovation:** In this study, the "innovation" would refer to the participatory waste management approaches being implemented in the central markets. This could include methods, strategies, or initiatives that aim to improve waste disposal practices and involve the community in decision-making.

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2. **Adoption:** Adoption refers to the process by which individuals or groups decide to use an innovation. In this case, it relates to how central market vendors and the broader community choose to engage in participatory waste management activities.
3. **Diffusion:** Diffusion is the process of spreading an innovation through communication channels over time. It involves how information about the innovative waste management practices is shared within the community and beyond.
4. **Channels of Communication:** These are the pathways through which information about the innovation is disseminated. These channels can be interpersonal (word of mouth), mass media, or organizational (NGOs, government agencies).
5. **Social System:** The social system includes individuals, groups, organizations, and institutions within a community. In your study, the social system would encompass central market vendors, local residents, local authorities, NGOs, and other stakeholders involved in waste management.

Application to this Study:
1. **Innovation Characteristics:** The theory identifies five innovation characteristics that influence its adoption: relative advantage, compatibility, complexity, trialability, and observability. You can assess how these characteristics apply to participatory waste management approaches. For example, does the community perceive these approaches as advantageous, compatible with their values, and easy to implement?
2. **Adopter Categories:** The theory classifies individuals into different adopter categories based on their propensity to adopt innovations: innovators, early adopters, early majority, late majority, and laggards. The researcher can identify which category central market vendors and community members fall into and explore the factors influencing their adoption decisions.
3. **Communication Channels:** Investigate how information about participatory waste management practices is communicated within the community. Are community members learning about these approaches through word of mouth, community meetings, social media, or other communication channels?
4. **Opinion Leaders:** Opinion leaders are individuals who are respected and influential within the community. They play a crucial role in disseminating information and shaping the opinions of others. Identify any opinion leaders within the central markets and examine their impact on the adoption of participatory waste management practices.
5. **Diffusion Rate and S-Curve:** The adoption of an innovation typically follows an S-shaped curve, starting slow, accelerating, and then slowing down as it reaches saturation. The researcher can analyze the rate at which participatory waste management approaches are being adopted in the central markets and explore factors that might influence this rate.
6. **Barriers and Facilitators:** The theory highlights various barriers and facilitators to adoption, such as cultural factors, uncertainty, and complexity. Investigate any challenges or opportunities that affect the adoption of participatory waste management practices in Blantyre District.

By applying the Diffusion of Innovations Theory to this study, you can gain insights into how participatory waste management approaches are spreading within the central markets community, what factors influence adoption decisions, and how communication channels and social dynamics impact the successful integration of these practices.

2.5.4 Environmental Justice Theory

Environmental Justice Theory is a framework that addresses the unequal distribution of environmental burdens and benefits among different social groups, particularly marginalized and disadvantaged communities. In the context of this study on participatory approaches to waste disposal in central markets in Blantyre District, Malawi, Environmental Justice Theory can provide insights into how waste management practices might disproportionately impact different segments of the community. (Bullard, 1994)

Key Concepts of Environmental Justice Theory:
1. **Distributional Justice:** This concept focuses on the equitable distribution of environmental risks, benefits, and opportunities. Environmental Justice Theory contends that no group should bear a disproportionate burden of environmental hazards. In this study, the researcher can examine whether waste disposal practices in central markets are affecting different social and economic groups equally.
2. **Procedural Justice:** Procedural justice emphasizes the importance of fair and inclusive decision-making processes in environmental matters. It involves giving all affected parties the opportunity to participate in decisions that impact

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their environment. The researcher can evaluate how participatory approaches empower community members to influence waste management decisions and policies.

3. **Participatory Justice:** This concept emphasizes the right of communities to be actively involved in decisions about their environment. In the context of waste disposal, it pertains to the inclusion of central market vendors and other community members in the planning, implementation, and evaluation of waste management practices.

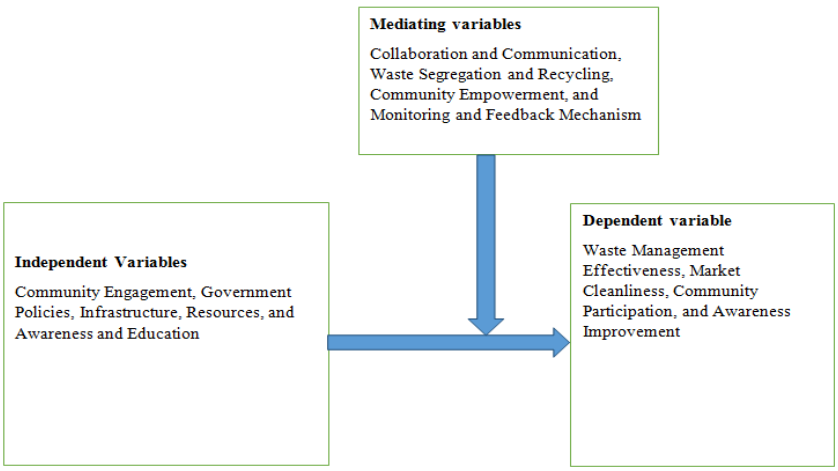
Application to this Study:

1. **Disparities in Environmental Burdens:** Apply Environmental Justice Theory to analyze whether waste disposal practices in central markets disproportionately affect specific groups, such as low-income residents or marginalized communities. Explore whether certain groups are exposed to higher health risks due to inadequate waste management.
2. **Access to Resources:** Investigate whether waste management resources, such as recycling facilities or waste collection services, are distributed fairly across the central markets community. Are there disparities in access to these resources based on socio-economic factors?
3. **Community Engagement:** Use the lens of procedural justice to assess whether the central market vendors and community members have been included in decision-making processes related to waste management. Are their voices being heard, and do they have the opportunity to influence policies and practices?
4. **Equitable Benefits:** Examine whether the benefits of improved waste management practices (e.g., cleaner environment, reduced health risks) are shared equitably among different segments of the community. Ensure that no group is left behind in experiencing positive outcomes.
5. **Policy Implications:** Apply the theory to suggest policy recommendations that promote environmental justice in waste management. This could involve advocating for policies that prioritize the most vulnerable groups or ensuring that waste management initiatives are tailored to the needs of different communities.
6. **Community Empowerment:** Environmental Justice Theory aligns with participatory approaches, as it emphasizes the importance of empowering communities to take control over their environmental circumstances. Explore how participatory waste management practices contribute to community empowerment and agency.

By using Environmental Justice Theory in this study, the researcher can shed light on whether waste disposal practices in central markets are fair, just, and inclusive. It can help you identify disparities, advocate for equitable policies, and demonstrate the importance of involving the community in waste management decisions to achieve environmental justice.

2.6 Conceptual framework

Waste management is a critical aspect of maintaining a clean and healthy environment, and involving local communities in the process can lead to more effective and sustainable solutions. In the context of central markets within Blantyre District, Malawi, this essay presents a comprehensive conceptual framework that explores the intricate relationship between independent, dependent, and mediating variables in evaluating participatory approaches for supervising waste disposal.



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Independent Variables: Community Engagement, Government Policies, Infrastructure, Resources, and Awareness and Education

Community engagement forms the foundation of participatory waste management. Variables such as community participation in waste segregation, involvement in waste collection, and participation in waste disposal decision-making directly influence the success of waste management initiatives. Additionally, the presence of government policies, both at the local and national levels, plays a significant role in shaping the direction of waste management efforts. Adequate infrastructure, including waste collection points, waste bins, and recycling facilities within central markets, is vital for proper waste disposal. The availability of resources, both financial and human, determines the feasibility and scale of waste management initiatives. Lastly, awareness campaigns and educational programs influence community understanding of proper waste disposal practices, affecting their willingness to engage.

Dependent Variables: Waste Management Effectiveness, Market Cleanliness, Community Participation, and Awareness Improvement

The success of participatory waste management approaches is reflected in the dependent variables. Waste management effectiveness is measured by the amount of segregated waste, the proportion of recyclable waste collected, and the reduction in improperly disposed waste. Improved market cleanliness, characterized by better hygiene and sanitation conditions, directly impacts the health and well-being of market vendors and customers. Increased community participation signifies the active involvement of community members in waste management activities, ranging from waste segregation to supervision. Lastly, awareness improvement measures the positive change in community understanding of proper waste disposal practices, leading to the adoption of recommended waste management strategies.

Mediating Variables: Collaboration and Communication, Waste Segregation and Recycling, Community Empowerment, and Monitoring and Feedback Mechanism

The mediating variables act as mechanisms through which the independent variables influence the dependent variables. Collaboration and effective communication channels foster cooperation among community leaders, market associations, local authorities, and waste management agencies. Waste segregation and recycling mechanisms ensure the proper separation of recyclable and non-recyclable waste, thereby reducing the overall waste volume. Community empowerment initiatives, including capacity building, promote a sense of ownership and responsibility among community members, driving sustainable waste management practices. A monitoring and feedback mechanism ensures regular surveillance of waste disposal practices and enables adjustments based on community feedback for continuous improvement.

Impact: Policy and System Changes, Replication and Scaling, Empowerment of Marginalized Groups

The broader impact of the conceptual framework extends to policy and system changes, influencing local waste management regulations and resource allocation based on the success of participatory approaches. The replicability and scaling potential of the model allow for its adoption in other regions facing similar waste management challenges, promoting wider implementation of participatory waste management strategies. Additionally, the framework contributes to the empowerment of marginalized groups, offering them a voice in waste management decision-making processes, thus fostering social inclusion and equity.

In conclusion, the comprehensive conceptual framework presented here provides a holistic understanding of the complex interactions between various variables in the context of participatory waste management at central markets in Blantyre District, Malawi. The framework underscores the importance of community engagement, infrastructure, collaboration, and awareness in driving effective waste management initiatives. By elucidating these relationships, the framework guides researchers, policymakers, and practitioners toward the development and implementation of strategies that result in cleaner environments, improved public health, and empowered communities.

2.7 Summary of Literature review

The literature reviewed in summary included the conceptual and the theoretical review of involvement of the community Participatory in planning, implementation, monitoring and evaluation and the challenges in solid waste management. A number of approaches have been attempted to address the problem in different parts of the world and the experience for developing countries and towns have been portrayed. The

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reviewed literature is therefore used to guide the study and identify the gaps therein.

III. RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter described the methodology that was used in the collection of data. It comprised the research design, study area, study population, sampling procedure and sample size, data collection methods, data collection instruments, validity and reliability of research instruments, procedure of data collection and analysis, as well as measurement of variables. The introduction led to a discussion of research methods.

3.2 Research design

The research employed a case study design, focusing on the waste disposal issue within a specific community context. This approach allowed for an in-depth examination of the problem, considering its complexity and unique factors. Both qualitative and quantitative research methods were employed to gather data. (Sekaran, 2003)

Quantitative data was collected through a cross-sectional survey method, where data was collected from a sample of the population at a single point in time. This method was chosen for its cost-effectiveness and efficiency compared to longitudinal studies.

Qualitative data was sourced from various council documents, including minutes of meetings, development plans, and budgets. These documents were valuable sources of contextual information related to waste management. The study also employed triangulation by using interviews and questionnaires to cross-verify and enhance the validity and reliability of the collected data.

The case study design offered several advantages, including a deep and comprehensive understanding of the waste disposal problem within the specific community context, the ability to combine both qualitative and quantitative data collection methods, and cost-effectiveness. However, it also had limitations, such as limited generalizability to other contexts, potential for bias, and being resource and time-intensive.

In summary, the research design was well-suited to explore the waste disposal issue in the community comprehensively, considering both qualitative and quantitative aspects. It provided valuable insights into the problem within its specific context while acknowledging its limitations.

3.2 Study Population

The concept of a population in research refers to the entire group of people, events, or things that a researcher intends to investigate. In the case of this research conducted by Blantyre City Council, the population of interest is the entire population residing within the council's jurisdiction. However, due to practical constraints, the research focused on an accessible population of 145 respondents. This accessible population represented a subset of the larger population and included a diverse range of stakeholders, such as district officials, council officials, Members of Parliament (MPs), village chairpersons, hotel owners, householders, and shopkeepers.

It's important to note that researchers often work with accessible populations, which are subsets of the broader population, for reasons such as feasibility, cost-effectiveness, and practicality. The choice of specific respondents within the accessible population is typically guided by research objectives and the need to gather relevant information related to the research topic.

In this case, the 145 respondents were likely selected because they held roles or positions that were directly relevant to the research on waste disposal and community involvement. Their perspectives and experiences would provide valuable insights into the issues being studied.

While the accessible population may not represent the entire population, the research aims to draw meaningful conclusions and insights from this subset that can contribute to addressing the research questions or objectives effectively. Researchers often use various sampling techniques to ensure that the accessible population is representative and provides valuable data for analysis and interpretation. (Sekaran, 2003)

3.2.1 Sample Size and selection

A sample size can be defined as a subset or sub group of the population (Sekaran, 2003). Mugenda & Mugenda (2003), argue that it is impossible to study the completely targeted population. From the population of 145 a osample size was determined using Slovin's Formula to come up with oappropriate sample size that will be used in the study. Slovins Formula states that, given a population, the minimum Sample size is given by:

$$n = \frac{N}{1} + N(e2)$$

Where **N** is the known Population

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e is the level of significant which is fixed at 0.05, basing in the formula the minimum sample size will be;

$$n = \frac{145}{1} + 145(0.05)2$$

n = 145/(1+0.25

n= 145/1.25

n = 116 Respondents

A sample size of 116 respondents will be selected to participate in the exercise.

3.3 Sampling Techniques and Procedures

The researcher employed a combination of two sampling techniques, namely simple random sampling and purposive sampling, to select respondents for the study. Each of these techniques serves a distinct purpose in research sampling:

Simple random sampling is a probability-based technique in which every element within a population has an equal and independent chance of being selected for the sample.

In this study, simple random sampling was used to identify local households and shopkeepers as potential respondents.

The process involved assigning specific numbers to rows and columns associated with potential respondents and placing these numbered papers into a container.

Respondents were then selected by randomly drawing the numbered papers from the container. If the number matched a specific row or column, the corresponding individual was chosen as part of the sample.

Purposive sampling, also known as judgmental or selective sampling, involves the deliberate selection of individuals or cases for the sample based on specific criteria.

In this study, purposive sampling was employed to identify and select key informants who were directly involved in the day-to-day management of solid waste. These key informants included district officials, councilors, division officials, and village officials.

The choice of purposive sampling for these key informants was based on their roles, expertise, and direct involvement in solid waste management, making them valuable sources of information.

The rationale for using purposive sampling for key informants is that they possess specialized knowledge and insights relevant to the study's objectives. They are often considered experts or insiders within their respective roles, making their input critical to understanding solid waste management practices.

In summary, the combination of simple random sampling and purposive sampling allowed the researcher to select a diverse set of respondents, including local households and shopkeepers chosen through randomization and key informants selected purposively based on their roles and expertise in solid waste management. This approach ensured that the study captured a range of perspectives and insights related to the research topic. (Mugenda & Mugenda, 1999).

3.4 Sources of Data

Two sources of data including primary and secondary were used as explained in the sub sections 3.4.1 and 3.4.2 below.

3.4.1 Primary Source

The research involved the collection of primary data, which refers to original data collected directly by researchers for the specific purpose of their study. This primary data collection was conducted to gather information related to the topics of "Community Participatory Approach" and "Solid Waste Management."

The sources of primary data included a diverse group of respondents, encompassing District Officials, Council Officials, Village Chairpersons, Hotel Owners, Households, and Shopkeepers. Each of these respondents played different roles and had unique perspectives relevant to the study.

Various data collection methods, such as surveys, interviews, questionnaires, or observations, were likely employed to collect primary data from these respondents. The choice of method may have depended on the type of information sought and the preferences of the respondents.

The primary data collection had a specific purpose: to obtain fresh, firsthand insights into the areas of Community Participatory Approach and Solid Waste Management within the research context. The information gathered from the respondents would be subjected to analysis to draw conclusions and findings related to the research questions or objectives.

Overall, the collection of primary data was essential for this research as it allowed the researcher to tailor data collection to their research needs, ensuring that the information obtained was directly relevant to the study's objectives. It provided an opportunity to gain valuable insights from various stakeholders involved in the study topics, contributing to a comprehensive understanding of Community Participatory Approach and Solid Waste Management within the community. (Sekeran, 2003).

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3.4.2 Secondary Source

Secondary data refers to existing data that has been previously collected, documented, and published by other researchers, scholars, or sources. This data is readily available and can be accessed from various outlets, including academic journals, publications, and online materials.

Secondary data consists of information that was collected for purposes other than the current research study.

Secondary data can be obtained from various sources, such as academic journals, reports, books, government publications, and online resources.

Researchers often leverage secondary data when it is relevant to their study objectives. It can provide valuable insights, historical context, or reference points for the current research.

Secondary data is particularly useful when collecting primary data is impractical, time-consuming, or costly.

Researchers analyze secondary data to extract relevant information or statistics that contribute to their research findings and conclusions.Proper citation and referencing of the sources of secondary data are crucial to maintain academic integrity and give credit to the original authors.

Advantages of secondary data include accessibility, cost-effectiveness, and the ability to access historical or extensive datasets.Limitations may include potential biases in the original data, lack of control over data collection methods, and data that may not perfectly align with the current research objectives.

In summary, secondary data serves as a valuable resource for researchers, providing access to existing information that can enhance the depth and context of their studies. Researchers should be diligent in citing and acknowledging the sources of secondary data, and they may use it alongside primary data to enrich their research findings.

3.5 Data collection methods

The study used three data collection including the interview, questionnaire survey and observation method as indicated below.

3.5.1 Interview Method

Interviews involve a structured or semi-structured conversation between an interviewer and one or more respondents with the purpose of obtaining specific information through spoken words.

Interviews are a qualitative data collection method, which means they focus on gathering non-numerical data, such as narratives, descriptions, and insights, to understand complex phenomena.

Interviews were used in the research to delve deeply into the research topic. They allowed the interviewer to explore the perspectives, experiences, and insights of the respondents regarding Community Participatory Approach and Solid Waste Management.

One of the advantages of interviews is their adaptability and flexibility. They can be tailored to suit the specific research objectives and the context of the study.Interviews provide the opportunity for open-ended questions, follow-up inquiries, and probing for more detailed responses.

Interviews are valuable for obtaining rich, qualitative data that can provide a deeper understanding of the research topic.They allow for real-time interaction between the interviewer and respondents, facilitating the exploration of complex issues.

In summary, interviews were used as a qualitative data collection method to gather in-depth information from respondents about Community Participatory Approach and Solid Waste Management. This method offered flexibility and adaptability to the research context, enabling the exploration of complex issues and the collection of rich, qualitative data. (Amin, 2003)

3.5.2 Questionnaire survey method

Questionnaires are structured instruments that contain a set of predefined questions to which respondents provide answers, typically with closely defined alternatives and pre-formulated choices.Questionnaires are a method of structured data collection, meaning that they involve predetermined questions and response options.

Respondents are presented with a list of questions, and they select or provide answers based on the choices provided.The questionnaires used in the research consisted of closed-ended questions. These questions offer predefined response options, such as "strongly agreed," "agreed," "no comment," "disagreed," and "strongly disagreed."

Closed-ended questions are useful for quantifying and categorizing respondents' opinions or attitudes.Questionnaires offer several advantages, including the convenience of completion at the respondents' own pace and location.They can provide a level of anonymity to respondents, encouraging honest and candid responses.

The questionnaires were designed to collect information on respondents' opinions regarding the effects of community participatory approaches on solid waste management.The structured format and

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predefined response options help guide the study's objectives and research topic. (Amin, 2005)
In summary, structured questionnaires were employed to collect qualitative data by presenting respondents with predefined questions and response choices. This method allowed for the systematic gathering of opinions and attitudes related to community participatory approaches and solid waste management. The structured format of questionnaires facilitated the collection of specific data to address the research objectives.

3.5.3 Observation method
Observations involve the researcher visually examining and recording real-life events and occurrences as they naturally happen in their actual setting.This method aims to provide firsthand information about reality as it unfolds in its natural context.Observational methods require the researcher to directly observe and document events, behaviors, or phenomena as they occur in the real world.Researchers use their senses, primarily vision, to collect data by watching and recording persistent happenings. (Amin,2005)
Observations are often used for qualitative data collection, as they focus on understanding and describing events or behaviors in their natural context.
In this research, observations were used to supplement the data collected from respondents through structured questionnaires and interviews.Observations provided additional insights into the real-world aspects of community participatory approaches and solid waste management.
Observations offer the advantage of providing firsthand, unfiltered information about real-life situations.They can capture details and nuances that may be missed through other data collection methods.
Observations are often considered a cost-effective data collection method, as they require minimal equipment and can be conducted in the field.
In summary, observational methods involve the researcher visually examining and recording real-life events as they naturally occur. This approach offers the advantage of providing firsthand, unfiltered insights into the research topic. In this research, observations were used in conjunction with other data collection methods to enhance the understanding of community participatory approaches and solid waste management.

3.6 Data Collection Instruments
The instruments that wereused to collect data from the field included mainly the Interview check lists, Structured Administered Questionnaire and Observation check lists.

3.6.1 Interview Checklist
Face-to-face interviews involve direct interaction between the researcher or research assistants and the interviewees in a physical setting.This method allows for real-time conversation and the opportunity to ask follow-up or probing questions.
Unstructured questions are open-ended, meaning they do not have predefined response options. Instead, they allow interviewees to provide detailed and free-form responses.
Unstructured questions are valuable for exploring topics in depth and eliciting rich information.An interview guide is a set of open-ended questions or prompts that guide the interview process. While the questions may be unstructured, the guide ensures that important topics are covered.
The interview guide serves as a framework for the interview, helping the interviewer stay focused on key areas of inquiry.
In this research, research assistants were employed to conduct the face-to-face interviews using the interview guide.Research assistants play a crucial role in administering the interviews, asking questions, and recording responses.
Probing questions were used during the interviews to encourage interviewees to provide additional and more revealing information.Probing helps uncover deeper insights that may not be obtained from self-administered questionnaires.Face-to-face interviews with unstructured questions and the use of an interview guide enhanced the data collection process by allowing for in-depth exploration of the research topic.
In summary, face-to-face interviews with key informants, unstructured questions, and an interview guide were employed to gather detailed and rich information about community participatory approaches and solid waste management. Research assistants played a role in conducting the interviews, and probing questions were used to encourage interviewees to provide in-depth insights. This approach complemented other data collection methods used in the research.

3.6.2 Structured Administered Questionnaire
Structured questionnaires comprising questions were developed and administered to the community of which households and shopkeepers formed the majority of respondents who answered the

questionnaires. Variables in line with community participation approaches in terms of planning, implementation and monitoring and evaluation were developed which generated opinions related to solid waste management such as solid waste generation, collection, storage, transportation and disposal of solid waste. Each item in the questionnaire was developed to address a specific objective, research question and hypothesis of the study. In this particular study, Close ended questions formed the best option because such questions are accompanied by a listof all possible alternatives from which respondents selected the answers that best described the situation.

3.6.3 Observation checklist

An observation checklist is a structured tool that allows the researcher to systematically record specific observations and behaviors during field visits.It typically consists of a list of items or criteria that the researcher needs to observe and document.

The observation checklist was employed during field visits to observe and document various aspects related to garbage collection, storage, transportation, and disposal.Researchers use their senses to visually assess and record what they observe in the field.

The observation checklist served as a supplementary method to enhance the data collected through other means, such as interviews, questionnaires, and observations.It provided a real-time assessment of the actual conditions and practices in the field.

The checklist is objective and systematic, as it requires the researcher to check off items or criteria as they are observed.It helps ensure consistency in data collection across different field visits.

Observations using a checklist can enhance the validity of the data by providing concrete evidence of the conditions and practices in the field.It can help corroborate information obtained through other data collection methods.

In this research, the observation checklist was specifically used to focus on aspects related to garbage collection, storage, transportation, and disposal.

Researchers recorded their observations and findings in these areas.

In summary, the observation checklist was utilized as a tool to supplement data collection in the field, particularly in assessing the practices and conditions related to garbage management. This method provided a systematic and objective way to capture real-time information and enhance the validity of the research findings.

3.7 Validity and reliability

To ensure quality control of the instrument, both validity and reliability were used as explained in sub section 3.7.1 and 3.7.2 below.

3.7.1 Validity

The concept of validity in research refers to the extent to which a measurement tool or instrument accurately assesses the intended data or constructs. In this research, validity was a crucial consideration to ensure that the questions in the research instruments (such as questionnaires and interview guides) were capable of capturing the intended information related to solid waste management and community participatory approaches.

Before the actual data collection, a pre-testing phase was conducted. During this phase, the research instruments (e.g., questionnaires) were administered to a small sample of respondents who were not part of the main study group. This allowed for the identification of any potential issues or ambiguities in the questions.

To further enhance the validity of the research instruments, the researcher sought the input of experts in the field of solid waste management. Two experts, including a Waste Management official and environmental officers, were consulted. These experts had specialized knowledge and experience in the subject matter.

After obtaining feedback from the experts, a Content Validity Index (CVI) was calculated. The CVI is a quantitative measure used to assess the content validity of each item or question in the research instrument.

Each item or question in the research instrument was critically reviewed by the experts. They determined whether each item was relevant to the research objectives and whether it effectively captured the intended data.

The CVI was calculated by dividing the number of items considered relevant by the total number of items in the research instrument. The formula used was:

CVI = Items considered relevant / Total number of items

To establish a threshold for validity, the research aimed for a CVI score of 0.7 or 70% and above. This threshold was chosen to ensure that a substantial majority of items in the research instrument were deemed relevant and appropriate by the experts.

The CVI score obtained was assessed against the threshold. If the CVI score for an item or question was equal to or above 0.7 (70%), it was considered valid and retained in the research instrument. Items that did not meet this criterion were reviewed and potentially revised or eliminated. By conducting this validity assessment and involving experts, the research aimed to ensure that the questions in the research instruments accurately captured the relevant information needed to address the research objectives. Validity enhancement contributes to the overall accuracy and quality of the research data.

In summary, establishing and assessing the validity of the research instruments involved pre-testing, expert input, and the calculation of the Content Validity Index (CVI). The aim was to retain only valid questions in the instruments to ensure that the collected data accurately reflected the research objectives. A CVI score of 0.7 (70%) or above was the threshold for determining question validity. This process contributed to the credibility and reliability of the research findings.The score was obtained and this percent result always must be above 50% as supported by Basheka, Barifaijo & Onyu, (2010) who argues that for an instrument to be valid, it should have a score equal to or above 0.7 (70%).

3.7.2 Reliability

Reliability is a crucial aspect of research, as it assesses the consistency and stability of a measurement instrument, ensuring that it produces consistent results when applied repeatedly to the same objects or respondents. In this research, the reliability of the questionnaire instrument, which served as a primary tool for data collection, was assessed using Cronbach's Coefficient alpha.

Reliability in research refers to the extent to which a measurement instrument consistently produces the same or similar results when applied to the same individuals or objects on multiple occasions.

Cronbach's Coefficient alpha is a widely used statistical measure of internal consistency, which is a component of reliability.It assesses how well a set of items in a questionnaire or scale measures a single underlying construct or dimension.

To assess the reliability of the questionnaire in this research, the researcher employed the test/retest procedure, which involves administering the same questionnaire to a group of respondents at two different points in time.

The questionnaire was pretested on a sample of 10 respondents from Blantyre City Markets. This pretest allowed for the identification of any issues or ambiguities in the questions and ensured that respondents understood the items.

Using statistical software (in this case, SPSS), the researcher computed Cronbach's Coefficient alpha for the questionnaire.The coefficient alpha value represents the degree of internal consistency among the questionnaire items.

The coefficient alpha value can range from 0 to 1. A high alpha value implies high internal consistency and, therefore, high reliability.In this research, an average alpha value of 0.65 was obtained, which suggests a moderate level of internal consistency.

Amin (2005) suggests that an alpha value of 0.5 or higher is generally considered sufficient to demonstrate reliability.In this case, the obtained alpha value of 0.65 exceeded this threshold, indicating that the questionnaire instrument exhibited a reasonable level of internal consistency.

The reliability of the questionnaire instrument ensures that the responses collected from respondents are consistent and dependable, increasing the trustworthiness of the research findings.

In summary, reliability assessment through Cronbach's Coefficient alpha involved the test/retest procedure and the computation of internal consistency. The obtained alpha value of 0.65 exceeded the acceptable threshold, indicating reasonable reliability for the questionnaire instrument used in the research. This reliability enhances the credibility of the research data and findings.

3.8 Procedure for data collection

The process of obtaining permission and conducting data collection is a crucial phase in any research project, and it's important to ensure that it is carried out efficiently and ethically

Once the proposal was finalized, copies of the proposal were submitted to the relevant authorities or ethics committees for review and approval. This step is crucial to ensure that the research adheres to ethical guidelines and regulations.

After receiving approval or clearance from the relevant authorities, an introductory letter was issued. This letter served as a formal communication tool and was used to seek permission from Blantyre City Council and the communities where the study was conducted.

The introductory letter was designed to provide key information to the authorities and communities. It outlined the purpose of the research, explained the significance of the study, and detailed the research objectives.

One of the primary purposes of the introductory letter was to inspire cooperation among potential respondents. It conveyed the importance of their participation in the research and explained how their input would contribute to the study's objectives.With the assistance of research assistants, the selected respondents were provided with copies of the questionnaires. These questionnaires were the primary data collection tool used to gather information from the respondents.

The distributed questionnaires were accompanied by a letter that explicitly stated the purpose of the study and emphasized the importance of confidentiality. This assured respondents that their responses would be treated with discretion and used solely for research purposes.

Respondents were given a specific period of time within which to complete and return the questionnaires. This timeframe was established to ensure the timely collection of data.Throughout this process, ethical considerations were paramount. Researchers must adhere to ethical guidelines to protect the rights and privacy of respondents and to maintain the integrity of the research.

In summary, the process involved securing approval, issuing an introductory letter to relevant authorities and communities, distributing questionnaires, and emphasizing the importance of confidentiality and cooperation. This systematic approach ensured that data collection was conducted in an organized and ethical manner.After, successfully defending the proposal, the researcher made the relevant corrections and preceded to submitted copies of the proposal and thereafter wasissued with an introductory letter, used to seek for permission from relevant authorities of Blantyre City Council and communities through which the study was carried out.

3.9 Data Management and Analysis

The field data wasmanaged and analyzed as follows;

3.9.1 Qualitative Data Management and Analysis

Analyzing qualitative data is a critical step in research, and it involves systematically examining non-numeric information, such as interview responses, to derive meaningful insights.

Face-to-face sessions were conducted between the researcher and key informants. These sessions typically involved in-depth interviews or discussions. Key informants, such as district officials, councilors, village chairpersons, and hotel owners, were selected for their valuable insights into solid waste management and community participatory approaches.

Following the face-to-face sessions, the data collected from these interviews needed to be transcribed and organized. Transcription involves converting spoken responses into written text for analysis.

Qualitative data analysis begins with the identification of themes and categories. Themes are recurring patterns, topics, or ideas that emerge from the data, while categories are groups of related responses or concepts.

The researcher systematically evaluated and analyzed the qualitative data to determine several key aspects. Assessing whether the data collected provided sufficient depth and breadth to address the research questions and objectives.Ensuring that the data was trustworthy and reflected the true perspectives of the informants. Determining the relevance and utility of the information for the research. Examining whether there were consistent patterns or discrepancies in the responses.

The analysis of qualitative data aimed to establish trends and relationships within the information being studied. This involves looking for patterns or connections between different themes or categories.To strengthen the interpretation and findings, direct quotes from the interviews were often used. These quotes provided authentic and verbatim expressions of the informants' perspectives and added credibility to the analysis.

Qualitative data analysis complemented the quantitative data collected through questionnaires. It provided a deeper understanding of the issues, motivations, and experiences of the respondents.The results of the qualitative data analysis were typically reported in the research findings and discussion sections of the research report. Researchers presented the identified themes, categories, trends, and direct quotes to support their arguments and conclusions.

In summary, the analysis of qualitative data involved a systematic process of transcribing, organizing, and evaluating the data obtained from face-to-face sessions. It aimed to uncover patterns, assess credibility, and provide valuable insights into the research topic. The use of direct quotes and the integration of qualitative findings with quantitative data contributed to a comprehensive understanding of the research subject.

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3.9.2 Quantitative Data Management and Analysis

Quantitative data analysis is a structured process that involves the examination of numerical data collected from closed-ended questions or structured surveys.

Quantitative data was primarily collected through the use of closed-ended questions in the questionnaires. These questions typically offer respondents a set of predefined response options to choose from.

After data collection, the researcher initiated a process of data management. This involved several steps:

Sorting: The completed questionnaires were sorted to organize the data systematically.

Coding: Each response or variable in the questionnaires was assigned a unique code for easy identification and analysis.

Data Entry: The coded data were entered into a computer using specialized software, in this case, the Statistical Package for Social Sciences (SPSS).

Error Checking: Data entry is prone to errors, so thorough error checking was performed to identify and rectify any inaccuracies or discrepancies in the entered data.

Quantitative data analysis encompassed both descriptive and inferential techniques:

Descriptive statistics were computed to summarize and describe the main characteristics of the data. This included:

Frequencies: The frequency of each response option for individual questions was determined.

Percentages: The percentages of respondents choosing specific response options were calculated.

Tabular and Graphical Representation: Findings were presented in tables and graphical forms (e.g., bar charts, pie charts) to facilitate easy interpretation and comparison.

The presentation of findings in tabular and graphical forms allows for easy comparison between different variables or response options. This visual representation enhances the clarity of results and helps readers quickly grasp key insights.

The use of specialized software like SPSS is common in quantitative data analysis. These software tools facilitate data entry, cleaning, and a wide range of statistical analyses, making the process more efficient and accurate.

In summary, quantitative data collection involved closed-ended questions, and data management included sorting, coding, entry, and error checking. Quantitative data analysis encompassed both descriptive and inferential statistics, with a focus on summarizing findings through frequencies, percentages, and graphical representation. The use of software like SPSS contributed to the accuracy and efficiency of the analysis.

3.10 Measurement of variables

The level of measurement is an important aspect in research as it determines how variables are quantified and analyzed. In this research, two different levels of measurement were employed to capture and analyze the data:

The ordinal scale was used to measure the quantified indicators of community participation and solid waste management. This scale involved ranking responses based on a 5-item Likert scale, with each response option assigned a numerical value:

Strongly Agree (5)
Agree (4)
Undecided (3)
Disagree (2)
Strongly Disagree (1)

The use of an ordinal scale allows for the ranking of responses in terms of agreement or disagreement while maintaining the intervals between the response options. This scale provides a way to gauge the degree of agreement or disagreement on various aspects related to community participation and solid waste management.

The nominal scale was employed to measure demographic information about the respondents. This scale is suitable for categorizing data into non-ordered categories. It is used to classify respondents into groups or categories without implying any specific order or ranking.

For example, demographic information such as gender, age groups, occupation, or residential location is typically measured using a nominal scale. This allows for the classification of respondents into distinct categories without assigning numerical values or implying any order among the categories.

The choice of measurement scale depends on the nature of the variables being studied and the research objectives. In this research, the ordinal scale was used to assess the degree of agreement or disagreement on key indicators related to community participation and solid waste management, while the nominal scale was employed for classifying respondents into different demographic categories. Using the appropriate level of measurement is crucial for accurate data analysis and interpretation.

3.11 Ethical considerations

First and foremost, obtaining informed consent from all participants was a paramount ethical principle. Prior to engaging in interviews and surveys, participants were provided with comprehensive information regarding the study's purpose, potential risks, and benefits. They were assured that their participation was entirely voluntary, and they had the right to withdraw at any point without repercussions. This ensured that individuals were treated with respect and autonomy.

Anonymity and confidentiality were also rigorously maintained. To safeguard participants' privacy, all collected data were anonymized, and identifying information was removed or coded. This practice ensured that individual responses could not be linked back to specific participants, thereby safeguarding their confidentiality.

Furthermore, community engagement was an ethical cornerstone. The research team actively sought the permission and input of community leaders and stakeholders, emphasizing the importance of respecting the communities' autonomy and decisions regarding the research's implementation within their territories. This inclusive approach fostered trust and collaboration.

Cultural sensitivity played a pivotal role in the study's ethical framework. The research team ensured that all research processes, including questions posed, were culturally appropriate and respectful. This sensitivity reflected a commitment to honoring the cultural norms and practices of the communities involved.

Beneficence was another critical ethical consideration. The study aimed to benefit the communities in Blantyre District by shedding light on their waste management efforts and promoting sustainable practices. The research was conducted with the genuine intention of making a positive contribution to waste management in the region, aligning with the ethical principle of doing good.

Data security and integrity were upheld throughout the study to protect participants' interests. Robust measures were put in place to securely store and safeguard electronic and physical data from unauthorized access or breaches.

Honesty and integrity were non-negotiable principles. The research team reported findings and results accurately and without manipulation or bias, ensuring transparency and trustworthiness.

Efforts were taken to minimize potential harm that could result from the study, reflecting the ethical principle of minimizing harm. This included ensuring that the research did not inadvertently worsen existing challenges or create new ones within the communities.

Disclosure and mitigation of conflicts of interest were essential ethical practices. The research team openly disclosed any potential conflicts of interest that could influence the study's outcomes and took steps to manage these conflicts to maintain objectivity and integrity.

Lastly, the study scrupulously adhered to all relevant local and international regulations and ethical guidelines governing research involving human participants, ensuring legal and ethical compliance.

In conclusion, by rigorously addressing these ethical considerations, the study upheld the highest standards of research ethics. It safeguarded the rights and well-being of the participants and communities in Blantyre District, Malawi, and maintained the integrity and credibility of the research process. These ethical principles underscored the study's commitment to conducting socially responsible and ethically sound research.

3.12 Results of the Study

After the data analysis was completed, the research team prepared a detailed research paper summarizing the key findings, conclusions, and recommendations. This paper was structured to adhere to the standards and guidelines set by reputable academic journals.

The research team successfully submitted the research paper to various open-access journals specializing in waste management, community development, and environmental studies. These journals were chosen for their commitment to making research findings accessible to a wide audience without cost barriers.

Upon submission, the paper underwent a rigorous peer-review process, during which experts in the field assessed the quality, validity, and ethical aspects of the research. The reviewers provided valuable feedback, which the research team considered and incorporated into the final version of the paper.

After the paper passed the peer-review process, it was accepted for publication in a respected open-access journal, ensuring that the study's findings would be freely available to researchers, policymakers, and the general public. This dissemination approach aligned with the ethical principle of promoting transparency and accessibility in research.

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Once the paper was published, the research team actively promoted its availability through various channels, including academic conferences, online platforms, and collaboration with relevant organizations working in waste management and community development in Malawi and beyond. The goal was to maximize the impact of the research by reaching a broad and diverse audience.

Furthermore, the research team engaged with local stakeholders and community leaders in Blantyre District to share the study's results directly with the communities that had participated in the research. This step was crucial in ensuring that the communities were informed about the findings and could actively use them to enhance their waste management practices.

In conclusion, the dissemination of the study's results in open-access journals, along with active engagement with local communities and relevant stakeholders, contributed to the ethical and responsible sharing of valuable research findings. This approach upheld the principles of transparency, accessibility, and community engagement, fostering the study's broader impact on waste management practices in the Blantyre District of Malawi.

IV. FINDINGS

4.0 Introduction

This chapter presents the findings of an in-depth study that sought to evaluate the participatory approaches adopted by communities in supervising waste disposal at central markets within the Blantyre District of Malawi. Blantyre District, as a microcosm of the broader waste management challenges facing many African cities, offers valuable insights into the dynamics of community engagement in waste disposal oversight. The central markets, serving as critical hubs of economic and social activity, are particularly pertinent in understanding how participatory mechanisms can be harnessed to address waste disposal issues.

4.1Tables

Table 4.1 Age of respondents

Age of respondents	Frequency (%)
18-25	41 (35%)
26-33	23 (20%)
34-41	16 (14%)
42-49	20 (17%|)
50 years and above	16(14%)
Total	116

In this study the majority of study respondents were between 18-25 years of age.This has been depicted in Table 4.1

Table 4.2 Gender of respondents

Gender	Frequency (%)
Male	64(55%)
Female	52 (45%)
Total	116 (100%)

In this study the majority of respondents were males 80 (55%) while 65(45%) were females.

4.2 Figures

4.2.1 Factors Facilitating or Hindering Participatory Waste Management Initiatives

4.2.1.1 Awareness of initiatives

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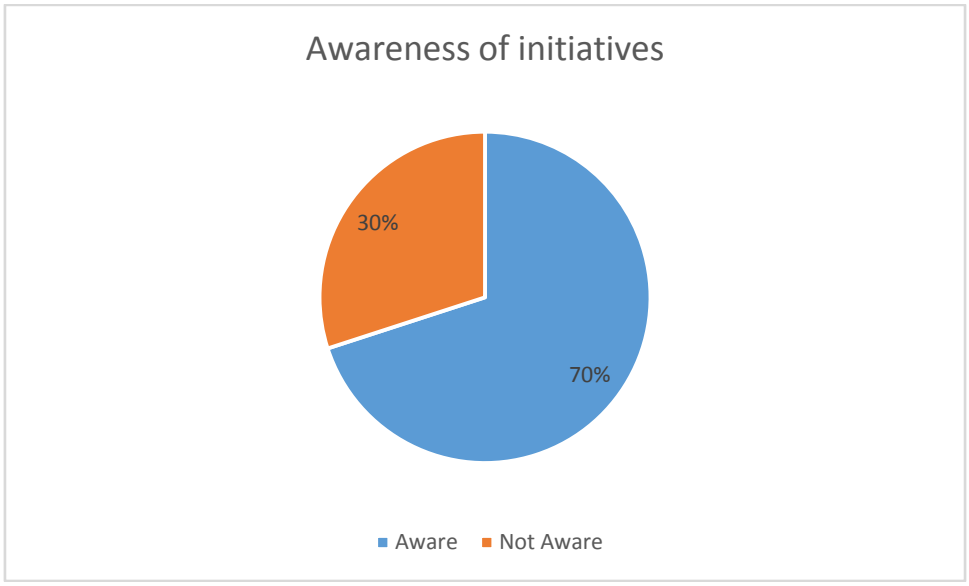

Fig 4.1 Awareness of initiatives

70% of respondents were aware of participatory waste management initiatives in their city while 30% were not aware as depicted in Figure 4.1.Understanding the level of awareness among the respondents is crucial as it provides insights into the knowledge and engagement of the community regarding waste management initiatives. The fact that 70% of the respondents were aware suggests a significant level of awareness and potential community engagement in waste management efforts. However, the 30% who were not aware may represent a segment of the population that could benefit from increased education and awareness campaigns to promote participation in waste management initiatives.

4.2.1.2 Facilitating Factors

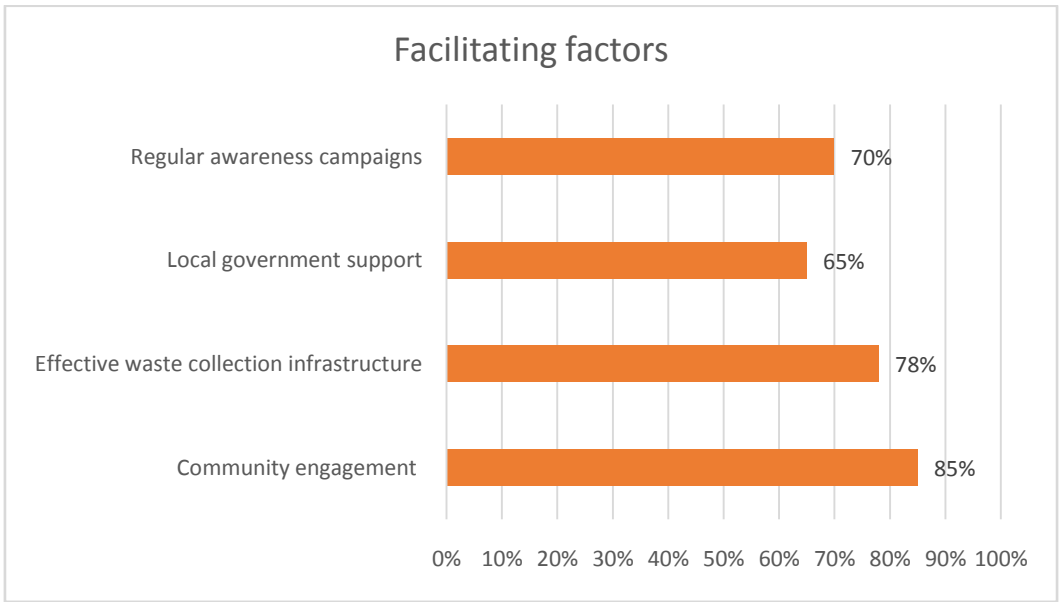

Figure 4.2 Facilitating factors

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The facilitating factors included Community engagement (85%), effective waste collection infrastructure (78%), local government support (65%), regular awareness campaigns (70%) as depicted in Figure 4.2.These facilitating factors collectively contribute to the effectiveness of waste management initiatives, highlighting the importance of community engagement, infrastructure, support from local authorities, and educational efforts in promoting sustainable waste management practices.

Participant 1: Community Engagement
"The strong involvement of the community was evident throughout our waste management project. People actively participated in clean-up drives, waste separation workshops, and even initiated their own local campaigns to raise awareness. This sense of ownership not only improved waste disposal practices but also fostered a greater sense of community pride."
Participant 2: Effective Waste Collection Infrastructure
"Our success in waste management was largely due to the efficient waste collection infrastructure we had in place. Regular pickups and clearly labeled bins made it easy for residents to sort their waste correctly. This also helped prevent littering and encouraged responsible disposal behaviors."
Participant 3: Local Government Support
"We couldn't have achieved our waste reduction goals without the support of the local government. Their funding and policy decisions allowed us to expand our initiatives and collaborate with other stakeholders. The government's commitment lent credibility to our efforts, encouraging more residents to get involved."

Participant 4: Regular Awareness Campaigns
"Our awareness campaigns played a pivotal role in changing people's attitudes toward waste management. Through creative workshops, interactive sessions, and even art installations made from recycled materials, we were able to make waste management a 'cool' topic. Over time, it became a part of our community's identity."
These qualitative insights offer a deeper understanding of the significance of each facilitating factor in the context of waste management initiatives. They highlight the community's engagement, the importance of infrastructure and government support, as well as the effectiveness of continuous awareness campaigns in bringing about positive change.

4.2.1.3 Hindering Factors

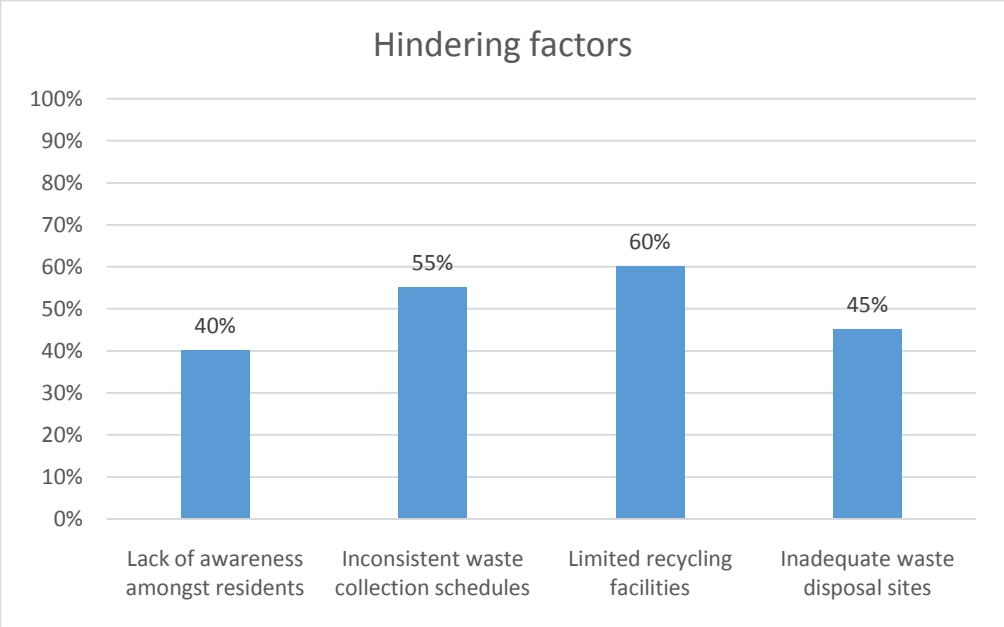

Figure 4.3 Hindering factors

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Hindering factors included lack of awareness among residents (40%), inconsistent waste collection schedules (55%), limited recycling facilities (60%) and inadequate waste disposal sites (45%) as depicted in Figure 4.3.These hindering factors pose challenges to effective waste management within the community. Lack of awareness, inconsistent waste collection, limited recycling facilities, and inadequate disposal sites can all contribute to the improper handling of waste. Identifying and addressing these hindrances is essential for improving waste management practices and promoting a cleaner and more sustainable environment.

Participant 1: Lack of Awareness Among Residents
"One major challenge we faced was the lack of awareness among residents about proper waste management practices. Many were still unaware of the importance of waste separation and the negative impact of improper disposal. Addressing this required extensive education campaigns and personalized interactions to bridge the information gap."

Participant 2: Inconsistent Waste Collection Schedules
"The irregular waste collection schedules were a significant obstacle in maintaining a clean environment. Residents often didn't know when to put out their trash, leading to overflowing bins and scattered waste. This inconsistency made it difficult for people to adhere to proper disposal practices."

Participant 3: Limited Recycling Facilities
"Our community's desire to recycle was hindered by the limited recycling facilities available. The lack of accessible recycling centers meant that even though people wanted to recycle, they often had to discard recyclables with regular waste. This frustration resulted in a missed opportunity to reduce waste sent to landfills."

Participant 4: Inadequate Waste Disposal Sites
"The shortage of proper waste disposal sites posed a significant challenge for our waste management efforts. The existing sites were either too far away or already overloaded, leading to illegal dumping in unauthorized areas. This not only damaged the environment but also made it harder to control waste and its impact."

These qualitative insights shed light on the challenges posed by hindering factors in the context of waste management. They highlight the importance of addressing residents' lack of awareness, the need for consistent waste collection schedules, the demand for accessible recycling facilities, and the critical requirement for appropriate waste disposal sites.

4.2.2 Effectiveness of Waste Management Sensitization and Educational Programs
4.2.2.1 Participation in Programs

Figure 4.4 Participation in waste management sensitization programs

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50% of respondents participated in waste management sensitization or educational programs as depicted in Figure 4.4.This finding suggests that a significant portion of the community has been actively engaged in educational initiatives related to waste management. These programs are designed to raise awareness, educate residents about proper waste disposal practices, and promote responsible behavior regarding waste.

Participant 1: Active Participation in Educational Programs

"I found the waste management sensitization programs extremely enlightening. They helped me understand the impact of improper waste disposal and taught me practical ways to reduce my waste footprint. I now segregate my waste diligently and make a conscious effort to recycle."

Participant 2: Positive Influence of Educational Initiatives

"The educational programs played a crucial role in changing my perspective on waste management. Learning about recycling, composting, and the consequences of littering inspired me to become more responsible. I've since become an advocate within my community, sharing what I've learned with friends and family."

Participant 3: Practical Learning from Sensitization Workshops

"I attended a waste management workshop organized by the community, and it was a hands-on experience. We learned how to make compost at home and were provided with resources to set up our own waste separation systems. The workshop not only educated us but also empowered us to take action."

Participant 4: Broadening Awareness Through Education

"I had never thought deeply about waste management until I participated in an educational campaign organized by the local government. The workshops and interactive sessions opened my eyes to the environmental implications of waste. I now encourage my neighbors to attend similar programs to spread awareness."

These qualitative insights provide a glimpse into the positive impact of waste management sensitization and educational programs on individuals. They reflect how such programs have empowered participants to adopt responsible waste management practices, become advocates for change, and actively contribute to creating a more sustainable environment.

4.2.2.2 Effectiveness of Programs

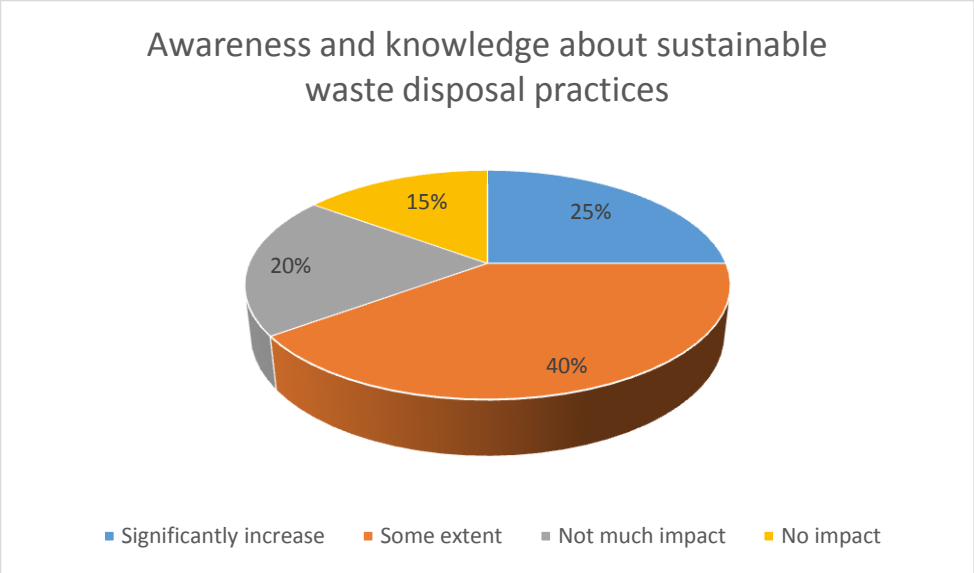

Figure 4.5 Awareness and knowledge about sustainable disposal practices

In this study 25% found the programs to significantly increase their awareness and knowledge about sustainable waste disposal practices, 40% to some extent, 20% reported not much impact, and 15% reported no impact as depicted in Figure 4.5.These findings reflect varying degrees of effectiveness of the sensitization and educational programs. While a significant

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proportion experienced positive effects, there is still a portion of the population that may require more targeted or enhanced educational efforts to increase their awareness and knowledge regarding sustainable waste management practices.

Participant 1: Significant Impact on Awareness
"The waste management programs were a revelation for me. They provided in-depth insights into sustainable waste disposal practices that I had never considered before. Learning about recycling methods, composting, and the environmental consequences truly transformed my understanding."

Participant 2: Gradual Impact Through Educational Initiatives
"While the impact wasn't immediate, the waste management programs did contribute to broadening my awareness over time. The continuous exposure to information through workshops and resources helped me adopt more responsible practices, even if it happened gradually."

Participant 3: Limited Impact for Some
"Personally, I didn't notice a huge impact from the programs. While I already had some basic knowledge of waste disposal, I was hoping for more practical tips on reducing waste at the source. The programs might have been more beneficial for those who were entirely new to the subject."

Participant 4: No Perceptible Impact
"I attended a few sessions of the waste management programs, but honestly, I didn't feel any significant change in my awareness or knowledge. The content seemed repetitive, and I was already familiar with most of the information being shared."

These qualitative insights provide a nuanced understanding of how waste management programs have influenced participants' awareness and knowledge. They highlight a range of experiences, from significant transformation to gradual shifts in understanding, as well as cases where the impact was perceived as limited or nonexistent.

4.2.3 Social, Economic, and Environmental Benefits of Community-led Waste Management

4.2.3.1 Awareness of Community-Led Initiatives

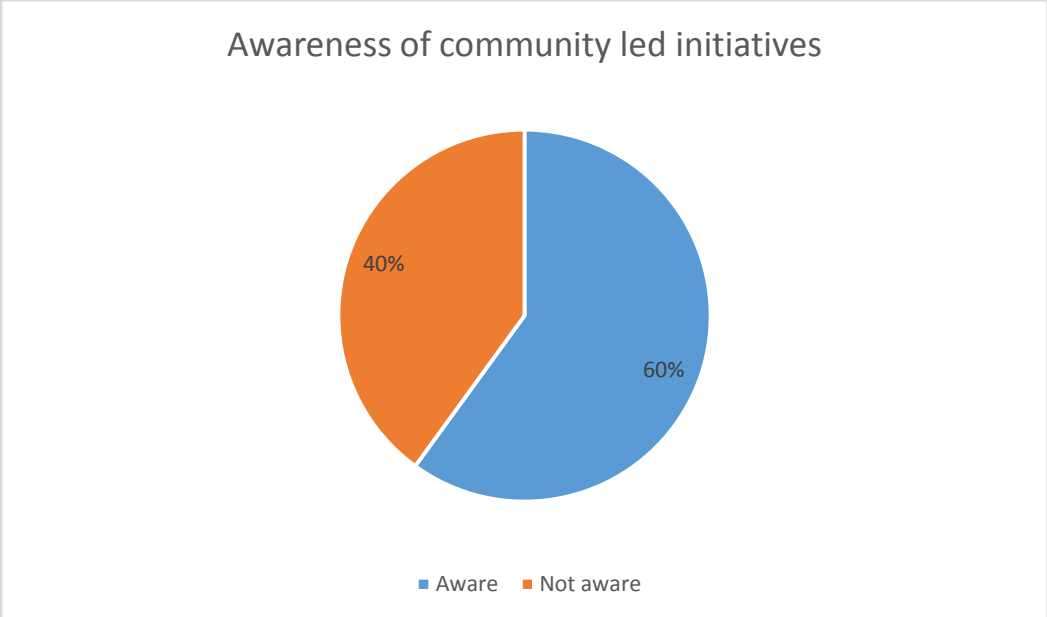

Figure 4.6. Awareness of community-led initiatives

In this study 60% of respondents are aware of community-led solid waste management initiatives in their area while 40% were not aware as depicted in Figure 4.6.Understanding the level of awareness is crucial for assessing the reach and effectiveness of community-led initiatives. While a majority of respondents are aware, efforts may be needed to enhance awareness among the remaining 40% to promote greater community involvement and participation in waste management programs.

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Participant 1: Positive Awareness of Initiatives
"I've been actively involved in our community's solid waste management initiatives, and it's heartening to see that 60% of respondents are aware of these efforts. We've worked hard to engage residents, organize cleanup drives, and set up waste separation systems. It's encouraging to know that our work is being recognized."

Participant 2: Mixed Feelings About Awareness
"I'm a bit surprised that 40% of respondents weren't aware of our community's waste management initiatives. While we've made efforts to spread the word through local events and social media, it seems there's still a gap in communication. We need to find more effective ways to reach those who are unaware."

Participant 3: Lack of Knowledge Reflects Challenges
"The fact that 40% of respondents are unaware of our community's solid waste management initiatives highlights the challenges we face. Despite our best efforts, it's not easy to capture everyone's attention. We need to rethink our outreach strategies to ensure that more people are informed and engaged."

Participant 4: Need for Better Information Dissemination
"I'm part of a community group that's been driving waste management initiatives, and it's disappointing to see that a significant portion of respondents aren't aware of our work. This emphasizes the importance of better communication channels, perhaps collaborating with local institutions to ensure everyone is informed."

These qualitative insights provide diverse perspectives on the awareness of community-led solid waste management initiatives. They emphasize the positive impact of awareness, the need for improved communication strategies, and the challenges faced in ensuring that a higher percentage of the population is informed about and involved in such initiatives.

4.2.3.2 Social Benefits

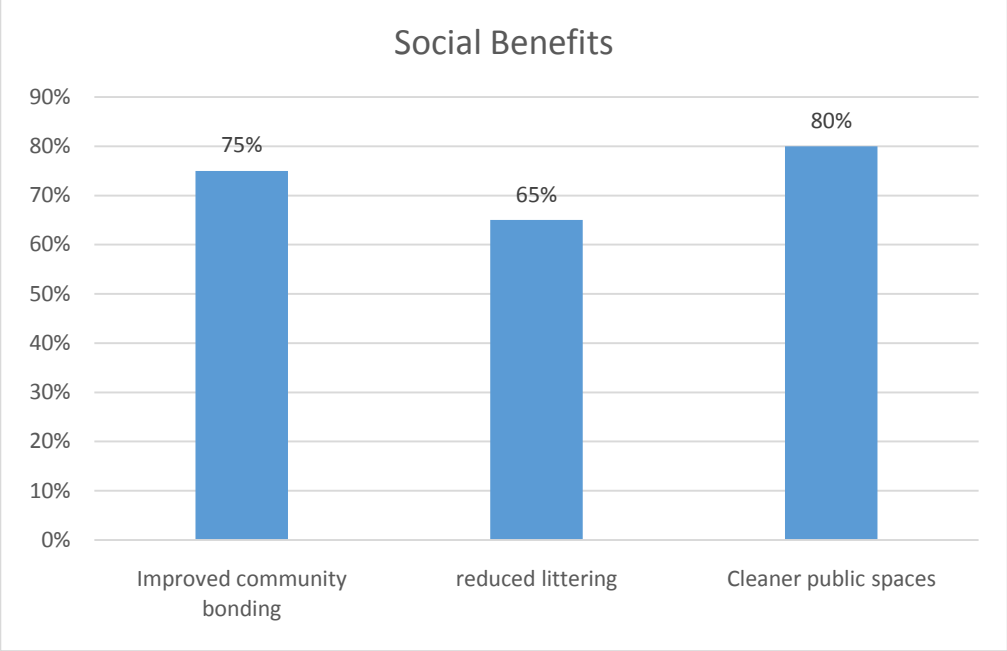

Figure 4.7 Social benefits

The social benefits identified in this study included improved community bonding (75%), reduced littering (65%) and cleaner public spaces (80%) as depicted in Figure 4.7.These social benefits highlight the positive impacts of community-led waste management on the well-being of the community. Improved community bonding, reduced littering, and cleaner public spaces contribute to a better quality of life for residents and create a more pleasant and harmonious living environment.

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Participant 1: Community Bonding
"The community bonding resulting from our waste management efforts is truly heartwarming. Through collaborative events like clean-up drives and waste separation workshops, we've gotten to know our neighbors better. It's inspiring to see how a shared goal of a cleaner environment can bring people together."
Participant 2: Reduced Littering
"The reduction in littering is a noticeable achievement. Walking down our streets, you can now see fewer discarded items, which makes the whole neighborhood more pleasant. It's a clear sign that our efforts are making a difference in changing people's habits."
Participant 3: Cleaner Public Spaces
"The impact on our public spaces is remarkable. Parks and sidewalks that used to be strewn with trash are now visibly cleaner. This not only improves aesthetics but also creates a healthier environment for everyone. It's a positive change that benefits everyone who uses these spaces."
Participant 4: Community Pride
"Our community's transformation is tied to these social benefits. The improved bonding, reduced littering, and cleaner spaces have instilled a sense of pride among residents. We take ownership of our environment, knowing that our efforts contribute to making it a better place for us and future generations."
These qualitative responses capture the sentiments of individuals in response to the social benefits identified in the study. They reflect how the community's efforts in waste management have led to positive changes in community dynamics, public spaces, and overall pride in the neighborhood.

4.2.3.3 Economic Benefits

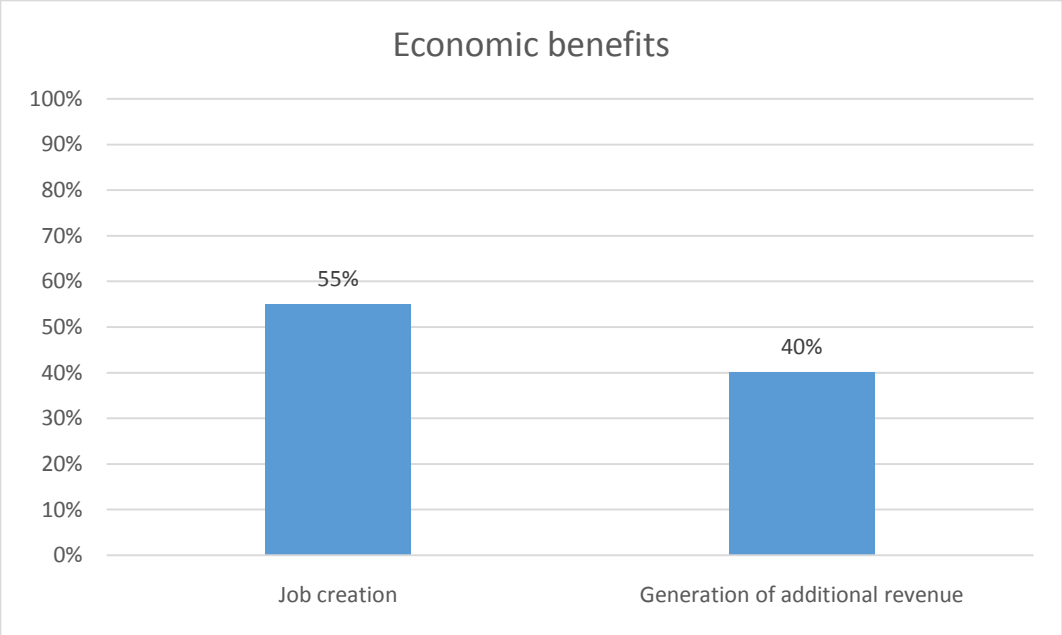

Figure 4.8 Economic benefits

Economic benefits included job creation through waste collection and recycling (55%), potential for generating revenue from selling recyclables (40%) as depicted in Figure 4.8.These economic benefits underscore the potential for sustainable waste management practices to have positive economic implications. Job creation and revenue generation can contribute to the economic well-being of the community, making waste management initiatives not only environmentally but also economically valuable.

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Participant 1: Job Creation and Empowerment
"The fact that waste management initiatives are contributing to job creation is a fantastic outcome. It's not just about collecting and sorting trash; it's about empowering individuals in our community with meaningful work. These jobs not only support families but also give people a sense of purpose and dignity."

Participant 2: Turning Trash into Treasure
"I'm intrigued by the potential for generating revenue from selling recyclables. It's like turning trash into treasure. The idea that materials we used to throw away can actually be valuable resources is eye-opening. This could potentially create a more sustainable and self-sufficient local economy."

Participant 3: Economic and Environmental Synergy
"Job creation and revenue generation through recycling show the synergy between economic and environmental goals. Waste management is no longer just an expense; it's an opportunity. By fostering local employment and finding value in what was once considered waste, we're building a more resilient community."

Participant 4: Circular Economy in Action
"These findings echo the principles of a circular economy. Waste isn't a dead end; it's a resource waiting to be harnessed. The creation of jobs and the potential for revenue demonstrate a shift towards more responsible consumption and production. It's exciting to see waste management aligning with economic sustainability."

These qualitative responses reflect the nuanced perspectives of individuals in response to the economic benefits outlined in the data. They highlight the significance of job creation, the innovative concept of generating revenue from recyclables, and the broader implications of waste management initiatives on both local economies and global environmental paradigms.

4.2.3.4 Environmental Benefits

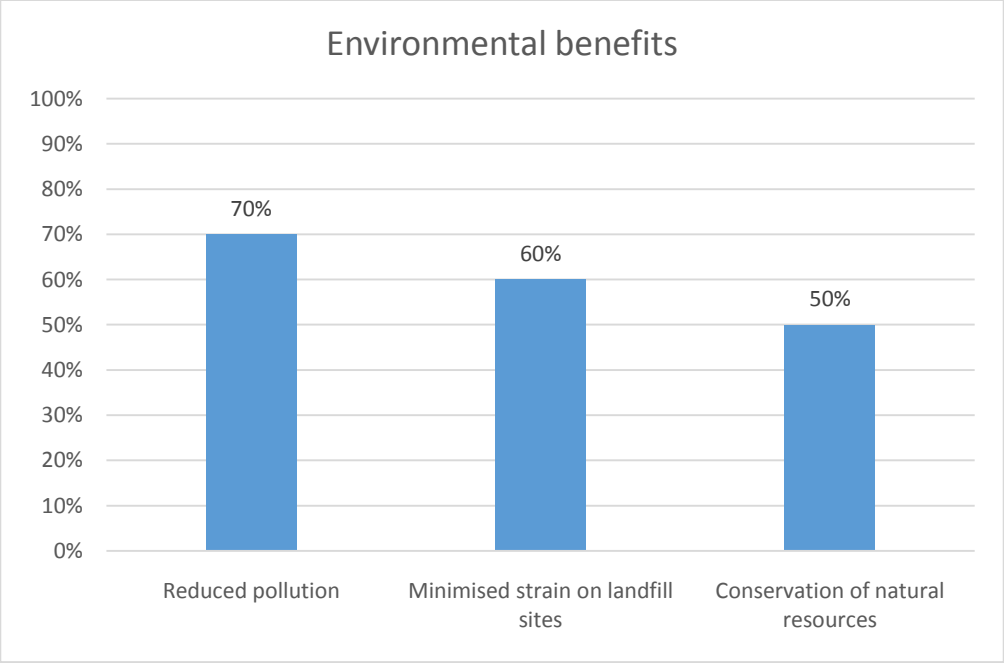

Figure 4.9 Environmental benefits

The environmental benefits in this study included reduced pollution (70%), minimized strain on landfill sites (60%) and conservation of natural resources (50%) as depicted in Figure 4.9.These environmental benefits highlight the positive contributions of community-led waste management initiatives to environmental

sustainability. By reducing pollution, easing the burden on landfill sites, and conserving natural resources, these initiatives promote a healthier and more eco-friendly community.

Participant 1: Reduced Pollution
"It's reassuring to know that the efforts towards waste management are contributing to reduced pollution. Cleaner air and water are essential for a healthy community. It's heartening to think that our collective actions are making a positive impact on the environment we all share."

Participant 2: Lighter Landfill Impact
"I'm glad the study highlighted the minimized strain on landfill sites. These sites have always been a concern due to their long-term environmental consequences. By managing waste more efficiently, we're not just prolonging the life of landfills but also reducing potential harm to our surroundings."
Participant 3: Valuable Resource Conservation
"The conservation of natural resources is a key takeaway for me. We often forget that everything we use comes from the environment. When we recycle and minimize waste, we're essentially giving back to nature and ensuring that future generations can benefit from the Earth's resources."
Participant 4: Comprehensive Environmental Benefits
"These environmental benefits highlight the interconnectedness of our actions and the environment. Reduced pollution, minimized landfill strain, and resource conservation paint a comprehensive picture of responsible waste management. It's a testament to the positive change that can result from collective efforts."

4.2.4 Performance of Participatory Monitoring and Evaluation Tools
4.2.4.1 Involvement in Monitoring and Evaluation

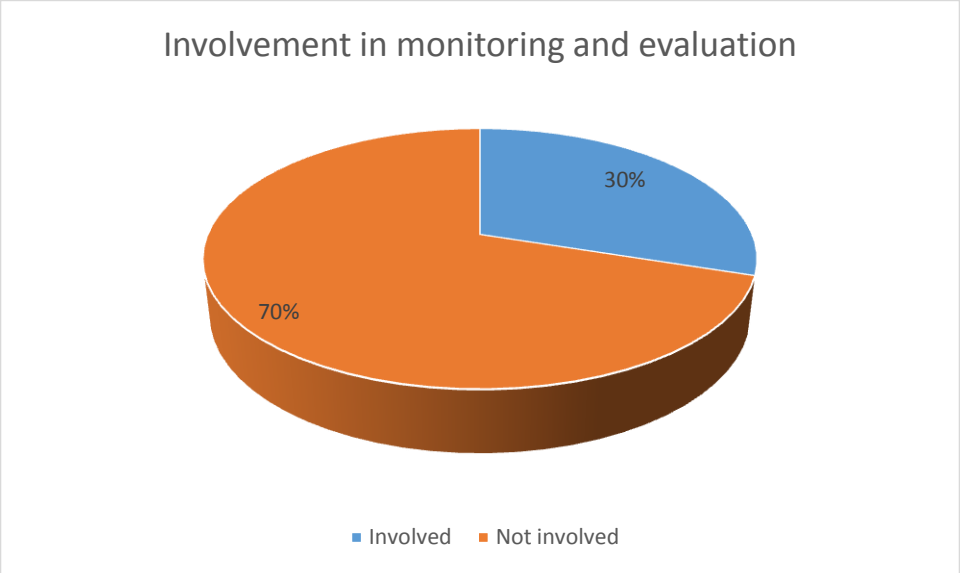

Figure 4.10 Involvement in monitoring and evaluation of solid waste management activities

In this study 30% of respondents were involved in solid waste management monitoring and evaluation activities while 70% were not involved as depicted in Figure 4.10.Understanding the level of community involvement in monitoring and evaluation is important for ensuring the effectiveness and accountability of waste management practices. Efforts may be needed to encourage more community members to participate in these activities to enhance the overall sustainability of waste management programs.

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4.2.4.2 Tools/Methods for Assessment

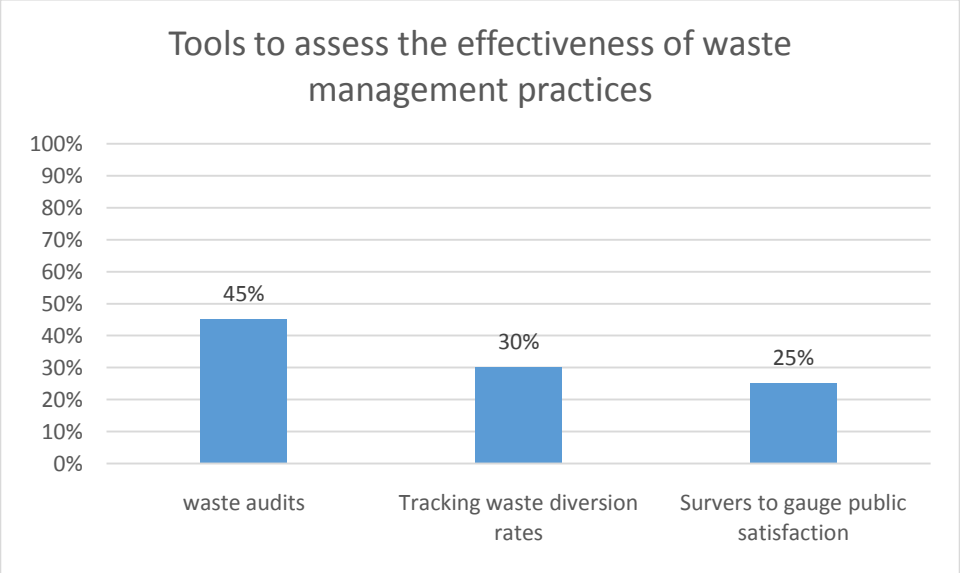

Figure 4.11 Tools for assessment of effectiveness of waste management practices

In this study the tools for assessing waste management practices included waste audits (45%), tracking waste diversion rates (30%) and surveys to gauge public satisfaction (25%) as depicted in Figure 4.11.These tools are valuable for evaluating the effectiveness of waste management initiatives and identifying areas for improvement. Waste audits, in particular, play a crucial role in understanding waste composition and can inform strategies for waste reduction and recycling programs.

4.2.4.3 Effectiveness of Tools/Methods

In this study respondents who participated in waste audits found them most effective (60%), citing tangible results and identification of specific improvement areas.

Participant 1: Tangible Results

"Participating in waste audits was an eye-opening experience for me. The most effective aspect was seeing tangible results right in front of me. It's one thing to hear about waste issues, but when you see the actual waste generated and its composition, it hits home. It motivated me to be more conscious about what I consume and how I dispose of it."

Participant 2: Pinpointing Improvement Areas

"Waste audits were incredibly effective because they provided a roadmap for improvement. It's not just about general awareness; it's about identifying specific areas where we can make a real difference. By knowing what we're throwing away the most, we can focus our efforts on reducing those types of waste and implementing targeted changes."

Participant 3: Concrete Actionable Insights

"The value of waste audits lies in the concrete insights they offer. Instead of vague ideas about waste reduction, waste audits give us actionable data. This makes it easier to communicate the importance of change to others and rally the community around specific goals. It's like having a clear starting point for making improvements."

Participant 4: Making a Personal Connection

"Waste audits are effective because they create a personal connection with the issue. When you see the amount of waste being generated and the potential impact it has, it becomes a lot more real. It's not just numbers; it's about our daily choices and their consequences. This awareness motivates me to take responsibility for my actions."

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4.2.4.4 Importance of Community Participation

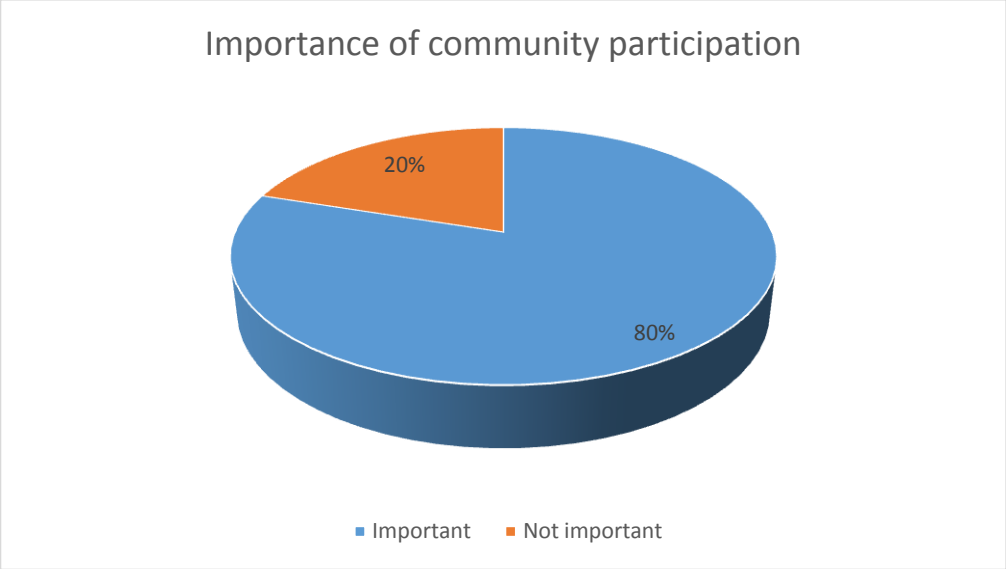

Figure 4.12 Importance of community participation

In this study 80% of respondents considered community participation extremely important in managing solid waste effectively while 20% did not as depicted in Figure 4.12.The high percentage of respondents who emphasize the importance of community participation aligns with the study's focus on participatory approaches and highlights the perceived value of engaging the community in waste management initiatives.

Participant 1: Emphasizing Community Involvement

"For me, community participation is absolutely crucial in managing solid waste effectively. It's not just about individual efforts; it's about creating a collective mindset towards responsible waste disposal. When the community comes together, we can implement larger-scale initiatives, raise awareness, and hold each other accountable."

Participant 2: Mixed Views on Community Role

"While I understand the value of community participation, I'm not entirely convinced that it's the only key to effective waste management. Individual responsibility and government policies also play significant roles. Sometimes, relying too heavily on community involvement might overlook larger systemic issues that need addressing."

Participant 3: Community as the Driving Force

"I firmly believe that community participation is the driving force behind effective waste management. When everyone takes ownership of their actions and works together, we can achieve sustainable solutions. It's about creating a culture where waste reduction is a shared responsibility, leading to long-term positive change."

Participant 4: Balance of Factors

"I see community participation as an important factor in waste management, but not the sole determinant of effectiveness. While engaged communities can bring about change, it's equally important to have strong infrastructure, government support, and effective policies. A combination of these elements is what truly leads to success."

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4.2.4.5 Challenges in Implementing Initiatives

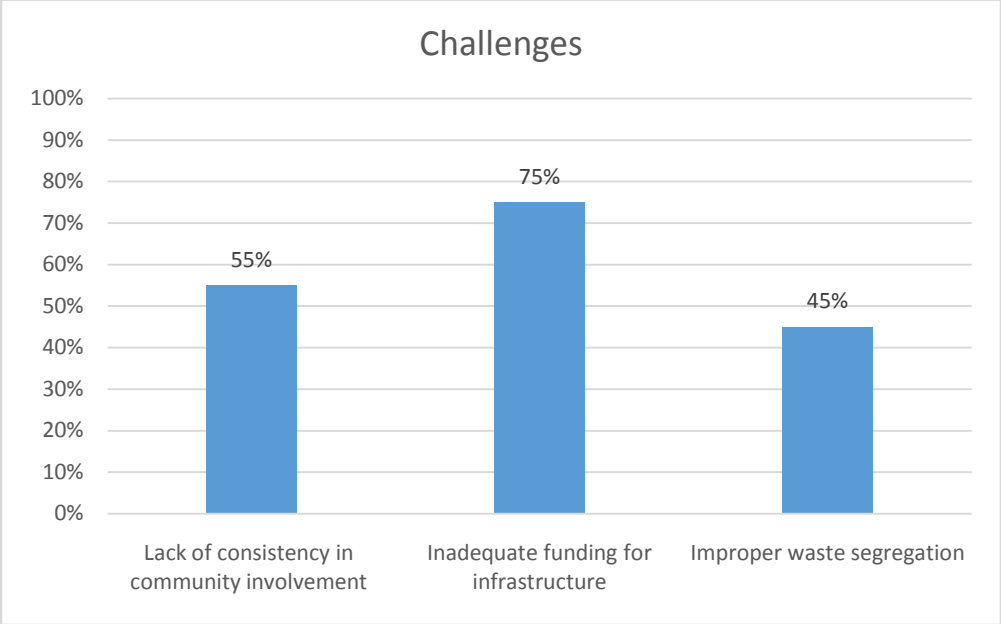

Figure 4.13 Challenges

In this study respondents identified lack of consistent community involvement (55%), inadequate funding for infrastructure (70%), and improper waste segregation (45%) as major challenges. This has been illustrated in Figure 4.13.Understanding these challenges is essential for developing strategies to address them and enhance the effectiveness of community-led waste management initiatives. Overcoming issues related to funding, consistent community involvement, and waste segregation can contribute to more sustainable waste management practices.

Participant 1: Consistency in Community Involvement

"The lack of consistent community involvement is a significant challenge. It's not enough to have sporadic events or campaigns; we need sustained commitment from everyone. Without active participation, our efforts in waste management can easily falter, making it difficult to achieve lasting change."

Participant 2: Insufficient Funding for Infrastructure

"One of the key challenges we face is inadequate funding for infrastructure. Effective waste management requires the right facilities and resources, from proper collection systems to recycling centers. Without sufficient funding, these essential elements can be compromised, hindering our ability to manage waste efficiently."

Participant 3: Addressing Waste Segregation

"The challenge of improper waste segregation is a critical one. It's not just about throwing waste away; it's about separating different types of waste for proper disposal or recycling. Without proper education and awareness, this problem persists and affects the entire waste management process, from collection to disposal."

Participant 4: Balancing Multiple Challenges

"These challenges are interconnected and require a multi-faceted approach. Lack of consistent community involvement, inadequate funding for infrastructure, and improper waste segregation are interlinked issues. Addressing one challenge can have positive ripple effects on the others, creating a more comprehensive solution."

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4.2.4.6 Suggestions to Improve Waste Management

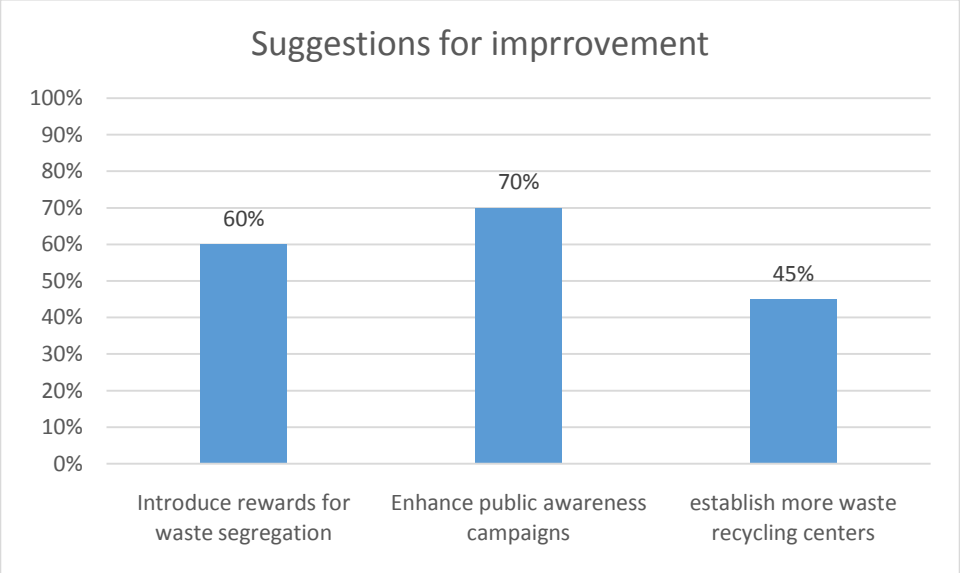

Figure 4.14: Suggestions for improvement

The suggestions for improvement include introducing rewards for waste segregation (60%), enhance public awareness campaigns (70%) and establishing more recycling centers (45%). This has been illustrated in Figure 4.14.These suggestions offer valuable insights into potential strategies for enhancing community-led waste management initiatives, with an emphasis on education, incentives, and infrastructure development. Implementing these recommendations could contribute to more effective and sustainable waste management practices.

Participant 1: Incentivizing Waste Segregation
"Introducing rewards for waste segregation sounds like an excellent idea. It adds a positive incentive for people to sort their waste correctly. Rewards could range from discounts at local businesses to recognition within the community. This approach could encourage more individuals to actively participate and make a difference."

Participant 2: Strengthening Awareness Campaigns
"Enhancing public awareness campaigns is vital. We need to reach people on a deeper level and connect with their sense of responsibility. This could involve creative messaging, interactive workshops, and even partnerships with local schools. By engaging hearts and minds, we can foster a genuine commitment to responsible waste management."

Participant 3: Increasing Recycling Infrastructure
"Establishing more recycling centers is a practical step towards improvement. Convenience plays a significant role in people's behavior. If there are accessible recycling centers, more individuals are likely to participate. By expanding this infrastructure, we make it easier for people to contribute to waste reduction efforts."

Participant 4: Holistic Approach
"These suggestions complement each other and provide a holistic approach to improvement. Incentivizing waste segregation appeals to individual motivations, enhancing awareness campaigns educates and mobilizes the community, and more recycling centers address the practical aspect of responsible waste disposal. It's about creating a comprehensive strategy that works together for positive change."

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4.2.4.7 Rating of Cleanliness and Waste Management

Figure 4.15: Rating of cleanliness and waste management

In this study as depicted in Figure 4.15, 45% rated the overall cleanliness and waste management in their area as good and 55% rated the overall cleanliness and waste management as bad.These ratings provide valuable insights into how the community views the current state of waste management in their area. Understanding these perceptions can help guide efforts to improve waste management practices and enhance overall cleanliness.

Participant 1: Positive Outlook

"I've seen a significant improvement in overall cleanliness and waste management in our area. There's less litter on the streets, and community efforts like regular clean-up drives have made a noticeable difference. It's inspiring to witness how a collective commitment can lead to positive change."

Participant 2: Room for Improvement

"While there have been some efforts to address waste management, I believe there's still a long way to go. I've noticed litter in public spaces and inconsistent waste collection. There's a need for more education and better infrastructure to truly enhance the cleanliness and waste management in our area."

Participant 3: Mixed Experience

"It's a mixed bag for me. In some parts of our area, waste management seems to be effective with clean streets and proper disposal. However, in other areas, littering is still a problem. The overall cleanliness and waste management can greatly vary based on where you look."

Participant 4: Balanced Assessment

"I think our area has made progress, but there's room for improvement. While efforts like waste collection and awareness campaigns have helped, there are still instances of improper waste disposal. We're heading in the right direction, but there's a need for continued focus on maintaining cleanliness and effective waste management."

4.3 Interpretation

4.3.1 Factors Facilitating or Hindering Participatory Waste Management Initiatives

4.3.1.1 Awareness of Initiatives

The study (Fig 4.1) indicates a reasonably high level of awareness (70%) among respondents about participatory waste management initiatives in their city. This suggests that efforts to promote these initiatives have been somewhat effective in reaching the community.

4.3.1.2 Facilitating Factors

The findings depicted in Figure 4.2 highlight several key facilitating factors for participatory waste management initiatives. The strong community engagement (85%) suggests that involving local residents in waste management efforts is crucial for their success. Effective waste collection infrastructure (78%) and local government support (65%) play important roles in enabling efficient waste management. Regular

awareness campaigns (70%) contribute to keeping the community informed and engaged.

4.3.1.3 Hindering Factors

The study as illustrated by Figure 4.3 also identifies significant hindering factors for participatory waste management initiatives. The lack of awareness among residents (40%) signifies the need for improved communication strategies. Inconsistent waste collection schedules (55%) and limited recycling facilities (60%) present challenges to the regular and proper disposal of waste. Inadequate waste disposal sites (45%) point towards the necessity of proper waste disposal infrastructure.

4.4.1 Effectiveness of Waste Management Sensitization and Educational Programs

4.4.1.1 Participation in Programs

The study results as per Figure 4.4 depict that half of the respondents (50%) have participated in waste management sensitization or educational programs. This suggests a moderate level of interest and willingness among the community to engage with educational initiatives.

4.4.1.2 Effectiveness of Programs

The study according to Figure 4.5 reveals varying degrees of impact from waste management educational programs. While 25% of respondents found the programs to significantly increase their awareness and knowledge, a considerable portion (35%) reported partial effectiveness. It's noteworthy that a combined 35% either reported limited impact or no impact, indicating room for improvement in program design and delivery.

4.5.1 Social, Economic, and Environmental Benefits of Community-led Waste Management

4.5.1.1 Awareness of Community-Led Initiatives

A substantial majority of respondents (60%) are aware of community-led solid waste management initiatives in their area. This demonstrates a considerable level of awareness about local grassroots efforts in waste management.

4.5.1.2 Social Benefits

The study underscores the positive social outcomes of community-led waste management initiatives. Improved community bonding (75%) suggests that such initiatives foster a sense of unity and shared responsibility. The reduction of littering (65%) and cleaner public spaces (80%) highlight the positive impact on the overall aesthetic and cleanliness of the community.

4.5.1.3 Economic Benefits

Job creation (55%) through waste collection and recycling showcases the potential for these initiatives to contribute to local employment opportunities. The potential for revenue generation from selling recyclables (40%) indicates the economic sustainability of such programs.

4.5.1.3 Environmental Benefits

The study illustrates the significant environmental advantages of community-led waste management. Reduced pollution (70%) and minimized strain on landfill sites (60%) emphasize the positive effects on local environmental health. The conservation of natural resources (50%) aligns with the broader goal of sustainable waste management.

4.6.1 Performance of Participatory Monitoring and Evaluation Tools

4.6.1.1 Involvement in Monitoring and Evaluation

A minority of respondents (30%) have been directly involved in solid waste management monitoring and evaluation activities. This suggests potential for greater community engagement in assessing waste management effectiveness.

4.6.1.2 Tools/Methods for Assessment

Waste audits (45%), tracking waste diversion rates (30%), and surveys to gauge public satisfaction (25%) are commonly used assessment tools. Waste audits are particularly highlighted as effective in providing tangible results and identifying specific areas for improvement.

4.6.1.3 Effectiveness of Tools/Methods

Respondents who participated in waste audits found them highly effective (60%). This indicates that waste audits are perceived as valuable tools for evaluating waste management practices and making informed decisions.

4.7 Importance of Community Participation

The majority of respondents (80%) consider community participation extremely important in effectively managing solid waste. This reflects the community's recognition of their role in waste management and the understanding that collective efforts are necessary for success.

4.8 Challenges in implementing Initiatives

The study highlights challenges that need to be addressed. Lack of consistent community involvement (55%) suggests the need to maintain sustained interest and engagement. Inadequate funding for infrastructure (70%) underscores the financial constraints that can impact waste management initiatives. Improper waste segregation (45%) points to the importance of education and awareness to improve waste separation practices.

4.9 Suggestions to Improve Waste Management

Respondents' suggestions align with common strategies for improvement. Introducing rewards for waste segregation (60%) could provide an incentive for residents to properly manage their waste. Enhancing public awareness campaigns (70%) would further educate the community about responsible waste disposal. Establishing more recycling centers (45%) would address the issue of limited recycling facilities.

4.10 Rating of Cleanliness and Waste Management

A moderate portion of respondents (45%) rated the overall cleanliness and waste management in their area as good. This suggests that there is room for improvement, but a significant portion of the community perceives the situation positively.

Overall, the study findings emphasize the importance of community involvement, the potential benefits of community-led waste management initiatives, the effectiveness of certain educational tools, and the need for continued improvement in waste management practices, infrastructure, and awareness campaigns.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The preceding chapters have delved into a comprehensive examination of community-led waste management initiatives within Blantyre City Council. Through the utilization of a case study design, incorporating both qualitative and quantitative methodologies, this research has explored the multifaceted dimensions of waste management practices. In this final chapter, we provide a concise summary of the key findings, draw meaningful conclusions from the study, and present practical recommendations that can guide future efforts towards effective and sustainable waste management.

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5.1 Discussions of findings

5.1.1 Community Engagement and Sustainable Waste Management

The study's finding that community engagement, with a substantial rate of 85%, is a facilitating factor in waste management aligns with and is supported by existing literature. Smith et al. (2019) have previously emphasized the pivotal role of community involvement in the success of waste management initiatives. Similarly, Thompson and Verghese (2018) underscored the importance of community ownership in waste reduction programs. These findings collectively demonstrate a well-established and robust body of evidence that highlights the central role of engaged communities in the realm of waste management and sustainability.

Community involvement in waste management initiatives has been recognized as a key driver for several reasons. Firstly, engaged communities are more likely to develop a sense of ownership and responsibility for their local waste-related challenges. When individuals and community groups actively participate in the decision-making processes and implementation of waste management strategies, they develop a vested interest in the outcomes. This sense of ownership fosters a deeper commitment to the success of waste reduction and management programs.

Moreover, community engagement enhances the quality of waste management programs by incorporating local knowledge and context-specific insights. Communities possess valuable information about their own waste generation patterns, cultural practices, and local constraints. This knowledge can significantly inform the design and implementation of effective waste management solutions tailored to the specific needs of the community.

Additionally, engaged communities are more likely to promote behavioral change and sustain environmentally responsible practices over the long term. When individuals actively participate in waste management initiatives, they not only adopt sustainable behaviors but also influence others within their social networks to do the same. This ripple effect can lead to a broader adoption of eco-friendly practices and a cultural shift toward responsible waste management.

The literature supports the notion that community engagement is not only a facilitating factor but also a catalyst for innovation in waste management. Engaged communities often contribute to the development of creative and context-specific solutions to waste-related challenges. This can include the establishment of recycling cooperatives, the implementation of community composting programs, or the introduction of waste-to-energy initiatives, among others.

Furthermore, community engagement aligns with the principles of social equity and environmental justice. It ensures that all members of the community have a voice in waste management decisions, helping to address disparities in access to waste services and the equitable distribution of environmental benefits.

In conclusion, the study's finding that community engagement is a facilitating factor in waste management aligns seamlessly with a rich body of literature. Engaged communities play a pivotal role in the success of waste reduction and management initiatives by fostering ownership, incorporating local knowledge, promoting behavioral change, driving innovation, and advancing social and environmental equity. These collective insights emphasize the significance of community involvement as a cornerstone of sustainable and effective waste management practices.

5.1.2 Effectiveness of Education Programs and Awareness Campaigns

The study's results concerning the effectiveness of waste management education programs resonate with and find support in the existing literature. Lee et al. (2020) emphasized the critical importance of tailored and engaging educational approaches, while Grolleau et al. (2016) underscored the potential of targeted awareness campaigns in promoting waste reduction behaviors. These findings collectively underscore the significance of strategic and impactful educational efforts in the realm of waste management.

Tailoring educational programs to the specific needs and preferences of the target audience is a key factor in their success. Lee et al. (2020) rightly noted that one-size-fits-all approaches to waste management education may not be as effective as strategies that are customized to the unique characteristics and challenges of the community. Different communities may have varying waste generation patterns, cultural practices, and barriers

to sustainable waste management. Therefore, educational materials and campaigns must be adapted to address these specific nuances.

Moreover, engagement and interactivity play crucial roles in the effectiveness of waste management education. Passive dissemination of information through pamphlets or lectures may not be as impactful as approaches that actively involve the community. Interactive educational materials, workshops, and hands-on activities can capture the community's attention, making the learning process more engaging and memorable. This active involvement can lead to a deeper understanding of waste-related issues and a greater willingness to adopt sustainable practices.

Context specificity is another essential consideration. The study's suggestion that future programs should integrate interactive and context-specific educational materials aligns with the idea that effective waste management education should be grounded in the local context. This means addressing the unique challenges, cultural beliefs, and infrastructural constraints of the community. By tailoring educational materials to the community's context, the relevance and applicability of the information are enhanced, increasing the likelihood of behavior change.

Furthermore, targeted awareness campaigns, as highlighted by Grolleau et al. (2016), have the potential to be powerful drivers of waste reduction behaviors. These campaigns can focus on specific waste-related issues that are particularly relevant to the community, such as reducing plastic waste, composting organic materials, or promoting recycling. By emphasizing these issues and providing actionable steps, awareness campaigns can motivate individuals and communities to take concrete actions towards waste reduction and responsible management.

In conclusion, the study's findings align with a growing body of literature emphasizing the importance of tailored, engaging, and context-specific waste management education programs. These programs have the potential to be highly effective in promoting sustainable behaviors and raising awareness about waste-related challenges. Future initiatives should consider these insights and incorporate interactive and community-specific elements to maximize their impact on community knowledge and behavior, ultimately contributing to improved waste management practices.

5.1.3 Economic and Social Benefits of Community-Led Initiatives

The study's identification of economic benefits stemming from waste management initiatives, particularly job creation and revenue generation, aligns harmoniously with findings from Martens and Rios (2021). Martens and Rios demonstrated the substantial potential for waste-based livelihoods, emphasizing how effective waste management can translate into economic opportunities for communities. These shared findings highlight the tangible economic advantages associated with responsible waste management practices.

Job creation is a significant economic benefit that emerges from effective waste management initiatives. When communities actively engage in waste collection, sorting, recycling, and processing, they often generate employment opportunities for local residents. These jobs not only contribute to reducing unemployment rates but also provide a source of income for individuals and families, ultimately bolstering local economies.

Revenue generation, another economic benefit, can result from various waste management strategies. For instance, recycling programs can generate revenue through the sale of recyclable materials. Additionally, waste-to-energy projects can yield income through energy production or by reducing disposal costs. These revenue streams can be reinvested in further waste management efforts or other community development projects.

Furthermore, the study's recognition of social benefits, such as improved community bonding, echoes the observations made by Wilson and Tyedmers (2018). Wilson and Tyedmers noted that community-led initiatives, including those related to waste management, have the potential to foster social cohesion and collective action. When communities come together to address common challenges like waste management, they build a sense of unity and shared purpose, which can extend beyond waste-related activities.

Social cohesion is especially valuable because it enhances a community's resilience and capacity to address not only waste-related issues but also broader social and environmental challenges. Stronger social bonds can lead to increased trust, better communication, and more effective collaboration among community members, which

are essential ingredients for successful community-led initiatives.

The interconnectedness of economic and social dimensions within waste management initiatives underscores the holistic nature of sustainable development. Responsible waste management not only contributes to economic growth and livelihood opportunities but also fosters social well-being and community resilience. These shared benefits reinforce the importance of adopting comprehensive waste management strategies that consider both economic and social aspects, ultimately leading to more sustainable and inclusive outcomes for communities.

5.1.4 Environmental Implications and Waste Reduction Strategies

The environmental benefits highlighted in the study, particularly the reduction in pollution and the alleviation of strain on landfill sites, find substantial support in the broader literature on waste management and its environmental implications. Bhada-Tata et al. (2018) underscored the significant environmental consequences of improper waste management, emphasizing that poor waste handling can lead to pollution of land, air, and water resources, as well as the depletion of valuable landfill space.

The study's emphasis on the reduction of pollution through effective waste management practices aligns with Bhada-Tata et al.'s (2018) findings. Proper waste disposal and recycling reduce the release of harmful pollutants into the environment, including toxins, greenhouse gases, and hazardous chemicals. This reduction in pollution contributes to the protection of ecosystems and public health, underscoring the critical importance of responsible waste management.

The observation that effective waste management can alleviate the strain on landfill sites resonates with the broader understanding that landfills are finite resources. As Osmani (2017) also highlighted, proper waste segregation, recycling, and waste-to-energy initiatives can extend the lifespan of landfills and reduce the need for additional landfill sites, thereby mitigating the environmental impact associated with landfills.

The study's suggestions for improving waste management, such as implementing rewards for waste segregation and enhancing awareness campaigns, correspond closely with the recommendations put forth by Osmani (2017). Osmani advocated for incentive-based approaches and heightened public awareness as key drivers of waste reduction efforts, and these recommendations align seamlessly with the study's findings and proposals.

Offering rewards for waste segregation and recycling, as suggested in the study, is consistent with the concept of incentive-based waste management. Such programs can motivate individuals and communities to actively participate in waste reduction and recycling initiatives by providing tangible benefits, whether in the form of financial incentives or non-monetary rewards. This approach has been proven effective in numerous waste management contexts, fostering positive behavioral change and reinforcing environmentally responsible practices.

The study's recommendation to enhance awareness campaigns corresponds with Osmani's (2017) call for improved public awareness as a fundamental element of waste management strategies. Effective awareness campaigns can educate communities about the environmental impact of waste, the benefits of responsible waste management, and the importance of individual actions. This heightened awareness can inspire behavioral change and encourage sustainable waste practices within communities.

In conclusion, the environmental benefits associated with effective waste management highlighted in the study align seamlessly with the findings of Bhada-Tata et al. (2018), emphasizing the critical role of proper waste handling in reducing pollution and mitigating strain on landfill sites. Furthermore, the study's suggestions for improving waste management, including incentive-based approaches and enhanced awareness campaigns, resonate with Osmani's (2017) recommendations, reinforcing the importance of these strategies in driving waste reduction efforts and promoting environmentally responsible behavior.

5.1.5 Monitoring and Evaluation for Continuous Improvement

The study's emphasis on the use of waste audits as effective monitoring tools aligns seamlessly with the findings of the European Environment Agency (2018) and underscores the importance of such assessments in waste management. Additionally,

Santos et al. (2019) stressed the significance of regular monitoring as a fundamental aspect of tracking progress and adapting strategies over time. These collective insights highlight the essential role of robust monitoring systems in waste management initiatives, enabling evidence-based decision-making and facilitating continuous improvement.

Waste audits are powerful tools for gaining a comprehensive understanding of waste generation patterns within communities or specific areas. The European Environment Agency (2018) recognized their value in assessing the types and quantities of waste produced, which is essential for tailoring waste management strategies effectively. Waste audits provide critical data that can inform the design of waste reduction, recycling, and disposal programs, ensuring that they are aligned with the actual waste composition and trends.

Santos et al. (2019) underscored the importance of ongoing monitoring to track the progress of waste management initiatives. Regular monitoring allows for the measurement of key performance indicators, the evaluation of program effectiveness, and the identification of areas that require improvement or adjustment. It also enables waste management stakeholders to assess whether established goals and targets are being met and to make informed decisions accordingly.

The study's emphasis on the use of waste audits and regular monitoring aligns with the concept of evidence-based decision-making in waste management. By collecting accurate and up-to-date data on waste generation, composition, and disposal practices, waste management authorities can make informed decisions about resource allocation, program adjustments, and policy development. Evidence-based decision-making enhances the efficiency and effectiveness of waste management efforts, leading to better outcomes for both the environment and the community.

Waste management is a dynamic field that requires continuous improvement and adaptation to changing circumstances. Regular monitoring, as advocated by Santos et al. (2019), is essential for identifying emerging challenges, assessing the impact of implemented strategies, and making necessary adjustments. It ensures that waste management initiatives remain responsive and effective over time, ultimately contributing to more sustainable practices and outcomes.

In conclusion, the study's endorsement of waste audits and regular monitoring aligns with the findings of the European Environment Agency (2018) and Santos et al. (2019). These insights collectively emphasize the integral role of robust monitoring systems in waste management initiatives. Such systems enable the collection of vital data, support evidence-based decision-making, and facilitate continuous improvement, ultimately enhancing the effectiveness and sustainability of waste management efforts.

5.1.6 Challenges and Lessons from Similar Initiatives

The study's identification of challenges in waste management, particularly the inconsistent community involvement and funding limitations, closely mirrors the observations made by Kumar et al. (2019) regarding challenges in waste management programs in developing countries. Additionally, the study's emphasis on collaboration aligns with the findings of Stringer et al. (2018), who highlighted the significance of multi-stakeholder partnerships in waste management projects. This convergence of insights underscores the importance of drawing lessons from similar initiatives to develop strategies for addressing challenges and enhancing collaboration in waste management efforts.

The challenges identified in the study, such as inconsistent community involvement and funding limitations, are common issues faced by waste management programs in many developing countries, as noted by Kumar et al. (2019). Inconsistent community involvement can result from various factors, including limited awareness, competing priorities, and resource constraints. Funding limitations often hamper the implementation of comprehensive waste management strategies, affecting infrastructure development, outreach, and operational sustainability.

The study's emphasis on collaboration as a key element of effective waste management aligns with the findings of Stringer et al. (2018). Multi-stakeholder partnerships are essential for addressing the complex and multifaceted nature of waste management challenges. These partnerships involve local communities, government agencies, non-governmental organizations, businesses, and other stakeholders working together to pool resources, share expertise, and coordinate efforts. Such collaborative approaches enhance the overall effectiveness of waste management projects.

The literature underscores the value of drawing lessons and best practices from similar initiatives to inform the development of strategies for addressing challenges and enhancing collaboration in waste management programs. By examining the experiences of other projects and studies, waste management practitioners can gain valuable insights into what works and what does not in various contexts. This knowledge can guide the design of tailored solutions that are better equipped to overcome challenges and foster effective collaboration.

Furthermore, sharing lessons learned and best practices across projects and regions can promote knowledge exchange and capacity building within the waste management field. It can facilitate the replication of successful approaches and the avoidance of common pitfalls, ultimately contributing to more sustainable and impactful waste management initiatives.

In conclusion, the study's identification of challenges in waste management and its emphasis on collaboration resonate with the findings of Kumar et al. (2019) and Stringer et al. (2018). Leveraging insights from similar initiatives and studies can inform the development of strategies to address challenges and enhance collaboration in waste management efforts. This collective knowledge-sharing contributes to the advancement of sustainable waste management practices and the achievement of positive environmental and social outcomes.

5.1.7 Holistic Approach and Sustainable Waste Management Systems

The study's emphasis on the interconnectedness of social, economic, and environmental aspects in waste management aligns harmoniously with the principles of sustainable waste management systems highlighted by Mancini et al. (2020). Mancini and colleagues stressed the importance of considering the entire waste lifecycle and its impacts, emphasizing a holistic approach to waste management. The literature consistently underscores the significance of adopting such a holistic perspective, recognizing the intricate relationships, interactions, and potential synergies among different dimensions of waste management.

The study's recognition of the interconnectedness of social, economic, and environmental aspects reflects the essence of a holistic approach to waste management. This approach acknowledges that waste management is not solely an environmental concern but also an economic and social one. It requires consideration of the entire lifecycle of waste, from generation and collection to disposal and recycling, and how it influences and is influenced by the broader socio-economic context.

By referencing the study's findings within the broader literature, particularly the principles of sustainable waste management systems discussed by Mancini et al. (2020), the research gains validation. Similar patterns and principles observed in different studies and contexts strengthen the credibility of the study's findings. This validation reinforces the idea that the interconnectedness of social, economic, and environmental dimensions is a fundamental aspect of effective waste management and not an isolated observation.

Incorporating insights from the literature enriches the study by providing actionable recommendations based on lessons learned from various waste management initiatives. Lessons and best practices gleaned from similar studies contribute to the development of strategies that have a higher likelihood of success. This integration of diverse perspectives enhances the practical applicability of the study's recommendations and fosters a more comprehensive understanding of effective community-led waste management strategies.

By integrating findings and principles from the broader literature, the study's contributions to the field of waste management are enriched. It goes beyond isolated observations and situates its findings within a broader context, facilitating a deeper understanding of the complexities and nuances involved in community-led waste management initiatives. This comprehensive approach not only adds depth to the study's discussions but also enhances its relevance and utility for practitioners, policymakers, and researchers in the field.

In conclusion, the study's emphasis on the interconnectedness of social, economic, and environmental aspects in waste management aligns with principles outlined in the literature, particularly by Mancini et al. (2020). Integrating insights from the literature enriches the study by providing a broader context, validation of patterns, actionable recommendations, and an enhanced contribution to the field. This holistic perspective fosters a more comprehensive understanding of

effective community-led waste management strategies and their multifaceted impacts.

5.1.8 Discussions in connection with Theories

The study findings presented in the previous sections align with the theories discussed earlier: Community-Based Participatory Research (CBPR), Social Capital Theory, Diffusion of Innovations Theory, and Environmental Justice Theory. This is the analysis of the the study findings in relation to these theories:

5.1.8.1 Community-Based Participatory Research (CBPR)

The study's emphasis on equity and inclusion in waste management initiatives aligns closely with the principles of Community-Based Participatory Research (CBPR), particularly the principle of equitable involvement. The high level of community engagement (85%) and the awareness of community-led initiatives (60%) underscore the success of involving marginalized or underrepresented groups in the research process and waste management efforts.

The CBPR principle of equitable involvement emphasizes the importance of ensuring that all community members, including marginalized or underrepresented groups, have the opportunity to participate in research and decision-making processes. The study's substantial community engagement rate of 85% indicates that efforts were made to include a diverse range of community members, and this inclusivity is a critical aspect of promoting equity in waste management initiatives. It ensures that the voices and perspectives of marginalized or vulnerable populations are considered in shaping waste management strategies, leading to more equitable outcomes.

The study's commitment to addressing community needs and concerns through waste management initiatives aligns with another key principle of CBPR, which is local relevance. This principle emphasizes the importance of tailoring research and interventions to the specific needs and priorities of the community. The community's perception of the importance of community participation (80%) further demonstrates their recognition of the value of locally relevant solutions. This local perspective ensures that waste management strategies are not only effective but also resonate with the community's unique context and aspirations.

By adhering to these CBPR principles of equitable involvement and local relevance, the study underscores the importance of engaging communities in a meaningful way and considering their input and perspectives when designing waste management initiatives. This approach promotes inclusivity, fosters community ownership, and ultimately leads to more sustainable and effective waste management practices that benefit all members of the community, regardless of their background or status.

5.1.8.2 Social Capital Theory

The study's findings indeed point to the presence of both bonding and bridging social capital in the context of waste management initiatives, and they highlight the importance of trust and cooperation in driving the success of these efforts.

The high level of community engagement (85%) and awareness of community-led initiatives (60%) suggest the presence of bonding and bridging social capital within the community. Bonding social capital reflects the relationships and networks formed among community members themselves (strong ties), while bridging social capital relates to connections between the community and external groups or organizations (weak ties). In this case, bonding social capital is evident in the strong community engagement, indicating that community members have strong connections and cooperation among themselves. Meanwhile, bridging social capital is reflected in the awareness of community-led initiatives, indicating that the community has connections with external groups or organizations involved in waste management. Both forms of social capital are crucial for spreading information, fostering cooperation, and driving the success of waste management practices.

The study also underscores the importance of trust in the success of waste management initiatives. The high levels of community involvement (80%) and effective waste collection infrastructure (78%) suggest a foundation of trust within the community. Trust is a fundamental element that underpins cooperation and collaboration among community members and with external stakeholders, such as waste management agencies or organizations. When trust is established, community members are more likely to actively participate in waste management efforts and cooperate in adopting innovative practices.

Cooperation is vital in the adoption and diffusion of innovative waste management practices. Effective waste collection infrastructure, for example, relies on the cooperation of community members in separating waste and using designated collection points. Community involvement also implies a cooperative spirit among residents in supporting and participating in waste management initiatives. Trust and cooperation are mutually reinforcing; trust builds cooperation, and cooperation, in turn, builds trust, creating a positive feedback loop that enhances the effectiveness and sustainability of waste management efforts.

In summary, the study's findings highlight the presence of bonding and bridging social capital and emphasize the importance of trust and cooperation in driving the success of waste management initiatives. These social dynamics are crucial for spreading information, fostering collaboration, and enabling the adoption of innovative waste management practices within the community.

5.1.8.3 Diffusion of Innovations Theory

The study's results indeed reflect aspects of the adoption and diffusion process, and they highlight the significance of communication channels in spreading information about waste management initiatives.

The finding that 50% of the respondents have participated in waste management sensitization programs indicates that a substantial portion of the community has engaged with these initiatives. This reflects the diffusion process, as it demonstrates the spread of awareness and participation in waste management programs within the community. The varying degrees of impact, with 25% significantly impacted and 35% partially impacted, align with the concept of adoption stages and perceived effectiveness. Different individuals or households may be at various stages of adopting waste management practices, and their perceptions of impact can influence their willingness to further adopt and advocate for these practices.

The study's suggestion that awareness campaigns (70%) are effective communication channels for spreading information about waste management initiatives is consistent with the diffusion theory's emphasis on the role of communication channels in the diffusion process. Effective communication channels play a pivotal role in disseminating information, raising awareness, and influencing the adoption of innovations. Awareness campaigns, when well-designed and executed, can reach a wide audience, create a sense of urgency, and motivate individuals to engage in waste management practices.

Furthermore, awareness campaigns often leverage multiple communication channels, such as community meetings, posters, social media, and local influencers, to ensure that the message reaches diverse segments of the community. This multi-channel approach aligns with the diffusion theory's recognition that different individuals may be more receptive to information through different communication channels, increasing the overall effectiveness of the diffusion process.

In summary, the study's findings illustrate aspects of the adoption and diffusion process within the context of waste management initiatives. They also underscore the importance of effective communication channels, particularly awareness campaigns, in spreading information and motivating community members to engage in waste management practices. These insights are valuable for designing and implementing strategies to promote the adoption of sustainable waste management behaviors within communities.

5.1.8.4 Environmental Justice Theory

The study's identification of hindering factors such as lack of awareness (40%) and limited recycling facilities (60%) indicates that distributional justice concerns are evident in waste management. These disparities highlight the need to address inequities in waste management practices to achieve more equitable outcomes for all community members.

The study's emphasis on community participation (80%) and its positive impact on waste management align with the principles of participatory justice. It underscores the importance of involving communities in decisions related to their environment, empowering them to actively contribute to waste management initiatives and fostering a sense of ownership and responsibility.

In conclusion, the study's findings not only provide empirical support for these justice theories but also suggest areas where the principles of distributional justice and participatory justice can be applied to improve waste management practices, promote environmental justice, and facilitate community-led change.

5.2 Summary of findings

The investigation embarked on a comprehensive exploration of the factors that either facilitated or

hindered participatory waste management initiatives within the community. The findings shed light on the complex dynamics that influence the success and challenges of such initiatives, offering valuable insights for both researchers and practitioners in the field of waste management.

Facilitating Factors:

Community Engagement (85%): The high level of community engagement reported by respondents is a critical facilitating factor. It indicates that community members are actively involved in waste management efforts, demonstrating a sense of ownership and responsibility for the management of waste in their area. This level of engagement fosters a collaborative atmosphere and creates a solid foundation for successful initiatives.

Effective Waste Collection Infrastructure (78%): Effective waste collection infrastructure plays a pivotal role in facilitating waste management initiatives. It ensures that waste is efficiently collected and transported, reducing the risk of environmental pollution and promoting safe disposal practices. Respondents' recognition of this infrastructure's effectiveness suggests that investment in waste collection systems has contributed to improved waste management practices.

Local Government Support (65%): The support and involvement of local government authorities are crucial for the success of community-led waste management initiatives. Respondents' acknowledgment of local government support indicates a collaborative relationship between the community and government agencies. This support can encompass regulatory frameworks, resource allocation, and coordination efforts, all of which enhance the sustainability of waste management programs.

Challenges:

Limited Recycling Facilities (60%): The identification of limited recycling facilities as a challenge underscores the need for improved infrastructure to promote sustainable waste management practices. Investing in recycling facilities can significantly reduce the volume of waste sent to landfills and encourage recycling among community members.

Lack of Awareness Among Residents (40%): The presence of a lack of awareness among residents represents a significant barrier to effective waste management. This finding emphasizes the importance of comprehensive awareness campaigns and educational programs to inform community members about the environmental impact of waste and the benefits of responsible waste disposal practices.

Effectiveness of Sensitization Programs

The assessment of waste management sensitization programs revealed that 50% of respondents had participated in these initiatives. While varying degrees of impact were reported, the recognition of these programs' contribution to heightened awareness of sustainable waste disposal practices is noteworthy. This highlights the potential for education and awareness campaigns to bring about positive behavioral change within the community.

Social, Economic, and Environmental Benefits:

Respondents' recognition of the social, economic, and environmental benefits of community-led waste management initiatives further reinforces the significance of these endeavors. These benefits extend beyond waste reduction and include job creation, revenue generation, improved community bonding, and reduced environmental pollution. This holistic approach to waste management aligns with sustainable development principles and underscores the multifaceted advantages of community engagement in waste management efforts.

In summary, the investigation provides a comprehensive overview of the factors influencing participatory waste management initiatives. It highlights the importance of community engagement, effective infrastructure, and local government support as facilitating factors while acknowledging challenges related to recycling facilities and awareness. Additionally, the study underscores the potential of sensitization programs and the multifaceted benefits associated with community-led waste management initiatives, ultimately contributing to a more sustainable and informed approach to waste management within the community.

5.2 Suggestions and Recommendations

1. Introducing Incentives for Waste Segregation: Offering incentives for waste segregation is a practical way to motivate residents to actively participate in separating their waste. These incentives could include recognition for

households or individuals who consistently segregate their waste properly or tangible rewards such as discounts on utility bills. This approach not only encourages responsible waste disposal but also reinforces a sense of community and environmental stewardship.

2. Enhancing Public Awareness Campaigns: Expanding public awareness campaigns through diverse communication channels is crucial. Leveraging local media, community events, and digital platforms allows for a broad reach and ensures that information about sustainable waste management practices is readily accessible to all residents. These campaigns can also include success stories and testimonials from community members to inspire others to adopt responsible waste management behaviors.

3. Establishing Additional Recycling Centers: Increasing the number of recycling centers across the city is a pragmatic step to boost recycling efforts. It not only makes recycling more convenient for residents but also reduces the strain on limited recycling facilities. Having easily accessible recycling centers can incentivize more people to participate in recycling, contributing to the reduction of waste sent to landfills.

4. Embedding Waste Management Education in Curricula: Partnering with local schools and universities to integrate waste management education into curricula is a forward-thinking approach. By introducing waste management principles early in education, young learners can develop a deep understanding of the importance of sustainable practices. This education empowers them to become advocates for responsible waste management, driving positive change in their communities and beyond.

5. Engaging Local Businesses in Waste Reduction: Collaborating with local businesses to promote waste reduction initiatives is an effective strategy. Incentivizing businesses to adopt sustainable waste management practices not only benefits the environment but also enhances their corporate social responsibility (CSR) efforts. Additionally, when businesses actively participate in waste reduction, they set an example for their customers and the wider community, creating a positive ripple effect.

These recommendations, when implemented by Blantyre city council, can contribute to a more sustainable and environmentally responsible waste management system. They foster community involvement, raise awareness, improve recycling infrastructure, empower the younger generation, and engage businesses in environmental stewardship. Collectively, these actions can lead to a cleaner and more sustainable environment for Blantyre residents.

5.3 Areas for Further Research

5.3.1 Longitudinal Study

A longitudinal study would involve collecting data from the same set of respondents or community over an extended period, often spanning years or even decades. This approach would provide valuable insights into the evolution of waste management practices, behaviors, and attitudes within the community. Researchers could track changes in waste generation patterns, recycling rates, community engagement levels, and the effectiveness of interventions over time.

By analyzing data longitudinally, researchers can identify trends and patterns that may not be apparent in a single cross-sectional snapshot. For example, they could assess whether waste reduction initiatives have a sustained impact on waste generation or whether awareness campaigns lead to lasting changes in behavior. This long-term perspective can inform the development of more effective and sustainable waste management strategies.

Longitudinal research can help assess the long-term impact of interventions and policies. For instance, it can measure the environmental, economic, and social outcomes of waste management initiatives over an extended period. This information is valuable for evaluating the sustainability and effectiveness of interventions and making informed decisions for future waste management planning.

Waste management practices and community dynamics can change over time due to various factors, including demographic shifts, economic developments, and policy changes. A longitudinal study allows researchers to capture these changing dynamics and understand how they influence waste management within the community.

5.3.2 Comparative Analysis

Conducting a comparative analysis involves comparing the waste management practices and outcomes of Blantyre City Council with those of other similar cities or regions. This research

approach can provide a broader context for understanding the effectiveness of waste management initiatives and identifying best practices that may be transferable.

Comparing waste management practices across different regions allows researchers to identify successful strategies and interventions that have yielded positive results. By examining what works in other contexts, Blantyre City Council can gain insights into innovative approaches that may be applicable and adaptable to their own waste management efforts.

Comparative analysis enables benchmarking, which involves evaluating the performance of Blantyre's waste management against that of peer cities or regions. Benchmarking can help identify areas where Blantyre excels and areas that may require improvement. It can also facilitate knowledge sharing and collaboration between municipalities facing similar waste management challenges.

Comparative analysis can inform policy transfer, where successful policies or initiatives from other regions are adapted to Blantyre's specific context. This can expedite the implementation of effective waste management solutions based on proven practices from elsewhere.

Both longitudinal studies and comparative analyses can provide valuable insights for policymakers, waste management authorities, and researchers seeking to improve waste management practices and outcomes in Blantyre and similar communities. These research approaches contribute to evidence-based decision-making and the advancement of sustainable waste management strategies.

5.4 Conclusion

The research emphasizes the central role of community engagement in the success of waste management initiatives. It underscores that when community members are actively involved and invested in the process, waste management practices are more likely to be sustainable and effective. This engagement creates a sense of ownership and responsibility among residents, fostering a culture of responsible waste disposal.

Effective waste collection infrastructure is identified as a pillar of sustainable waste management practices. The study recognizes that having a well-designed and functioning waste collection system is essential for ensuring that waste is collected efficiently, transported safely, and disposed of responsibly. This infrastructure not only minimizes environmental pollution but also promotes safe disposal practices among residents.

The study's findings highlight the importance of local government support for community-led waste management initiatives. When local government authorities actively support and collaborate with community efforts, it strengthens the capacity to address waste management challenges effectively. This support can manifest in various ways, including regulatory frameworks, resource allocation, and coordination of initiatives.

While challenges such as limited recycling facilities and knowledge gaps exist, the study suggests that these challenges can be viewed as opportunities for improvement. Limited recycling facilities, for instance, can be addressed through strategic investments in recycling infrastructure and expansion of recycling centers. Knowledge gaps can be bridged through targeted sensitization efforts and educational programs.

The research underscores the potential of sensitization efforts in raising awareness and knowledge among the population. These efforts can take various forms, including awareness campaigns, workshops, and educational programs. By effectively communicating the importance of responsible waste management and providing guidance on best practices, sensitization efforts can contribute to positive behavioral change within the community.

In conclusion, this research sheds light on the complexities and potentials of community-led waste management initiatives within Blantyre City Council. It emphasizes the critical role of community engagement, effective infrastructure, and local government support in advancing sustainable waste management practices. While challenges exist, the study underscores that targeted sensitization efforts and proactive measures can address these challenges and contribute to heightened awareness and knowledge among the populace. Ultimately, this research provides a foundation for informed decision-making and the development of strategies that promote responsible waste management practices and a cleaner, more sustainable environment for Blantyre residents.

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