


Unpacking Public Value Destruction through Solid Waste Management: A Case Study of Pakistan

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Abstract: *The management of solid waste from its collection to disposal is a widespread issue all around the world. This is a stinging issue in the rural and urban areas of the developing and developed states of the world. The mismanagement in Pakistan in the context of solid waste is required to be recognized because it is not only affecting the health of the public but also affecting the health of the environment. Therefore, this study conducts qualitative research methodology and conducted interviews with mega cities' solid waste management officials and waste pickers, for analyzing uses Grounded theory through the lens of thematic analysis to highlight how public value is being destroyed by the mismanagement of solid waste in Pakistan. This study inspects and critically analyzes the effects of corruption, mismanagement, lawlessness, lack of accountability, budgetary issues, health, environmental and social inequalities issues, and no proper methods for the disposal of solid waste as the major causes that are destroying public value. The study emphasizes the significance of community awareness and active public participation in enhancing solid waste management practices. It also emphasizes the need for robust institutional frameworks and stricter enforcement of regulations to mitigate the risks associated with improper waste management. Moreover, the need for combined efforts by policymakers as well as governments, communities, and all relevant stakeholders is highlighted in the research to address the issue of sole waste management in developing states. To achieve a sustainable model for solid waste management that is able to protect the environment and public health, it is important to promote recycling, increase public awareness as well as improve waste segregation.*

Key Words: Solid Waste Management, Public Value, Health, Economic and Environmental Sustainable Issues, Accountability

Introduction

Solid waste management (SWM) is a significant issue for cities around the world, especially in developing countries such as Pakistan. Urbanization and population growth in Pakistani cities have compounded municipal solid waste (MSW) management issues (Ahmad, 2024). Low waste management practices' quality without constituting extreme environmental and public health threats, yet reducing the life quality of citizens in urban areas (Ali et al., 2024; Mahar et al., 2019; Masood, Barlow, & Wilson, 2014). Pakistan's SWM system is bedeviled with numerous challenges like poor infrastructure, financial deficiencies, corruption, and accountability shortcomings. These are compounded by inefficient governance systems and unrealistic enforcement of regulations in existence (Iqbal et al., 2022; Atta, Hussain, and Malik, 2020). The informal sector plays a role in waste collection and recycling but without formal support and acknowledgment, rendering the waste management system even more complicated (Wilson, Velis, & Cheeseman, 2006). Grounded theory with a qualitative research approach is a solid foundation for examining complex, context-specific problems in SWM. This approach can enable the development of

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ethical frameworks capable of informing generations and policies and practices from data (Glaser & Strauss, 1967; Charmaz, 2021).

Applying the theory underlying it, the study aims to make known the main issues and dynamics of SWM in Pakistan and achieve a well-rounded understanding of challenges and possibilities. The study focuses on some key areas concerning SWM, including the functions of the different stakeholders, the impacts of the shortage of finance and infrastructure, the spread of corruption, and lack of accountability. It also addresses the importance of improving public awareness and public participation in improving WM practices (Batool & Chaudhry, 2009; Fadhullah et al., 2022). Through thematic analysis, the research shows examples and the most significant themes to highlight areas of focus and need for reform.

The research intends to offer policymakers practical recommendations for enhancing the effectiveness and efficiency of SWM systems in Pakistan. The research endeavors to add to the creation of sustainable waste management approaches that can enhance public health and environmental outcomes in Pakistani cities, managing the challenges highlighted and basing its conclusions on the findings of a well-established review (Ahmed et al., 2020; Aslam et al., 2022).

RQ1: What are the primary challenges faced by solid waste management organizations in metropolitan cities of Pakistan, and how do these challenges impact the effectiveness of waste management practices?

RQ2: How can community awareness and stakeholder participation be enhanced to improve solid waste management practices and reduce public value destruction in Pakistan?

Literature Review

The collection, transportation, disposal, and recycling of solid waste produced by homes, businesses, industries, and other sources is known as solid waste management. Like most of the developing states, Pakistan faces challenges related to efficient SWM due to population increase, urbanization, and poor infrastructure. Pakistan's rapid urbanization, population growth, and industrialization have led to massive garbage output, making solid waste management a very worrying issue (Ahmed et al., 2020). The current literature review will cover a range of topics related to solid waste management in Pakistan, such as challenges encountered, strategies used, and possible fixes. Over the years, Pakistan's solid waste management system has faced a number of problems. Poor infrastructure, insufficient funding, and volatile government policies have impacted effective waste management practices. Additionally, rapid urbanization has contributed to the expansion of informal settlements with poor access to waste collection services, hence exacerbating the situation (Ali & Kuroiwa, 2009).

Solid waste management systems have encountered numerous challenges over the years. According to Guerrero et al., (2013) and Hoornweg & Bhada-Tata, (2012), Poor infrastructure, insufficient funds, and poor government policies have hindered effective waste management practices.

Rapid urbanization has also resulted in the widespread expansion of slums with poor access to garbage collection services, which further aggravates the problem (Ali & Kuroiwa, 2009). In WM, the informal sector plays a crucial role since official systems typically leave gaps that the informal sector fills (Wilson, Velis, & Cheeseman, 2006). The best methods and solutions for managing municipal solid waste can be learned from the comparative experiences of other developing nations, such as India (Zhu et al., 2008). Effective management of municipal solid waste requires sustainable recycling, and other successful initiatives can teach us valuable lessons (Troschinetz & Mihelcic, 2009). In the social sciences, grounded theory is a scientific approach that entails developing ideas via methodical data gathering and analysis (Glaser & Strauss, 1967). Therefore, this theory is well-suited to examine the intricate and situation-specific issues of SWM in Pakistan since it places a strong emphasis on developing theories based on data. Through a systematic analysis of qualitative interview data from stakeholders, this study aims to build insights based on the lived experiences of the individuals involved in waste management. Public value theory emphasizes the public manager's role in generating value for society.

It transcends traditional measures of efficiency and effectiveness, focusing on the broader impact of public services on well-being in society (Moore, 1995). Public value theory provides a normative method for evaluating the impact of waste management practices on well-being in society. Effective waste

management is not only a technical or administrative problem; it is a valued public service that adds to citizens' health, safety, and quality of life. Mismanagement of solid waste, therefore, is a profound failure in public value generation.

Institutional theory examines the way institutions as rules, norms, and beliefs that frame social action—build organizational practices and outcomes (Scott, [2004](#)).

Institutional theory offers a framework for the study of structural and organizational pressures that shape waste management practice. Division of responsibilities, weak governance, and unequal enforcement of regulations are the most significant institutional barriers that hinder effective waste management in Pakistan. These institutional challenges must be overcome for the institution of a more responsible and effective waste management system. Pakistan faces a lot of issues in solid waste management, including inadequate infrastructure, low public awareness, scarce resources, weak regulation enforcement, and inefficient waste collection mechanisms (Akmal & Jamil, [2021](#)). The only remedy for these issues is a multi-faceted solution that focuses on community education, stakeholder involvement, and efficient institutional arrangements. There are, however, efforts underway to improve the situation by implementing effective waste management policies, sanitary landfills development, promotion of recycling, and public sensitization on the importance of waste reduction and segregation.

The government, public, and individuals need to work together in adopting sustainable measures and practicing good waste management to address the issue of SWM in Pakistan (Aslam et al., [2022](#)). The system of solid waste disposal in Pakistan typically includes the following activities:

Municipal staff or private companies collect solid waste from residential, commercial sites, and other sites.

Depending on the area, collection is done manually using hand carts or mechanically by means of garbage collection vehicles. Waste from the collection point is further taken to the transfer stations or to the disposal facility directly (Atta et al, [2020](#)). It is carried by trucks, compactors, or other transportation vehicles. Pakistan currently heavily relies on landfills and open dumping for disposal.

But these are now viewed as being unsustainable and against human and environmental health. The government and other non-government organizations have initiatives that promote recycling and reusing of solid waste. To keep recyclables out of landfills, some of them are separating materials including paper, plastic, glass, and metal at the place of origin. Some attempts are made to produce energy from solid waste using techniques like anaerobic digestion and incineration in order to lessen the environmental impact and maximize the energy potential of garbage (Sakai et al., [1996](#)). Pakistan's solid waste management problem is complex and calls for coordinated action from governments, legislators, the general public, and other interested parties. A cleaner and healthier environment for all Pakistanis can be achieved by establishing sustainable WM systems, investing in state-of-the-art infrastructure, encouraging recycling and waste reduction, and increasing public knowledge and engagement (Masood et al [2014](#)).

Several initiatives and best practices have been implemented in various parts of the country to address solid waste management issues.

These include introducing waste-to-energy technologies, improving segregation of waste, establishing recycling plants, and promoting public-private partnerships. These have worked and can be replicated elsewhere (Mahar et al [2019](#)). Pakistan produces a lot of solid garbage every day, mostly paper, plastics, organic waste, and other household waste. Waste composition differs from city to city and is impacted by a number of variables, including population, economic activity, and cultural values.

Collection and transportation of wastes in Pakistan also become major issues. Insufficient resources, no equipment, and inefficient waste management systems are some of the reasons why collection of waste becomes challenging (Korai et al, [2017](#)). Collection mechanisms vary from city to city, and the majority of informal waste pickers are involved in collection without protection against safety. Pakistan relies heavily on conventional waste disposal methods, including open dumping and landfilling. This practice poses serious environmental and health hazards through the release of toxic leachate and greenhouse gases.



Limited waste treatment capacity for facilities, including recycling and composting plants, compounds the issue (Iqbal et al [2022](#)). Active public involvement and community consciousness are vital for the improvement of solid waste management practices. Mobilizing the people, informing them on waste minimization, segregation, and recycling, and propagating environmentally friendly waste management approaches can contribute to favorable behavioral change and enhanced waste management (Joiya et al., [2023](#), Batool, [2009](#)). Efficient solid waste management requires a robust policy and institutional framework. In Pakistan, the responsibility for waste management lies with local authorities. However, weak governance, lack of coordination, and inadequate enforcement mechanisms hamper effective waste management implementation. There is a need for comprehensive legislation and stricter enforcement of existing regulations. Improper waste management practices have severe health and environmental consequences. Open dumping and burning contribute to air and water pollution, and the release of hazardous substances poses risks to human health and ecosystem integrity. Communities residing near waste disposal sites are particularly susceptible to various diseases (Fadhullah et al [2022](#)).

Research Methodology

The research methodology is qualitative, and all the data that has been gathered and collected by the sources in the form of interviews in the mega cities of Pakistan and other sampling techniques has been qualitatively observed by using the most authenticated grounded theory to get the authentic and more reasonable and clear results and findings to construct and basic framework to highlight the core issues (Mohajan, [2018](#)).

To protect ethical considerations, the material used in the thesis does not include the localities, area names, or the names of the interviewees to preserve their identity and privacy, which is their utmost right. Under the shadow of various logics, levels, and actors in the context of institutional and local governance, the researcher has decided to conduct interviews with various stakeholders within a wide range. The stakeholders include the officials (superior and inferior) of the solid waste institutions and the ordinary waste pickers to generate the themes regarding solid waste management. The researcher has conducted separate interviews with officials of the solid waste management department and ordinary waste pickers. The questionnaire of each stakeholder was different because the ordinary waste pickers were not educated, so their questions were different as they had little knowledge about the department's policies, legalities, or illegalities. However, such questions were implicated in the questionnaire of the officials, and ordinary waste pickers were asked different questions. Moreover, the ordinary waste pickers contained males and females. Their gender and identity were preserved in light of ethical considerations.

To this end, the researcher utilized the N-VIVO software and the logical pragmatic and snowball sampling to increase the pool of possible and prospective interviewees outside of the jurisdiction of the network of the researcher's study. The author endeavored to interview to collect as much data as possible and ceased interviewing when he learned he was not finding anything new. This study uses thematic narrative analysis (Vaismoradi, [2013](#)). However, the researcher used precious assistance from senior colleagues in the field, and the supervisor helped him a lot. Moreover, he debriefed by the sustained assignment and checked the following criteria to increase the trustworthiness of qualitative research (Butler, [2018](#)).

Grounded Theory and Its Application in this Study

Concerning qualitative research, the most prominent and promising theory is called grounded theory, which is also a developing theory because, in grounded theory, the research has proceeded despite testing the hypothesis postulated. The grounded theory tempts qualitative research by following an individual inquiry's natural arrangement, outline, or design (Oktay, [2012](#)). It can also permit the researcher to observe or generate an understanding of any area of research more keenly through generating, creating, and refining a theory to explore more and more about any area of research. Grounded theory is theoretical and very pragmatic as it provides a context, agenda, and framework of the entire research along with the research processing and mode and method for extracting the data (Chun, [2019](#)). Grounded theory is a theory that provides means and methods for the collection of the data, method for the analysis, and means for the engendering theory (Turner, [2021](#)).

It is necessary to describe that the ground theory provides an explained version for the inspection and description of the actual research process through illustration (Birks et al., 2019). Grounded theory is a well-established theory generated after fulfilling the requirement of three analysis phases. However, it is also necessary to note that these phases are not essentially sequential, and the research is provided with ample space for undertaking the various phases simultaneously as the research can add more and more documents and texts to the sample which is under consideration or which is in the process of analysis (Mohajan, 2022).

It involves the analysis of the interviews, discussions, observations, annotations, documents, notes, and transcripts to describe or discover intangible and theoretical sets from the data, also called the "basic codes" (Vollstedt, 2021). The question is how the document can be read and observed during this research phase. Grounded theory asks to read each page of the document word by word and line by line, and there is also a need to make notes during the document inspection. The notes are to be taken of the important words, phenomena, sentences, saying, quotes, sentences, or passages to generate an understanding of the concept to its depth (Lambert, 2019).

According to the grounded theory, the researcher must note and point out anything he considers striking. This step can go beyond any explanation of what a researcher should note as he is reading that can include any texts and reactions, but anything that is relevant and is springing to the researcher's mind should be noted (Sosa-Díaz, 2022). This phase is called open coding. It is called open coding due to its breadth. With time, the researcher is obliged and is required to refine his concept and give a brainstorming to them. The caution is that he must have the solid concepts kept by the researcher while reading the documents. In this phase, the researcher is required to refine their stuff. It means that he is required to remove the stuff which is less important or which is of no need. The irrelevant stuff should be separated from the important, relevant stuff. It is required to align the data and concepts (Belgrave, 2019).

Axial Coding is the second phase of coding and generates the relationship and co-relation between more and more specific concepts by their proper inspection and examination to create the theoretical categories in the context of the memos created in the first phase. It is called axial coding (Douglas, 2003). It is stated that "if one follows Strauss' and Corbin's view, the researcher needs to undertake this phase in the light of a particular theory. On the other hand, Glaser criticizes this standpoint and considers that true grounded theory requires the researcher to take their lead from the data rather than trying to impose a particular theoretical approach on the process" (Gorra, 2010).

The third and last phase of the data analysis is to utilize the theoretical categories in generating the core and fundamental concept, basic relevant theory, and specific and reasonable conclusion (Sebastian, 2019). In each phase, the data analysis leads to an extremely reasonable extent of abstraction from the main and authenticated data. Due to the cyclic design, it is also an option that the data to be collected from the data cycle of the second phase, as the data of the former cycle is also considered for analysis or scrutiny. There is always a perpetual comparison until the researcher thinks there is no need for further refinement. There is no need to add or reject further data; the conclusion is evident, actual, and crystallized (Charmaz, 2021). This study employs the qualitative research approaches, so the author has selected the grounded theory because it satisfies the requirement of the study, and the study is based on the observations and concepts generated not only by the documents but also by the interviews. Therefore, the grounded theory is the last reasonable resort for it.

Procedure for Analysis Based on Grounded Theory

The procedure is entirely based on the theory of qualitative research, the grounded theory comprising three types of coding effectively presented in the study (Vollstedt, 2021). The coding involved is open, and the third type is axial. Flick (2015) stated that "this provided additional assurance in the determination of the densification of various emergent insights in the grounded theory-based research as opposed to the thematic approach, which only uses one level of analysis. The input from the first stage of open coding was incorporated sequentially into the second stage of axial and the final selective coding analysis in this study. In the open coding, no filters were used for the analysis, and no data were excluded, creating voluminous amounts of data" (Chun, 2019). The main aim is to create an exclusive social interest and

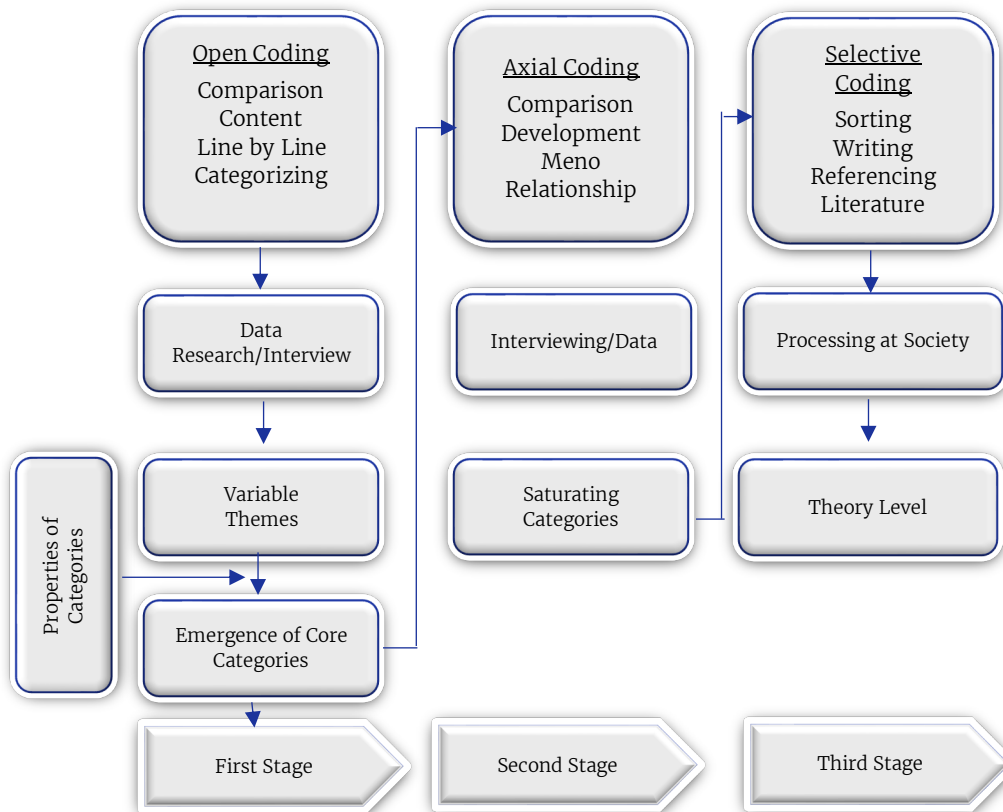


frame a sustainable model to recognize the issue and highlight the reasonable reasons and causes of the destruction of public value through solid waste management.

Steps for the Analysis Based on Qualitative Research

Figure 1

Steps for the Analysis Based on Qualitative Research



Data Collection

The data for this study has been collected from solid waste organizations of various metropolitan cities of Pakistan to fulfill the required need of the study and highlight the high quality of the qualitative research (Bowen, 2008). Moreover, the researcher has pinpointed the megacities because these cities are hubs with references to solid waste management organizations. The data has been gathered from the cities of Pakistan, including Peshawar, Islamabad, Karachi, and Lahore, to create a high impact of the study (Isaacs, 2014). The respondents include solid waste management organizations' officials and ordinary waste pickers (Creswell & Poth, 2016).

The interviews conducted for this study were 200 in number, but the data has been saturated at 20 from the solid waste management organization officials and 20 from waste pickers, and these were conducted in a way that should give a pilot perspective. These were also followed by some other essence of full-fledge study in context to verify the reliability of the conceptions and the phenomena under consideration (Eisner, 2023). Initially, the researcher conducted these interviews independently and took help and assistance from some of his nominated associates. The author has done the interviews with the correspondence of them. In the initial interviews that have also been conducted by the officials of the solid waste management organizations and then the collectors of the waste, several issues regarding the challenges in the context of solid waste management, accountability on corruption or corrupt practice accountability, visitation, knowledge, techniques of solid waste management policies and lawlessness has been revealed which were further supported by the interviews of the collectors of the other cities (Jamshed, 2014).

In these interviews, basic questions were involved about what they knew about solid waste management and their response to problems they face (Snyder, 2012). Additionally, what are the problems in the solid waste management system, how the value of the public is destroyed, and how the machinery

of the public is wasted? What are their ways of collecting solid waste, and how can they segregate the gathered solid waste? A study based on the same methods stated "on managing tensions in social enterprises for utilitarian and normative social identities of organizations using a qualitative research design and a grounded theory-based analysis (Autio et al., 2014). Another interview-based study was conducted by Vazquez (2016) in Lyon, France, which stressed that poor people are hard to access and heavily stigma-ridden. Likewise, the respondents of this study acted like mobile waste management firms of recycling for their livelihoods, but in the process created a complementary self-organizing mechanism in the informal economies of developing nations like Pakistan." The author faced many problems while collecting the data and conducting the interviews, but the work yielded good results (Oun & Bach, 2014).

Sampling

In qualitative research, sampling usually remains inconsistent, particularly at inception (Næss et al., 2018). It is the grounded theory that specifically uses comparative techniques for the collection of data and its analysis (Creswell & Poth, 2016). To this end, the data at multiple levels has been collected using the 200 interviews. These structured interviews were also conducted with the waste pickers and the officials of solid waste management organizations. However, the data has been saturated at 20 from solid waste management officials' interviews and 20 from waste pickers' interviews (Higginbottom, 2004).

Solid waste management is a full procedure using different mechanisms and machinery. That's why managing the solid waste of industries in Pakistan properly and this province requires a handsome amount of budget and proper setups (Suri, 2011). Recently, applying an innovative procedure of solid waste management in Pakistan has been under discussion. This SWM comes under the applications of Municipal Solid waste management. Such a new procedure applies to cultivated lands. As the material used or residual remaining after completing the process is purely organic, that would increase the organic content of land. This practice is also helpful in coping with the problem of pests. It saves land from the hazardous effects of landfilling. A study by (Qazi et al., 2009) has been conducted that analyses the impact of high Phosphorus levels on crop fields to check the dangerous impacts of landfilling (Coyne, 1997).

The grounded theory in this study employed the theoretical sampling codified into three code stages. The sampling procedure has been purposive regarding the open coding processes. However, in axial coding, the sample numbers have been the same as the level and are naturally systematic. Posch et al., (2018) stated that in the case of selective coding, sampling has been utilized to assimilate the 200 categorized findings to the level of theoretical saturation (Posch et al., 2018).

In the views of Creswell & Poth (2016), the variance in interview numbers has been 10 to 20. However, Charmaz (2021) has called for 20, but Burgess favored 50 numbers of interviews. Brinkman stated the 6 ± 8 interviews. Thus, this study's interview saturates at 20 (Naderifar et al., 2017).

This study struggles to conduct the balanced interviews that should be adequate but not inadequate as insufficient interviews cause ambiguity while the maximum number of interviews also is problematic to the level of uncertainty. Society of Pakistan is conservative; hence, this study also tries to consider the interviews of the women's family members who act the backing the waste pickers and the officials of the solid waste organization. The main aim of this study is to evolve the conception of solid waste management and utilize it to construct a framework for creating public value (Noy, 2008).

Guide for Interviewing

In the views of Holloway, when the interview is being conducted, there is a need for the proper pauses. Moreover, the verbal and non-verbal actions are ascertained and given as clues to make your statements more explicit and clear to the listener (Ryan, 2009). Additionally, "such as coughs, pauses, frowning, laughing, nods, noises, leaning back or forward, and silence, were noted using careful emphatic listening. Listening techniques, such as repeating back sentences after the respondents and Ah, wow, that's very interesting, tell us more about it, were incorporated to elicit the true voice of the respondents." Furthermore, there should be techniques that would be used to re-listen the interviews that have been conducted. The questions that were being asked were easy and clear. These questions were refined, and before the final interview, the author conducted mock interviews to create easiness and understanding for the people (Dempsey et al., 2016). In this study, the mode of interviewing is one; the author has conducted



the interviews face to face. This mode was easier, and due to it, the author assisted the people to understand what he was asking more easily. The author has not used the technologies like Zoom or Skype. The reason is that the interviewees, including the officials of solid waste organizations and waste pickers, were not so comfortable, and for their satisfaction, the interviews were conducted face to face, which, according to the researcher, is a pure mode of interviewing.

The researcher reserved the following cautions:

- ▶ The researcher has maintained the ethical consideration and agreed with the interviewees not to mention their names up front.
- ▶ The researcher has not forced the interviewees with undue influence.
- ▶ The interviewees were told about the reason for their interviews.
- ▶ The researcher ensured the interviewees that nothing from their answers with deter them.
- ▶ The research ensures moral, ethical, and open discussion.
- ▶ Nothing in the interview is slander or libel for the department or the Government of Pakistan.

Themes and Thematic Representation

The researcher's work sought to pinpoint the pattern regarding solid waste management to pinpoint how public value has been destroyed and the fundamental challenges concerning solid waste management. Thereby, the patterns relating to “challenges”, “problematization”, “techniques”, “management”, “knowledge,” “visitation”, “corruption”, “accountability” and “budget” have been selected. Nanda & Berruti's (2021) work has driven this analysis approach. This approach to analysis is extraordinary. In this approach, various steps include selecting the relevant texts, perceiving persistent ideas, and then shaping and organizing this extracted and reasonable stuff into themes connected to the framework (Bengtsson & Andersen, 2020). The theoretically informed description utilized in this study conducted by the researcher is developed and used credibility via the electronic and print media, reports, and various other pieces of research enshrined in the findings section (McAllum et al., 2019).

Table 1

Analytics of Themes

Analytics	Themes
Challenges	What are the fundamental challenges the solid waste management department faces?
Problematization	How societal risks (like illness of the people), environmental risks (pollution) and social risks (loss of public machinery, public value) are problematized.
Techniques	What are the basic techniques for collecting solid waste, its segregation, and disposal?
Management	How does the management of solid waste management organizations work?
Knowledge	What is the acumen of the stakeholders concerned with the policies and the laws relating the solid waste management?
Visitation	How often does the supervisor and site in charge visit the site (where the waste is collected or disposed of for supervision)?
Corruption	What is the gravity of corruption (in the maintenance of vehicles, petrol, or management of budget and public machinery)?
Accountability	What is the accountability mechanism in the Solid waste management department (how are the accused in any charge dealt with)?
Budget	How is the budget managed (whether there is any budget constraint)?

List of Interviews

The following are the list and dates of interviews conducted by the author.

Table 2

List of Interviews

Stakeholders	Date	Codes
Superior Official 1: Solid Waste Management Organisation: City X	(March, 2022 July,2023)	SOR
Superior Official 2: Solid Waste Management Organisation: City X	(April, 2022 July, 2023)	SOR1
Superior Official 3: Solid Waste Management Organisation: City X	(March, 2022 July,2023)	SOR02
Superior Official 4: Solid Waste Management Organisation: City Y	(April, 2022 July, 2023)	SOR03
Superior Official 5: Solid Waste Management Organisation: City Y	(March, 2022 July,2023)	SOR04
Superior Official 6: Solid Waste Management Organisation: City Y	(April, 2022 July, 2023)	SOR05
Superior Official 7: Solid Waste Management Organisation: City Z	(March, 2022 July,2023)	SOR06
Superior Official 8: Solid Waste Management Organisation: City Z	(April, 2022 July, 2023)	SOR07
Superior Official 9: Solid Waste Management Organisation: City W	(March, 2022 July,2023)	SOR08
Superior Official 10: Solid Waste Management Organisation: City W	(April, 2022 July, 2023)	SOR09
Total Interview: 100		
Inferior Official 1: Solid Waste Management Organisation: City X	(May, 2022 March, 2023)	IO
Inferior Official 2: Solid Waste Management Organisation: City X	(May, 2022 March, 2023)	IO1
Inferior Official 3: Solid Waste Management Organisation: City X	(January, 2022 March, 2023)	IO2
Inferior Official 4: Solid Waste Management Organisation: City Y	(May, 2022 March, 2023)	IO3
Inferior Official 5: Solid Waste Management Organisation: City Y	(January, 2022 March, 2023)	IO4
Inferior Official 6: Solid Waste Management Organisation: City Y	(May, 2022)	IO5
Inferior Official 7: Solid Waste Management Organisation: City Z	(January, 2022 March, 2023)	IO6
Inferior Official 8: Solid Waste Management Organisation: City Z	(March, 2023)	IO7
Inferior Official 9: Solid Waste Management Organisation: City W	(January, 2022 March, 2023)	IO8
Inferior Official 10: Solid Waste Management Organisation: City W	(April, 2023)	IO9
Total Interview: 100		
Ordinary Waste Picker 1: City X	May 2022 March, 2023	P
Ordinary Waste Picker 2: City X	January 2022 January, 2023	P01
Ordinary Waste Picker 3: City X	May 2022 March, 2023	P02
Ordinary Waste Picker 4: City Y	January 2022 January, 2023	P03
Ordinary Waste Picker 5: City Y	May 2022 March, 2023	P04
Ordinary Waste Picker 6: City Y	January 2022 January, 2023	P05
Ordinary Waste Picker 7: City Z	May 2022	P06



March, 2023

Ordinary Waste Picker 8: City Z
 Ordinary Waste Picker 9: City W
 Ordinary Waste Picker 10: City W
 Total Interview: 100

Findings

Respondents Profile

The conducted interviews gave us information about four characteristics of the participants of the interviews, i.e. Gender, Age, Education, and Experiences. The interviews gave us the information that the majority of the participants of the interviews were male, but not by far. The percentage of male participants was 61.3 %, while the remaining 38.7 % of participants were female. There are four classes in which the age of the participants was divided; the least number of participants aged 36 or more took part in the interviews. 15.0 % of the participants were either 36 years old or even older. 35.5 % of the participants were between the ages of 31 and 35. This age group has the highest number of participants. 28 % of participants were age between 26 and 30, and almost 21.5 % of participants belonged to the age group of 20 to 25 years old. The education variable of these interviews showed that people from the education level of intermediate or below to Ph.D. and the least number of participants had a Ph.D., and half of the participants were intermediate or below because mostly include waste pickers. There were 49.7 % of participants who had an Intermediate degree or below, and 29.0 % of participants had a Graduation degree which includes both waste pickers and officials. 15.9 % of participants had a Master's degree. 3.2 % of the participants had M.Phil. level education, and 2.2 % of the participants had some type of Ph.D. Even though the education factor was skewed, their work experience factor was somewhat equal. There were 36.6 % of participants with 1 to 2 years of work experience, which was the highest percentage of experience among the participants, there were 31.2% of participants with 2 to 5 years of experience, and the rest of the 32.2% of the participants had the experience of more than 5 years.

Table 3

Demographics

VARIABLES	CATEGORY	PERCENTAGE
Gender	Male	61.3%
	Female	38.7%
Age	20 to 25 years old	21.5%
	26 to 30 years old	28.0%
	31 to 35 years old	35.5%
	36 years old or above	15.0%
	Intermediate or below	49.7%
Education	Graduation	29.0%
	Masters	15.9%
	M.Phil.	3.2%
	Ph.D. degree	2.2%
Experience	1 to 2 years	36.6%
	2 to 5 years	31.2%
	5 years and Above	32.2%

N = 200

Thematic Analysis

The researcher reported themes that have emerged from the data. It has been drawn from Hainmueller, Hangartner & Yamamoto (2015) that vignettes are very precise elucidations of an individual or a social situation that comprise short references to have been perused or thought to be extremely significant in the making of either a decision or judgment that the respondents have processed. The themes discussed below are the thematic vignettes that describe the original data. Hence, the most significant issues can be highlighted and raised during the general, broad, introspective, and thoughtful discussions on the data (Corlett & Mavin, 2018).

Theme 1

Lacked of Financial Resources and Budget

The first theme vignette in this study has been grounded on the single narrative that pinpointed that solid waste management organizations are facing a lack of economic resources, due to which the department's problems and challenges are being galvanized over time. This theme came from the views of the superiors and inferior officials of the solid waste management departments as they emphasized the financial resources' influence and impact on the department's standing, position, and functioning.

What is the basic and foremost issue is that vehicles of the solid waste department do not have as much fuel as they require, due to which the visitation the sites where solid waste has been collected are not transported to the sites where it is required to be dumped or disposed (SOR07). The department's finances fail to buy new vehicles, so with the increasing population, the waste is being increased but not managed properly (SOR02). The basic department is purchasing no equipment for the process. There is no management, which is affected by less financial availability. Hence, the solid waste is not being collected for being disposed of (IO3).

Theme 2

Inadequate Infrastructure and Resources (Modern equipment, technology and Capacity)

The second theme vignette combines two narrative samples that highlight two aspects that are accompanied together. One is the equipment that is the objects being used for the solid waste management department or organization to collect solid waste. The equipment includes all the objects related to the performance of these tasks, like bins, vehicles, balers, disc screens, bag openers, eddy current separators, magnetic separators, optical sorters, and trammel screens. This equipment is absent in the departments, so the departmental dysfunctionality is increasing daily (SOR08). Moreover, there is no perfect budgeting for making, maintaining, and buying all these required objects (SOR04).

The term capacity has been utilized in the context that due to the absence of all these objects, the capacity of the departments to deal with solid waste has been affected badly (SOR01). The capacity of waste produced is not managed due to less capacity of the department to manage it (SOR). This term has been utilized differently under the observation of the inferior solid waste management officials as they stated that the departments have less capacity for additional workers (IO5). The departments have no workers as much as required to solve solid waste problems (IO1).

Theme 3

Health, Environmental Risks, and social Inequalities

The next theme vignette is also a combination of narratives evinced from the interviews of all three stakeholders. The theme explores the health and environmental risks associated with improper waste management practices. The study found that marginalized communities, such as informal waste pickers, bear the brunt of the negative impacts of poor waste management practices. This theme also revealed a lack of community awareness and participation in waste management practices. Many residents are unaware of proper waste segregation and disposal methods, leading to increased environmental and health risks.

It also includes the impact of open dumping, burning of waste, and inadequate disposal methods on public health and environmental sustainability.

This theme also discussed the techniques the solid waste management departments use to dispose of the collected solid waste from the sites. The ordinary waste pickers gave the straightforward answer. They stated that they used to burn the solid waste to reduce its size, and they then used to sell it (P3). The burning of the waste is helpful in size reduction, and the reduction helps sell at good prices (P7). They stated that the objects or wastes that are not of their use are being thrown on the grounds which increases health-related issues (P4). Communities often lack access to basic services and face significant health and safety risks (P1).

The superior officials stated that when the machinery is adequately present, useful, and working well, the solid waste collected from the sites is segregated (SOR2). However, some believe that segregation is



done but not continuously (SOR09). They stated that they have sites for dumping solid waste, but they are inadequate to fulfill the requirement (SOR06). They believe that proper waste management and adequate facilities for waste pickers can reduce health and environmental issues (SOR07). Proper awareness programs and campaigns about waste disposal among communities and other stakeholders can reduce health and environmental issues (SOR03). The need for inclusive and equitable waste management policies are required (SOR04).

Theme 4

Weak Governance and Fragmented Responsibilities

The fourth theme vignette is the combination of two narratives that include weak governance and fragmented responsibilities. The governance structure for solid waste management in Pakistan is characterized by weak coordination and fragmented responsibilities among various government agencies. This fragmentation leads to inefficiencies and gaps in service delivery. The supervision and regular visitations of the field officers or the superiors on the sites so that they could check the functioning and the working of the workers on the sites. It is very important because supervision is necessary for the effective working and effective running of the system in Pakistan. It has been found that there were two perspectives; one was of the ordinary waste pickers. According to them, the sites had very few visitation terms (P). They stated that if anyone came to supervise, they only saw from their cars (P02). However, the senior officials said they used to visit the sites once or twice a week and would go further if their departmental policies offered them to visit the sites (SOR06). However, it has been found that the supervisors occasionally visit the visitation sites outside of cities (P06). The officials also explain that there is weak coordination with other government agencies working with collaboration (SOR08).

Theme 5

Corruption and Mismanagement

The last theme vignette states two narratives that include corruption and mismanagement, although these can be studied together as this might be a single narrative with two different dimensions or two narratives with a single dimension. The main reason for including these narratives is to highlight how corruption is dislocating the department's effectiveness and how corruption and dishonesty are destroying public value. P04 stated that the machinery is not on the sites as the departments usually do not put bins on the sites where they are required. However, P06 stated that the bins were stolen from the site due to departmental dishonesty or mismanagement. They said they never steal such objects because they are helping them collect waste, but the department's people are involved in such corrupt practices (P02).

Moreover, stealing petrol from vehicles is also not new. They were usually stolen by senior officials (IO7). The tires of vehicles (IO4) and the maintenance prices and budgets are being mismanaged (IO9). The superiors forge the entries in the registered (IO) orders. Moreover, the jobs are not given on merits (IO6). They are usually given to the siblings and relatives of the superiors (IO8).

These comprehensive themes provide a structured framework for understanding the multifaceted challenges and potential solutions related to solid waste management in Pakistan. By addressing these issues, stakeholders, government agencies and other stakeholders can develop targeted strategies to improve waste management.

Discussion

There are several factors that are destroying the public value in the department of Solid Waste Management. There is no single factor but multiple factors are interconnected and have the single irreparable damage to the department which is mismanagement. Mismanagement is the basic step due to which the department started being less effective (Ilmas, 2018). That not only has the social effects but also has the environmental effects. For instance, the mismanagement of solid waste affects the health of people. The mismanagement of waste encourages viruses, bacteria, and pests to attack the population. Due to this malaria and bronchitis and other lung-related diseases are promoted and transmitted in human beings. Destruction of the health of the public due to the mismanagement of solid waste is also the destruction of public value (Hashmi, 2019). The economic ramifications of health issues in Pakistan, which

can be linked to the health risks associated with poor waste management practices are also key factors and co-related (Ali et al., 2023).

The mismanagement has an effect on the public at large as well. As it is stated, in metro-cities of Pakistan, there is no concept of segregation of waste through a proper process but burning is a method that is used to segregate the waste. A large amount of burning of waste certainly affects the health of the environment. The recent increase in the temperature causing the production of greenhouse gases and global warming are the challenges for humanity and the mismanagement but the waste department is also assisting in the increase of temperature of the globe (Haider et al, 2015). "Open burning of waste or open disposal is commonly practiced in Pakistan, although data on the amounts of waste disposed of via this route are currently very limited. The practice is generally more prevalent in the rural areas and small cities, where there is little infrastructure and collection/ transport facilities are negligible or nonexistent" (Mahar et al. 2007).

Corruption is undoubtedly a curse that is the cause of mismanagement of the department. The stealing of petrol due to which the vehicles are unable to reach the proper places for the collection of waste, and the stealing of public machinery, bins, cans, and spare parts of the vehicle are affecting the department and playing a role in the destruction of the public value. The dishonesty and corrupt practices are destroying the value. The mishandling of the budget causes financial constraints due to which the department fails to fulfill its needs. The required machinery is not purchased which is essentially required for the management of the solid waste. Due to this, the proper methods are not being used for the disposal of waste. Due to less number of landfills and dumping sites, burning has become the main method for the disposal of waste. It has been stated that "the waste management system should be guided by appropriate legislation and controlled at the national, regional, and local levels, but responsibility for actual service delivery and implementation should be left to the local authorities. Adequate staffing capacity is required at all levels. There are no tax incentives for private sector work in the waste management sector" (Iqbal et al, 2015). The role of community awareness and education in improving waste management practices, drawing on the example of Zakah awareness is very important (Aljounaidi et al., 2023). The importance of good governance and building trust in improving waste management practices in developing countries like Pakistan will create positive changes in the waste management system (Ahmad & Esposito, 2022).

This study demonstrates the usefulness of Grounded theory based on the identification of complex and context-specific problems and the generation of data. This approach could also be replicated in other developing countries facing similar challenges. It also emphasizes the importance of aligning waste management strategies in order to increase public value, as well as providing a deeper understanding of how governance structures, policies, and institutional reforms and response to crises and institutional capacities influence waste management outcomes (Naeem et al., 2023).

The results of this study can inform policymakers about critical areas that need attention, such as corruption, lack of accountability, and inadequate infrastructure. By addressing these issues, policymakers can develop more effective and comprehensive waste management policies.

The study highlights the importance of community awareness and participation. Concrete strategies can include educational campaigns to inform citizens about the proper methods of waste disposal and disposal, thereby promoting a culture of sustainability.

The study also highlights the need for institutional reforms to address governance issues and improve coordination between different agencies involved in waste management. Practical steps may include defining clear roles and responsibilities, improving communication between agencies, and implementing robust accountability mechanisms.

To discuss the broader implications of corporate social responsibility in the context of environmental management, including solid waste management will also play a vital role (Esposito et al., 2023). Impact of greenwashing on public perceptions and its relevance to promoting genuinely sustainable waste management practices and the role of corporate social responsibility in fostering green behavior among employees as the role of green human resource management practices in enhancing the sustainability of waste management operations are necessary to improve the waste management system (Ahmad & Esposito, 2022; Khan et al., 2021). Also, the government should draw parallels between the quality of care



in healthcare and the quality of waste management practices, emphasizing the importance of a supportive work environment (Ali & Ahmad, 2024).

Conclusion

The solid waste management system of Pakistan is at its worst stage in the metro-cities which are the hubs. There is no proper management system. Corruption, lack of accountability, financial constraints, dishonesty, and lack of supervision are the reasons that are destroying the value of the public. There is a need to recognize the current trends in waste collection and the waste disposal system because there is no proper technique for the collection, segregation, and disposal of waste in Pakistan (Ahmad, 2024). There is a need to seek possibilities for improving the current system. Progress can only be made with the help of the introduction of the proper institutional framework for the management of solid waste in Pakistan that should be focused and solely work for the betterment of the department. There is also a need for the proper execution of the laws and policies for effective functioning. There is a need to create a waste management strategy that could work in the promotion of recycling in Pakistan and use the of solid waste for the production of energy. In Pakistan, there is also a need to educate the people so they can deal with waste properly and the teams should help them in telling the techniques for the reduction of the production of solid waste. Due to minimizing solid waste, landfill, and incineration methods would be preferred in Pakistan. The digitalization efforts in public value creation in European countries and other developed and developing countries and the potential for similar initiatives in Pakistan's solid waste management are very important (Ahmad & Esposito, 2024).

This study enhances knowledge by applying Grounded theory based on the context of solid waste management in Pakistan. It demonstrates the use of a theory based on the discovery of complex, context-specific problems and the formation of information-based concepts. This approach could also be replicated in other developing countries facing similar challenges. The study highlights the wider qualitative implications of waste management practices. This study emphasizes the importance of adapting waste management strategies to increase public value and thus to expand the application of public value theory in the environmental and public health sectors. It also gives us a deeper understanding of how governance structures, policies, and institutional opportunities affect waste management outcomes which is needed to improve systems.

Practically, this study provides a foundation to strengthen accountability mechanisms to implement transparent budgetary processes and anti-corruption measures to reduce corruption and improve the efficiency of waste management systems. Increase awareness and community participation by launching educational campaigns to raise awareness about the importance of proper waste management and the benefits of recycling and composting. Invest in waste management infrastructure to allocate sufficient funds for the purchase of waste management equipment, such as vehicles, bins, and recycling facilities. Implement institutional reforms to clarify the roles and responsibilities of various government agencies. Invest in training and capacity-building programs for waste management professionals to improve their technical expertise and operational efficiency. Promoting the adoption of sustainable waste management practices such as recycling, composting, and waste-to-energy initiatives. Engage the private sector in waste management through public-private partnerships that use private sector expertise, technology, and investment.

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