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The waste collectors in Sindh, Pakistan: an exploratory study of the environment-friendly self-employment

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Abstract:
This study investigates how waste collectors use their work as a resource for establishing self-employment and their role in the country's developing economy through waste reduction. They collect garbage to meet their basic needs but lack the self-care practices of the participants. It reflects on the workplace environment and attitudes toward health threats. They face many challenges of being perceived as second-class citizens, thus facing meagre social status. This descriptive study focused on qualitative research using observational techniques. The study also examines several aspects of formal and informal waste collection and recycling practices. Data were collected by using primary and secondary sources. Representatives of all scrap dealers and waste collectors in the target area were selected. The study found that Pakistan's recycling industry is completely unorganized, unregulated, and has little support due to a lack of funding and systematic planning. Formally registered institutions only manage about 50 percent of Pakistan's municipal waste. The other half is what informal entrepreneurs' livelihoods depend on. Some poor people have no alternative to collecting, sorting, and selling valuable items. Their work is invaluable in environmental terms but not financially rewarding. It is also hazardous.

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1. Introduction

We use different things in our daily lives, and when those things become useless, expire, or are out of order, we throw them away because we consider them garbage or trash. But in our society, some people value these discarded items and put in their efforts throughout the day to earn a livelihood. These individuals are called waste collectors and have no monetary investment. They use only themselves as human resources and invest their physical effort, time, mind, and precious health, ignoring profit and loss only. They do this by selling these items to collection units for recycling and earning a small amount of money for their efforts. This is their only source of income for themselves and their families on a daily basis. Waste collectors are primarily uneducated and untrained because they do not find other means for better opportunities. They hope to contribute to the local economy and public health by doing so, in order to create a more sustainable and environmentally friendly society. As rising countries' living standards rise, so does their waste footprint; this might have become unsustainable without national laws and restrictions (Ferronato & Torretta, 2019).

The term "waste collector" was adopted at the first world conference in Bogota, Colombia. In 2008, the term "waste collector" was adopted to facilitate global networking, from March 1, 2008 to April 4, 2008. Thirty-four countries were represented at the conference, which brought participants together from Latin America, Africa, Europe, North America, and Asia. The participants were solid waste pickers and representatives of development agencies, private enterprises, NGOs, and the government (First International and Third Latin American Conference of Waste Pickers, 2008). It is chosen to deprecate terms like "scavenger." Most of the languages have their own specific terms, such as matadors in Portuguese and recicladores in Spanish (WIEGO, 2008).

The research objectives of the study are: a) To understand how a waste collector meets their basic needs and supports their families by employing them as a human resource by investing their physical effort, time, mind, and a significant risk to their health; b) To analyze the key role the waste collector performs for the environment and economy; c) To learn about the importance of waste management while addressing the importance of proper regulation and control in order to protect the individuals who are involved in this dangerous task on a daily basis in order to earn a small living.

2. Literature review

In Pakistan, people who are at the bottom of the social hierarchy scrounge through trash to find recyclable objects to pay for their living expenses in a tacit manner that is rarely noticeable (Asim et al., 2012). They occasionally yell out recycling collection requests via loudspeaker amplifiers in the street in brief, synchronized bursts before rapidly vanishing to avoid creating an excessive noise problem (Kahn, 2016). In order to survive, hundreds of families in Pakistan have turned to sifting through trash in metropolitan areas, which contrasts with 2% of the

population in Latin America (Aparcana, 2017). Picking up trash is beneficial for people's health, plays a key role in keeping cities clean, and enhances the attractiveness of the surrounding. Informal garbage collectors frequently create their own social circles or are members of minorities, such as the underprivileged Afghan immigrants in Lahore or the residents of Karachi's slums and ghettos (Umair et al., 2015). The primary informal collectors also include tricyclists, street scavengers, pick-up dealers using voice amplifiers, and collecting organizations. They directly collect recyclable trash from various locations across the city, while scavengers look for and remove the remaining waste from the dump.

2.1. Waste collectors

Wilson et al. (2006) define waste collectors, recyclers, waste pickers, and garbage/trash collectors as people who make a living by selling recyclables found in the trash. Despite being devalued, underpaid, and unprotected, garbage pickers remain an important part of our society, contributing to the cleanliness of our cities and playing a crucial role on a worldwide scale. They choose a profession that often goes unnoticed by most of our society, and in some instances, these individuals are looked down upon. Waste-pickers contribute to the economy and improve the environment, yet they are socially marginalized, discriminated against, and harassed by the public, and the government ignores or treats them as a nuisance (Nadeem, 2020).

2.2. Use himself as a human resource

Chartmann (2018) says that waste picking is an important source of income for low-income families and contributes to social, economic, and environmental marginalization. The physical effort they put in throughout the day amounts to them carrying the collected items through the streets and crowded or public places such as famous road interchanges, railway stations, bus terminals, universities, or around shopping centers, and the small profit that comes out at the end of the day is in no way equal to the time and effort they have put in throughout the day. A green work opportunity is created by the garbage collector, which also lowers poverty, saves money for towns, restores industrial competitiveness, protects natural resources, preserves the environment, and benefits both the country's economic sector and the environment (Colombijn & Morbidini, 2017).

Informal waste recycling is a common way to earn revenue in developing countries because millions of people invest their physical effort, time, mind, and health worldwide in making a living collecting, recycling, sorting, and selling materials that someone else has thrown away, i.e., garbage and trash (Medina, 2010). The human resources that waste collectors utilize for starting their own business are depicted; by doing this, they use themselves as a human resource while endangering their well-being and without any sort of technical equipment, as shown in Figure 1.

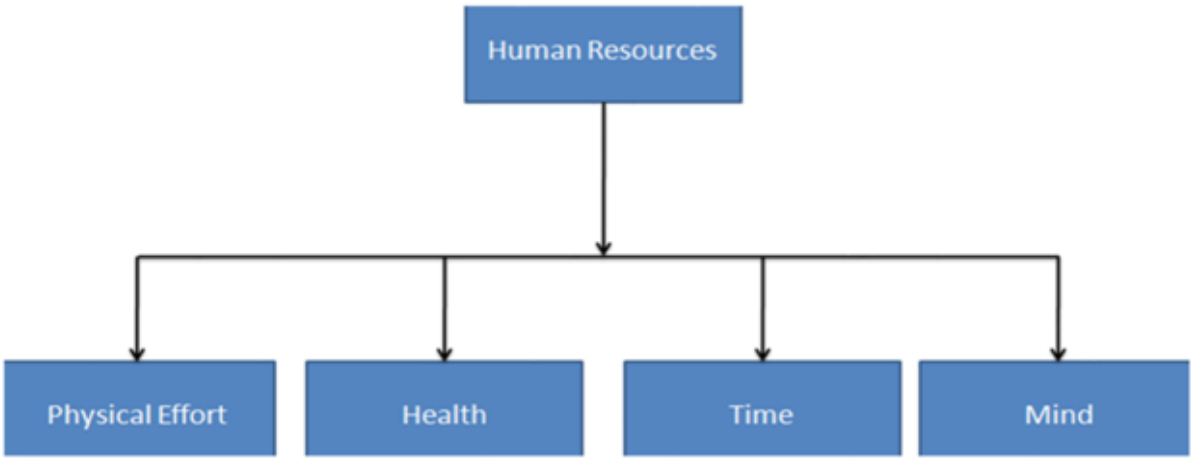

Figure 1: Resources towards creating self-employment

2.3. Circumstances of waste collectors

Informal laborers include self-employed and salaried workers who perform a wide range of tasks, from small shopkeepers to small manufacturers, rickshaw drivers to shoe shiners. In Pakistan, measuring the added value input of informality is difficult (Tahir & Tahir, P., 2012). Due to poverty, they are hard to work, get paid small amounts, are isolated, work long hours, are both married and unmarried, and have little or no education. According to women in informal employment globalizing and organizing (WIEGO), in 2008, waste collectors could vary from poor people who go through the trash to meet needs such as food, clothes, shoes, and other items during the waste collection process. Migrants from rural areas searching for employment survived in an area adjacent to the landfill, and this section was used to sort recyclable materials for sale to the recycling industry.

A recent study conducted by the Asian Development Bank (ADB), a multilateral organization, estimates that Pakistan produces roughly 30 million metric tons of municipal garbage annually. Because officially registered institutions are only expected to manage 50% of the waste, informal waste pickers are critical to reducing waste quantities and reintroducing recyclable items into the economy. However, they estimate that "more than 80% of the valuable recyclables (paper, plastic, glass, metal, and rubber) are stolen away by the informal sector before they reach the disposal sites. The ADB study laments the lack of accurate statistics about this issue.

2.4. Research gap

As for the three groups (home-based workers, street vendors, and waste pickers) of workers of particular interest to WIEGO in 2008, all countries except Pakistan have programs, projects, and research directly focused on waste pickers. Not much has been done on female hawkers and scavengers (Medina, 2010). In light of the comprehensive overview of the literature, it has

been found that very few scholars have worked on waste collectors, especially in Pakistan. Consequently, this study aims to bridge this gap by contributing empirical evidence on the subject.

5. Research methodology

This study is exploratory in nature and focuses on qualitative methodology. Bhattacherjee (2012) says that qualitative research intends to discover and build theories, but not test them, by using empirical pieces of evidence from the data collected through interviews, personal experiences, case studies, observation, historical events, audiovisuals, and written text. The researchers observe a particular aspect of human behavior with as much objectivity as possible and records the data. Data was gathered through both primary and secondary sources. Secondary data was collected from an Internet source, international journals, research articles, books, and newspapers, and the data was reviewed from the literature resources available and from secondary sources: the living society in Pakistan, whereas primary data was collected through observation.

5.1. Research areas

Data was collected in Sindh. The choice to do observations and interviews is due to diversity, ethnicity, and economic activity in Sindh province. Sindh has Pakistan's second-largest economy, while Karachi is Pakistan's largest city. The researcher lives in Sindh province, so it was easy to get more information in this area and it was not easy to go to another province of Pakistan during COVID-19 to observe the street vendors at different times. A map of Sindh Province is shown in this slide data was collected from the cities highlighted in circles.

5.2. Data collection

The data were collected through participant observation, photographs, anthropological or in-depth interviews, and text documents (Schilling, 2006). A valuable picture for data collection: This method's positive effect is that it allows informants who have long-term mental illnesses to express their perceptions (Erdner & Magnusson, 2010). The data was collected from Sindh, Pakistan. The observation method is described as a method to observe and describe the behaviour of a subject. In this method, the researchers collect data by recording videos and making notes. Record videos and notes, which are used for analysis at a later stage (Bhasin, 2020).

5.3. Participant observation

At the initial stage, the researchers followed the observation method to record the collection methods followed by the waste collectors. The participant observation method was used to increase the validity of the study. Participant observation is the process through which

researchers learn about the activities of people and understudy them in a natural setting through observation or participation in those activities (Kawulich, 2005). The participant observation method is used to increase the validity of the study, and the observations help the researchers have a better understanding of the context and phenomenon under study (Musant & DeWalt, 2002).

5.4. Observation technique

All types of waste collectors were observed during the observation. Gold (1970) describes the techniques of the participant-observer as follows:1) Complete participant; 2) participant as observer; 3) participant as observer; and 4) complete observer.In a complete observer stand, the researchers is neither seen nor noticed by the participants (Cherry, 2018; Gold, 1970). The researchers followed the "complete observer technique" of the participant observation method. Choosing different times of day to conduct observations without interaction with the targeted population, several cities, public places, open ground, streets, and crossroads were personally visited to observe the waste collectors. A large number of waste collectors were photographed in different cities in Sindh, Pakistan.

5.5. Sample

The study sample was all types of waste collectors from the Sindh province, Pakistan.

5.6. Data analysis

The analysis of observational documents such as written field notes, reports, and materials from the environment, including pictures, videos, and pamphlets, can all be used for the analysis of the observational data (Allen, 2017; Phillippi & Lauderdale, 2018). For the analysis of observation, the researchers used recorded videos, photos, and field notes, written immediately during observation.

6. Data findings

6.1. Characteristics of waste collectors

Waste collectors composed of single men or women, young or elderly, frequently help sustain their families because of hardship or other causes, which is why they work so hard to earn as much as they can to support their families. Most of them were old males in Pakistan. The age distribution of waste collectors is very old; the average age of respondents is very old, which is 50 years or over for the operation as trash buyers and garbage collector sellers. The 20–30 age groups undertake most of the work as pure waste collectors, either alone or partially accompanying their parents until they have had enough experience (Rini et al., 2013).

According to Dias and Samson's (2016) study on the “Informal Economy Monitoring Study Sector Report: Waste Pickers” found that, generally, the majority of waste collectors had an inadequate degree of formal education, the high rate of informal education was partially due to their lack of access to or unwillingness to study educational institutions, and they were illiterate or technically illiterate. The study also found that the majority of waste collectors are uneducated.

6.2. Waste collector’s living style

In Pakistan, waste collectors usually live in tents to transport waste from one location to another. They have a well-organized living structure. The majority of garbage collectors choose to stay in the same location. They pitch tents in the same way as tribal people do. They have a robust community system and excellent cooperation (Nadeem, 2020). Waste collectors built their living places temporarily because they change their homes from time to time.

6.3. Waste product or material collected

Hazardous waste such as faeces, toxic chemicals, infected needles, glass shards, and other hazardous materials are collected by waste collectors (Nadeem, 2020). Scan for recyclable materials such as paper, glass, bottles, and broken mirrors, as well as steel scrap, hospital trash, and plastic bags to be collected by waste collectors (Medina, 2010). The waste collectors are forced to use their bare hands to rummage through putrefying garbage containing fragments of glass, medical waste, newspapers, shoppers, bottles, dead animals, hazardous substances, heavy metals, and other goods that they can sell in the local market.

The waste collectors continue to gather reusable, repairable, and marketable pieces of waste, and e-waste has been labelled a "sleeper" waste. Electronic waste comprises unused consumer goods such as laptops, handheld devices, and televisions (Chikarmane, 2012). The most coveted items are plastic and steel goods and scraps. Animal waste is another kind of waste that is poorly dumped on the roads and in public areas. Nonetheless, animal waste is sold to companies that make goods from the remains of dead animals. However, this is a dubious activity in an Islamic country because this type of waste gives the waste collector more benefit than other waste.

6.4. Working time

McAllister, (2015) reported that the situation in smaller towns was much the same. The waste collectors covered the same area many times a day, with a continuous decline in the volume of waste found. The researchers also found the working time of waste collectors in the morning, midday, or evening. Their working period was sporadic and prolonged regularly for an infinite amount of work time each day.

6.5. Tools of waste collection

Many waste pickers do not use gloves to protect their hands when sorting saleable things from garbage, leaving them prone to skin conditions (Nadeem, 2020). Researchers have also seen that they work on the garbage with their hands, putting them in danger of injury. A small number of garbage pickers use a rudimentary tool such as a stick or fork made of wood or metal. Waste pickers should be instructed to use appropriate, practical equipment, such as tiny hand forks, to reduce the danger of injury. The efficacy of recyclable materials collection is improved by using such strategies (Cowing, 2013).

6.6. Locations for collection

Mostly waste dumps, often disadvantaged people tend to gather waste materials from open dumping sites near roadsides, open plots, and drains (Laurieri, 2020). On the curb or from dumpsters, along the streets and waterways, or on municipal dumps and landfills. They can collect from private waste bins, houses, stores, restaurants, shopping centers, and public areas such as beaches, parks, bus stands, etc. Also, open fields or waste areas are the most common location for gathering litter or waste. There is no proper waste collection system in Pakistan, but the waste pickers collect and sort solid, non-organic unwanted from highways, markets, and communities.

6.7. Separation of waste material

There is no proper segregation system for different types of waste in Pakistan, and there are no adequately controlled sanitary landfills (Qasim, 2015). This study also supports the point that there is no proper segregation system for different types of waste as there is in other countries. Petrosino (2021) found that many countries such as Afghanistan, Bangladesh, India, Indonesia (certain local governments), Japan, Kenya, Malaysia, Mexico, Nepal, South Africa, and Thailand (Chiang Rai) all have national legislation dictating trash segregation categories and a color-coding system for garbage bins. With color coding styles, it is easier for staff handling waste to put waste items into the correct container and maintain segregation of waste during transport, storage, treatment, and disposal. Color coding also provides a visual indication of the potential risk posed by the waste in a particular container. Where there is no national legislation, a World Health Organization (WHO) scheme is available.

In Pakistan, waste collectors are general; gathered materials are segregated at the association site. At the same time, separation happens in certain instances in the scavenger's own home. Some products pose a health danger to the waste collector and their families if they are not adequately sorted. Nonetheless, as illiterate and reliant on them for a much greater motivation than their health and well-being, they rarely consider these concerns. The garbage collector operates on the sidewalks, often scattering waste from plastic cans and sullying the pavement, generating additional jobs for street sweepers in the area (Schwarz et al. 2020).

6.8. Stored product and material

In Pakistan cities, there is improper storage of waste at the source. Only household things are sorted out at the local level, while other wastes do not have a proper segregation system of MSW (Qasim, 2015). In every business tactic, these waste collectors realize with time and experience that, as is the concept of supply and demand, they will gain a higher sum to store those forms of waste later after the price has risen. Waste collectors store their collections in their homes or places where they think it would be safe. The bulk of these waste collectors keep their supplies.

6.9. Selling process

Waste collectors sell their recyclables both to private scrap, dealers/middleman (kabariwalas), and flea market/junks and by hand/direct means where these waste dealers work with one buyer and several sellers in a cartel market. Therefore, waste collectors have no alternative but to embrace low prices in pursuit of essentials, and others rummage through garbage; others gather and market recyclables to middlemen or corporations (Colombijn & Morbidini, 2017). In general, these dumps are temporary and grade them to sell for their livelihood. They have knowledge of what kinds of waste they need to gather to receive the total return or, instead, what waste will give them the maximum return from selling waste materials obtained to dealers. All this material is sorted, washed, and sold for recycling to the industry by middlemen.

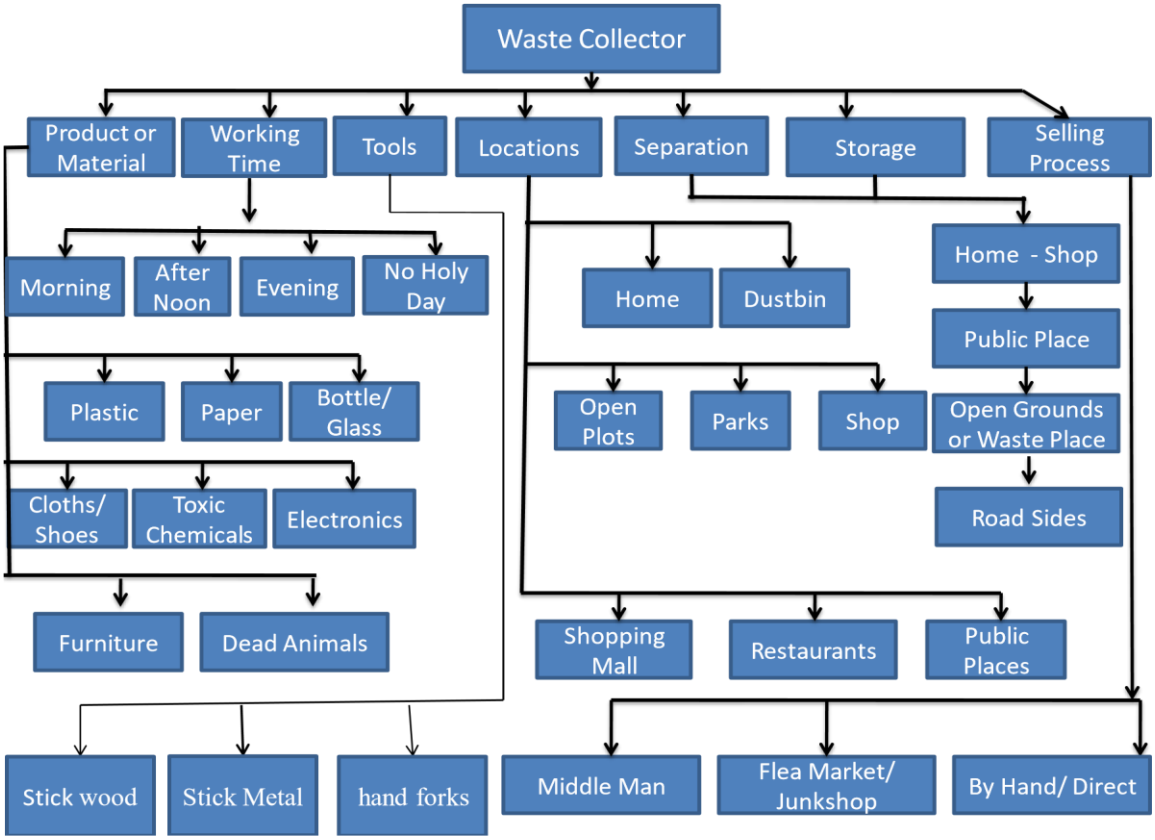

Figure 2: Diagram of Waste Management Flow

6.10. Recycle product or material process

Pata (2021) defines a radical rethinking and reorganization of production and consumption cycles that must achieve economic growth and sustainable development while reducing the global ecological footprint. Garbage collectors in Pakistan play a vital role. Without their efforts, massive amounts of recyclable waste would have to be burned, releasing carbon dioxide (Nadeem, 2020). An estimated 24 million people worldwide are engaged in recycling: collecting, recovering, sorting, grading, cleaning, baling, or compacting waste, as well as processing waste into new products (WIEGO, 2013). According to the international labor organization (ILO), in 2013, it is alleged that 1520 million people earn their living globally by recycling waste (Lundgren, 2012).

As a result of the efficacy of the locally executed information campaigns, residents who practice separate garbage collection utilizing a door-to-door system are better for the recycling process, and people are happier with that system. Waste collector looks for the items/ materials which already: wasted, expired, and ruined; in other words, they collect out of order or out of time (Calabro & Komilis, 2019). One of the cheap and fast methods to reduce greenhouse gas emissions is that waste collectors pick up the waste and sell that material for recycling. The market for recycled plastic is often weak, so forward-thinking companies could reduce their environmental footprints by supporting the demand for recycled plastic (Schwarz et al., 2020). Waste pickers play a critical role globally by stopping plastic waste if they don't collect it, resulting in plastics being burned or left in open pit dumps. The publicly dumping can block sewerage systems or end up in ecosystems after deprivation. In many cases, toxic fumes are released from burning plastic, and many people expect that the hidden energy in waste plastic will be recycled as usable energy.

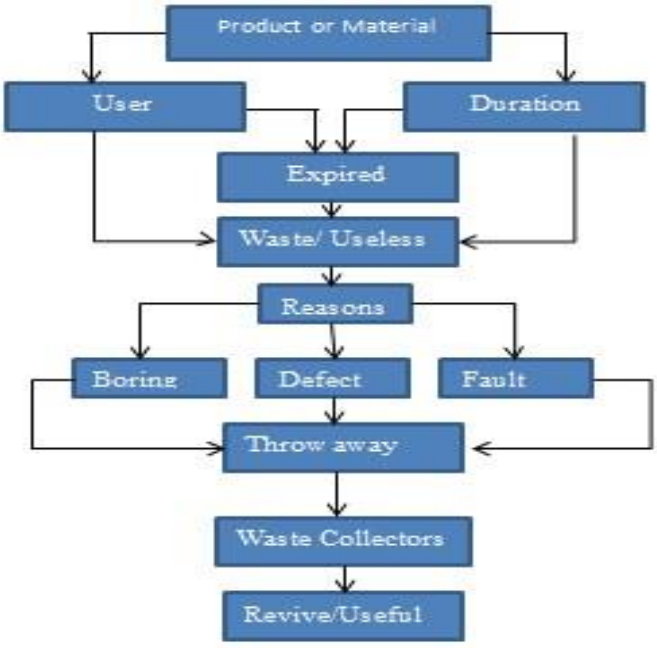

Figure 3: Recycling Flow Diagram

6.11. Health risks faced by waste collectors

A garbage collector's life is full of uncertainties; there is a high occurrence of diseases among waste pickers because of the increased finding of dangerous materials such as fecal matter, damaging chemicals, infected needles, glass fragments, etc. due to the lack of availability of defensive gear and also due to a lack of awareness. Moreover, female waste pickers are subjected to harassment, accidents, and potential health risks (Nadeem, 2020). The waste collectors do not worry themselves with personal health or defensive tools when picking up waste. Waste pickers have a sense of high self-esteem or honor and are highly motivated to work as waste collectors (Petrosino, 2021). Waste collectors do not take care of themselves, and as a result, many injuries, illnesses, and diseases, such as scabies, tuberculosis, respiratory infections, animal bites, asthma, cuts, and other injuries, occur.

According to BBC News (2000), on July 10, 2000, hundreds of garbage collectors were killed in rubbish slides in a large garbage mountain after monsoon rains hit an open dump in Payatas, Philippines. Akmal and Jamil's (2021) research defined Pakistan’s solid waste management situation as a matter of grave concern as more than 5 million people die each year due to waste-related diseases. In Pakistan, just about 20 million tons of solid waste are generated each year, with an annual growth rate of approximately 2.4%. Karachi, the largest city in the country, generates more than 9,000 tons of public waste daily. In Pakistan, Karachi has the largest concentration of waste collectors. Many waste collectors who are not part of any organized structure make their living by collecting material from standard bins, transfer points, and waste disposal sites for reuse or recycling; these individuals may be among the poorest of the poor.

6.12. Economic impact

Many people are unaware of the social, economic, and environmental benefits of garbage collectors' cycling activities. In developing nations, the purpose of trash collectors and the benefits they provide are critical for both ecological and economic reasons (McAllister, 2015). In two ways, informal recycling increases industrial competitiveness. To begin with, commodities recovered by garbage collectors are usually less expensive. Second, recycling uses less energy, resulting in cheaper operational expenses for the sector (Medina, 2010). Sorting trash fractions at home for a door-to-door collection system has been found to have a positive impact on waste management practices, reducing landfills, and developing new circular economies (Laurieri et al., 2020).

Kumar et al. (2013) says that working situations differ significantly across countries. Still, some basic categories of waste collectors exist globally. (1) What garbage collectors have in common is that they do this work to meet their basic living needs. (2) Garbage collectors have made outstanding contributions to solid waste reduction and recycling, but their role in solid waste management has not been recognized. (3) The scavengers have a high sense of self-esteem or honour and are actively engaged in the work of scavengers.

6.13. Training for waste collectors

According to the informal economy monitoring study IEMS from 2013, there is no preparation for waste collectors, and there are no opportunities for decent jobs; they are generally unemployed. Poor-quality accommodations were also troublesome, and the waste collectors removed large quantities of materials from the waste stream (Dias & Samson, 2016). The firms participating in recycling provide social welfare, offer jobs, and certainly contribute to the livelihoods of society. Waste collectors need better preparation for the waste or trash owner to go around and sort, sell, or buy garbage.

7. Conclusion

This study aimed to gather information about waste pickers and how they invest themselves in completing their basic needs. This occupation choice may come out of necessity, but it has powerful impact on the environment and recycling in the country. They face many challenges, and among them, the most significant one is that they are looked down upon and thus face a deficient social status. This study describes how a waste collector meets their basic needs and supports their families by using them as a human resource, putting in physical effort, time, mind, and a significant risk to their health.

An overview of the collection sites for waste is provided, which highlights the important role the waste collector performs in the environment and the economy. This study also emphasizes the importance of waste management, as well as the importance of proper regulation and management to protect the individuals who are involved in this dangerous task on a daily basis in order to earn a small living. Unfortunately, the waste collection system in developing countries is still not a priority for the government, as it already faces many other issues. Even with little or no government support and deplorable living and working conditions, these waste collectors wake up every day with the task of collecting more and better waste to earn a livelihood for themselves.

The government should make strong policy, and strategists should consider the waste collectors as formal businessmen and organize associations to support them and solve their problems globally, and many organizations have been founded. The government needs to put in some initiatives to further motivate, increase the morale, improve the work methods, and establish an organization or community for the waste pickers' welfare. According to our society, researchers should make a long-term survey on waste pickers in different provinces in Pakistan, just as other countries have deeply studied waste pickers and published their reports.

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