

EXPERIENCING THE EVERYDAY OF WASTE PICKERS: A SUSTAINABLE LIVELIHOODS AND HEALTH ASSESSMENT IN DHAKA CITY, BANGLADESH

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Abstract: Waste pickers make a livelihood by collecting recyclable waste contributing to urban development and poverty reduction. Most often, they are socially excluded and exposed to different vulnerabilities (e.g. occupational health risks and accidents). This study adopts the sustainable livelihoods framework to assess multifaceted aspects of everyday life and work experiences of waste pickers in Dhaka, Bangladesh. The framework takes an integrated and transdisciplinary approach to livelihood assets and vulnerabilities. Our findings reveal a situation of extreme poverty and neglect of waste pickers, while they are making the city more sustainable. Specific policies, strategies and actions are required to reduce risks and improve the working conditions of waste pickers. © 2020 John Wiley & Sons, Ltd.

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1 INTRODUCTION

Waste pickers, also called reclaimers, diverters or recyclers, lead their lives by collecting recyclable materials from various places such as households, streets, market places, municipal disposal sites or informal dumpsites primarily in low-income and middle-income countries but to a smaller extent also in high-income countries

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(Samson, 2015). The act of recovering resources translates into increased sustainability, with wasting less and recycling more. Yet these individuals are often negatively perceived by the formal waste management sector and the general public, because of the unhygienic and often unorganised work conditions (Wilson, Velis, & Cheeseman, 2006). Sometimes, there is tension between the formal and the informal waste management sectors. In Managua, Nicaragua, for example, serious conflict happened between Churequeros (local informal waste pickers) and the municipal waste collectors, which led to a strike and blockade of the 'La Chureca' waste disposal site (Olley, Jgosse, Rudin, & Alabaster, 2014). Waste pickers are socially excluded and vulnerable (Sarkar, 2003), and yet they are indispensable for the recycling system of cities in the Global South (Bolaane, 2006; Damanhuri & Padmi, 2012; Dias, 2016; Hayami, Dikshit, & Mishra, 2006). High rates of frustration among waste pickers are very common and often linked to stigma, exclusion, poverty, joblessness, family rejection and political negligence (Uddin & Gutberlet, 2018).

Waste pickers work under unsafe conditions and are easily exposed to infectious diseases and injuries during collection, transportation and separation of recyclable materials (Alvarado-Esquivel *et al.*, 2008; Binion & Gutberlet, 2012; Gutberlet & Baeder, 2008). Because they are generally very poor, they are even more vulnerable to various kinds of occupational health risks or hazards (burns, cuts, body injuries, pain, etc.) and diseases (flu, bronchitis, ulcers, chemical poisoning, high blood pressure, etc.) (Gutberlet, 2008; Gutberlet & Baeder, 2008; Sarkar, 2003; Wilson *et al.*, 2006). Other health effects include growth retardation in children and youth, undernutrition and malnutrition, anaemia, tuberculosis, bacteria and parasitic diseases and are very common among the waste pickers in lower-income countries, like India or Bangladesh (Sarkar, 2003). Their workspaces are unsafe, particularly when collecting at dumps, landfills or open dumps in the streets. Household waste comes sometimes mixed with hospital waste or industrial waste, creating additional risks for these workers (Akter, Hussain, Trankler, & Parkpian, 2002). Individuals dealing with hospital waste suffer from various infectious diseases, including viral hepatitis B/C, tuberculosis and skin diseases/allergy. Moreover, in many countries in the Global South, waste pickers are also considered a risk group for *Toxoplasma gondii* infection because of the lack of education, lack of access to sanitation and hygiene and high exposure to contaminated garbage, which sometimes becomes a food source for these individuals (Alvarado-Esquivel *et al.*, 2008). The unprotected working conditions of most waste pickers put this population at high risk of viral infections, such as COVID-19, for which they usually have very little resources to protect themselves. Despite epidemics or pandemics, many waste pickers continue working, with this activity being their only income source. Even simple proactive measures, such as frequent handwashing with soap and hand sanitising, are not possible for most waste pickers, heightening the public health risks, also on a global scale.

These catastrophic livelihood situations and risk experiences of waste pickers call for more attention of policymakers and government agents to the situation of waste pickers in their city. There is a need to include the voices of waste pickers in urban planning and policy development specifically related to solid waste management and recycling, as a strategy to improve their livelihoods, to expand resource recovery and to protect the environment and the health of these workers. In that way, resource recovery and recycling as part of the wider waste management system can become a form of income generation and poverty alleviation.

This research presented here adopts the sustainable livelihoods framework (SLF) to assess multifaceted aspects of everyday life and work experiences of waste pickers in

Dhaka, Bangladesh. We take a transformative and constructivist philosophical worldview in this research, focusing on the livelihoods of waste pickers, through the lens of these research participants, lending insights into their world, experiences and perspectives. The fieldwork for this study was conducted between July and August 2017, in Dhaka City. Elevated migration from rural areas, small towns and other cities in the country to the capital Dhaka has produced rapid population growth and territorial expansion of urban Dhaka (Bahauddin, Rahman, & Ahmed, 2014). These circumstances generate serious environmental and social challenges. As in so many cities in the Global South, this development trend of urban expansion and population growth has exceeded the capacity of local governments to offer efficient and effective delivery of basic services and infrastructure, including in waste management. On average, the population in Bangladesh generates 0.5 kg of waste per day and per capita, or 2.1 kg/day per household, amounting to 13 000 tons/day. Dhaka City alone produces over 4000 tons/day of household waste. In Bangladesh, 74 per cent of the waste is considered organic, 9 per cent are paper and cardboard, 4 per cent are plastics and 13 per cent are composed of other materials (rubbers metal, glass, chemical and medical waste, textiles, etc.) (Enayetullah, Sinha, & Khan, 2005; UN Habitat, 2010).

The city collection covers approximately 60 per cent of the population but is unable to manage the rapidly increasing urban periphery and the resulting growing amounts of waste in these neighbourhoods. Usually, household waste is collected by small enterprises who take the waste to transfer points or to designated sites on the roadside (UN Habitat, 2010; Yasmin & Rahman, 2017). On average, the city collects 3340 tons/day, of which 20 per cent (668 tons/day) are recycled, 37 per cent (1236 tons/day) are illegally dumped and the remaining 43 per cent are deposited at the local landfill (Afroz, Hanaki, & Tudin, 2011). While Dhaka City Corporation is officially in charge of collecting and landfilling household waste, waste management in Dhaka largely depends on different informal waste collection and recycling schemes. It is estimated that approximately 120 000 urban poor engage in waste picking in the city. These informal workers collect on average 2 tons of material per worker per year. Dhaka is considered one of the cities with the highest concentration of informal waste pickers, with 1.7 per cent of the population being a waste picker (Wilson *et al.*, 2012). These individuals reclaim nearly 15 per cent of the total solid waste (mostly inorganic) produced in Dhaka, amounting to 475 tons of materials reclaimed by the informal sector, every day. The work of waste pickers is not regulated or controlled by the local authorities (Ahsan & Zaman, 2014).

The number of sources of hazardous waste (generated by the chemical industries, such as tanneries and textile mills; medical centres; and clinics) has been increasing rapidly in Bangladesh (ADB, 2010). The increased generation of hazardous waste also creates the potential for thousands of waste pickers to become exposed to these materials when recovering recyclables from dumps in urban areas. Most of the waste pickers are illiterate and work long hours every day to make a living. They are often unaware of health risks and usually are unable to access running water and soap readily. The majority lives below the poverty line, with an average income ranging from US\$1 to US\$2.5 per day. According to Global Alliance of Waste Pickers (n.d.), a large number of migrants are also involved in this work.

There is a significant gap between the daily generation of solid waste and what is actually collected, which also leaves urban administrations vulnerable to citizens' complaints (Bhuiyan, 2010). Local governments struggle with limited financial and human resources and often lack the technical expertise to improve waste management and

simultaneously address livelihood challenges such as poverty, unemployment and social exclusion. Few studies focus on waste recycling or on the collection and use of organic waste in Bangladesh (Hoque, 2006; Matter, Dietschi, & Zurbrugg, 2013; Salahuddin & Shamim, 1992; Wood & Salway, 2000). One of the few studies describes the informal recycling chain in Khulna City (Bangladesh), where waste pickers collect and sell reusable materials such as papers, plastics, bottles, furniture, garments and electronics (Bari, Hassan, & Haque, 2012a, 2012b). This study recommended training programmes on personal hygiene among the workers in all reuse schemes. Yet none of these studies have investigated the overall livelihood aspects and health risks of waste pickers in Bangladesh, with the purpose of building on the assets they bring to inform policy interventions and creating new opportunities in local waste management. This is a pertinent matter, given the public health risks involved with the spread of highly contagious infectious diseases, as we currently experiencing with the COVID-19 outbreak. Waste pickers are among the vulnerable populations also in that context.

In the next section, we introduce the SLF (Baumann & Sinha, 2001; Chambers & Conway, 1992; Chant, 2004, and others), a useful tool for us to find out about the multiple assets and barriers in the livelihoods of waste pickers and which provided insights into the everyday survival strategies of these individuals. We then describe the appraisal method used to assess the livelihood situations and health risk factors of waste pickers in Dhaka City, involving surveys, interviews, workshops and focus group discussions as our data collection tools. We then present our results and highlight the findings regarding the different livelihood facets. In our conclusion, we provide some recommendations to improve the health and livelihood conditions of waste pickers in Dhaka and elsewhere and suggest strategies to develop more inclusive solid waste management systems.

2 THEORETICAL FRAMEWORK

The concept of sustainable livelihoods takes a social systems approach to human livelihoods and the environment. It builds on identifying assets and capabilities, seeking to address the barriers and vulnerabilities to sustainable livelihoods. Assets are understood as ‘capability to be and act’; they are the power to intervene, to challenge or to change rules and ultimately make up the level of agency a person has or is lacking (Sen, 1997). From this perspective, power to resist is also an important asset. Different assets contribute to well-being outcomes. Vulnerability, on the other hand, identifies risks, insecurities, shortcomings, stress, impacts or threats. Peoples’ livelihoods and the capability of using their assets are fundamentally affected by critical trends and seasonality as well as by other kinds of shocks (DFID, 1999). These developments include population trends, resources trends, climate-related seasonality and trends, economic and technological developments, and trends and shifts in governance. Seasonality is linked to prices, production, employment opportunities, weather and health. The shocks are related to natural shocks (e.g. extreme weather patterns, climate change and biological risks), economic shocks (changes in resources prices, taxes, inflation, etc.), human health shocks (epidemics or pandemics, weather-related and pollution-related health impacts, etc.) and conflicts (political, social and cultural). Vulnerabilities can also shed light on existing resilience, for example, on how individuals, households or communities cope with certain trends, seasonality and shocks and how they adapt or compensate these.

Multidimensionality is critical in improving individual and household socio-economic well-being and poverty reduction. Particularly, when dealing with long-term persistent structural poverty, as is often the case with waste pickers, it is important to understand the complexity of the livelihood factors that shape and impact the life of an individual exposed to deep-rooted poverty and exclusion. The framework needs to be dynamic and requires flexibility, accounting for these trends and seasonality.

The SLF emerged as assets-based approach, rooted in the poverty alleviation debate, particularly around rural communities and the urban bias, in the 1990s (Chambers, 1992, 1994; Chambers & Conway, 1992; Carney, 2002, and others). The framework has been used in research to identify key challenges, to inform policymakers and ultimately to help make better development decisions, seeking equity and tackling the impacts of livelihood shocks and vulnerabilities, while focusing on existing assets and entitlements of the poor (Moser & Dani, 2008). This approach permits a multifaceted way of capturing everyday life perspectives covering not only the economic aspects but also the social, environmental and political facets of poverty. The method originally identifies only five types of assets (physical, financial, human, social and environmental). We have added political assets as another side to the framework, tackling aspects related to politics, power structures, empowerment and rights, inspired by Baumann and Sinha (2001).

A livelihood is considered sustainable when it can 'cope with and recover from stresses and shocks and can maintain or enhance capabilities and assets both at that time and in the future, while at the same time not undermining the natural resource base' (Moser & Dani, 2008, p. 51). To identify assets and ways people have coped with shocks before can carry important information for identifying development strategies and actions that build asset accumulation (DFID, 1999).

While critiqued as not generating sufficient evidence from the SLF to translate into better development and policy outcomes, Carney (2002) has argued that the research can be useful in determining poverty eradication strategies or social inclusion measures. The SLF is an operational tool that organises and captures diverse data on the everyday livelihood perspectives of individuals or households and helps determine key challenges and structural bottlenecks that require actions. Insights can be gained on specific livelihood circumstances that can then be tackled with appropriate microlevel to macrolevel planning and policies, as well as strategic interventions (Mensah, 2012). Political and institutional constraints, deficits, absences or missing links can be made more visible and thus become a call for more transparency, equity and accountability. Kabeer (2004) specifically studies the broader institutional configurations and how the poor and their livelihoods were supported or not in poor countries.

Building on Moser and Dani (2008), the framework operates on three levels: the normative, the analytical and the operational level. The normative level brings in the human rights perspective and highlights the shortcomings and assets in different human rights, often anchored in the country's constitution and universal rights, as well as other legal frameworks. The analytical level identifies flows, interceptions and absences of resources, knowledge, power and so forth, to better understand the rationale for current circumstances, relationships and relations. Finally, the operational level deals with the programming and strategising as to how best to address the deficiencies and the weaknesses and how to most effectively employ existing assets.

The SLF in itself becomes a transformative methodology, when it takes an assets-based community development approach. Research participants, particularly local leaders,

elders, women's groups, youth or particular communities (communities defined by their geographical boundaries or by shared interests, values or experiences), identify the assets that need to be build up and supported, in order to strengthen their capacity to overcome the risks, vulnerabilities and shortcomings (Mathie & Cunningham, 2003). The research creates opportunities to expand the assets and also to build on their agency and empower the participants.

Depending on one's standing in society, solid waste can be seen as a livelihood source (e.g. waste pickers, recyclers and waste workers) and a public health hazard (e.g. public health agents and community), or waste might be ignored by authorities and communities, even when piling up along roads and creeks causing a local nuisance. For the urban poor, it becomes a commons' problem, a resource and also a survival strategy (Dias, 2016; Ezeah, Fazakerley, & Roberts, 2013; Gutberlet, 2016, 2015; Gutberlet & Donoso, 2015; Wilson *et al.*, 2006). The following section describes our study and methodology capturing different angles of the livelihoods for the waste picker population in Dhaka City.

3 METHODOLOGY

The empirical study was conducted by one of the researchers, who is also a local from Dhaka, with the support of four local research assistants. We used a mixed-methods approach to collect data on the various facets of the waste pickers' livelihoods. The tools included several transect walks and participant observation with waste pickers and scrap dealers in parts of Dhaka where data were collected (Figure 1), to obtain a spatial understanding of their activities. This observational method helped capture information on the collection, transportation, marketing strategies of recyclables, and other diverse aspects related to waste and the work with waste. We organised three focus group discussions with six to eight waste pickers, conducted six key informant interviews and applied a structured survey to 210 waste pickers. The application of the survey involved four local research assistants, who were each accompanied by one waste picker.

Three focus group discussions with six to eight waste pickers each were conducted in three different locations, one of them being a landfill site. The location for these group discussions was important to better understand the overall situation of reclaiming recyclables and their ways of making an income and to understand the health context and current situation of the participants. In addition, six key informant interviews were conducted with waste picker leader (1), community-based organisations (1), waste business enterprise (2), and key government officials from the city (1) and landfill sites (1). The key informant interviews were conducted by the researcher, and notes were recorded manually for analysis.

We used a simple random sampling technique to apply the structured survey to informal waste pickers, collecting data on income, health, other challenges and livelihood aspects. The population of waste pickers is highly mobile and scattered throughout the city but concentrated at certain times near scrap dealers and dump sites. Snowballing technique also played a role in order to find the waste pickers, by speaking either to the waste pickers or to scrap dealers. A total of 210 surveys were collected through this method. We analysed the data using qualitative content analysis (Creswell, 2003) and Microsoft Excel (MS Excel), USA for semi-quantitative analysis (Creswell & Creswell, 2017).

At the end of the study period, in August 2017, an Evidence-Based Interactive Workshop, which is a qualitative research method, was organised, with a range of

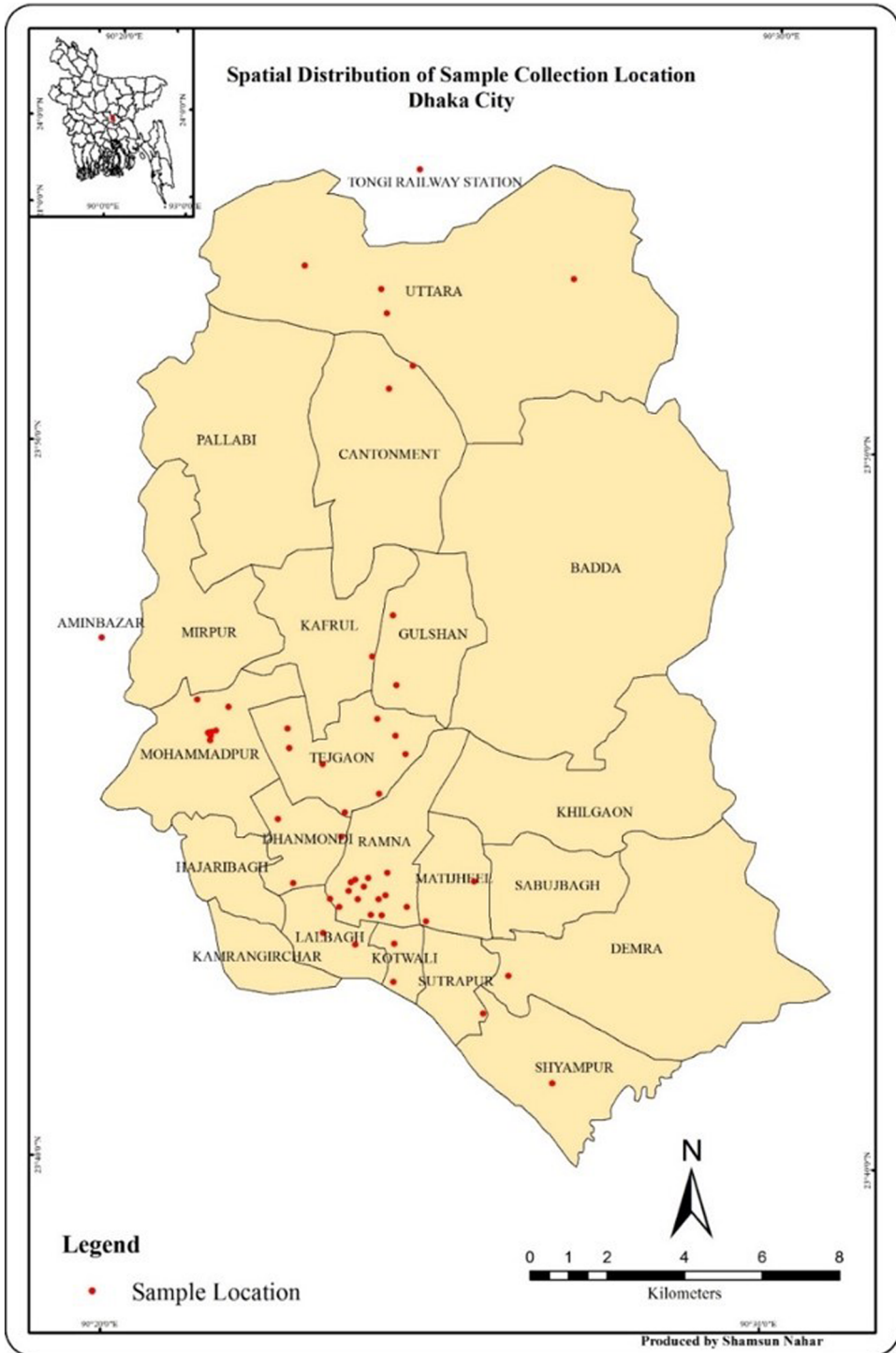


Fig 1. Location of the study sites for survey application in Dhaka, Bangladesh (cartography: Shamsun Nahar) [Colour figure can be viewed at wileyonlinelibrary.com]

professionals in the field of waste management, including scrap dealers, waste pickers, government officials, university faculty, students and non-governmental organisations (NGOs). A total of 25 individuals participated in the workshop, which took 5 h and was conducted at the Stamford University Bangladesh in Dhaka. First, findings/evidence of the study were presented during this workshop, and the most important issues and possible solutions or recommendations were discussed by the participants in detail. The participants were divided into two smaller groups to discuss multiple open questions related to topics on waste picker livelihood issues, including health, waste management policies and advocacy. The key objectives of the workshop were to deliver first results and to further capture the views and opinions of the participants on future directions for inclusive waste management in Dhaka City and other parts of the country. The researcher facilitated the workshop, and the research assistants helped in documenting the discussions during the workshop.

We manually entered the survey data into an EXCEL spreadsheet and familiarised ourselves with the data set through multiple readings. Part of the survey data lend to a quantitative reading, and particularly, the interview and focus group data as well as the open-ended questions in the survey contributed to qualitative data analysis. The common practice in qualitative research of the 'researcher-as-the-instrument' (Morse, 2006) allowed for specific insights and direct inference. All names of the research participants have been changed to fictitious names, for confidentiality reasons. We used the SLF to organise our data regarding the working and living conditions of waste pickers in Dhaka and their everyday routines and impacts. Our focus was particularly on the health of these workers, because health is central in being able to achieve a sustainable livelihood. Our results contribute to applied knowledge generation that can assist development changes, particularly in local waste management, creating opportunities for more sustainable livelihoods and better environmental and public health.

4 RESULTS AND DISCUSSIONS

The following section analyses the data to describe the livelihood aspects relevant for waste pickers. We will discuss assets and vulnerabilities identified through the survey, workshops, during key informant interviews and the participant observation during the transect walks. Figure 2 is a schematic representation of the aspects we considered in our analysis of the livelihoods of waste pickers.

Results from our observations, key informant interviews and focus group discussions revealed that most of the waste pickers collect recyclables from various locations such as along the streets in residential, commercial and industrial areas; at market places; formal and informal dumpsites in streets; at the two landfill sites; at train and bus stations; and in parks. Most of them mentioned that they were not allowed to visit shopping malls, to go inside the household compounds or to visit commercial offices, because of the restrictions enforced by security guards. Generally, they try to sort different materials recovered from these collection sites; however, there are no specific places for them to separate the recyclables. Most of the time, they put everything in one large bag and sort them near the recycling shops of the scrap dealers when they sell these materials. Waste pickers have no means of transportation, and they have to carry their recyclables from the collection points to the recycling shops on their back. Scrap dealers are considered the intermediary within the informal recycling system in Dhaka and have high influence on price control.

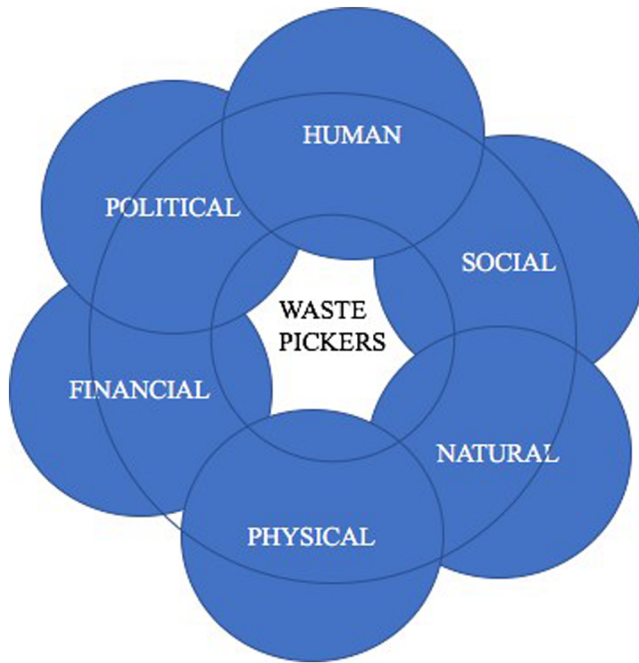


Fig 2. Livelihood assets and vulnerabilities (adapted from Baumann & Sinha, 2001) [Colour figure can be viewed at wileyonlinelibrary.com]

4.1 Human Assets and Vulnerabilities

The survey results show that most of the participants were identified as male (81 per cent). A shocking number of waste pickers surveyed were very young, between 7 and 15 years old (34 per cent). Another 35 per cent were between 16 and 30 years old and 23 per cent were between 31 and 45 years old. This means over 90 per cent of the waste pickers are very young and many of them are in formal working age. The majority of the waste pickers in Dhaka are illiterate (BLF, 2018). Some local NGOs, for example, the *Grambangla Unnayan Committee*, provide education for children of waste pickers working on the landfill site in Dhaka. However, the demand is significantly larger than the programmes offered to this population.

Most of the survey respondents (84 per cent) have migrated to Dhaka from rural Bangladesh, where they used to farm, often following disaster events (e.g. river erosion, cyclones and flooding), lack of jobs or family conflicts (Figure 3). Often expelled because of extreme weather events, possibly linked to climate change, already poor farmers leave the countryside to find a job in the city. As a consequence of natural hazards, they have lost their harvests and often all their belongings, including their home.

The following story reveals what such an event means in a life of a person.

‘My name is Salam and I was leading a happy life in my home district in Patuakhali. I was a farmer and I had a small piece of land where I used to cultivate various crops and vegetables. But after the cyclones SIDR and Aila, I lost everything including my house. Then, I migrated to Dhaka in search for a job. I was not able to get one and now I am a Tokai (waste pickers) and collect waste from the streets for my livelihood.’

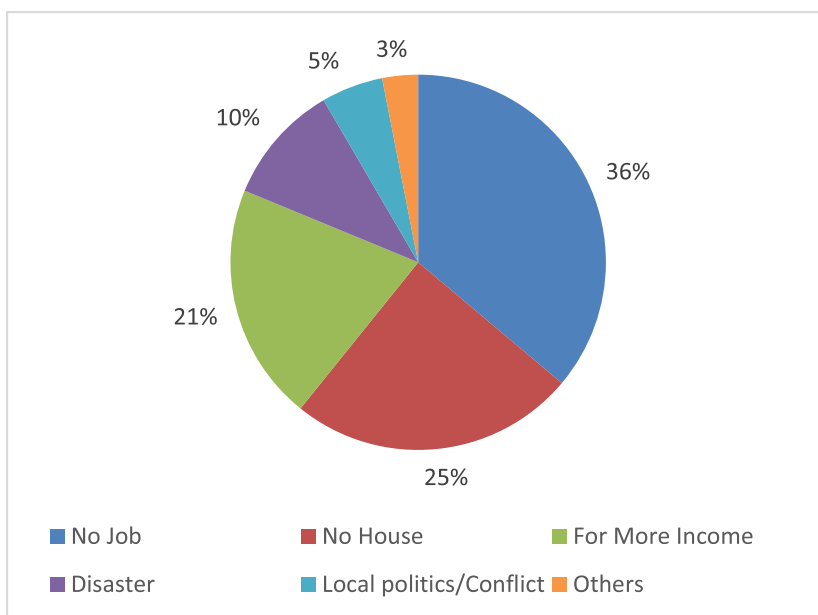


Fig 3. Primary reasons waste pickers migrated to Dhaka [Colour figure can be viewed at wileyonlinelibrary.com]

Another account adds to that perspective.

‘My name is Kutub, I migrated from Bagerhat to Dhaka, in search of work. I could not find a job and, at first, I did not have a meal per day. Finally, to support myself, I made the choice to collect waste to make an income. I am doing that work already for 10 years. ... I live in the street, in parks, or roadsides. I feel hugely frustrated for being excluded from society. Everywhere I go, people neglect me and do not grant me access to recyclable materials. ... Over the last five years, I have suffered from several health problems such as heart disease, tuberculosis and I need treatment to survive.’

About half of the survey participants were currently experiencing health issues (47 per cent). The problems most mentioned by them were fever (75 respondents or 36 per cent), skin disease (52 or 25), stomach disease (31 or 15 per cent), diarrhoea (15 or 7 per cent), cuts (14 or 6.5 per cent), dysentery (6 or 3 per cent) and other diseases or illnesses.

The majority of the respondents (79 per cent) were not able to access public services (education, water and sanitation), leaving a bleak perspective of negligence and exclusion in the daily life of waste pickers. Not being able to enter formal education prevents progress and skill building and often maintains them lifelong excluded. Low levels of education and the lack of formal work experience impact negatively on labour market mobility and thus on their ability to compete for jobs in the formal market (Viljoen, Blaauw, & Schenck, 2016). Low barrier jobs are required for this part of the population. Not having sufficient access to clean water and sanitation represents a major health concern, besides not conferring a dignified life. The low socio-economic status, lack of adequate housing conditions and poor household hygiene practices of waste pickers contribute to their health vulnerabilities (Singh & Chokhandre, 2015). In an earlier study,

Uddin *et al.* (2016) reported various water, sanitation and hygiene (WASH)-borne diseases including diarrhoea, malaria, typhoid, stomach pain, fever, jaundice and skin diseases among the homeless people in Dhaka, Bangladesh. Factors behind these diseases include lack of safe drinking water, insufficient public toilets, lack of public facilities for a regular shower, lack of water for handwashing and cloth washing, widespread littering and open defecation practices. Our current study also found these same factors applying to the waste pickers and their health hazards.

4.2 Social Assets and Vulnerabilities

Waste pickers in Dhaka can rely on very few social assets. There is no formal organisation or network that supports these workers. In Bangladesh, waste pickers are informal, autonomous and not organised in cooperatives or associations. There is very little support from government or NGOs to improve their livelihoods; 84 per cent of the survey respondents stated that they did not receive support from either the government or NGOs, and 91 per cent said that they had never cooperated with the government or an NGO on waste management-related issues. Most of them did also not receive any support from their neighbours or family members (94 per cent), which means that they are on their own, with little social cohesion and consequently very low trust levels.

Waste pickers face many competitions. They generally do not have direct access to the households, only the formal local municipal waste collectors can approach households for recyclables. During the formal door-to-door collecting of household waste, these formal waste workers sort out most of the recyclable materials and they also sell these to scrap dealers. In yet another variable, households keep their recyclables and exchange these materials with so-called hawkers for food items or plastic toys. Hawkers travel with four-wheeler vans, bicycles or on foot, going house to house and asking for recyclables. The following flow diagram shows major actors and interactions involved in collecting and trading recyclable materials in Dhaka (Figure 4). There seems to be no collaboration between the municipal waste workers, the hawkers and the informal waste pickers.

There is an informal relationship between waste pickers and scrap dealers. In some cases, waste pickers sell their recyclables always to the same scrap dealers, and they establish more trustful relationships. Scrap dealers can catalyse cooperation between them and the waste pickers, providing support when needed. In many cases, however, absence of trust is prevalent because of the price control and power scrap dealers have.

Social stigma and social exclusion further aggravate the situation for waste pickers. They are not recognised for the contribution they make, reclaiming materials and reducing the amount of recyclable materials that end up in landfills or dumps. Like all over the world, waste pickers carry a strong social stigma, being associated with filth and waste and often harassed by officials and the general public, often translating into self-reinforced stigma. Studies have observed that social marginalisation and stigmatisation of waste pickers can cause psychosocial health issues (Da Silva, Fassa, Siqueira, & Kriebel, 2005) and furthermore reduce their ability and willingness to seek medical attention when faced with health threats (Parizeau, 2015).

Results from our survey and interviews show that most of the respondents feel socially excluded and frustrated in their lives because of not getting a regular job, because of their low-income and for not receiving any support from others. The following account reveals the frustration of a waste picker in Dhaka:

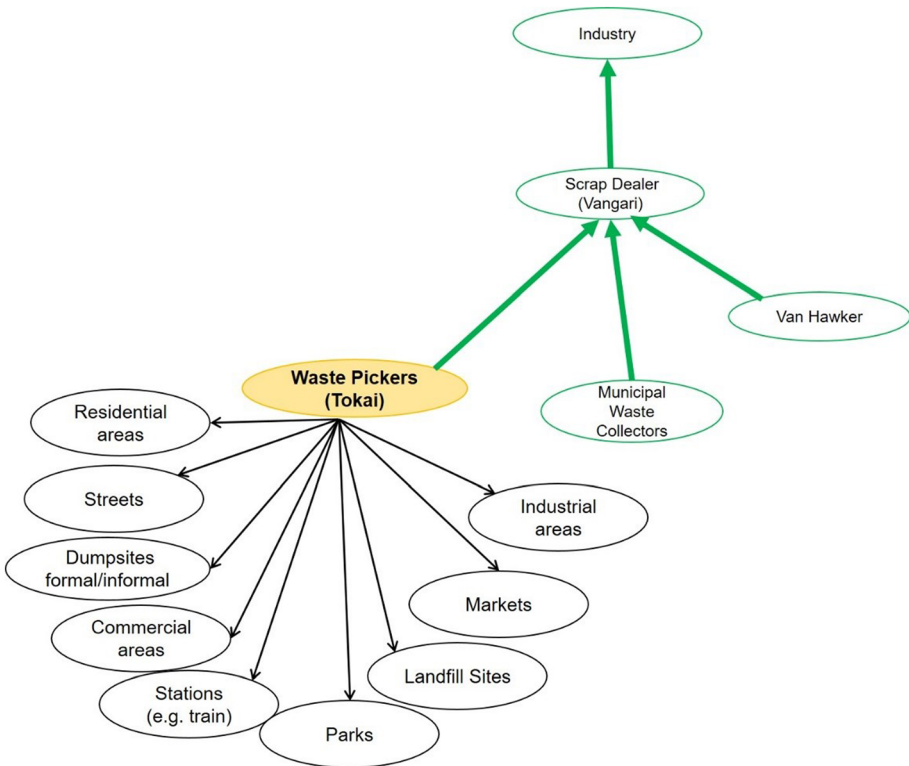


Fig 4. Actors involved in collecting and trading recyclables and their interactions in Dhaka [Colour figure can be viewed at wileyonlinelibrary.com]

‘My name is Rabyea Begum. I am a 50-years old homeless women. I pick up plastic bottles, papers and other wastes in the Teachers Students Center (TSC) area of the University of Dhaka. I was living happily with my husband and two daughters in Faridpur district. Ten years ago, my husband died due to a road accident. I had no other ways of income and became bound to come to Dhaka in search of income and a job. After being disillusioned in my job search, I started to pick up waste. Another considerable reason for waste picking is that I want my daughters to get married and I am anxious about this. I live in a tiny room with my two daughters in the Aftabnagar area of Dhaka city with huge frustrations and feelings of negligence by the society. After a day-long collection of waste, I can sell the materials and earn about 15-200 Tk. per day. I do not prefer this work and I want monetary support or other kind of help from the Government or an NGO to improve my livelihood. Now, I only want to see my daughters happy in their life.’

Drug and alcohol abuse are often a huge problem as a form of escape from a bleak reality. Some of the respondents had previously conducted crime and had addiction problems. This story reveals the role addiction can play:

‘My name is Idris and I got addicted to cannabis at the early age because of my social environment in the living area of Barguna. Due to conflict with family members regarding the addiction, I left home and came to live in Dhaka. To earn food and

be able to buy cannabis, I started to collect waste materials. Sometimes, I take glue as a drug. I confess myself as a drug addicted I am homeless and most of the day I spend in the Dhanmondi area. Life is not good through waste picking ... and society doesn't perceive this as good. I want a job or work opportunity or government support. If I could develop a recycling business, I would be able to develop my livelihood.'

Idris' story is a testimony for the social isolation many waste pickers commonly experience and the often-related drifting into drug addiction that further reinforces stigma and exclusion. Except for the third-sector initiatives, these individuals have very little support and few opportunities to recover.

4.3 Natural Assets and Vulnerabilities

Recyclable materials found in garbage or waste can be seen as natural assets (Uddin & Gutberlet, 2018), which explains the competition among different groups over these resources, as shown in Figure 2. Access to these materials can be limited and sometimes provoke conflicts. Key informants in the Amin Bazar landfill site testify that most waste pickers must sell their recyclables to certain powerful intermediaries, who stay near the landfill site. They are forced to sell for low prices and are not allowed to trade with outsiders. These controlling actors further reinforce the vulnerability of waste pickers. Only the formal waste collectors have direct access to households and shopping malls during the formal collection and are thus able to reclaim cleaner materials of better quality and higher value. As waste pickers are neglected and stigmatised, their access often gets restricted by the household owners and security guards of shopping malls, and they have to rely on what has been dumped (Figure 4). Waste pickers and middlemen are also subject to the global price fluctuations of recyclable materials, which directly impact the waste pickers' livelihoods.

4.4 Physical Assets and Vulnerabilities

The staggering majority of survey respondents (81 per cent) are homeless, without access to temporary shelter. They sleep under the weather in parks, railway stations, bus stations, on the footpaths or beside the railway tracks, on riverbanks and at specific public buildings, such as the Dhaka University Campus. Results from the observations show that, generally, waste pickers in Dhaka use large plastic bags or bags made out of Jute to carry their materials, as they cannot afford a cart or a vehicle. Moreover, because of traffic restrictions, small vehicles or carts are not allowed to enter main roads in the city.

Most survey respondents (80 per cent) do not have access to public services including education, safe drinking water or public toilets and facilities for handwashing. This result has also been validated by Uddin *et al.* (2016) who also show that homeless people in Dhaka are excluded from official basic services and WASH programmes. Results from the key informant interviews reiterate that fact that waste pickers do not have access to toilets and practise open defecation and urination, which creates public health hazards. There are some public toilets in the city (The Daily Star, 2011), but the usage fee makes it prohibitive for low-income waste pickers in Dhaka.

The majority of waste pickers can also not afford transportation means, while local and municipal waste collectors have their own four-wheeler vans for the collection.

‘My name is Mamun and I am forty-five years old and a waste picker, in the old Dhaka city area. I pick up bottles, plastics, cartoon boxes and other types of solid wastes and sells them in the recycling center. I came to Dhaka when I was about twenty and from then on, I am engaged in waste picking, as I didn’t get any other job or work. Due to being involved in this profession for long time, I cannot give it up. The reasons behind coming to Dhaka were a disaster along with family conflict. In the year of 1988, a great flooding occurred all over the country. I lost my house, land and all other resources to live. After coming to Dhaka with my father for income and survival, both of us started the only easy job of picking up waste. Sometimes I tried to switch jobs but I think, other jobs are difficult to get, so I have selected this work permanently. I live in a tiny cottage without access to water supply, sanitation and other daily life facilities. I want to get help from the Government or an NGO or another group. I think that I am in the last stage of my life and now want to pass the rest of my time in peace.’

Many waste pickers have become lifelong excluded without possibility to save up and plan for retirement, creating situations of extreme vulnerability for their livelihoods in old age.

4.5 Financial Assets and Vulnerabilities

Waste picking is the main source of income for most waste pickers (91 per cent) in Dhaka, with the daily income for most of them (89 per cent) ranging from 50 to 400 BDT (from US\$0.59 to US\$4.7 per day), which is not sufficient to live in Dhaka (Figure 5).

One of the stories shared with us revealed a similar evidence:

‘My name is Rafique and I am 10 years old. I was living happily with my parents in the home town in Kishoreganj. Suddenly, my father died and after his death, my mother got married to another person. My mother didn’t take care of me anymore. I became helpless, hopeless and bitter. I shifted to Dhaka for leading my life. After not setting out any other way to earn my livings I started picking wastes from several locations within the Dhaka city. I sell those waste materials to recycling shops [scrap dealers]. I get a small amount of money from selling those materials and the money is insufficient to lead a decent life.’

The price of recyclables fluctuates frequently because of a range of factors such as rainy season, flooding, price control by scrap dealers (intermediaries), influence of powerful actors and of course world market prices (Table 1). Waterlogging is a common issue in Dhaka, particularly during the monsoon season. Our study confirmed the reduced quality of recyclables related to waterlogging (The Daily Star, 2017). The prices then reduced dramatically, greatly impacting the daily income of waste pickers. Most respondents complained about the price control by scrap dealers or intermediaries. Our study did not find any collective organisation, for example, association or cooperative of waste pickers in Dhaka, which did tackle this situation.

Repeatedly, waste pickers related periods of low income to the chikungunya disease, caused by mosquito bites. Many respondents were infected by this disease and had

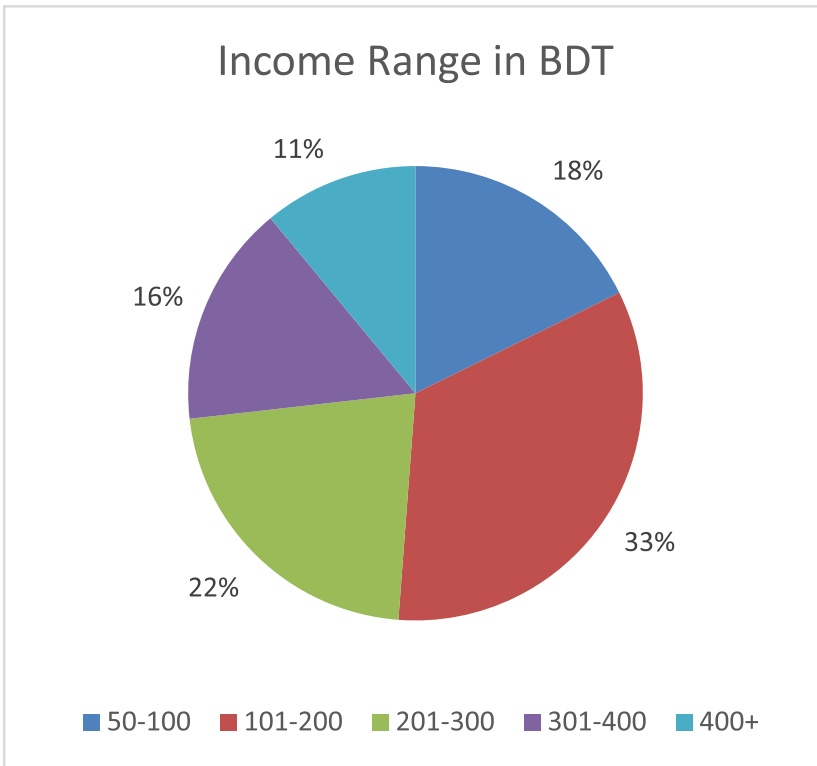


Fig 5. Daily income range of the waste pickers in Dhaka in BDT (1 USD = 80 BDT) [Colour figure can be viewed at wileyonlinelibrary.com]

Table 1. Range of prices of major recyclable materials in Dhaka

Average prices of recyclable materials (BDT per kg)				
Glass	Aluminium cans	Iron	Paper	Cardboard
10–20	15–20	12–22	8–18	15–20

experienced severe pain, lasting from 7 to 30 days, during which they were not able to move and work and thus did not have an income.

4.6 Political Assets and Vulnerability

The survey uncovered the fact that waste pickers are not included in current city waste management. There are no policies or programmes in place to support the work of waste pickers and to help them tackle their livelihood challenges. Results from the interactive workshop revealed a range of short-term and long-term suggestions (Table 2) that could help improve the health and livelihoods of waste pickers. Short-term training has been proposed by the participants to educate about the appropriate sorting and recycling

Table 2. Workshop outputs to improve livelihoods and health of waste pickers in Dhaka

Short-term plan	Long-term plan
Training	Provision of healthcare cards
Counselling and awareness	Policy advocacy
Safety gear (e.g. gloves, boots and dress)	Mechanism to stabilise prices
Small-scale recycling facilities	Involvement of waste pickers as stakeholders in waste management
School and recreational facilities	Formalisation of the profession
	Assurance of basic needs and services

techniques, use of protective equipment during collection, transportation and sorting. Counselling was suggested to address social exclusion and frustration and the widespread loss of hope among waste pickers. It has been suggested to provide safety gear such as hand gloves, boots, and adequate, visible dressing for waste pickers to protect them from the risks and hazards during their work. As our study did not find any recycling facility where waste pickers could sort their collected recyclable materials, participants from the interactive workshops recommended the establishment of sorting centres in different locations. These centres could also educate waste pickers on collective commercialisation and how to negotiate better conditions with middlemen and industry. The workshop also suggested that schools and recreational centres could address the issue of child waste pickers, specifically giving them education.

A number of long-term plans have been suggested by the participants during the workshops. One of them was the provision of health cards for waste pickers, to ensure public health treatment. Advocacy was suggested to convince government officials to formalise their work within the official waste management system, supported with policies protecting these workers. As the scrap dealers and other powerful actors control the prices and often also the access to the recyclable resources, this issue could be addressed by the government regulating the prices of recyclable materials, for example, by establishing minimum values for certain materials or introducing refund systems for glass and plastic bottles or cardboard and metal drink containers.

5 CONCLUSIONS AND FINAL RECOMMENDATIONS

This study highlights the precarious and vulnerable livelihood situation waste pickers in Dhaka are subjected to. Their capabilities to be and to act are low, which according to Sen (1997) means having little power to intervene, to challenge or to change rules and ultimately restore the level of agency they are lacking. The degree of human assets development is degraded among this population, specifically in terms of school attendance, work experience and professional skills. They are facing barriers that make it difficult for waste pickers to find a job in the formal sector or to overcome drug addiction, social exclusion, frustration and social isolation. In addition, social and cultural barriers are interdependent with economic ones and are collectively responsible for keeping waste pickers in the lower levels of the informal economy, with little opportunities and hope of improving their socio-economic conditions, as has also been documented for other parts of the world (Viljoen *et al.*, 2016). '[A]ny person needs the capabilities to reap the benefits from economic opportunities in order to reduce their poverty and to provide them with economic security and social well-being' (Krantz, 2001, pp. 10–11).

The lack of infrastructure and specific policies to support the work of waste pickers is evident in our case study. In Bangladesh, waste pickers remain invisible and their profession is not recognised as such. They are not paid for the service they provide. Many of them have shared their stories, informing us about their reasons and motifs for working with waste. Most of them were forced into this situation, because of natural and human made disasters, which had affected their rural livelihoods to a point of not being able to survive or to return. Other reasons were linked to conflicts among family members, the criminal record or addiction problems, which have disconnected some individuals from their family support. There is often no help for these new city dwellers, and waste picking is the only immediate low barrier, income-generating activity. Yet most waste pickers do not succeed in moving into different jobs and remain in extreme poverty. Our data revealed that almost 18 per cent of the surveyed population make less than one US\$ per day, which is worldwide unacceptable extreme poverty. Waste pickers all over the world are part of the population that needs to be targeted as suggests Goal Number 1 of the Sustainable Development Goals. The research indicates that there are approximately 21 600 waste pickers in Dhaka, which live below the survival minimum and which encounter some of the everyday livelihood situations described in our stories. Everywhere, cities need to target specifically this vulnerable population, in order to make progress on the Sustainable Development Goals and to improve urban waste management.

Today, waste pickers have no agency to influence the prices for the recyclable materials; the market is controlled by other more powerful players in the waste system. Without organising and collectivising, waste pickers will remain excluded and powerless in determining the value of their work. There are many examples in the literature that demonstrate how the organisation of waste pickers has contributed towards their emancipation and greater participation in waste management (Dias, 2016; Gutberlet, 2016; Murakami *et al.*, 2015). Membership-based organisations can improve the workers' life in many ways, by facilitating better working conditions, improving health, decreasing stigma and raising self-esteem and oftentimes also higher incomes (Dias, 2016). The responses given by the third-sector organisations such as Women in Informal Employment: Globalizing and Organizing (WIEGO, 2020) or the Global Alliance of Waste Pickers (2020) as well as country-specific NGOs such as Chintan (2020) or Safai Sena in India, to address the current COVID-19 pandemic demonstrate that membership-based organisations are important vehicles to disseminate crucial information and organise actions and interventions helping the waste pickers.

Furthermore, 'formalization approaches strive to promote the presence of children of recyclers in schools' (Aparcana & Salhofer, 2013, p. 1113). Livelihood differences are reported from some places, particularly in Latin America, where waste pickers have started to organise themselves (sometimes with the help of the government or NGOs). Research confirms that public policies need to be in place to support waste pickers, making funding and credit accessible and providing infrastructure support and interventions to boost personal growth and human development (Gutberlet, 2016). Market regulations alone will not be able to fairly remunerate the work. A value shift is required from waste picker to service provider as documented by many scholars (Gutberlet, 2016; Luckin & Sharp, 2004; Tirado-Soto & Zamberlan, 2013; Velis *et al.*, 2012; Wilson *et al.*, 2006). To build on political will to implement public policies to guarantee remuneration of waste pickers that are providing essential services in resource recovery are key recommendations from the literature.

Our research results confirm the request of waste pickers, to access capacity building and professional training, to be able to expand skills and work opportunities. In addition, awareness building and counselling are important, specifically to decrease health risks. Adequate equipment and technology, as well as access to sanitation (toilets, running water and soap) can also address and prevent health issues associated with informal recycling (Omotoso, 2017). However, the first step is to recognise the profession of waste pickers as service providers, which will de-stigmatise the workers. Finally, in this article, we have outlined several measures that support a shift from a waste management system characterised by omission, neglect and disposability to a system that promotes resource recovery, inclusion and income generation.

Ethical Statement

This research project was approved by the Human Research Ethics Board of the University of Victoria, with the protocol number 17-106.

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