

The Integration of Informal Female Waste Workers in Solid Waste Management of Kathmandu

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Abstract

Kathmandu, the country's capital, is one of the world's most polluted cities. Unplanned urbanization and increased population have exacerbated urban solid waste, and local governments are under intense pressure to manage these wastes. Though the government devised various plans and alternatives, they were unable to solve the waste problem on their own. The purpose of this study is to better understand the socioeconomic status of female waste workers, their occupational safety practices, and the gender-specific challenges in solid waste management. This research is being carried out to conduct an in-depth examination of informal waste workers. To select sample points, preliminary surveys were conducted in various locations. Questionnaires were created with three major sustainable dimensions: social, economic, and environmental. According to the survey, 70 percent did not know how to read or write, while 14.71 percent attended school but did not complete their education. Similarly, it is found that the only primary protective equipment they use when handling waste is a mask and gloves. Boots and other forms of protection are used by a very small percentage of the population. The study also shows informal female waste workers lack skills and confidence, their work has less social value, and they are frequently paid less than men. Building self-confidence and trust among informal sector workers is a prerequisite for creating a productive working environment. They have no health or social insurance and work in dangerous conditions in the dirt. The study concludes with necessity of integration of informal waste workers in solid waste management of Kathmandu. The necessary suggestions are made in order to motivate the female waste workers.

Keywords

informal female waste workers, municipal solid waste, integration, livelihood, waste management

1. Introduction

With rapid urbanization, environmental sanitation, including solid waste management has become a critical issue[1]. Waste management of developing countries couldn't be managed without informal sectors like waste pickers, scrap collectors, traders and recyclers. This sector is not officially recognized by government but plays a significant role in managing solid waste of cities by collecting, sorting and trading. Informal sector refers to the people or group of individuals who make a living by collecting and adding value to the waste thus supporting municipality and environment. Various researches have shown that informal sectors helps to manage municipal waste by collecting it from the street, alleys and rivers, which are often neglected by formal sectors. It is known that the main concern of formal

sector is on collection, transfer and dispose the waste rather than recovery, reuse and source reduction and thus spends around 3-15percent of a city's operation budget for waste management.

As the livelihood of the informal sector is directly linked to the value they earn from the collected waste, the percentage of waste recovered by informal sector is quite better than that of formal sector.

Though the exact number of informal waste workers are still unknown but various estimated it to be around 10,000 to 15,000. In developing countries like Nepal, the informal recycling sector is structured in pyramid. Waste pickers lies at the bottom and is the primary source for waste collection who is engaged to collect waste from various sources like landfills, dumping sites and garbage bins. After the collection, the sold are then sold to the itinerant buyers and through different levels

Table 1: Waste recovery rate[2]

Cities	Tons per year recovered by all sector	Percent recovery by formal sector	Percent recovery by informal sector
Belo Horizonte	145,134	0.1%	6.9%
Canete	1,412	1%	11%
Delhi	841,070	7%	27%
Dhaka	210,240	0%	18%
Managua	78,840	3%	15%
Moshi	11,169	0%	18%
Quezon City	287,972	8%	31%

of traders, the waste is finally processed by recycling units. The waste is sorted and refined at every level thus increasing the value of waste as it moves up the pyramid and these materials are added to the industrial value chain.



Figure 1: Informal Waste Collectors’ Hierarchy[3]

Table 2: Scrap waste collection methods in Kathmandu Valley [3]

Places of collection	Percentage
Door to door	41.18
Street	11.76
Transfer station	0.00
Auction	29.41
Kabadi	5.88
Others	11.76
Total	100

2. Problem Statement

Females in Nepal holds less formal jobs than male which can be due to various reason like education, social stigma and more and hence they are compelled to work and are victims of social violence. Due to this, they are less likely to start business of their own and are deprived of the ownership of the property. The

report published by ILO¹ in 2004, shows that nearly 83 percent female population does not own any of valuable assets like land, building and livestock. Also less than 1 percent have ownership of all three assets. It was also known that females were heavily discriminated in wages compared to males and their activities are thus defined as non-economic and were also discriminated in terms of opportunities concerning employment, promotion, training and more. Due to violence at work or society or non-cooperation of members of the family in home or nursing activities, women were not active in organizational, social and career development roles[4]. Poor working condition, access to training, low income, participation in decision making of society and organization, risk to personal security, lower level of levels, ownership of organization in the informal sector provides challenges to the women.

3. Rationale

The activities of the informal sector are adaptive, flexible, responsive, and in many cases completely suitable for local government. While the focus is on modernizing the waste management system, it is important to understand and appreciate the role of the informal sector. The complexity, cost and coordination of waste management required multi-stakeholder engagement at every stage of the waste stream, which calls for an integrated approach to waste management and the incorporation of informal waste manager. Gender issues have been seen as backdrop for socioeconomic status. Nepalese women face a heavier economic and social disadvantages than men. Despite of this, Nikita Sharma, a graduate student from NTNU² in her master thesis entitled, “Governance And Women’s Group Participation In Solid Waste Management In Nepal: A Case Of Lalitpur Sub Metropolitan City” found that having a women participant have more effectiveness and highly efficient waste management.

4. Research Objectives

- To understand the socio-economic status of Informal female waste worker in Kathmandu
- To understand the occupational safety practice of the female workers

¹International Labor Organization

²Norwegian University of Science and Technology

- To understand the gender specific challenges in solid waste management

5. Limitation

The study is limited to female waste worker working on dry solid municipal waste only. This study does not consider the drainage and sewage treatment sector.

6. Methodology

This research is conducted for an in-depth analysis of informal waste workers. Preliminary surveys was conducted in different locations to select sample points. Consultation with experts on reuse and recycling waste management helped in understand the depth of the situation. Primary and secondary data was be collected from literature reviews, field studies, and interviews with stakeholders, recyclers, kawadiwals, and observations.

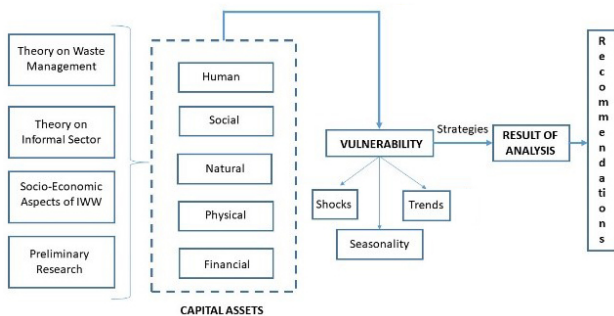


Figure 2: Research Framework

Questionnaires were designed considering three major sustainable dimensions viz. social, economic and environment. Under social dimension, skills, knowledge, health, ability to work, relations of trust and mutual support, leadership, mechanism for participation in decision making, land and property were mainly taken into account. While savings, wages, access to financial services, bonus were considered under economic dimension. Similarly, waste generation, composition, segregation and disposal techniques, collection techniques were mainly focused in case of environment dimension. Mobile Ethnography using kobo toolbox was used to collect data and MS-Excel is used to analyze the collected data.

To analyse opportunities for integration of informal female waste worker, several stakeholders influencing the informal waste workers of Kathmandu into a more sustainable model were identified as:

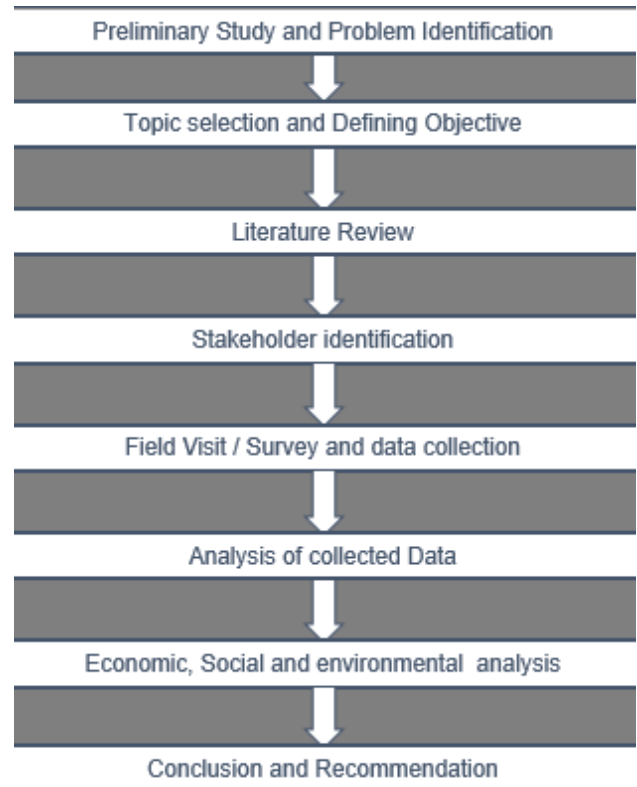


Figure 3: Research Flow Chart

- Local government
- Development Partners
- NGO's and INGO's
- Private Sector Organization

7. Literature Review

Urbanization in Nepal is increasing at an alarming rate with an increase from 3-17 percent in the last 5 decades[5]. With increase in urban population the volume of waste generation is also in rise and on the same hand the problem of unemployment is the major concern. Although these informal waste managers are vital in managing urban waste, the profession is considered shameful and degrading and is not recognized by the society.

These urban waste pickers are among the poorest and underprivileged people in Kathmandu. Most of them live in the squatter settlements along the riverbanks and some of them even live along the roadsides. Due to their continuous exposure to the waste in unhealthy and unprotected manner, they are at high health risk. Despite these informal waste managers contribution in removing and recycling large quantities of waste, they

are despised by rest of the society. This exploitation may be due to various range of factors including lack of knowledge, illiteracy, lack of skills and technology, lack of bargaining power and market information.

There is large workforce involved and employed in waste collection, sorting, recycling and disposing. Informal waste managers are active in solid waste collection and recovery. The informal sector is a part of an economy that is not sponsored or monitored by any form of government, nor taxed, nor included into the gross domestic product, unlike the formal economy. The majority of the IWS³ consists of self-employed waste reclaimers working individually, as groups or as families. Informal work provides crucial livelihood opportunities for the poor, alleviates poverty and functions as a buffer between employment and unemployment. Most people working as small farmers, street vendors/hawkers/traders, micro-entrepreneurs, home-based workers, street reclaimers and artisans belong to the informal sector.

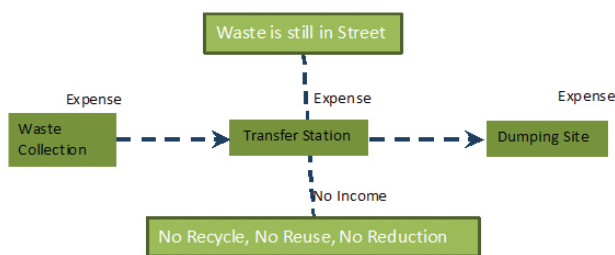


Figure 4: Current Status of Waste Management in Kathmandu[6]

In the absence of specific legal protection, they work in fragile conditions. IWS are one of the unstable jobs, and the national minimum wage and working hours are not even enforced. IWS collect, separate, wash, recycle, value-added processes and other activities of domestic solid waste. The wages of these workers are very low and they are not supervised/protected by national laws. Because of abuse, abuse, and violence both inside and outside the workplace, their situation is often fragile. The status of IWS is difficult to determine because it is concentrated in the private environment where scrap metal dealers (Kawadi) or landfills serve as informal sector employment. However, it is believed that the situation of these workers is gradually improving over the years, and the society’s perception of them is undergoing positive changes. However, the rate of change is very slow[6].

³Informal Waste Service

7.1 Economic and Social Context of Nepal

Nepal located in the southern Asia is one of the developing countries in the world. With total population of 26.4 million (CBS⁴, 2011). It is estimated that 6 million people live in poverty. Sustainable growth is not performed as expected. Nepal economy depends on agriculture, which is important source of economy. Since political situation is unstable it is difficult to achieve greater economic growth. Nepal lags behind the Southern Association for Regional Cooperation (SAARC) countries. Poverty refers to deprivation or the inability to obtain the necessary resources to escape the daily struggle for survival. These resources include economic resources such as land and capital, human development resources such as education and health, and social resources such as power and political influence. Most IWWs are engaged in this profession to meet the needs of daily life. Occupation is challenging due to difficult geographic and economic conditions.

Nepal’s constitution contains a number of provisions on labor issues, which form the basis of the country’s labor administration. These include the prohibition of slavery and forced labor; freedom of assembly, association and expression; freedom of trade and occupation; equality, the promotion of social justice and the economic well-being of people, and the right to eradicate evils. But there are no special regulations related to IWW⁵.

Work is essential for life, development and personal fulfillment. Unfortunately, essential activities, such as food production, raw material extraction, commodity manufacturing, energy production and services, involve processes, operations and materials, which are more or less harmful to the health of the people. Workers and nearby communities, and the environment in general. However, the production and release of hazardous substances into the work environment, as well as mechanical, chemical, physiological, socio-psychological, physical and biological hazards, can be prevented through appropriate hazard control interventions, which not only protect the workers’ health, but it also limits the impact on the environment. If harmful chemicals are removed from the work process, they will not affect workers, nor will they exceed them and pollute the environment. Occupational health and safety activities

⁴Central Bureau of Statistics

⁵Informal Waste Worker

are especially aimed at preventing and controlling hazards during work. Occupational safety and health objectives include protecting and promoting workers' health, protecting the environment, and contributing to safety and sustainable development.

7.2 Where Informal waste workers operates?

Recyclable materials are collected from four main sources: landfills, roadides, roadside (household or public containers), and businesses. This requires a selective selection of the most valuable materials. Although formal companies and informal scavengers carry out recycling, 90percent of the solid waste collected is still transported to landfills in the form of mixed waste. Therefore, IWW are attracted to landfill sites and often live in or near landfill sites. When IWW operates from a landfill work unit, especially busy urban landfills that use heavy machinery, recyclers encounter serious health and safety hazards and hinder on-site operations.

7.3 Environmental advantages integrating informal sector

The recycling rate in the informal sector is very high (up to 80percent), because recycling capacity is critical to the livelihood of the people involved. Therefore, various recyclable materials can be separated and processed according to the new demands and technological progress of the recycling industry.

By reducing the amount of waste that ends up in landfills and landfills, a large amount of disposal can be saved and the service life of the site can be prolonged. Developing countries and newly industrialized countries have the highest amount of waste in landfills and landfills. The decomposition of organic matter in the waste leads to the emission of gases composed mainly of methane (50.70percent vol.) And CO₂ (30.5percent vol.). Methane is of particular concern because its warming effect in the atmosphere is 23 times stronger than carbon dioxide. In addition, a large amount of debris was scattered and eventually buried. Although the greenhouse gas generated by dispersed waste is significantly reduced due to the presence of oxygen, it pollutes the soil and poses a risk to the health of the population.

The high recovery rate in the informal sector directly contributes to reducing emissions. The separation of organic matter is usually used for feeding animals or

composting, which can reduce the generation of landfill gas. The recyclable non-organic materials they recover are reintroduced into industrial processes and significantly reduce the energy consumption and emissions in these production processes.

7.4 Economic Advantages of integrating informal sector

Job and employment opportunities are created through the integration of the informal sector. Activities that support the integration of the informal sector include credit promotion, skills development, and improvements in management and marketing knowledge to increase the competitiveness of small-scale, labor-intensive activities.

However, it is clear that the informal economy recovered in solid waste management supplements the formal system in many ways. By increasing the recycling rate, the informal sector helps reduce the consumption of raw materials, natural resources and energy that would otherwise be used to produce new products. Primary resources are becoming increasingly scarce, so prices continue to rise, which means that the use of waste as recyclable materials has considerable economic and ecological potential. These high and unstable prices limit the possibility of political and economic actors seeking to improve the efficiency of resource use. In this context, optimizing the relationship between raw materials (input) and products (output) and reducing by-products play an important role.

Recycling reduces the rate of consumption of natural resources, reduces the impact of industrial activities on resources and mining, and the land area required for waste disposal. Replacing new materials with recycled materials reduces energy consumption in the production process. This applies to both the formal and informal sectors, as long as they recover and recycle materials. However, recycling activities in developing and emerging countries are often fully or mostly completed by the informal sector.

7.5 Social Advantages of integrating informal sector

Although the income and living conditions of informal garbage workers vary significantly due to their main activities, most informal garbage workers (garbage collectors and street garbage collectors) constitute the lowest level of society. Working

conditions are unimaginable and include permanent exposure to dangerous, toxic and infectious substances. They live in an inhumane and humiliating environment and generally lack health services, medical care and social welfare.

The starting point for the integration of the informal sector is to strive to improve social inclusion and protection. The integration of the informal sector aims to use the entrepreneurial skills of waste collectors to create business models that can be adapted to the current economic paradigm. The integration of workers in the informal sector has the potential to significantly improve their living conditions. In addition, the integration of the informal sector can also help optimize solid waste management services for the previously unserved poor. This helps improve public health and wellness.

The services provided by informal collectors, recyclers, and businesses have several important social impacts. On the one hand, these workers provide important services to the community and help improve sanitary conditions in settlements that are not normally covered by the formal sector. At the same time, good management of this sector generates many people, jobs and income in informal activities that can help eliminate poverty. While informal workers are not always very poor, in the case of informal entrepreneurs, recycling and retailing activities of valuable materials provide specific income opportunities for the whole family and informal workers in informal employment.

8. Case Area

The study is done for waste worker working in Kathmandu Only as the volume and composition of waste is diverse and for the efficient management of waste, the proper understanding of those who will have direct impact should be considered. It was estimated that there are around 15,000 waste workers working in different locations inside Kathmandu valley[7].

9. Findings and Discussion

From the survey it was found that more than 97percent female workers working were married and living with the families and have average children of 2.64. Among surveyed, except one, others were living on the rented house or temporary shelter. 94.12percent women send

their children to school for primary education others lacked financial support to send their children to go to school.

Talking about the education level, more than 70percent didn't know how to read or write while 14.71percent did go to school but didn't get opportunity to complete their education, and very few learned how to read and write from their friends.

9.1 Health

Health is considered a primary concern in this sector for both men and women. The exposure may lead to different health issues with a high incidence of respiratory illness. For women, the issues in health could lead to threatening their ability to earn and manage their role in the household.

During pandemic, many people hide being infected with covid19 because they fear they will not be allowed to work and starve without a source of income. However, no official statement has been reported or announced regarding their infection. This shows the how important the job is for these worker for their livelihood and at the same time the exposure could lead to the serious health issues. From the study it was found that only mask and gloves are the primary protective gear they use while handling waste. Very few uses boots and other protection. They claim that wearing extra gears will slow down their process of collection thus reduces their income.

9.2 Safety

Women's lack of safety is one of the biggest challenges and issues while working in the waste sector. Though this sector is not monitored by formal institutions, women are often exposed to crime and violence. Also, the working conditions of these sectors are often hazardous as well as challenging.

From survey, it was found that women prefer to work in group than individual due to fear of violence and social stigma, they often collect their waste from landfill and collection centers rather than going on street and door-to-door collection. Most of the women are in sorting and segregation business as it requires less mobility and due to this they are less exposed to possible vulnerability. They feel comfortable working near a group of women.

9.3 Physical Challenges

Women are often considered incapable to do heavy physical labor intense works and thus they have less access to the equipment and carrying vehicles. Also, bulk and heavy materials that have higher value are often passed over by them to carry easier materials thus results in lower incomes. While on survey, it was found that most workers do not know the prices of materials and have to depend on scrap dealers for prices. A lot of people work every day and complain that they have lower wages than their male colleagues and while trying to find out it is because the men do the heavier and more skilled jobs than the women. Material prices change seasonally, especially during the rainy season, as wet materials are heavier, so around 10percent has been removed from the overall collection. Also during the rainy season, it is very difficult to collect and transport the waste, so that during the rainy season their income is lower than in other seasons.

9.4 Social Stigma

Lack of respect towards the business has long affected both physically and mentally the women working in the waste management sector.

More than 50percent were working for more than 8 years. But one the recycling factories, it was found that most of them were very new to the profession and once they gets knowledge they either demand more money or leave the job with better facilities. As the unemployment is high, the company could easily hire to whom they can pay less for the equal work done. And it was in most of the case where more than 65percent claims they didn't get any vocational training and choose the profession as it requires less or no skills at all.

Unless felt extreme poverty and lack of skills, they do not want to participate as a waste worker. From the survey it was found that of the female waste workers deals with dry solid waste out of which 97.06percent of them deals with plastic and pipes. Around 26percent deals with papers products and very few (5.88percent) deals with organic waste. As dealing of organic waste requires skills and capital to collect and difficult to handle, they are less interested in organic waste.

9.5 Wages and bonus

The survey of the waste worker shows that, on average the income of a waste worker lies between 10,000 and

20,000, and they must work at least 8 hours a day. They are afraid to demand rights, complaining that they are not receiving salary in a timely manner, with no incentives or increased income, may lose their only source of income. If they are formally integrated, they may be bound by law and can claim their rights.

It has been found that informal workers working in cooperatives earn more than those working individually or in the private sector and benefits from health protection and financial support. However, more than 50percent have seen the potential of this field and are satisfied with their profession. But very few people are willing to progress in this field while more than 15percent under 30 years of age are ready to switch careers while older people tend to think they can't do another job or don't want to change it.

The existing problems identified and that need immediate attention was the income that they gain over the collected materials. As the pricing or wages are not standardized, the selling price of materials varies upon the bargaining power of the workers. Women tends to be less powerful when it comes to bargaining, so often gets less payment for equal volume of waste. Earlier they had access to the transfer station from where they can collect large volume of waste from small area, but now due to restrictions, they need to go to landfill site at Sisdol to collect the same materials that was transported from the transfer station. This has consumed more energy and time for the same waste collected. The other noticeable problems were the lack of skills, opportunity and family support.

10. Conclusion and Recommendation

This study provides the socio-economic status of the informal female waste workers in Kathmandu valley. The study concludes that the informal female waste workers lacks skills and confidence. Their work is also have less social value and are often paid less than men. Building self-confidence and trust among workers in the informal sector is a prerequisite for creating a efficient working environment. Working in the dirt and dangerous working conditions, they have no health or social insurance.

In a patriarchal society like in Nepal, it is typically women who manage household waste. From the survey, it is found that women prefer to work in segregation and collection centers. This shows the preferences and willingness of women to work on

certain center/sector. Similarly, the survey also showed that there is less participation of women in decision making. Acknowledging this result through gender specific intervention, we can manage human resources and the policy in order to improve solid waste management, thus affirming that gender-specific interventions help to improve solid waste management in Kathmandu.

The possible solutions are:

- The use of Personal Protective Equipment (PPEs) can be helpful to improve safety, hygienic and professional dignity in the workplace. The health of women has an impact on both waste as well as family, so the use of gears should be made mandatory. Training regarding first aid, personal hygiene, sanitation, and materials handling should be provided and made mandatory before they start to work. They should be properly vaccinated against infections.
- Daycare for the children should be provided while the mother is working this helps to prevent the possible health risk of the children and at the same time, women could work more freely.
- Leadership skills, awareness campaigns, and capacity building training and support for upgrading or existing business will have a positive impact and helps to minimize the possible risk and builds confidence within them, and can eager them to join or establish other prominent business ideas. As most of the informal sector are migrants, they are unaware of their legal rights. So this type of training will have a positive impact when they know about their responsibility and rights.
- Public-Private Partnership (PPP) model is very effective for social inclusion. Working with the public and private sector helps in accessing a large volume of waste and mutual handling could have a positive impact on income as well as socially. Though the integration of IWW is

gradual, it is important to imitate the relevant process that would assist the enterprise.

- Furthermore, it is essential to create a national standards for handling waste at local levels and its effectiveness should be checked throughout the process. Public-Private Partnership (PPP) model is very effective for social inclusion of waste workers. Further studies can be done to develop a guidelines for handling the municipal solid waste by informal sector.

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