

Informal Sector of Waste Disposal Management: Desirable or Redundant?

TANVI KHURANA
Teri University

Abstract:

Informal waste sector is a very important source of livelihood for communities, families and individuals. The informal waste collectors also known as the scavengers face social and health problems while contributing significantly to the economy and the environment. This sector is usually not officially recognized and acknowledged, still its members contribute significantly to the waste management of the cities, by collecting waste from door to door, sorting, processing, and trading waste materials in the recycling value chain. The informal waste recycling systems that already exist in many developing countries reduce the cost of formal waste management systems by reducing the quantity of waste for collection, resulting in less money and time spent on collection and transport. However along with the positive, comes the negative impact of their activities, the methods used by this sector in recycling and recovering wastes often negatively affect their health and the environment. Another important issue is the social exclusion of workers of informal waste sector. This term paper investigates the positive as well as the negative aspects of the existence of this informal waste sector.

Key words: Informal recycling, informal sector, waste pickers, unemployment, socially excluded class, formal sector, formalizing

INTRODUCTION

For the urban poor in developing countries like India, informal waste recycling is a common way to earn income. Waste pickers

are the members of the poorest sections of the society of these countries. Waste markets are physically important in an emerging capitalist, consumer economy as they provide employment to the urban poor working in the so called unorganized sector of such and economy (Gill, 2007, as cited in Mamphitha, 2011). Material discarded as waste by other members of the society is an important source of their livelihood. With the new capital intensive production technologies people are increasingly losing jobs and are dragged to unproductive and hazardous activities. Their contribution in the maintenance of urban public health at the cost of their own health is not recognized by the 'World' (Choudhary, 2005). Waste collected by these people is broadly classified as solid recyclable waste (glass, bottles, cans, metals, clothes, batteries etc.), biodegradable waste (food and kitchen waste, green waste, paper etc.), electrical and electronic waste (WEEE) (TVs, computers, mobiles etc.) and manual waste. 'The waste pickers collect the reusable or the recyclable waste from various places like roadside, sanitary landfill sites, dumping grounds etc. without paying anything except their labor power' (Choudhary, 2005). Importance of their existence is a debatable issue. However, there is increasing consensus among all stakeholders and experts that the informal sector in general, and the Informal Recycling Sector in particular, should not and, in fact, cannot be ignored while attempting to improve waste and resource management systems in developing countries (Agamuthu, 2010; Ali, 2006; as cited by Velis et al., 2012). Collection of discarded domestic waste and recovering value from it is a source of income to this socially excluded class. But can such a life without dignity be called living, is a concern (Kumari). This paper tries to answer the following question and sub questions;

- ❖ What role does the informal sector of waste disposal management play in developing countries?

- What are the negative impacts of informal sector operating in isolation of formal systems?
- Is the existence of this sector justified on ethical grounds?
- How can the informal sector be made economically secured?
- How can the informal sector be empowered in an environmentally sound and socially desirable manner?

INFORMAL WASTE SECTOR: WASTE COLLECTION AND RECYCLING

Recycling is a labor intensive activity that provides millions of jobs. In fact an estimated 24 million people worldwide are engaged in recycling: collecting, sorting, recovering, cleaning, compacting waste, as well as processing waste into new products (WIEGO, "Waste Pickers, n.d.). Laborers of the informal sector (IS) often collect solid waste in the parts of the towns which are not covered by public and private (formal) service providers, and in peri-urban or densely populated slums or squatter areas. These laborers are involved in collection of waste, in sorting and trading of recycled raw-materials, and - to a lesser extent – also in processing of recycled raw material. Such recycling process carried out by these individuals and families is often termed as informal recycling. These activities are important sources of income generation for the urban poor and generally a large number of women, children and elderly persons work are involved (Gerold, 2009). Usually informal recycling is carried out by poor and marginalized social groups who resort to scavenging to generate income to survive every day i.e. they survive on an uncertain daily wage. These people are often poorly educated. Economical conditions and limited employment opportunities drive them to informal recycling. Scavenging for waste products in order to recycle them is also amplified by insufficient collection by formal authorities,

uncontrolled street collection points and improper disposal in landfills that allow disposed products to be readily available for the informal waste recycling. These scavengers recover any possible value from collected products using methods that create pollution, thus a low collection capacity of the formal system would mean that collection rate of scavengers increases and leads to pollution. On the hand a high collection capacity of the formal system leads to lesser amount of waste material collected by the scavengers, causing unemployment for this class (Besiou, 2012).

‘Waste picking is an occupation that offers easy entry, flexibility of hours and worker autonomy. Although vulnerable, the waste pickers have agency and often choose to work in this sector, which can offer better returns on labor than their other options’ (WIEGO, “Waste Pickers”, n.d.).

Importance of Informal-waste Sector

Private (formal) service providers and municipalities of towns and cities are mostly not in a position to provide sufficient collection services for covering all the households in the city and for recycling all the recyclable solid waste. They do not have the required financial and organizational capacities for carrying out overall collection of solid waste, recycling and environmentally sound disposal at landfills through mechanization and highly capital intensive equipment (Gerold, 2009).

The informal sector keeps large amounts of materials out of disposal as they dig out value from the waste till it is profitable, creating operational and environmental benefits to the cities. When the informal sector “goes away” the amount of materials that is disposed off in landfills increases. Informal sector recycling and recovery activity is associated with significant environmental benefits in the cities of developing countries, related to the avoidance of negative extraction impacts. The damage to the environment associated with mining and refining virgin or primary natural resources by

formal systems is reduced, or many a time avoided when recycling activity provides industry with secondary materials. The informal sector uses much less fossil energy and extracts and recovers more material at a lower cost than the formal sector. The informal sector thus produces a positive environmental impact (Scheinberg et al., 2006).

Gunsilius (2010) says that by making recycling and composting possible, the informal sector thus also contributes to the reduction of greenhouse gases; this is because a lot hazardous component along with non reusable and non recyclable waste products is separated from the recoverable waste products by the scavengers.

Table 1: Overview of the informal sector in six cities

	Number of informal sector workers	Annual Tonnes Collected (Per Worker)	Average Earnings of an Informal Sector Worker (Euros per day)	Ratio of Informal Sector Workers to Formal Sector Workers	Number of City Inhabitants per informal sector worker	Number of City households per informal sector worker	Number Informal Sector Workers Per km sq.
Cairo	40000	54	4.3	6:1	432	88	6
Cluj	3226	4.6	6.28	10:1	0.12	36	18
Lima	11183	48	5.4	1.28:1	694	162	4
Lusaka	390	251.72	6.52	.66:1	1.238	498.4	1.23
Pune	9509	12.4	2.8	3:1	315	69	69
Quezon	10102	14	6.26	2:	246	54	63

Source: Scheinberg et al 2006

In a study by Scheinberg et al (2006) of six cities namely, Cairo, Cluj, Lima, Lusaka, Pune and Quezonof, it is observed that all the cities have an widespread solid waste informal sector summarized in Table 1. In all of the cities, this informal sector is on the go in recycling and recovery, extracting, processing, transporting, and selling the materials as their main source of earnings.

Table: 2 Comparison of material recovered by formal and informal sector in the six cities in the baseline scenario (in percent of total waste generated and in tonnes)

	Formal Sector recovery	Formal Sector recovery	Informal Sector recovery	Informal Sector recovery	Total Material Recovered
City	Percent	Tonnes	Percent	Tonnes	Percent
Cairo	11%	365725	63%	2161534	73%
Cluj	5%	8879	8%	14604	13%
Lima	0.30%	9380	19%	529370	20%
Lusa ka	4%	12027	2%	5419	6%
Pune	0%	0	22%	117895	22%

Source: Scheinberg et al, 2006

From Table 2, we deduce that the formal sector in all of the cities has its chief focus on waste removal and disposal, and does much less on materials recovery. As a result, more materials are in general recovered informally.

Society and Ethics

Waste pickers worldwide lack a dignified and decent work, despite their significant contributions. They usually earn very little and have no social protection, while facing great risks (WIEGO, "Waste Pickers", n.d.). Waste pickers usually belong to socially excluded and economically marginalized populations, for examples Dalits and minorities in India, blacks in South Africa, Vietnamese refugees in Cambodia, displaced rural people in Colombia(WIEGO, "Waste Pickers", n.d.). The waste pickers survive in a hostile social environment, and are often ridiculed by the society. They work on the streets and in open dumps, and daily are in contact with all kinds of waste—including hazardous and medical waste that poses risks to their health (Cointreau 2006 as cited in Medina, 2008). E.g. Mexico City scavengers have a life expectancy of 35 years, while the general population's is 67 years (Medina 2000, as cited by Besiou, 2012). Scavengers, due to their way of life, are often marginalized as their activities are considered unhygienic (Medina and Dows, 2000 as cited by Besiou, 2012), and they constitute a subject of harassment by the authorities and police (Eerd, 1996 as cited by Besiou, 2012). Recyclables recovered by

waste pickers is sold to the scrap dealers who act as middlemen- often earning large profits, and paying too little to waste pickers to escape poverty. Thus, even after being the poorest in the society they are exploited (Medina, 2008).

Benefits of Working Formally

Municipalities often consider waste pickers a problem as unorganized waste picking can have an adverse effect on neighborhoods and cities. They scatter the contents of their garbage bags or bins to retrieve anything of value to them. They do not always put the garbage back, increasing the municipality's cost for waste collection. However, studies suggest that when organized and supported, waste picking can stimulate grassroots investments by poor people, create jobs, reduce poverty, save municipalities money, improve industrial competitiveness, conserve natural resources, and protect the environment (Medina, 2008).

Besiou (2012), states that scavenging can bring the following social and economical benefits if addressed properly, by incorporating it to the formal waste management system. The benefits could be (a) efficiency level of formal system will be improved; (b) there will be less pollution generation as compared to procurement of virgin materials, along with less water and energy requirements; (c) required collection and disassembling capacity will be reduced along with their costs; (d) creation of jobs for unskilled and poorly educated individuals; (e) will make the scavengers accountable for their actions, hence, will bring some control over their actions aiming to stop illegal dumping.

'Governments and regulators may also consider assisting manufacturers and formal waste systems to incorporate scavengers in their activities by the implementation of a legislation that includes informal systems in social welfare and government insurance schemes. In this way unemployment of specific social groups will be reduced and more natural

resources and landfills will be available for future generations' (Besiou, 2012). Thus, bringing the informal waste sector under a legalized framework will benefit in specific some social groups and in general society as a whole.

Also, it is noticed that informal sector activities very often take place outside official and formal channels, unlicensed and untaxed, they nevertheless contribute significantly to the national economy. Scrap collectors are entrepreneurs who add value by collecting and then transforming waste into tradable commodities. When such new enterprises are formed, capital accumulation and investments take place, trading networks evolve and savings are made in terms of raw materials, energy and transport. Furthermore, additional employment is generated through informal sector integration and gives income opportunities to disadvantaged social groups (Gunsilius, 2010).

The case study of the Sasolburg waste pickers as cited in Theron (2010) illustrates that as individuals, waste pickers are far more vulnerable to competitors: in fact every other waste picker may be a challenger.

The other benefits given by Theron (2010) to waste pickers from working under a formal system are as follows; they are less vulnerable to the risks as compared to an individual who is self-employed faces, as an organization waste pickers will have the capacity to take on superior and dignified jobs, working with the formal systems allows waste pickers to pool resources to buy machinery such as bailing machines and trucks, that will help them get higher prices for their materials, they are able to negotiate better terms and conditions with buyers, local authorities and the industry, they can mobilize for changes in legislation affecting them, and self-employed workers more generally, lastly as working under formal systems waste pickers can provide for their own social protection through medical coverage, funeral schemes and the like.

Theron (2010) says that the rights of workers in the formal economy therefore provide a guideline as to what greater recognition from the local authority could mean (a) job security i.e. waste pickers are not arbitrarily barred access to landfill sites and the like, and local authorities adopt policies that facilitate access to the waste-stream; (b) Income security, i.e. the local authority intervenes to prevent an exploitative situation.

E-WASTE

In many developing countries informal sectors play significant roles in recycling E-waste (Terazono et al., 2006). E-waste contains precious and special metals, including gold, silver, palladium and platinum, as well as potentially toxic substances such as lead, mercury, cadmium and beryllium, therefore, responsible end-of-life management of e-waste is imperative in order to recover valuable components and properly manage hazardous and toxic components (Namias, 2013). End-of-life management of e-waste includes reuse of functional electronics, refurbishment and repair of electronics, recovery of electronic components, recycling e-waste, and disposal and reuse, refurbishment or repair of electronic products is most desirable since this option increases the life span of the electronic product and higher resource efficiency(Namias,, 2013). Recycling of electronics allows for precious and special metals to be recovered, reduces the environmental impact associated with electronic manufacturing from raw materials, and ensures that unsafe and toxic substances are handled(Namias, 2013). But, informal recycling of e-waste reduces the profits of formal sector and also while recovering the value of used products scavengers pollute the environment (Besiou, 2012). “The e-waste increase day by day is much higher than the recycle, recovery and disposal. The most numbers of wastes recycle and recovery by the informal sector is much higher than the formal sector. The

informal sector has more manpower and unskilled employees which are not governed by any health and environmental regulation.”(Yoheeswaran 2013)

Informal Recycling of E-waste: Major issues

‘Scavengers are usually people with limited employment potential to make their living by collection all kind of materials for reuse or recycling and by directly extracting recyclable and reusable materials from waste. However, the participation of scavengers often creates a barrier to formal solid waste collection operations’ (Besiou, 2012).

Because of lack of control and regulation of recycling industry (India), the poorest strata of the population find an economic benefit in recovering the valuable parts of e-waste with non scientific methods, while simply dumping the non profitable and often hazardous fractions (Rochat et al., 2008). Moreover toxic chemicals are used to recover valuable metals like gold silver or copper from the printed circuit wiring boards, causing a straight impact to the workers’ health and to the environment (Rochat et al., 2008).

The informal sector uses wet chemical leaching processes for the recovery of precious metals, which is an inefficient method (Kelley, 2006; as cited by Rochat et al., 2008). During leaching process 20% of the gold contained in printed wiring boards is recovered, while integrated smelters and precious metal refineries recover at least 95% of the 17 different metals (Hagelucken 2006b as cited by Rochat et al., 2008).

‘Apart from this, workers are also exposed to other hazards leading to physical injuries and chronic ailments such as asthma, malnutrition, skin diseases, eye irritations etc. and in some cases even to long term and incurable diseases. However, the economics of recycling and the prevailing scales of operations are some of the factors that keep the informal sector going. An additional important factor is the social bondage

between recyclers in the informal sector, which could be used as a cohesion factor to bring them closer and provide a platform for them to share their thoughts. The differences among the informal recyclers need to be ironed out to bring about an attitudinal change, to build a strong bondage within their community. The intention behind this process would be to provide an identity to the cluster/group and facilitate an exchange of their experiences and knowledge. Organized socio-cultural gatherings and entertainment should become an important social activity' (Raghupathy et al., 2010).

Remedies

The high pollution caused by informal recycle, recovery and disposal of e-waste can be reduced if the discarded material is collected, separated and transported by the informal sector and recycled, recovered and disposed by the formal sector (Yoheeswaran, 2013). 'The process of integrating the informal sector with the formal sector, however, is a challenging one. On one hand, too little is still being known on the diversity of networking amongst informal recyclers, and their distribution of tasks and financial mechanisms amongst the various stakeholders. On the other hand, the informal sector is very diverse and comprises multiple stakeholders, and hence, requires a multi-level approach to develop a path forward to their inclusion in the formal recycling market' (Raghupathy et al., 2010).

'For the Indian government the role of the informal sector in the value chain of e-waste continues to remain important due to its potential to generate employment. There is a need being seen to integrate the activities of the informal sector into the mainstream recycling of e-waste by dovetailing the activities of informal and formal sector' (Raghupathy et al., 2010).

Workers from the informal sector need to change their habits, and instead of collecting e-waste and breaking in for gold only, they need to arrange the optimal fractions for shipping to integrated smelters (Rochat et al., 2008). An alternative business model suggested by Rochat et al, (2008) for the Indian informal e-waste recycling sector is that since integrated smelters and metal refineries don't really exist for the moment in India, the recoverable material should be shipped to the Umicore Precious Metal Refinery (UPMR), Belgium.

There is a need of incentivizing the informal sector to integrate with the formal sector. Two difficulties with incentive systems were pointed out by Terazono et al (2006), first, when the profit generated by remaining informal is larger than the incentive to become formal, the incentive system does not work; second, if illegally imported wastes are satisfactorily profitable, there is no need to collect domestic wastes. This means that international material cycles could create obstacles to the proper management of domestic E-waste. Despite these difficulties, subsidization seems to be a strong candidate solution, and all participants agreed that proper subsidies should be provided (Terazono et al., 2006).

MANUAL SCAVENGING: A CAUSE OF POVERTY, ILLITERACY AND CASTE BASED DICRIMINATION

Labor welfare is regarded as input to boost production and productivity. Manual scavengers are the part of labor class living life of untouchables. In their life, air, water and food are the only fundamentals to survive life. Dignity has no place in their life. But, this kind of life cannot be called as living (Kumari).

Manual scavenging is a major concern in developing countries like India. In India manual scavenging is a caste based occupation which is generally carried out by dalit (Singh, 2009). 'In Indian context the core feature of social exclusion is

the denial of equal opportunities by certain groups of society which impose themselves upon others that leads the inability of an individual to participate in the basic political, economical and social functioning of the society. Manual scavengers in India, who are caste based occupational groups, constitute one such socially excluded class' (Singh, 2009).

'The social and economic realities of modern India reveal a series of paradoxes. While legally manual scavenging is banned, caste apartheid and poverty perpetuate this practice' (Singh, 2009).

UN Women (Baseline Study Report, 2014) data for Uttar Pradesh, Bihar and Madhya Pradesh put forward that women scavengers were paid too less, and the amount paid is not even fixed at many places. Most scavengers earned less than Rs.2000 per month. Also 50% of the manual scavenging families had no other source of income.

Since this work is caste based in India and is considered compulsory for a particular caste within the 'Dalit' community by traditional society, it has not remained merely an occupation but has continued as a practice and custom. The system has rendered vast majority of people oppressed who are considered "untouchables", deprived of their social, economic and political rights. Any progressive attempt has been subdued by acts of discrimination and exclusion that has exacerbated their sense of powerlessness. Discrimination and exclusion in all spheres of life – social, religious, economic and political– have resulted in loss of their identity and dignity. Further, the lack of resource ownership and opportunities aggravates their vulnerability (UN Women, Baseline Study Report, 2014). While the practice was banned by law in 1993 with the passage of The Employment of Manual Scavengers and Construction of Dry Latrines (Prohibition) Act, it still continues in several parts of India and the deadline for the eradication of manual scavenging from the country, after having been revised thrice (December

2007, March 2009 and March 2010), was recently set for 2012-end by the National Advisory Council (Singh, 2010).

According to Vidisha District Collector Yogendra Sharma economic deprivation is not a reason for manual scavenging rather it is the easy money for them as compared to jobs that require hard work like agriculture (Singh, 2010).

Rahtriya Garima Abhiyan (2013) pointed out Indian Railway to be the largest employer of manual scavenger and these people are employed at a very low wage rate thus, railways were not finding alternative to this inhuman practice (Kumari).

Heightened poverty and illiteracy propagated this practice for centuries. Also lack of alternate jobs and fear of unemployment continued it to be a hereditary occupation in these sections of the population (Kumari). Rahtriya Garima Abhiyan (2013), focuses on the failure of government programmes due to scanty financial support and deficiency of consistent number of manual scavengers (Kumari).

ECONOMICS OF INFORMAL RECYCLING

Reno (2009), asserted that waste picking makes up a significant portion of the world's growing informal economic sector (as cited in Mamphitha, 2011). Medina (2008), suggests that Brazil boasts one of the highest aluminum recycling rates, largely due to 0.5 million trash pickers who toil the streets collecting trash, also worldwide at least 15 million people make a living by recovering and recycling trash (Mamphitha, 2011).

The solid waste informal sector recycling mobilizes noteworthy economic resources to the assistance of sectors of society which would otherwise have no income. Amalgamation of the informal sector in the solid waste system alleviates poverty by creating livelihoods and income for poor people. When the informal sector is integrated into the system, the amount of money which goes to poor people increases

drastically. In four of the six cities average earnings are two to five times higher than the legal minimum wage and higher than salaries of unskilled labor in industry (Scheinberg et al., 2006).

Table 3: Livelihoods in the informal and formal waste Sector in the cities.

	Cairo	Cluj	Lima	Lusaka	Pune	Quezon
Total livelihoods in informal waste sector	40000	3226	17643	390	8955	10105
Total employment in the formal waste sector	6750	330	13777	800	4545	5591
Ratio of persons informal waste sector to those employed in the formal waste sector	5:9	9:8	1:3	0:6	1:9	1:8
Population	17620580	380000	7765151	1238227	3000000	2487098
Number of households	3524116	116884	1810614	252699	656455	550243
City area in Sq. kilometers	6298	180	2817	360	138	161
Density of informal sector (persons/km ²)	6.4	13.4	6.3	1.4	64.9	62.76
Ratio of households/km ² to informal sector	88:1	36:2	102:6	498:4	73:3	54:5
Total livelihoods in the informal waste sector	40000	3226	17643	390	8955	10105

Sources: Scheinberg et al, 2006

From Table 3, we infer that in all cities, average earnings in the informal waste sector are two to four times higher than salaries of unskilled labor in industry.

Formalizing for Empowerment

By getting integrated in formal sectors, waste pickers can strengthen their bargaining power with the industry and government, can become actors in development process of the economy, and overcome poverty through grassroots development. Working in cooperation with the formal authorities they can gain stability, higher incomes, and legalization of their activities. They can also obtain better prices by circumventing middlemen and adding value to materials sold (Medina, 2008).

CONCLUSION

Informal Recycling Sector (IRS) is a source of income to many individuals in developing countries. It is one sector that generates employment for the socially excluded class members. Informal waste sector has a better collection capacity when compared to the formal systems. It uses much less fossil energy and extracts and recovers more material at a lower cost than the formal sector.

However working in competition and isolation with the formal sector, IRS reduces the profits for the formal system by causing lack of material availability for them. Also they are not governed by any legal framework so they don't pay any taxes too, thus not contribute significantly to the economy when they work informally.

However if formalized they can broaden their sources of income and lower the costs of recycling as they have better door to door collection capacity. Incorporating waste pickers into the formal systems can provide waste pickers with income and job security, and in many cases it can also be socially advantageous; however, for this the decision makers need to be aware of that they are an asset to the society. Once formalized the largest problem i.e. the non ethical existence of the members of this sector can be solved. In countries India customary and traditional practice of manual scavenging needs to be completely barred. They can also then participate in economic development programmes and help in capital accumulation if organized. Informal recycling has a big economic force too as it creates jobs and income generating opportunities for millions all over the world. It helps to alleviate poverty. IRS can reduce costs and increase productive efficiency of the formal recycling sectors. Along with the economic benefits IRS has environmental benefits too. It uses less fossils and energy and recycles waste at much cheaper cost as compared to the formal sector. Thus, the appropriate future

course of action should be the integration of formal and informal sector for economically empowering the waste pickers in an environmentally sound and socially desirable manner. Also, this would help them overcome the social exclusion.

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