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SOLID WASTE MANAGEMENT IN DELHI – A SOCIAL VULNERABILITY STUDY

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Abstract

Management of burgeoning solid wastes has become a critical issue for almost all the major cities in India. Although the responsibility of solid waste management remains primarily with the municipal bodies, several other stakeholder groups play significant roles in the process.

In the Indian scenario the so-called waste pickers, who come from highly vulnerable social backgrounds, play a unique role. Waste pickers, scavengers or rag pickers as they are commonly called eke out a living by collecting and selling recyclable materials out of municipal solid wastes. In the process they make a significant contribution to the environmental management in different metropolis’ over and above rendering a service to the local economy.

The present paper intends to present a vulnerability study of the rag pickers of Delhi with focus on the socio-economic and occupational health aspects. The paper makes use of a database, parenting to the socio-economic profile of the rag pickers including the working conditions, and their problems and expectations. This database has been developed through literature review, questionnaire survey and open-ended interviews conducted to generate data on rag pickers in Delhi. Further, relevant policies of the Delhi Government have been examined to assess its understanding of the overall role of the waste pickers, and to explore the concerns and commitments of the Government towards them.

Recommendations have been made to enhance the efficiency of the Government ventures in addressing the basic problems of the waste pickers, associated with deplorable working conditions, poor returns, exploitation and their everyday harassments. Suggestions have been made to improve the design of policy initiatives

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aimed at integrating waste collection and disposal by incorporating the employment needs of the urban poor and migrants, with adequate attention to the occupational health aspect of these people.

Introduction

The quantity of municipal solid wastes generated in Delhi has been consistently rising over the years. This can be attributed to the rapid population growth, mass migration of population from rural to urban areas, increase in economic activities in general in the city and the change in lifestyle of the people. According to the Population Census 2001, the highest percentage of urban population in India is in Delhi (93.01%). There has been a decennial population growth of 46.31% between 1991 and 2001 as against the corresponding All-India level, which is 21.34%. Along with intrinsic population growth the rural to urban mass migration account for additional population pressure on the city. Change in lifestyle of the people has resulted in increased wasteful consumption, leading to a change in the composition and increase in the quantum of solid waste generated.

Urban solid waste is normally a complex mixture of household, construction, commercial, toxic industrial elements and hospital wastes. On an average, Delhi generates 4000 tonnes¹ of municipal solid waste per day. A physical analysis reveals that it consists of about 32% compostable matter. The recyclable components include paper 6.6%, plastics 1.5% and metals 2.5%. Primarily the responsibility of solid waste management is vested upon several public sector agencies. However, various other stakeholder groups, such as waste pickers, waste dealers, recyclers and recycling unit workers play significant roles in the overall scheme of things.

Solid Waste Management in Delhi

Three municipal bodies - the Municipal Corporation of Delhi (MCD), the New Delhi Municipal Council (NDMC) and the Delhi Cantonment Board (DCB), are responsible for solid waste management in Delhi. MCD alone manage almost 95 % of the total area of the city. The above authorities are supported by a number of other agencies. The Delhi Development Authority (DDA) is responsible for siting and allotment of land to MCD for sanitary land filling. Delhi Energy Development Agency (DEDA) under Delhi Administration (DA) is responsible for solid waste utilization projects aiming at bio-gas or energy generation in consultation with the Department of Non-Conventional Energy Sources (DNES), and Ministry of Environment and Forests (MoEF), Government of India. The Department of Flood Control of Delhi Administration looks after the supply of soil to be used as cover for sanitary landfills by the MCD.

¹ Status of municipal solid waste generation collection treatment and disposal in class – 1 cities, CPCB, April 2000

Apart from the above public agencies there are other important agents who play their part in the overall scheme of solid waste management in the city. They are private sweepers and garbage collectors employed by the people for cleaning privately owned premises, waste pickers, waste dealers and recycling industries, which consume recyclable waste to produce recycled products.

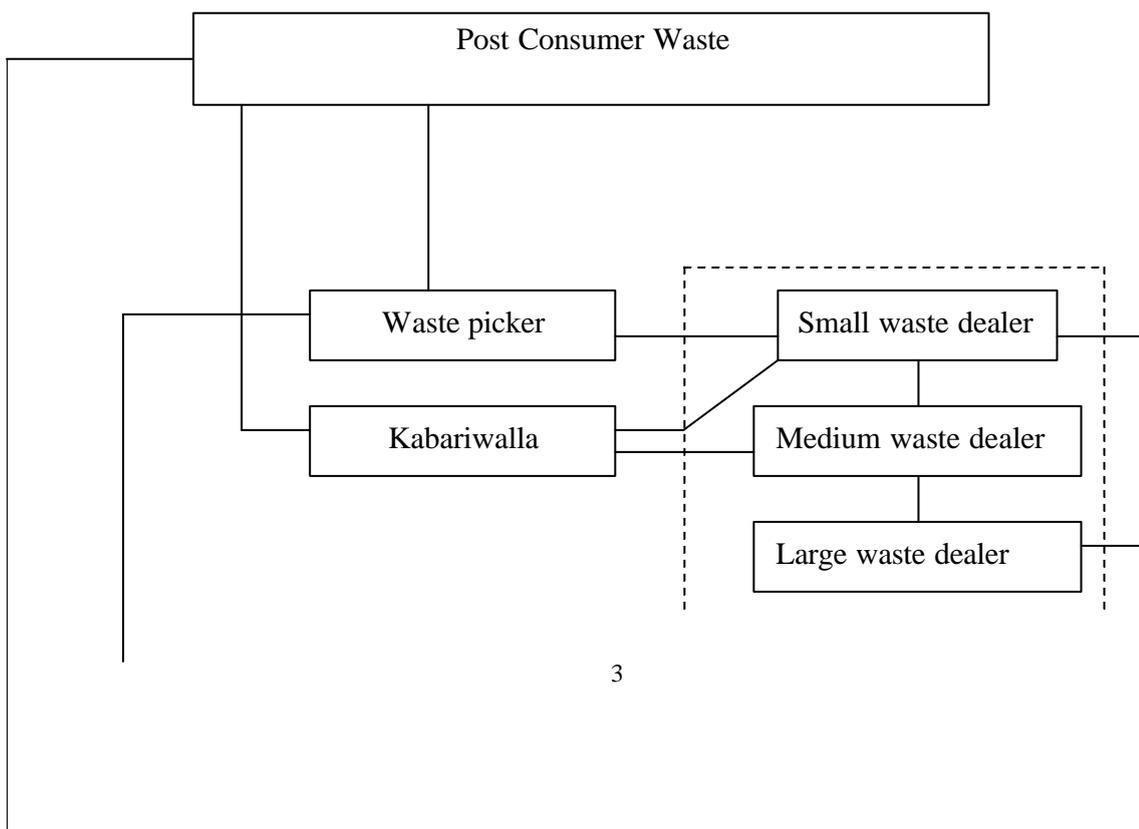
Stakeholders involved in recycling of Solid waste in Delhi

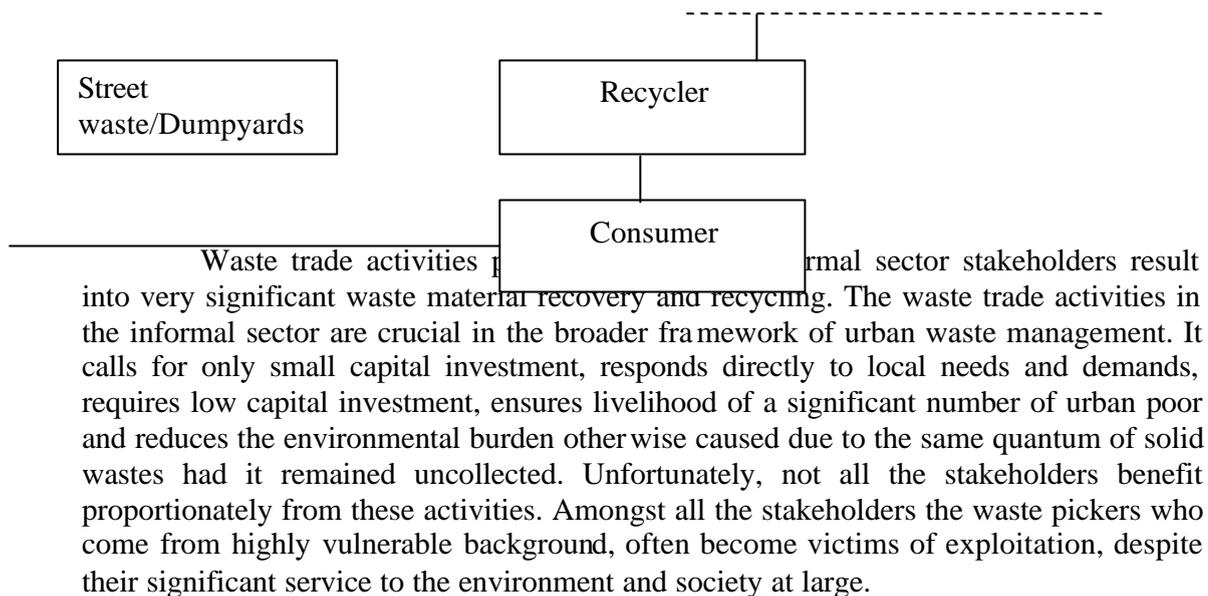
In the overall sequence of activities, starting from collection of recyclable materials to the final disposal and recycling of waste, significant contributions are made by a range of private stakeholder groups outside the municipal authorities. These stakeholder groups wheel the informal sector recycling trade activities namely segregation, collection, sale and purchase of recyclable materials, and the actual process of recycling at recycling units.

Residents and shopkeepers sell recyclable items, such as newspaper, glass containers, tin cans etc. to *kabariwallas* or itinerant waste collectors. The waste pickers retrieve recyclable materials from what is discarded by households, commercial establishments and industries from municipal wastes. Larger commercial establishments and industries sell the recyclable waste (in segregated form or otherwise) to waste dealers in bulk, who then sell it to recyclers.

Waste pickers pass on the retrieved materials to waste dealers. Then there are agents who facilitate transactions between medium / large waste dealers and recycling unit owners. A typical structure of waste trade is presented in Fig 1.

Fig 1. Recycling and movement of waste through the various people involved in the waste trade





An attempt has been made here to make use of the findings of a survey conducted by Srishti² from June 2001 to January 2002 to elucidate the socio-economic profile of the waste pickers including their working conditions, and their problems and expectations. The paper makes use of the database of one hundred and ninety eight waste pickers who were interviewed from different parts of the city between 10 am and 4 pm.

Socio Economic Profile of waste pickers

Most Vulnerable

Waste pickers, scavengers, or rag pickers as they are commonly called, constitute that segment of the people involved in the waste trade who make a living by collecting and selling recyclable materials out of municipal solid waste. Though they play a pivotal role in the larger waste management systems they remain most vulnerable in the urban society. Any effort to categorize them meets with limited success as they represent varied demographic and social characteristic.

Due to the extremely unorganized and scattered nature of the waste picking activity it is difficult to give an accurate estimate of the population involved in waste picking. Rough estimates give the number of waste pickers in Delhi as ranging between 80,000 and 100,000³.

In the absence of a formal census, it is also not possible to ascertain the precise age or the sex profile of this population. The survey found 24% female and 76% male

² Srishti is an environmental group registered as a society, involved in issues regarding environment, waste, toxicity and communities. For the past several years Srishti has been working primarily on waste and waste trade issues

³ Study conducted by Chintan an NGO in Delhi working with waste pickers

waste pickers. Overall 45% were above the age group of 25 and 24% below 16 years of age. 31% were between the age group of 16 to 25. The survey results reveal fewer females in the occupation. This might be because most women return to their household chores before noon and the survey was conducted between 10am and 4pm. Again there exists area wise variations.

On the whole it is found that either both men and women within the household are engaged in waste picking or only the women are involved. Often the children assist their parents during waste picking. A study conducted by National Labour Institute (NLI) in 1997-1988 found waste picking to be the fourth largest occupation for street children in Delhi⁴. The present study found only 24% of the waste pickers to be children. A possible reason could be that most child waste pickers take up waste picking as a family occupation and collect waste with their parents.

It is not possible to arrive at a religious or community profile of the waste pickers in Delhi based on the micro surveys that have been conducted in limited areas. However, the study reveals 52% of the waste pickers were Muslims. Most of the Muslim families did not allow women and adolescent female members of their family to do waste picking.

Waste pickers as migrants

Most waste pickers are migrants from rural India. Unemployment and poverty are two prime reasons for their migration into urban setups. 97.5 percent of the migrants surveyed revealed that they came to Delhi looking for employment and ended up waste picking as a means to survive. In Delhi, 10% of the waste pickers are found to be Bangladeshi immigrants who have either come during 1971 war as refugees or illegally entered India. They include both Hindu and Muslim refugees. Once in the city most of them took up waste picking as a means to survive. Moreover, the very nature of the activity, which requires no skill, no investment and no contacts or references, might be other reasons for migrants to become waste pickers.

Income of waste pickers

Adult waste pickers earn meager Rs 45 to 80 per day. A child waste picker earns Rs 10-15 when he is assisting his parents. If he is working independently he earns Rs 20 and Rs 30 as he can then devote more time to his activity. A waste picker with a cycle earns Rs 50- 80/day and one with a tri cycle earns Rs 150-200/day.

They usually sell the collected waste to the local waste dealer on a daily basis, as they have no place to store the waste. Since they have little savings they depend on the waste dealer for loans and advances. About 75% of them are illiterate. Even after several years at waste picking they do not acquire any special skills and are hence unable to move into any other occupation. Trapped in the vicious circle of poverty and debt they are forced to continue with waste picking.

Quantity of different types of waste collected by the waste pickers

⁴ NLI, A, Working and Street Children of Madras National Institute, Noida, 1992

The most common waste material collected by the waste pickers is plastic as it has wide application and is found everywhere. The quantity and kind of material collected depends on the area in which collection is done. In residential areas mostly mixed waste items like plastic, paper and glass are collected. In the market areas mostly packaging waste like cardboard cartons or gatta are available. On an average an adult waste picker collects between 5 and 15 Kg of plastic and 10 to 15 kg of paper and cardboards. Additionally he collects some glass as well. Table 1 gives a list of different recyclable waste materials collected by waste pickers, their colloquial names and prices

Table 1

Waste material	Colloquial name	Price at which sold to waste dealer (Rs)/Kg
PLASTIC		
PET bottles (coke, mineral water bottles etc.)	Raincoat	2
Plastic thread, fibres, rope, chair cane	Cane	6-7
Milk packets	Dudh Mom	6
Hard plastic like shampoo bottles, caps, plastic box, etc.	Guddi	7
Plastic cups and glasses, LDPE, PP	Fresh PP	7-8
PAPER		
White paper used in offices/press cutting	Saphed (White)	3
Mixed shredded paper	Raddi	2
Mixed paper	2 NoRaddi	0.50-0.75
Cartons and brown packing papers	Gatta	2.50
Fresh News Paper	Gaddi	4.50-5.00
Carton sheets	Raddi	4.50-5.00
Tetrapack	Gutta Sheet	2
ALUMINIUM		
Beer and cold drink cans		50
Deodrant, perfume bottles		50
Electrical wires		40
Aluminium foil	Foil	20
Other Metals		
Steel utensils	Steel Bartan	20
Copper wires	Tamba	80
GLASS		

Broken glass Bottles (Beer)	Shisha Bottle	0.50 2
*Selling prices of all items as on January 2002 Polyethylene		
PET: Polyethylene Terephthalate LDPE: Low density Polyethylene HDPE: High density Polyethylene PP: Polypropylene		

Source: Recycling Responsibility, Traditional systems and new challenges of solid waste in India, Srishti, 2002

Working Conditions and Occupational Health Hazards

The different kinds of waste pickers in the city of Delhi

Primarily there are four different kinds of waste pickers.

- Who carry a sack on their back and collect whatever has any resale value.
These street waste pickers move in their respective localities and pick up waste from streets, drains, municipal bins and open dumpings. Some waste pickers go to landfills and collect waste. They usually carry a magnet fitted with a bamboo or wooden handle to gather ferrous metals.
- Who carry a huge sack slung in two partitions across a bicycle and keep the items separately
They collect only specific items like glass bottles, plastic etc. and sell them separately
- Who use a tricycle and collect over 50 kgs of waste per day
They collect mixed waste and usually travel long distances for selling the waste.
- Who work for waste dealers
These waste pickers are committed to sell their daily collection to the waste dealers who employ them. Often they also sort the waste for the waste dealer. In exchange they get food and a place to sleep. Sometimes they also get a paltry sum of Rs 10 – 20 depending on the waste they collect.

Waste pickers have a well-coordinated method of working. They enjoy an informal and camaraderie method of working relation and good comprehension for operating by area. For waste collection some kind of territorial boundary exists. The waste pickers of one particular area do not encroach into other areas.

Almost all the waste pickers interviewed collect waste on a daily basis and 85% said that they had no option but to do so as it was their only source of livelihood. Those who collect waste from markets or industrial areas take off the weekly closure day.

Health Hazards

The occupational health hazards of waste pickers arise from two aspects – poverty and their occupation itself. Since they belong to the poorest and most deprived section of the urban population, under nutrition, growth retardation, anaemia, tuberculosis and other bacterial and parasitic diseases are very common amongst waste pickers. These make them all the more susceptible to occupational health hazards.

In the hope of discovering some saleable item the waste pickers rummage through putrefying waste heaps including toxic medical waste using their bare hands and feet and hence come in direct contact with waste material. Infections and infestations results due to such contact with human and animal excreta, sputum, dead animals and potentially infectious hospital waste dumped in refuse dumps This makes them highly susceptible to a number of health hazards.

Injuries in form of cuts and bruises

Hazardous working conditions lead to frequent injury in the form of cuts and bruises from glass, metal sharps, broken bottles etc. 28% waste pickers reported experiencing such injuries often while 61% said that they got injured once in a while.

Injuries from medical waste

The survey reveals that there exists an illegal nexus between waste dealers and hospital staff. Either the staff calls the waste pickers through the waste dealers or dumps the waste at a place convenient for the waste pickers to collect. 27% of the waste pickers who collect medical waste sustain injuries from syringes, sharps and broken bottles and ampules. Often proper medical attention is not given to these injuries, which leads to non-healing ulcers. Injuries sustained from medical waste are all the more dangerous because the waste pickers maybe unknowingly get infected by Hepatitis B and C or HIV or other bacterial infections through contaminated sharps and needles.

Many of them admitted that they were aware that buying and selling of medical waste was illegal yet they indulged in the trade as there was more profit to be made from the recyclable items collected. Since most of the plastics in medical waste are of good quality it fetches higher price compared to other items collected.

Injuries caused by animals

In search for saleable waste material waste pickers often visit landfills and open dumpyards. Hungry animals like dogs and pigs foraging for food also frequent these places. Rodents are attracted to dumpsites from surrounding areas or maybe delivered to the site in load of wastes where they multiply rapidly. There is a high prevalence of the waste pickers being bitten by rodents, snakes, dogs and bites and stings from other

vermin. These animals transmit a variety of infections either by themselves or through the vectors they carry.

Air borne diseases

During long dry periods the surface of landfills and open dumping grounds becomes dry and very dusty. The waste pickers are exposed to air borne dust which makes their working conditions all the more unpleasant. Under these conditions infections and allergic disorders, especially of the respiratory tract, are common.

Chemical Poisoning

Chemical poisoning includes pesticide poisoning. Waste pickers often come across empty containers of chemicals, which they sometimes use for storing food or water or burning such containers as source of heat in winter. Several anecdotal pesticide poisoning cases have been documented in children who have used discarded pesticide tins as glass for drinking water⁵, lead poisoning in families where discarded lead battery containers were used as fuel have been documented.

Other Diseases

Tuberculosis, scabies, multi-system allergic disorders, asthma, respiratory infections, ophthalmic diseases, ulcers and stomach problems are other commonly reported diseases.

The problem is acute because waste pickers are not protected by occupational health and safety measures. None were found to use any kind of protective gear like gum boots, plastic aprons, masks or gloves. Moreover, waste pickers do not come within the purview of any labour legislation. Hence they are not entitled to any benefits or security of livelihood.

Waste pickers who also work as waste sorters

Some of the waste pickers also work as waste sorters for the waste dealers, segregating different recyclable components of the waste. Most of the waste pickers who work as sorters do their work in open spaces. Almost all the sorters reported occupational related health problems. 30% said they had respiratory ailments. 51% had fever and skin diseases. 19% said that they experienced all three problems. Sometimes there are sharp metal objects attached to the plastic or cardboard. So cuts and injuries are routine. At times, waste materials maybe contaminated with various hazardous substances like chemical residues, pesticides, used syringes etc. Only 17% of the waste pickers said that the waste dealers either provide them with the doctors fee or some basic first aid.

Waste pickers are victim of several vices

⁵ Ramachandran, 1986

The dull monotonous work, and extremely poor working conditions with no hope for a better future makes the waste pickers long for some means of escape. So they easily fall prey to several evils like drinking, smoking, taking drugs, gambling etc. The survey reveals that even women and children as young as six year old can be victims of such vices.

Government Initiatives and Policies

Employment requirements of increasing numbers of urban poor and management of vast quantum of solid waste generated are the key factors that have combined to create the increasingly growing occupation of waste picking.

Though the waste pickers play a significant role in the entire process of waste management yet their services go unnoticed and issues concerning their livelihood go unaddressed. Government approaches to the needs of the waste pickers are too compartmentalized and fails to have a holistic view of their problems and requirements. It is imperative that policies be so designed that they are more responsive to the needs of the waste pickers.

In the present section an analysis has been done of the government policies and programs on the main factors that have contributed towards the growing occupation of waste picking.

1. Employment opportunities of the urban poor

The number of urban poor has increased over the last three decades in contrast to the decreasing rural poverty in India. This can be attributed to the fact that the Indian policy makers focused on rural development. Urban poverty alleviation got sidelined as it was assumed that urban poor had greater access to opportunities in urban areas and hence had less insecurity to cope with. As urban systems and poverty within it grew, urban poverty could no longer be ignored. However, so far there is no segmentation of the urban poor to determine the size of the waste pickers in urban setups for enabling exclusive interventions.

Employment integrated into overall planning process and Employment Oriented Urban Poverty Alleviation Programmes

Urban poverty as a priority area occupied the attention of the planners only in the Seventh Five Year Plan (1985-1990) when urbanization was realized as an integral part of economic development⁶.

In the seventh plan emphasis was given to urban employment generation as a means to tackle urban poverty. Self-employment programmes, namely, Self-Employment Programme for the Urban Poor (SEPUP) was introduced in 1986 and Nehru Rozgar

⁶ NIUA, 1990

Yojana (NRY) was introduced in 1989. SEPUP was the first urban poverty reduction programme with emphasis on employment. It was a stand alone, one-dose small credit intervention programme. NRY was a more comprehensive employment programme with increased number of interventions like widening the employment base for the skilled as well as unskilled workers including women, through promotion of micro-enterprises (ME). Thereafter, other poverty alleviation programmes were also introduced.

The informal sector, as a component of the development process in the economy, was first recognized in the Eighth Five Year Plan (1992-97). The National Capital Region Planning Board, Government of India's regional planning agency, has accepted the informal sector employment generation route as one of the policy strategies to develop towns around Delhi and to decrease unemployment of increasing migrated population in Delhi. In the nineties, two micro enterprise oriented programmes, were introduced in view of the growing urban poor. The basic objectives of these new Programmes were employment generation, community empowerment and environmental improvement giving attention to the informal sector, which was growing at a rate of 6% against the tardy general employment growth. To provide sustenance to programmes of income generation, the Urban Basic Services for the Poor (UBSP) was implemented as a centrally sponsored scheme during the Eighth Five Year Plan. Its main objective was to meet the basic physical and social needs of the urban poor through community organisation, mobilisation and empowerment.

In the Ninth Plan (1992-97), it was recognized that rapid economic growth was most important to increase employment opportunities. Public intervention for employment generation was considered crucial and the necessity of achieving full employment was a major determining factor in setting up of the growth rate of the Indian economy during the nineties. The Prime Minister's Integrated Urban Poverty Eradication Programme (PMIUPEP) was launched in November, 1995. It was basically an employment generation programme which sought to address the problems associated with urban poverty by building up community based organizations (CBO) as the centre of the development process and by facilitating direct participation of the targeted groups.

Towards the end of the nineties, another programme, Swarna Jayanti Shahari Rozgar Yojana (SJSRY) was introduced that included all the urban programmes in existence. The programme seeks to alleviate urban poverty by converging employment components of the earlier schemes and seeks to provide gainful employment to the urban unemployed or underemployed poor through encouraging the setting up of self-employment ventures or provision of wage employment. The two schemes under SJSRY are the Urban Self Employment Programme (USEP), and the Urban Wage Employment Programme (UWEP).

The Tenth Plan (2002-07) also provides a high priority to employment growth and it has been a central issue in determining the growth rate of the economy.

2. Government Policies towards management of the huge quantum of waste generated

At the national policy level, the Ministry of Environment and Forests has legislated the Municipal Waste Management and Handling Rules, 2000. It gives details of the practices that are to be followed by the municipalities for managing urban waste. Though the rules recommend recycling they do not say how to follow it or give any direction towards promoting recycling. Indirectly waste to energy technologies are encouraged through the formulation of technology standards.

Other policy documents include:

- Manual on Municipal Solid Waste Management, prepared by an expert committee constituted by Ministry of Urban Development, GOI, January 2000
- Recycled Plastics Manufacture and Usage Rules, Ministry of Environment and Forests (MOEF), GOI, September 1999
- Solid Waste Management in Class I Cities in India. Committee constituted by Honourable Supreme Court of India and headed by Mr. Asim Burman, Municipal Commissioner, Calcutta Municipal Corporation, March 1999
- National Plastic waste Management Task Force. Committee constituted by MOEF, GOI, August 1997
- Report of the High-powered Committee on Urban Solid Waste Management in India, headed by Prof B.S. Bajaj, Member, Planning Commission. Constituted by Planning Commission, GOI, 1995
- Waste to Energy Policy as promoted by the Ministry of Non Conventional Energy sources (MNES), 1995

The policies lack a holistic approach towards management of waste in urban India. The waste management as it presently occurs involves many people for whom it is a source of livelihood. Hence policies should be so directed as to integrate the employment requirements of the urban poor with managing waste in an environment friendly manner. Clear policy directions towards recycling will not only help in resource conservation but also strengthen the role played by the waste pickers ensuring their livelihood.

Conclusion and Recommendations

Though industrialization has created jobs, the increase in employment opportunities in urban centers has failed to maintain a balance with the increased labour population. Despite various government programs and policies directed towards poverty alleviation in urban areas, lack of gainful employment even in the informal sector still remains a key area, which needs immediate attention. Rather than a holistic approach the thrust of urban policies so far have been disjointed and compartmentalized.

A typical example would be the management of Solid waste in Delhi involving various stakeholders. The most vulnerable among them are the waste pickers who are engaged in this occupation with abysmal working conditions solely as a means to survive. In the process they address the basic need of the society and environment of waste management by removing waste from the waste stream thereby substantially reducing the

amount of uncollected waste. This saves on municipal expenditure and minimizes the environmental impacts of uncollected waste.

Their contributions remain unacknowledged and they continue to languish due to various occupational health hazards arising out of abysmal working conditions. Moreover they receive extremely low economic returns and are victims of harassment from the police, municipal workers and the general population.

Institutionalizing waste picking

The waste pickers requirement for employment and decent lifestyle needs to be properly integrated with the existing system of waste management and recovery of material for recycling. Taking cognizance of the extremely poor working conditions, very low monetary returns, exploitation and harassment faced and the potential of the waste pickers to make better contributions towards urban waste management there seems a need to legitimize their role. Institutionalizing their activities would enhance the scope of their work and at the same time provide better working conditions. They could be organized with the help of civil society groups around micro enterprises related to recycling. This would also help restore their self-esteem apart from assuring their livelihood.

Integrated approach towards waste management

Institutionalizing waste picking would necessitate a change in urban waste management practices. There is a need to build up public awareness on the social and environmental component on waste management. Only then will the waste pickers get their due recognition in the society. There is a need for information dissemination and creating awareness on the importance and need to recycle. This awareness would generate changed waste handling habits of households. An approach towards changed waste dealing habits could be achieved through providing households with monetary incentives for segregating waste. Presently such a practice exists for glass bottles and news papers. It can be implemented for all recyclable materials. The waste pickers can then directly collect the recyclable waste materials from households who will in turn benefit from practicing segregation. The working conditions of the waste pickers would then automatically improve.

Dual role of collection of both recyclable and biodegradable waste

A possibility of the services provided by the waste pickers may be explored by engaging them in the collection of the biodegradable component of municipal waste as well. They can then play an active role in facilitating decentralized composting in specific urban pockets. Such an approach will not only ease the burden of municipalities but also legitimize their work providing them with social and economic security.

Encouraging recycling

Recently, waste to energy technology propagated by private industries is slowly gaining a foothold as a method to manage increasing urban waste. This will replace

traditional systems of waste management based on reuse and recycle and threaten the livelihood of waste pickers. The waste to energy policy with the objective of promoting waste solely as an energy source, supported by the Ministry of Non Conventional Energy Sources (MNES) needs to be reviewed. There is a need to encourage recycling as a viable option of waste management through subsidies on recycled products. This will in turn safeguard the livelihood of the various stakeholders involved in the waste trade, most importantly the waste pickers.

Setting up of co operatives

Presently though waste pickers contribute substantially towards recovery of recyclable materials they work and live under extremely unhygienic conditions. It is essential to improve their living and working conditions. The waste pickers could be organized to set up cooperatives with the help of NGOs. The waste pickers could then collect waste directly from households instead of foraging in garbage dumps. This will reduce the occupational health hazards providing them with better working conditions and also better economic returns. In the process their contribution towards waste management will be recognized in the society.

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