

Spatial segregation and social discrimination in the context of pirana landfill site for waste pickers community

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Abstract— As a part of our regular activities through out the day we create a lot waste around us, the manner in which this generated waste is handled, collected, stored and disposed can be of vital concern especially with respect to public health as well as from environmental perspective. Thus included a wide range of activities that target towards minimising environmental, health and also aesthetical impact of the various waste generated. A recent study conducted by Chintan, an Environmental Research and Action group suggested that the municipality saves about nearly Rupees 6 hundred thousands daily due to the efforts and contribution of the waste pickers of the city. They added further that the municipal authorities save 24% of their expenses by the removal of waste from the main waste stream. A host of industries also receives raw materials as a product of the collected waste by the waste pickers, who thus contribute to saving a considerable amount of natural resources. A recent study conducted by Chintan, an Environmental Research and Action group suggested that the municipality saves about nearly Rupees 6 hundred thousands daily due to the efforts and contribution of the waste pickers of the city. They added further that the municipal authorities save 24% of their expenses by the removal of waste from the main waste stream. A host of industries also receives raw materials as a product of the collected waste by the waste pickers, who thus contribute to saving a considerable amount of natural resources. The vital players of the solid waste sector as have less been acknowledged by any formal or institutional development. Clearly stating a strong need and concern for a study to understand and comprehend the requirement of these waste pickers and their contribution to the city. The situation becomes even more alarming when these waste pickers scavenge waste from the dumpsite, exposing them to a host of health issues. This study thus attempts to understand a similar nexus of informal sector at dumpsite.

Index Terms—Waste, Dumpsite, Waste Picking, Livelihood, Urban Poor, Need, Aspirations of community

1 INTRODUCTION

India is home to 1.7 million waste pickers, earning \$1 to \$2 per day (Developed Nation, 2012). In urban India in particular, more than a million urban poor find livelihood by engaging in waste collection and recycling activities within the purview of the informal sector and in a way are responsible for managing an average of about 15–20 percent of the city's recyclable waste that would otherwise add to the existing piles of waste and cause havoc given the current state of the formal municipal solid waste management status in our cities. Popularly known as waste pickers, this segment of the urban poor is one of the most disadvantaged communities, and they are the poorest of the poor. They are also a very vulnerable segment of the population, vulnerable to health hazards due to their scavenging activities as well as vulnerable to exploitation and social stigma. Despite their significant role in waste management in a city, this group enjoys no recognition, no job security, or any form of social welfare safety net. This invisible section of the society is also not the target of welfare schemes and policies of the government. Their livability is a stark reflection of the harshness and the vicious circle of poverty that inflicts them.

Concentration of urban poverty within the milieu of rampant urbanisation in the neoliberalism era and its manifestation in the forms of informalities in housing and infrastructure access and occupation has become more of a rule rather than an exception in cities of the developing world. The Indian cities are no exception to this trend. However, the filtration of the benefits aiming to remove urban disparities by providing access to housing and infrastructure to the most vulnerable poor communities has remained elusive. Resultantly, the poorest sections continue to remain “invisible” on the radar of the city housing reforms and provision agenda. Left to fend for themselves, they respond by creating informal and precarious housing solutions on their own, sadly unrecognised and sidelined by state interventions. The research article investigates the vulnerabilities afflicting the waste picker community through detangling physical, social, economic, and politico-legal vulnerability dimensions and their access to affordable housing in the formal sector. The article argues that affordable housing remains more of an allegory than a veracity for the most vulnerable communities such as the waste pickers and emphasises recognition of the multidimensional vulnerabilities and protecting their right to live with dignity, free of contestations and threat of evictions. Ahmedabad has risen to be the first metropolis in Gujarat, with a population of 6,240,201 and it is ranked 7th in the list of 55 metropolitan cities of India as per Census 2011. The city generates 4000 Metric Tons of waste daily (The Tribune, 2013). Though the Municipal Corporation claims to collect at least 80 percent of the waste, this does not appear to be the case considering the current state of waste management in the city. Though there is no formal count available, based upon information gathered from surveys. It can indeed be visualized that in the absence of these waste pickers, our city would present a much more dismal scene than it already does with piles of waste littered around, given the apathy or rather the inefficiency of responsible for waste management in the city.

2 Informal sector in today's context

2.1 Review Stage

Several Studies have shown that the environment is greatly impacted by the waste recovery activities which are driven informally. Collection and transportation burden is significantly reduced by the presence of this parallel service provide in a city. Waste pickers thus save considerable portions of cost. Yet in most places, municipalities, residents and local businesses fail to recognise them for these services. Worse, is done by private companies who are granted contracts for collection and disposal. Some of these private companies claim to have done their services with waste that informal recyclers have diverted, thus hiding the savings realised through the informal waste pickers and undermining waste pickers contributions.

The new waste rules 2011 define waste pickers as "individuals or group of individuals engaged in the collection of plastic waste" Pasiwala are also at the same level in the collection chain as the waste-pickers but they collect recyclable waste including plastic waste, generally using a hand cart, by moving from house to house and hence are perceived to be higher in the hierarchy. Waste pickers and pasiwala are present at each and every nook and corner of the city and hence their locations can not be pin pointed like others.

Thus one can say that in Indian Context, collection of the recyclable waste is done either by the waste-pickers or by pasiwalas. The waste pickers mainly look for recyclable waste along the roadside, municipal bins and in public and commercial places, whereas the pasiwala move through households and collect the discarded items of their interest. Waste pickers and pasiwala sell this waste to pithawalas who store these recyclable items to sell them in bulk to the wholesalers. The following figure illustrates the flow of the waste that is generated from a household to the final

trade who would deal with it after being recycled. The stages of each are shaded in different backgrounds to highlight the change in hierarchy.

Fig 1. Flow chart depicting the informal waste cycle

Being hierarchically different doesn't completely separate from each other, both of these are small self-employed agents of a typical urban informal sector which deals with the collection and segregation of urban waste. They are theoretically different at one critical point. Pickers need to capital investment for packing up waste. i.e. they can have access to waste sources without any monetary deposits. Collectors on the contrary, but their waste from the producers of waste or from waste pickers in cash; this would imply essentially a quality amount of opening capital based on their total expected quantity of operation. Correspondingly, the scale of operation of waste collectors with respect to quantum of waste collected is usually much larger than that of waste pickers.

Thus, with increase in the amount of waste being traded earning would also increase. This justifies the hierarchical position of the waste collectors over the waste pickers. The figure given below shows the usual pyramid of hierarchy that follows in a typical informal waste sector. Each stage may be known locally by a different name; however the overall functions of them within their sector mostly remain the same throughout in various different contexts.

2.2 Opportunities for Informal Waste Sector

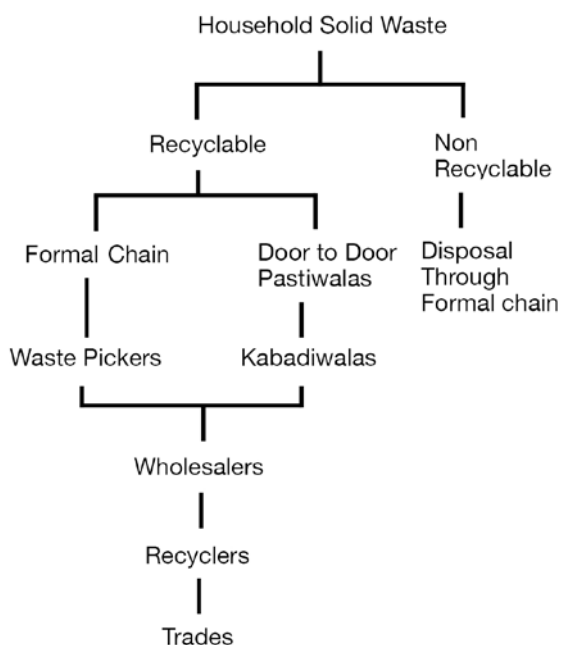
This organically grown informal sector is highly adaptable, flexible and able to respond quickly to demand-driven forces. Informal waste collectors and recyclers constantly come up with strategies to access waste and circumvent barrier while at the same time integrating new systems as they emerge. One major reason for such a dynamic condition could also be attributed to the sheer need of livelihood which forces them to always response quickly and adaptively to the situation.

2.2.1 Health and Social Aspects of Informal Sector

Even though the income and living condition of informal waste workers differ significantly according to their main activities, the majority of informal waste workers are confronted with extremely hazardous working and living conditions. They generally lack of sanitary services, health care and social benefits. Child labour is very frequent, and life expectancy is low.

2.2.2 Environmental Aspects of Informal Sector

According to a report, the high recovery rates that the informal sector achieves are mainly because the ability to recycle is directly linked to the livelihoods of the people involved. Consequently a huge variety of recyclables is segregated and is further processed in accordance with the new demands and technological advancements in the recycling industries. i.e. In Egypt, A drop in recovery rates was witnessed in Egypt following private sector involvement in waste collection; this clearly indicates the im-



portance of the informal sector recycling schemes. Also, by making recycling and composting possible, the informal sector significantly contributes to the reduction of greenhouse gases.

On the other hand, it should also be noted that the negative environmental impacts by informal recovery activities are no less. While sorting out recyclable waste in the streets of dump-site, some informal workers contribute to scattering waste that might directly add on the pollutants present in the environment.

2.2.3 Economic Aspects of Informal Sector

Informal sector activities largely take place outside official and formal channels, unlicensed and untaxed, their significant contribution to the national economy ought to be acknowledged. Waste collectors could be rightly termed as entrepreneurs who add value by collecting and then transforming waste into tradable commodities. A study conducted by several leading research organisations has shown that in majority of the developing countries most informal waste management operations achieve considerable rate of return benefits while formal waste management operations have largely seen large costs hidden resulting in lack of returns. This could partly be justified by the fact that the informal sector works primarily focuses on the service related issues of the waste i.e.; collection, disposal etc. Moreover, it can also be attributed to the fact that the informal sector functions much more than visually seen, this sector included actors who are oriented on the productive use of waste materials in order to be self-financing.

Waste pickers thus tend to contribute a lot to the society, however the reverse is not quite observed. There have been several instances in which these waste pickers were recognised with due considerations. Such instances of recognition have proven quite successful and thus have driven the entire concept of treating the waste pickers as liability of a managing authority into a fruitful asset. It is therefore important to holistically approach the issue of informal waste pickers by understanding and analysing such approaches in various contexts that have been introduced.

3 INFORMAL SECTOR IN TODAY'S CONTEXT

3.1 Introduction of MSW in Ahmedabad

In the recent years, Ahmedabad has been able to attract a large number of populations into the city. It has become the 7th largest growing metropolis of the country. As urban phenomena, the increase in population not only directly helps the growth of economic activities in the city but also burdens the local bodies with additional responsibilities of serving the ever increasing population.

Ahmedabad is a home to about 60 lakh people within a geographical area of about 466 Sq Km. The city is divided into 6 zones which are further divided into 64 Municipal wards. The AMC provides all the basic services to the citizens of the city. Water supply, collection of sewerage, solid waste management, building roads and transportation, street lights, medical and educational facilities are

some of the few key services of AMC. The following Map schematically represents the base map of Ahmedabad city with various major roads, highways and authority boundaries.

Under the Environment Protection Act 1986, the MoEF, Government of India issued a notification on the 25th September 2000 which stated that all cities and towns should undertake MSWM as prescribed by the rules. These are popularly known as "The Municipal Solid Waste (Management and Handling) Rules 2000". It is due to such initiatives that the ULBs were encouraged to take up the responsibility of the MSW. Almost, 4000 metric tons of solid waste is generated from the city on a daily basis. This waste generated follows the conventional cycle of collection, transportation, treatment and disposal as prescribed by the guidelines and rules.

According to the official AMC figures, nearly 60% of the MSW is collected from municipal bins and street sweeping which is carried out by a workforce of more than 11,000 street sweepers throughout the city. The municipality had begun door-to-door collection from residential units with the help of contractors since 2009. Claiming to have 100% coverage in door-to-door collection the project has received great success and appreciation collecting about 1500 MT of waste on a daily basis. Apart from the domestic mixed waste the municipality also has identified special categories of waste like Hotel and Restaurants waste, Car-cass, Construction demolition waste etc.

Even after such efficient collection mechanism, it is disappointing to see that only 2% of the waste goes to the scientific landfill of the city. Apart from the scientific landfill, there have been several private players trying their bit in recycling and treatment of waste, however, only 10% of the waste goes to various such waste treatment plants. The city has a good presence of informal waste sector that further helps the ULBs in the entire process of waste management in the city. However, the contributions of this sector aren't recognized qualitatively either quantitatively by the ULB. Fewer studies on these lines thus making it essential for one to document and study the pattern of working in this sector.

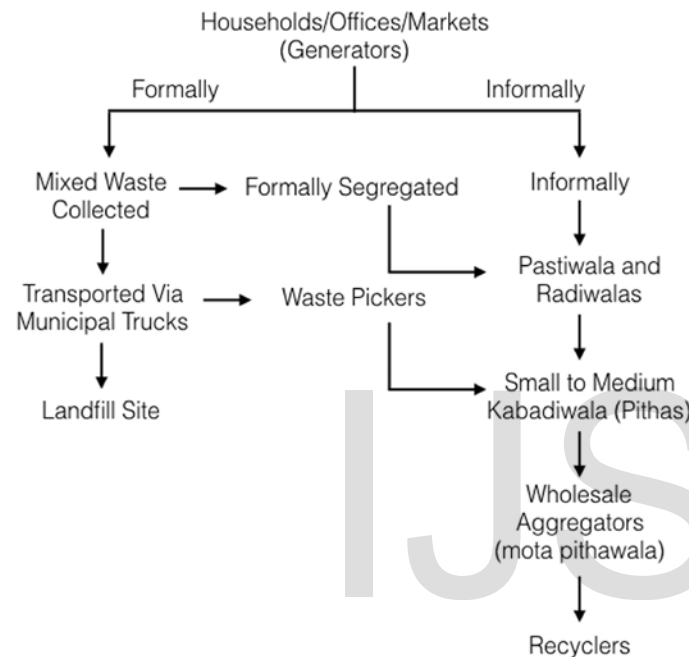
3.2 Informal Sector in the city

Before understanding the informal waste sector of the city it is vital to understand the overall waste chain of the city. Almost all cities of the developing world have a strong presence of informal sector working in deep connection with various formally recognized stakeholders within the administrative and legislative boundaries of the city.

In this case, Ahmedabad is no exception, where there is an equally strong presence of the informal sector which accounts an employment to about 12,000 people (about 1.5% of total population). The following chart attempts to track the chain of waste management both working formally as well as informally. Quite evident from the above cycle that the two entities of waste management for the city of Ahmedabad work in their respective framework which is divided by a very thin membrane. The waste that reaches the dumpsite from a household would likely have

passed through about 3 screening in search of valuables. The process of screening begins mostly from the generators itself who directly a certain amount of their waste to the Pasiwalas or Radiwalas. Mostly in this screening, the items involved are of the category 1. The materials recovered from this screening usually involve high quality of waste both in terms of their value and composition. Once this initial screening is done the next stage of screening is either at a community level by the formally employed waste collectors itself who later sell in the informal

markets else informally by roadside waste pickers who collect



waste from community level bins.

Fig 2. Waste Cycle of Ahmedabad

The quality of items extracted from the waste keeps decreasing both in terms of quality and composition as the levels of screening increases. This could also be understood due to the decreasing options available as the stage of segregation keeps on increasing. The decrease in quality directly affects the reselling price of the materials and thus places a very vital role in this entire process. This second screening majorly involves items that belong to Category 2. However, there could be instances in which one would observe sorting of items belonging to Category 1 but rarely of Category 3. The final sorting stage happens at the dumpsite where dumpsite waste pickers sort from heaps of already sorted waste to find leftover valuables which are brought in an unsorted manner mixed with other municipal wastes and sometimes even with hazardous and clinical wastes.

3.3 Working in the waste industry

According to a study done by SEWA, an Ahmedabad based NGO; estimated in their study conducted during the year 2008

that about 37.5% of waste that is generated within the city is picked by waste pickers and goes unaccounted into the informal waste management cycle. The waste industry has always been a cause of concern for people from various backgrounds like social scientists, environmentalists, planners etc. However in the middle of all the discussion it is important to understand the hurdles that these people face in their day to day life. The below given are issues that the waste pickers in the city associate to during their daily routine of waste picking. These points emerged from FGDs with various waste pickers as a part of the preliminary visits to the site. However, it includes views of both the category of waste pickers, i.e. waste pickers at the dumpsite and waste pickers at the roadside. Also, it is important to understand this perspective with respect to the planning realm. As such studies would help policymakers to deduce the exact reasons for such practices among a certain section of people and furthermore help shape physical or policy driven interventions for the betterment of this section of the society.

3.3.1 Social Exclusion

People are forced into this occupation majorly due to social exclusion from all other types of occupations. They basically are Harijans by caste; most of them belong to the Vankar (weaver), Bhangin (Sweeper) and Chamaar (Leatherworkers/ mocha (Cobbler) community (UNDP, 2009). The caste hierarchy had forced their ancestors to continue with the occupation and due to the vicious cycle of poverty many of the current informal waste pickers still continue in the sector because of this reason.

3.3.2 Unskilled Work Force

Another main cause of concern is the relatively low skills that these waste pickers possess. Most of them have been involved in this activity since their teenager and thus find it very difficult to switch gears and explore their careers in some other field. A large amount of the workforce comprises of women who have been trained informally through peers just to segregate and pick up valuable waste thus aggravating the situation as it results in no other form of productive involvement of these waste pickers.

3.3.3 Gender and Safety Issues

Another striking amount this group is large and equal presence of women in comparison to men. One reason that the women claim to continue this profession willingly is the ease with which the work can be done without any answerability to any authorities. Also, the flexibility in terms of working hours also makes this a preferred part-time work for women of the underprivileged groups. Apart from the above-mentioned factors, the reason for large women involvement in the sector is the relative ease of entry and exit seasonally. However, with the increasing amount of rich urban waste coming to the dumpsite, these are various men also joining this profession of waste scavenging. In the recent 10-20 years, there has been a large migration of Bangladeshi migrants at the dumpsite with the sheer objective of waste picking, about 200-250 workers.

Such large migration has resulted in a. A large number of safety concerns among the women workers at the dump. The inferiority

of becoming a minor ratio in the dumpsite has further aggravated



in the situation.

3.3.4 Work Culture

The seasonality of waste pickers makes it an advantage for people with irregular income of the underprivileged families to practice waste scavenging at times when there is no availability of any other job. Also, independence of an individual waste picker for the purpose of picking and selling also makes this job attractive to people.

Still, despite all the difficulties and extremities thousands of people continue to walk around the streets and scour the waste bin in search of valuables that the urban society calls 'Waste'. The situation

worsens when people begin to search for similar and equally lower quality of valuables from heaps, dumps and moun-

tains of urban city waste. Surely, these waste pickers can be considered as the poorest of the poor, lowest of the lower tiers of informal waste management.

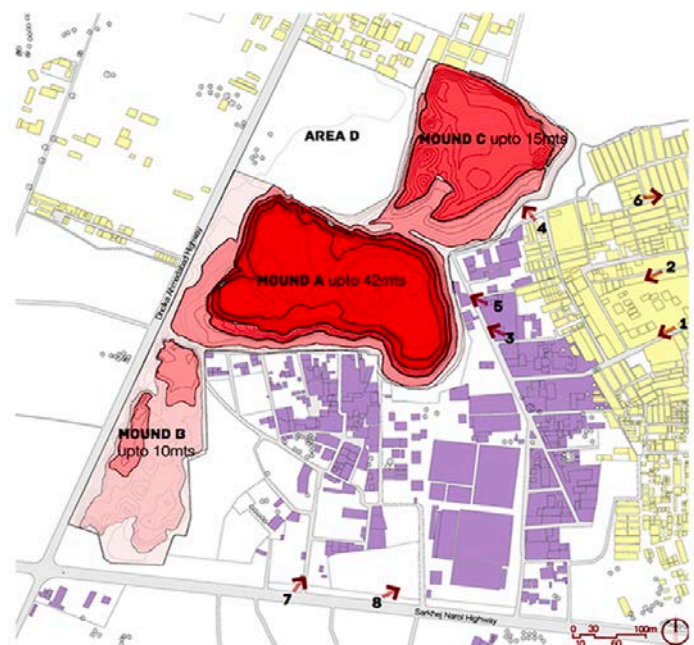
3.4 Introduction to Pirana Dumpsite

Waste pickers at dumpsite are present all over the world. As long as there is no household recycling program in a municipality and open dumping adopted, people can collect sellable products such as waste paper, cans, glass and plastic bottles, and metals that they can sell to intermediate dealers called junk shops. The city of Ahmedabad is no exception, the only open dumpsite of the city Pirana has the same story to tell.

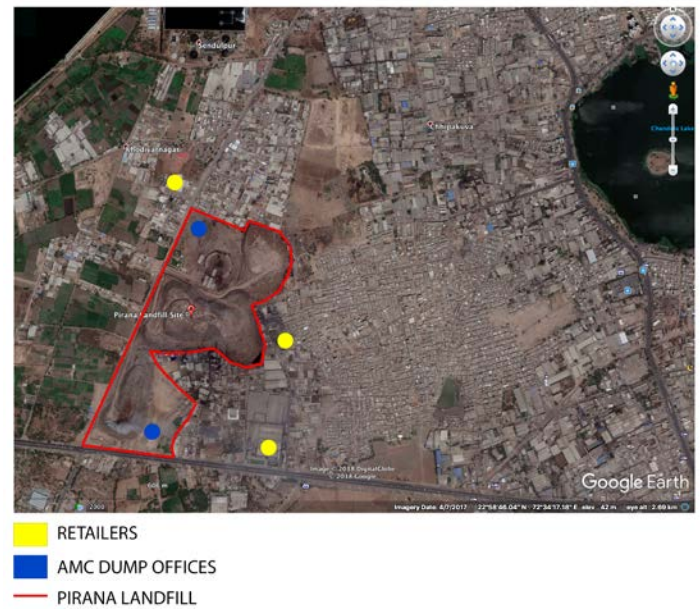
Pirana dumping site, one of the largest dumping grounds of the country, was commissioned in the year 1980 and spreads over an area of about 84 acres. About 66.40 acres of the site is filled completely with Municipal Solid Waste (MSW) and approximately more than 200 lacs metric tons of MSW has been accumulated. The map given shows the strategies location spatially of the dumping site in the context of Ahmedabad with the road map of the city taken as the base map.

Fig 3. Pirana Key Map

The dumpsite lies near the Sarkhej-Narol Highway and falls politically in the Sarkhej Ward of the New West Zone of AMC. While traveling along the highway one can easily sense that nearing of the dump yard from as far as a kilometre or even more by the mere awful smell that it releases along with a host of toxins. This has even forced trespassers to use masks while driving through the roads nearby. The distant view of Pirana is no less



than an appearance of a giant mountain and a few small hills in the mists of small, medium and large industries. Never the less the constant smoke caused by burning of the waste due to the



heat generated also creates a sign of familiarity for people who know about the waste mountain a little better than the others. The dumpsite has been always been a fascination for the re- searchers and a live example to depict the side effects of rapid unplanned urbanization that usually in a part of the global south countries.

Fig 4. Detailed Map showing Pirana Mountains

According to McKinley Global Institute (MGI, 2010), India and China alone will account for more than 62% of the overall growth of the urban population in Asia and about 40% share of the urban global population for the period 2005 to 2025. This is also evident in the context of Ahmedabad in the way the dumpsite expanded to about 36 acres by 2010 and reached about 55 acres by 2015. The following image tries to capture a timeline of 17 years of Pirana dumpsite which is highlighted in red in the above image.

However on digging deep into this vivid picture, one finds hidden layers of Pirana, a place which is much more than a mere dumpsite. It is a source of livelihood opportunities. The present Pirana was officially functional since the 1980s as the dumpsite of the city and was then considered as an outskirts area of the city. However with the growth and expansion of the city. The dumpsite of Pirana is now no more an outskirts but very much part of the city. An increasingly large number of industries have come up in the vicinity. Also, a large presence of industries around the dumpsite makes it interesting to even understand the dependence of the industries on the dump and vice versa. The figure given below shows the overall land use pattern around the Pirana dumpsite.

Apart from the industries that cater around pirana another significant land use pattern observed around are agricultural pockets just adjacent to the dumpsite. Also, the proximity to important

nodes and roads also increase the chances of human interaction with the dumpsite which could have adverse effects. However, looking closer at the vicinity of the dumpsite we nd a host of activities related to waste sprawling.

Mainly there are 3 major dumps located on the existing site based on their height and age of dumping. The largest and the oldest dump have a height which varies between 36 to 42 meters. Another dump which is located in the Excel industries has a height which varies between 16-25 meters. AMC has recently started depositing MSW at new dump varies between 1 to 10 meters. In the figure all the three dumps have been clearly demarcated by highlighting it in different colours, the red being the oldest; yellow being the one behind Excel industries and the recent dump is green. Apart from the visible dumps, there are various other typical features of a dumpsite which are also visible in Pirana.

One of the most striking features being the leachate drain that flows along the entire road stretch from Excel industries till the weigh bridge. The thick black fluid in itself is enough a proof to speak about what has happened over more than 35 years on the place and how will that affect the generations to come. Apart from this the weighing machine at the entrance to the site is to ensure and calculate the total amount of waste that is being dumped at the site on a regular basis. This weigh bridge is managed by AMC. Adjacent to the weigh bridge is the main office of AMC for Pirana dumpsite. Another office of AMC is at the entry gate which is at the foot of the oldest dump. The entire campus from the entry gate onwards is a completely restricted zone for a common man however within the limitations of restrictions there exist several unseen men and women who work for their bare existence. The given figure below thus tries to sum all the key location of the dumpsite.

3.5 How does pirana dumpsite function?

The dumpsite is a complex jungle of activities which is far beyond what one can see from outside. The pirana dumpsite is a 24 hours functional dumpsite. There are about 12 AMC officials appointed who include 3 supervisors and 6 assistants and 3 clerks



working in 3 shifts of 8 hours each.

Any truck or tractor that has been appointed or permitted by AMC can only dispose the waste at this dumpsite. However, before dumping the waste the vehicle has to first Check in at the weigh bridge where there is an auto-generated slip given to the driver of each vehicle. The slip has details of the vehicle and also the net weight of the vehicle. Once the vehicle has disposed of the waste it has to again come and weigh at the weigh bridge. This gives the authorities a track of how much waste is been disposed at the site on a daily basis.

Once a truck has collected slip from the weighbridge. It has to enter the dump only from the entry gate and no other place. At the entry gate, the vehicle is asked to produce the slip and then allowed to go up the dump to dispose of the waste. Tractors and lighter vehicles are required to dispose their waste at dump no.2 i.e. The dump behind the Excel industries. While bigger vehicles are required to climb the oldest and the largest of the dump i.e. dump no 1 to dispose of their waste. The newly formed dump is only to be accessed during monsoons or conditions when terrain of the other two dumps become difficult to be assessed.

Once the vehicle has disposed of the waste in the designed place, the JCB functions itself to push the waste downwards the slope. This action is performed from an elevated area so as to level the surrounding regions to the same level as the peak from where it is being disposed. Once the level of the downward slope reaches a considerable height the compactor further compacts the waste and levels it for further dumping.

This process has been going on for years and that's how Pirana has got the 3 dumps. The truck is stamped at its exit so as to record verification that it has disposed the waste at the designated area and it is completely empty for the next trip. This entire process from entry to exit happens in a span of 10-15 minutes and interestingly it functions very smoothly without much chaos or traffic which is quite remarkable.

The time interval between the waste is been dumped by the truck or tractor and rolled downslope by the JCB. There is a sudden burst of activities around that freshly arrived waste. People like a flock of sheep, gather over the waste and try to sort and snatch their share of waste from that dump and collect it in huge white sacks. One has to be quick at it since anytime the JCB can come over and tip the waste downslope.

A slow move would result in losing opportunities of collecting the freshest waste available at the dump. These people are the rag pickers of the dumpsite who live in a world of their own isolated and detached from the urban Ahmedabad. Their working conditions and poor hygiene would make one question and rethink of the fact that manual scavenging can even happen above the ground urban Ahmedabad.

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3.6 Waste pickers at Pirana

A large number of waste pickers are involved in the business of waste scavenging to earn a livelihood to understand the overall nexus of waste pickers that work at the dumpsite which is also discussed in detail in the previous chapters. The following tools of data collection were used during the study:

- Recognition Survey
- Recognition Survey
- Interviews with waste pickers at Pirana
- Interviews with retailers and wholesalers of recyclable wastes
- Focused discussion with AMC site officials
- Focused group discussions with city NGOs working towards the betterment of waste pickers at the dumpsite.

The basic objectives of the data collection were to understand the working condition of the waste pickers under the following categories:

- Gender Influence
- Economic Conditions
- Social well-being
- Cultural Influence
- Health Conditions

The pirana dumpsite even though being a great cause of concern for various authorities around the city, has never been documented on the perspective of livelihoods of waste pickers and

hence there was no available literature about the same. Hence the numbers and estimates were mainly through interviews with sample size waste pickers and with discussion and consultation with AMC officials at the site and also surrounding waste retailers and wholesalers.

Thus estimated 350-400 waste pickers are currently working at the dumpsite and are solely dependent on the waste from the dumpsite for their livelihood. These rag pickers come from various part of the city but a large number of them are located near the Chandola Lake.

3.7 Profiling of a Waste Picker

The first stage of primary survey was conducted through interviews and the study targeted to understand the profile of the waste pickers. Here the attempt was to analyze the age, sex and various other vital details of the waste pickers. As understood from the discussion with various stakeholders, a total of around 300-350 waste pickers are working on the Pirana dumpsite. To develop a clear picture of the issues of these waste pickers, interviews of 55 waste pickers (roughly 22.5% of the total rag pickers) was carried out. The information discussed in the following sections is based on the information provided by these survey sample waste pickers and other interactions and discussions done with the stakeholders associated with these waste pickers. Each information is also supported by statistical representation in the form of tables.

3.7.1 Age Distribution

Around 60-70% of the total ragpicker were in the age group of 18 to 40 years of age, which is also considered as an ideal age for working. A very small percentage of workers were below the legal age of work, i.e. below the age of 18 years, this accounted for about 5-10%. The rest were above the age of 40 years and age we could find a handful of them about 5% above the age of 60 working on the dumpsite. The distribution highlights the concentration of the workforce within the age group of 18-40 years. These members are the mostly single earners of their family.

The above numbers help us understand the average age of a waste picker at the dumpsite. The below-given table would help understand the distribution statistically clearer:

Age Group	Percentage out of Total
Below 18 Years	5-10 %
18 Years to 40 Years	60-70 %
40 Years to 60 Years	20-30 %
60 Years and Above	5-10 %

3.7.2 Gender Profile

According to Catalyst, in 2011-2012, in India context, women comprise 14.7% of the total urban workers. Compare to such national averages, in the informal sector there is a considerable participation of women waste pickers who work at the dumpsite. However, many female workers highlighted the drastic decreases in the number of women waste workers over the years due to the increase in safety issues with the arrival of large groups of migrant male waste pickers. About 35-40% of the total rag pickers workforce at the dumpsite constitutes of women who are mostly Gujaratis, the rest about 65-70% are shared by male waste pickers which constitute a mix of both Gujarati speaking population and Bangladeshi population.

The following statistically represents this distribution:

Gender	Percentage with
Male	65-70 %
Female	35-40 %

3.7.3 Experience of working at the dumpsite

Majority of these waste pickers of Pirana had begun working at the dumpsite mostly in the past decade and a half. This sudden increase in numbers could be attributed to the large-scale migration of Bangladeshi workers to the dumpsite in search of better livelihood opportunities. As also discussed earlier the urbanization trends and other factors that lead to an increase in the total area of the dumpsite had also seen a peak in the last decade which provided the much-required threshold for these opportunity seekers.

Mostly the Gujarati men and women who are engaged in this occupation have been associated with the Pirana dumpsite since their early teen ages. However, these are a few who have shifted to street sweeping or other like jobs. The entry and exit for a waste picker at the dumpsite is quite an easy task and thus this could also be attributed as the reason for sudden increase in workers in the last decade. Around 75% to 80% of the workers were identified as newcomers around the last decade or so. A small portion, majorly Gujarati women claim to have been working at the dump for more than 20 years.

The following table illustrates statistically the share of work experience with respect to the total dumpsite waste pickers population.

Year of Experience	Percentage with
0-5 Years	25-30 %

5-10 Years	60-70 %	would like to sell his/her segregated waste collected from the dumpsite.
10-20 Years	10-15 %	The other miscellaneous costs involved include costs incurred in the transportation of waste pickers daily to the dumpsite. These costs which are involved in the overall working mechanism of the waste pickers at the Pirana Dumpsite, thus these costs are termed here as the "Operations and Maintenance Costs" for the waste pickers.
Above 20 Years	5-10 %	

3.7.4 Income level of Waste Picker

As discussed earlier, one of the major reasons why these waste pickers continue to work at the dumpsite is due to the feasibility of work that the dumpsite provides to them. Most of these waste pickers do not have any specific predefined schedule of working or holidays.

This choice is entirely upon the individual waste picker. Thus most of these waste pickers take a break from waste picking on and off; depending on their situation and condition. This flexibility of work makes it very difficult for one to estimate the exact earning of a waste picker per day. On interviewing these waste pickers most of them were aware of their weekly average earning but uncertain about an average daily target. Also since most of these waste pickers sold their segregated waste once in 2-3 days depending upon the collection of waste.

Despite these barriers, an attempt was made to understand a very rough value of total daily earnings of a waste picker at the Pirana dumpsite. This was again through focused interviews with the waste pickers and also stakeholders like the waste retail to estimate their daily earnings. The following table statistically depicts the same.

Daily Earning	Percentage
Less than Rs. 250	25-30 %
Rs. 250-500	40-50 %
Above Rs. 500	30-40 %

3.7.5 Operations and Maintenance Cost

On interviewing the waste pickers' one common cause of concern for all these workers were the high hidden costs that are involved in the entire process of waste picking at the Pirana dumpsite. The entire process of sorting by reselling the segregated waste is an expensive affair. There is a large number of monetary resources that are spent by these waste pickers to continue with such activities in the informal market. These additional costs levied on

the waste pickers directly include the cost of transportation of the waste from uphill at the dumpsite to downslope for the purpose of selling the dump, furthermore charges incurred in transportation of waste to the retailer's outlet. Where the waste pickers

Based on the interviews with the waste pickers and discussions with the stakeholders an estimate was made on the range of costs incurred by these waste pickers on a daily basis at the pirana dumpsite. This measure is one of the most important aspects to understand the overall working conditions of the waste pickers. This is also important from the perspective to analyze the expenditure done by the waste pickers as compared to their incurred income. This comparison would also highlight the overall profitability a waste picker could earn at the dumpsite.

The following table statistically shows a range of operations and maintenance costs that a waste picker pays per day for his livelihood to various intermediates during their activity at Pirana dumpsite:

O&M Cost (per day)	Percentage with at Dump
Below Rs. 100	30-40 %
Rs. 100 to Rs.250	50-60 %
Above Rs. 250	5-10 %

3.7.6 Health and Safety Issue

On initial site visits, It was quite evident that the waste pickers would have been facing a tough time at the dumpsite with respect to their health issues, diseases, and safety of women workers. Thus, understand the health and safety issues of the waste pickers also became an important part of the interviews. A few issues related to health were boldly seen at the site itself, these included lack of safety equipment that may result in minor and sometimes even major injuries related to glass or metal scratches, nail piercings etc.

Another common issue that was coming out from visual inspection was that of risks of infections to these waste pickers through instances of animal bites, virus contacts etc. Also, considering the overall environment around the dumpsite it could also be assumed that people working there could even have serious respiratory issues in context with the level of pollutions present in the vicinity of the dump forget alone within the dump. However, in the due course of interviews and discussions, it was found that most of these waste pickers never faced any direct health impacts

directly due to their working environment. It could also be so that these people would be unaware of their overall health ailing to the inability to adequate medical and health facilities. Thus, most of these waste pickers refused of any kind of health issues due to the working conditions.

The following table shows statistically numbers that could, in a nutshell, explain the above-discussed situation.

Health Issues	Percentage at Dump
Major Health Issue like Lung, Cardiac diseases	60-70%
Skin Issues	5-10 %
Minor Injuries	15-20 %
Suffering from cancer	

Hence based on the structured interview conducted for the waste pickers, an opinion of women waste pickers was recording.

The following table shows statistically the representation of the opinion of major women waste pickers on the issue of women safety at the Pirana dumpsite.

Opinions on Safety Issues	Percentage with at Dump
No major safety concerns	20-30 %
Random issues of eve teasing at the dumpsite	40-50 %
Frequent issues on women safety	20-30 %

3.8 Resale Market for waste pickers

Apart from the collection of waste from the dumpsite another important task that the waste pickers are burdened with is finding a suitable market for their collected waste. As discussed earlier, due to the mixed nature of waste entering the dump site the valuables collected by the waste pickers are inferior in comparison to other segregated and street picked waste. Thus, finding a suitable buyer for the segregated waste becomes an important decision the waste pickers have to make.

The vicinity around the dumpsite have a lot of recycling industries and at the outset, many may think that most of these recyclers are working based on the raw material collected by the waste pickers of the dumpsite. Contrary to this assumption, based on primary survey and stakeholder interactions it was found that maximum of these retailers doesn't except recyclables recovered from the dumpsite. According to the survey conducted as a part of the research, these are about 200 recyclers in the vicinity of the dumpsite, but strangely only a handful 5-10 retailers except waste recovered from the dumpsite.

Apart from health concerns, another important concern that a few women raised was the issue of safety of women waste pickers during work at the dumpsite. On further understand their concerns, both from the women working as waste pickers at the dumpsite and the other stakeholders. It was clear that due to a few incidents in the past, the women working at the dumpsite were a little apprehensive about their safety. However, on asking the men waste pickers about their opinion on this issue of women safety at the dumpsite, They seemed quite reluctant to response anything regarding the question.

Waste pickers are likely to get attracted by the waste retailer in the vicinity of the dumpsite as it would ideally reduce the time taken for commutation, reduces the cost of transportation of waste and thus reduces the overall O&M Cost. However, during the course of the research, an interesting finding was emerging. These were several incentives provided by the retailers to these waste pickers. The incentives would include services like providing free collection of a segregated waste of the waste picker from any foot location of the dump to the retailer's shop, free of cost. On further discussion, it was understood that due to

estimated prices of the waste valuable sorted from the dumpsite by the waste pickers, the transportation services help reduce the O&M cost. From the retailers' point of view, this initiative guaranteed a regular supply of waste recyclables within strict competition among various retailers.

One very famous retailer seemed to emerge up during the several rounds of interview with the waste pickers. This retailer has located about 7 km away from the dumpsite and this fact was worth exploring the reason of the popularity of this retailer as compared to the others even though considering the large distance between the dump and the retailer shop. The location of the famous retailer at such far distances from the dumpsite meant the existence of a deep layer of connections which required intense visits. It was later found that the entire business of a waste retailer is largely credit driven to their customers i.e. the retailers at times do not immediately pay the waste pickers, rather pay these waste pickers a few days later. This is practiced to first ensure quality check of the material that the waste picker brought and secondly to avoid payment in huge amount. Considering these dynamics of payment mode it is evitable for a waste retailer (pithawalas) to create good creditworthiness amongst the waste pickers. Over the years the famous retailer irrespective of the distance. Also, to maintain such a loyal image this retailer provided free transportation services from the dumpsite to the retailer shop and back. Furthermore, these retailers may also give other incentives like early payment due to personal reasons of the waste pickers.

3.9 What do waste pickers collect and what do they wish to do.?

The valuables that a waste picker at the dumpsite searches for almost remain the same irrespective of the city where the dump site is located. However, in context of Ahmedabad the waste pickers aspire to collect better quality of waste from the dumpsite, this aspiration of waste materials forms their wish list materials are hard to find in comparison to regularly available recyclers, due to their higher quality these waste fetch more money than the other regular materials that the waste pickers collect from the site.

The table given below shows the wish list materials along with its price prevalent in the retail market for the waste pickers.

Wish List	Price (Per Kg)
Plastic Bottles	Rs. 10 to Rs. 12
Plastic Bags, Pouches	Rs. 12 to Rs. 15
Cardboard	Rs. 10 to Rs. 12
Glass	Rs. 1 to Rs. 2
Rubber	Rs. 20 to Rs. 25
E-waste	Rs. 10 to Rs. 50

But in a normal working day finding something from the wish list in that heap of waste is no less than a treasure found these waste pickers. During the process of finding items of the wish list, these waste pickers collect inferior quality recyclables being very pessimistic about their luck in finding valuables. In monetary terms, these inferior quality items actually account for more than 90% of the daily collections for the waste pickers at Pirana. Thus, these items are what mostly a dumpsite waste picker may be perceived to hunt for. These items are considered inferior for the resellers as well, and thus the inferior items fetch lesser price than the wish list items even if they belong to the same category of reusability. For instance, a cardboard if dry and clean is considered as a wish list item, however, that same cardboard when mixed with domestic waste becomes damp and then fall under the inferior item category.

The following is the list of items that fall under the category of an inferior item along with their prices.

Apart from items collected to be sold to the resellers, there are a few valuables collected for personal use also. These items mostly include torn clothes, wood (as cooking fuel) and left-over food packets. Consumptions of leftover food packets from the dumpsite are something that astonished during the research. This instance completely justifies the term of "inhuman" working condition for the waste pickers.

Inferior Item List	Price (Per Kg)
Low Quality Plastic	Rs. 8 to Rs. 10
Low Quality Cardboard	Rs. 5 to Rs. 8
Low Quality Rubber	Rs. 10 to Rs. 15
Broken Metal	Rs. 30 to Rs. 40
Tampered E-Waste	Rs. 8 to Rs. 10
Broken Toys	Rs. 10 to Rs. 15
Broken Glass	Rs. 0.5 to Rs. 1
Torn Clothes	Mostly for personal use
Wood	Mostly as cooking fuel
Left over Food Packets	Mostly for personal use

4. CONCLUSION

The waste picking community of the Pirana dumpsite of Ahmedabad is quite unique in itself. The need for livelihood makes these waste pickers scramble over waste mountains. Waste scavenging is inhuman, however; it is a source of livelihood for millions of family worldwide. Additionally, the contributions it makes in terms of recycling can also not be neglected. To elevate such people to a better platform with due consideration to their occupation would mean a thorough understanding of the opportunities and challenges that this waste picking sector at the dumpsite possesses.

In the context of Ahmedabad, there is, however, a complex nexus between the authorities, waste pickers and the waste retailers with very thin boundary lines drawn. However complex the system of waste picking at Pirana, one of the greatest opportunities that it possesses is the ability to bring various stakeholders together, each at the right level of interaction for the purpose of earning a livelihood through recycling.

Thus, identification of actual opportunities and challenges for these waste pickers would also vitally depend on the views and opinion of the various stakeholders involved in this entire process of waste recycling at the dumpsite.

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