



Give Back Our Waste¹

What the Okhla Waste-to-Energy Plant has
Done to Local Wastepickers
(2012)



CHINTAN
ENVIRONMENTAL RESEARCH
AND ACTION GROUP

About Chintan Environmental Research and Action Group

We are a registered non-profit organization with a vision of inclusive, sustainable, and equitable growth for all. Our mission is to reduce ecological footprints and increase environmental justice through systemic change brought about through partnerships, capacity building at the grassroots, advocacy and research, and sustainable, scalable models on the ground.

Authors

Bharati Chaturvedi, Imran Khan, and Pujarini Sen

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238, Sidhartha Enclave, New Delhi - 14, India
Email: info@chintan-india.org
Phone: +91-11-46574171 or 46574172
Website: www.chintan-india.org

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¹ Paraphrased from what one waste picker in Tughlakabad village said when asked what she would say to the municipal commissioner or the private contractor that runs the WtE facility regarding the recent changes in waste picker livelihoods.

Executive Summary

Waste-to-Energy (WtE), the process of creating energy from waste, has gained broad appeal domestically and internationally with programs such as the Clean Development Mechanism (CDM) providing funding for many WtE projects across the world. In India alone, 31 such facilities are expected to be funded, even as their technological appropriateness remains questionable. On the other hand, in countries such as India, a large number of people depend on collecting, segregating and recycling solid wastes to maintain their livelihoods and provide a crucial environmental and public health service to the city. By diverting wastes to the incinerators, WtE facilities reduce waste pickers' access to the waste stream, their primary source of income. In the city of Delhi alone, there are an estimated 40-50,000 waste pickers, collecting wastes from households, businesses, factories, roadsides, municipal dumps or *dhalaos*, and landfills, and selling recyclables to small godown owners who in turn provide employment to waste segregators. The Okhla landfill is one such place that used to provide a means of livelihood to over 450 adults in the surrounding neighbourhoods. In January 2012, a WtE facility became functional at Sukhdev Vihar, near the Okhla landfill. Consequently, approximately 1300 tons of waste that used

to be dumped at the landfill daily is now fed to the incinerator. Of the more than 450 individuals that relied on landfill waste before the establishment of the WtE facility, less than a 150 landfill-related waste workers were remaining at the time of this survey. As new WtE facilities are being developed at two other locations in Delhi, understanding their socio-economic impacts becomes crucial. To this end, this report summarizes the results of a socio-economic impacts assessment survey of waste pickers directly and indirectly linked to the Okhla landfill informal waste economy, nine months after the WtE plant began operations.

In September and October 2012, approximately 9 months after the WtE plant commenced its operations, Chintan conducted a survey of 429 adult residents at three neighbourhoods near the Okhla landfill (Tughlakabad village, Tughlakabad Extension, and Tehkhand village) in order to answer the following broad questions: How dependent are these communities on waste and waste work? How has the Okhla landfill closure and establishment of the WtE facility impacted the income of the surveyed waste workers? How has it impacted waste workers' families? Do these changes impact men and women differently?

To compare the results of this survey to a pre-WtE plant establishment baseline, we used the results from a similar survey conducted in June 2011. The key findings from an analysis of the survey results are as follows:

- Between June 2011 and August 2012, the three communities show significant depopulation (40 percent decrease), particularly among landfill workers (74 percent decrease). The establishment of the WtE facility and the subsequent loss of livelihoods might be a major reason for out-migration from the surveyed communities.
- Waste provides a crucial source of livelihood to many residents (approximately 88 percent) near the Okhla landfill and WtE plant even though it is arduous work and unpredictable in terms of its income generation possibilities.
- The WtE plant is one of the main factors in decreased incomes of waste pickers. This decrease in income can also be seen in their responses to questions about getting loans, eating meat/fish, and celebrating major festivals. Landfill workers are planning to take even more loans on average than they have in the past year suggesting the severe extent of financial constraints faced by them. All waste workers noted a decrease in meat/fish consumption this year but the decrease was particularly acute for landfill workers. 23 percent noted not being able to celebrate festivals as well this year compared to last year.
- One of the most immediate impacts of decreased incomes has been the enlistment of previously non-working family members into the workforce and decreased school attendance for children. 67% of those whose children had stopped attending school cited having not enough

money and having to enlist children as income earners as the reasons for their children stopping schooling.

- Even though women in general work more than men, women experience greater income instability than men.

Since waste provides a crucial source of livelihood to a segment of the urban poor, technological solutions such as WtE plants can push them further into poverty. Based on these findings, we make the following key policy recommendations:

- Although India has taken some steps in providing a policy framework for incorporating waste pickers into solid waste management programs, cities need to do much better at following the spirit of waste picker inclusion laid out in these policies. Several examples of these already exist across India, ranging from doorstep waste collection, recycling through local MRFs, waste collection for institutions, and space for waste trading depots.
- All solid waste management programmes in India should plan for managing the 60 percent organic portion of solid waste, which is an environmental and a public health problem. This could be managed using waste-to-energy technologies such as bio gas and other methane based technologies.
- Wastepickers must be allowed to access dry waste through doorstep collection, Material Recovery Facilities (MRFs) at the landfill and other mechanisms. Wastepickers are already providing a solution to one portion of the waste stream. Only wastes not used by them should be considered for any other technological solution options.
- Spaces such as MRFs must be allocated through city master plans and zonal

plans for waste pickers to segregate recyclables. In fact, wastepickers, because they provide a crucial service to the city, should be included in urban planning processes and programs to ensure their voices are heard.

- Although WtE plants have become a CDM favorite, these should not be adopted blindly without regard to the socio-economic context. Even in terms of achieving environmental goals of decreased greenhouse gas emissions, Chintan has shown the informal sector waste worker community in Delhi alone far exceeds the annual emissions reductions from any proposed or currently functioning WtE facility.

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Chapter 1 Background

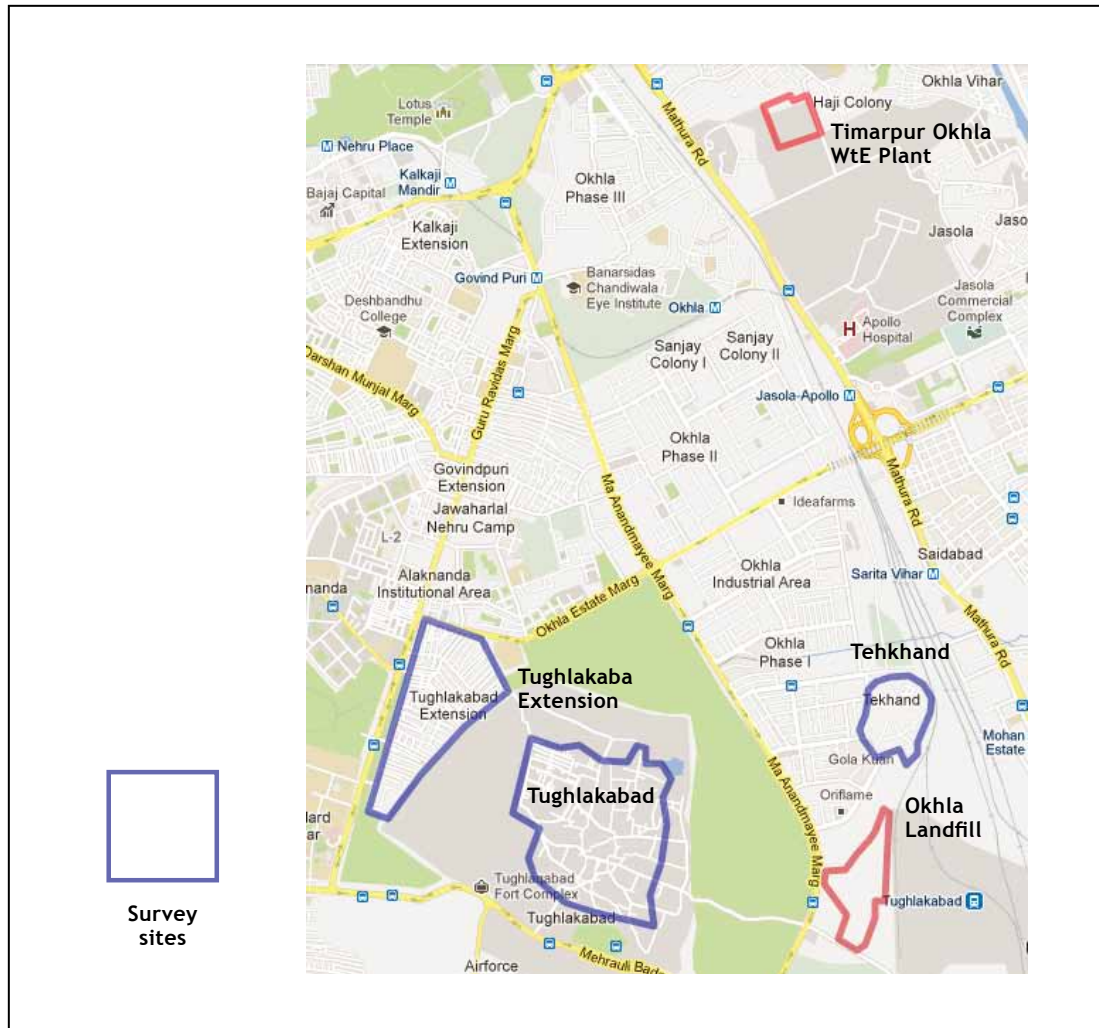
Waste-to-Energy (WtE) is the process of creating energy from waste either through incineration (direct combustion of waste) or by producing a combustible fuel commodity such as methane gas capture and refuse-derived fuels (RDFs). WtE has gained broad appeal domestically and internationally because of two large problems that this technological solution is simultaneously believed to be able to address – reducing the amount of waste that needs to be disposed in landfills and generating energy to meet our ever growing requirements. Both these are highly contested claims that have not been back by evidence from any on-the-ground implementations. Yet, due to these purported benefits, the Clean Development Mechanism (CDM) has provided funding for many WtE projects across the world including 31 such facilities in India alone¹. Its appropriateness to the developing world remains even more questionable. In countries such as India, a large number of people depend on collecting, segregating and recycling solid wastes to maintain their livelihoods. By diverting wastes to the incinerators, WtE facilities reduce waste pickers' access to the waste stream, their primary source of income.

¹ <http://cdm.unfccc.int/Projects/projsearch.html>

In the city of Delhi alone, there are an estimated 40-50,000 waste pickers, collecting wastes from households, businesses, factories, roadsides, municipal dumps (also called *dhalaos*), and landfills. Then there are small godown owners who buy the wastes from waste pickers to segregate and sell recyclables to larger dealers in recyclables. Small godown owners provide employment to waste segregators who help them sort recyclables that are then ultimately sold to recycling units. The city's wastes are thus able to directly support the livelihoods of the urban poor in the informal sector, who simultaneously provide a crucial environmental and public health service to the city.

The Okhla landfill is one such place that provides a means of livelihood to over 450 adults in the surrounding neighbourhoods², not only those who collect waste directly from the landfill but also small godown owners and those who are employed by the small godown owners to segregate the recyclables to re-insert them into new

² This number is from a survey Chintan conducted in September 2011. In our current survey, this number has been reduced by half because many have moved away due to lack of landfill related waste work opportunities since the inception of the plant.



commodity circuits. The map below shows the location of the three survey sites in relation to the landfill and the WtE facility.

In January 2012, a WtE facility became functional at Sukhdev Vihar, near the Okhla landfill, which means that approximately 1300 tons of waste that used to be dumped at the landfill daily is now fed to the incinerator. Further, a new WtE plant is being planned for another landfill in Delhi at Ghazipur.

Understanding the socio-economic impacts of the existing plant in Okhla can help the communities understand the implications and develop better risk mitigation strategies. To this end, this report summarizes the results of a socio-economic impacts assessment survey of waste pickers directly and indirectly linked to the Okhla landfill informal waste economy, nine months after the WtE plant began operations.

Chapter 2 Research questions and hypotheses

To understand clearly the socio-economic impacts of the Okhla landfill closure and establishment of the WtE facility, we asked the following research questions of this study:

- Are there any gender-based differences in the nature and amount of work of those involved in waste work? Has the Okhla landfill closure and establishment of the WtE facility impacted men and women differently?
- How dependent are the surrounding communities on waste and waste work? What proportion of residents are involved in what kind of waste work? How has the Okhla landfill closure and establishment of the WtE facility impacted the nature of waste work of the surveyed communities?
- How has the Okhla landfill closure and establishment of the WtE facility impacted the income of the surveyed waste workers? Are there any shifts in loans/credit practices among waste workers? Are waste workers able to eat as many high-protein (e.g. meat/fish) as before? Are they able to celebrate festivals such as Eid and Diwali as they used to?
- How has the Okhla landfill closure and establishment of the WtE facility impacted waste workers' families? Have they needed to enlist any previously non-working family members into waste work? Have children needed to stop going to school in order to supplement the family income?

Chapter 3 Methods and survey site description

In September and October 2012, Chintan conducted a survey of all adult (above 18 years of age) residents at three neighbourhoods near the Okhla landfill: Tughlakabad village, Tughlakabad Extension, and Tehkhand village. A total of 429 residents were surveyed. In addition, we conducted semi-structured interviews with approximately 15 residents in the three communities. Some brief stories from these conversations are also provided in this report. In June 2011, Chintan had released a report based on a similar survey of all adult residents in the same three communities, the results of which serve as a convenient baseline comparison¹.

With the above questions in mind, Chintan designed and conducted a survey of the three

¹ For a detailed report of the results of the June 2011 survey, see the 2011 Chintan report titled *Waste-to-Energy or Waste-of-Energy? Social and Economic Impact Assessment of Waste-to-Energy Projects on Wastepickers near Ghazipur and Okhla Landfills in Delhi*.

communities. The survey was divided into four parts. Part 1 asked for general information such as name, gender, age, address and phone number. Questions in part 2 sought information on waste-related work and income from respondents. Type of waste work was divided into the following categories: landfill workers, small godown owners, waste segregators, and other waste workers². Part 3 focused on the impact of the WtE facility on waste workers' incomes. Part 4 focused on the impact on waste pickers' families. Table 1 provides a summary of basic demographic information survey respondents for the three sites. For purposes of comparison, information from the June 2011 report is also provided in Table 2.

² Other waste workers include door-to-door collectors, *pheri* workers or those who walk around on foot or use bicycles or rickshaws collecting recyclables from roadsides and municipal dumps, and cycle *kabaris* who use bicycles or rickshaws to collect recyclables from households and businesses.

Table 1. Summary of demographic characteristics of surveyed communities (August 2012)

	Tughlakabad Extension	Tehkhand Village	Tughlakabad Village	Total
Number surveyed	219	115	95	429
Number and percentage of male respondents	199 (90%)	90 (78%)	68 (72%)	357 (83%)
Number and percentage of female respondents	20 (10%)	25 (28%)	27 (40%)	72 (17%)
Number and percentage of waste workers	176 (80%)	113 (98%)	88 (93%)	377 (88%)
Landfill workers	14 (8%)	74 (66%)	17 (20%)	105 (28%)
Small godown owners	8 (5%)	10 (9%)	1 (1%)	19 (5%)
Waste segregators	5 (3%)	7 (6%)	8 (9%)	20 (5%)
Other waste workers	149 (84%)	22 (19%)	62 (70%)	233 (62%)

Table 2. Summary of demographic characteristics of surveyed communities (Baseline survey June 2011)

	Tughlakabad Extension	Tehkhand Village	Tughlakabad Village	Total
Number surveyed	297	147	276	720
Number and percentage of male respondents	273 (92%)	112 (76%)	156 (57%)	541 (75%)
Number and percentage of female respondents	24 (8%)	35 (24%)	120 (43%)	179 (25%)
Number and percentage of waste workers	276 (93%)	142 (97%)	265 (96%)	683 (95%)
Landfill workers	69 (25%)	119 (84%)	212 (80%)	400 (59%)
Small godown owners	7 (3%)	9 (6%)	5 (2%)	21 (3%)
Waste segregators	14 (5%)	11 (8%)	8 (3%)	33 (5%)
Other waste workers	186 (67%)	3 (2%)	40 (15%)	229 (33%)

Chapter 4

Key findings

This section summarizes the key findings of the survey.

4.1 Between June 2011 and August 2012, the three communities show significant depopulation. Additionally, the number and percentage of waste workers, particularly landfill workers shows a massive decrease. The establishment of the WtE facility and the subsequent loss of livelihoods is most likely the primary reason for out-migration from the surveyed communities. Residents might have moved back to their villages or to other areas of the city seeking other forms of employment.

- The total number of adult residents decreased from 720 to 430 between June 2011 and August 2012. This equates to 40 percent decrease in population in the three villages. Of the three, Tughlakabad village exhibits the most drastic population decrease of 66 percent.
- The number of waste workers in the three communities decreased from 683 to 377 or a 45 percent decrease over this time period. Of these, landfill workers were affected the most showing a decrease from 400 to

105, that is, a 74 percent decrease. Small godown owners and waste segregators also showed a 10 and 40 percent decrease respectively while other waste workers showed a mild increase, indicating that those dependent on the landfill directly and indirectly have suffered the most due to the establishment of the WtE facility.

4.2 Waste provides a crucial source of livelihood to many residents near the Okhla landfill and WtE plant even though it is arduous work and unpredictable in terms of income generation.

- 88% of the residents in the three neighbourhoods depend upon waste as their main source of income. Of these approximately 28% depend directly on the landfill for their livelihood and another 10% (small godown owners and waste segregators) depend partially on the landfill and partially on door-to-door collectors and *pheri* (cycle/rickshaw and on foot) workers.
- Landfill workers reported working the most number of days per month (26 on average) in August 2012, suggesting that they have to

I have picked trash on the Okhla landfill for four years. There are six of us in my family – my mother, my father, and my three brothers. All my brothers – Sanjay, Sahibul, and Raju – work on the landfill. Neither of us have ever attended school. The landfill is all we have known. Before the plant came, we made Rs. 300-500 working 3-4 hours a day on the landfill. Now we have to start work at 6 AM and work until the evening and even then we only make about Rs. 200, if that.

– Salman
Tehkhand Village

work more than workers in other occupational categories to make the meager income that they do. Informal discussions with landfill workers also elicited two observations. First, they have to now scavenge the landfill two-three times a day and for each visit have to pay the landfill officials a bribe of Rs. 5-20 depending on whether the worker is a pre-teenaged child, teenaged child or an adult. Second, the recyclable material that they are able to now find on the landfill is metal because the only things that come to the landfill is ash from the WtE plant or construction debris as opposed to plastics, glass, cardboard etc. prior to the establishment of the WtE plant.

- Survey respondents were asked what waste-related work they had done in the past and what they do now. Although the proportion of residents involved in waste related work remained approximately the same, the proportion of landfill workers

decreased by 6%. There was an associated increase in those involved in door-to-door collection, *pheri* (cycle/rickshaw and on foot) workers and cycle *kabaris*, suggesting that there is a notable occupational shift from landfill work to other waste-related work

- Waste work (particularly landfill work) is tenuous in terms of income. Decrease in waste due to the WtE plant and resultant increase in competition between waste pickers due to decreased availability of waste was cited most frequently as the reason for decreased incomes.

I worked on the landfill but when the trash stopped coming, I started working in a *kothi* doing dishes, dusting, cleaning, cooking. I used to make more money working on the landfill than I do working in a *kothi*. On the landfill, we used to find many different things of different qualities and different prices. Working in a *kothi*, I always make the same amount of money, about Rs. 5000 a month. On the landfill, I could have made Rs. 10,000, maybe even Rs. 15,000.

– Sadhna
Tehkhand Village

- Survey respondents were asked to report their maximum income from a single day's work. Landfill workers and waste segregators reported the lowest maximum income among all occupational categories. In addition, landfill workers reported being able to make this income most frequently as compared to workers

in other occupational categories. This suggests that landfill work is unstable with daily incomes varying much more frequently than the more predictable work of workers in other occupational categories including waste segregators. Further, even a good daily income for landfill workers and waste segregators is the lowest among all occupational categories. Table 3 provides further details on the minimum and maximum daily incomes and their reported monthly frequencies.

- Survey respondents were also asked to report their minimum income from a single day's work. Landfill workers

reported the highest minimum daily income among all occupational categories but also reported making this income most frequently of all occupational categories. Waste segregators reported close to the lowest minimum daily income among all occupational categories. But the frequency of this minimum daily income among waste segregators was the least frequent among all occupational categories. Again, this points to the unpredictability of daily income among landfill workers as opposed to workers in other occupational categories.

Table 3. Maximum and minimum daily incomes and frequencies

	Maximum daily income		Minimum daily income	
	Amount (in rupees per day)	Frequency (no. of times/month)	Amount (in rupees per day)	Frequency (no. of times/month)
Landfill workers	302	3.5	164	4.6
Small godown owners	422	4.8	138	5.6
Waste segregators	236	9.8	130	14.1
Other waste workers	318	5.7	122	6.9

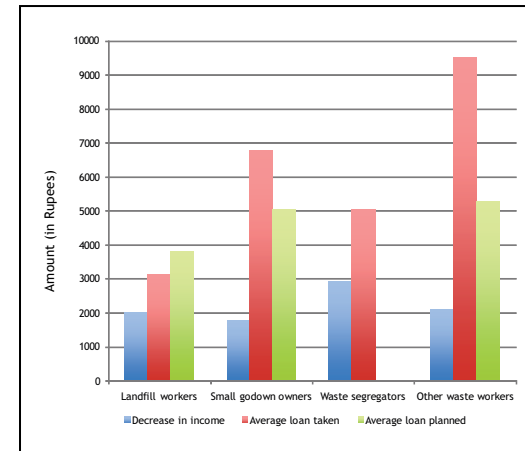
4.3 The WtE plant is one of the main factors in decreased incomes of waste pickers. Although there are differences across occupational categories, a decrease in income is also seen in their responses to questions about getting loans, eating meat/fish, and celebrating major festivals.

- Survey respondents noted an overall 21% decrease in income this year across all waste occupational categories. Landfill workers reported a 24% decrease and waste segregators reported a 22% decrease.

I have worked on the landfill for 14 years. Nobody told me when the plant was started and the trash stopped coming to the landfill. Before the landfill closed, we used to get plastics, metal, cardboard, paper. Now all we get is a little metal about 10-15 kilos. Before starting to work on the landfill, I used to farm in my village. Before the landfill closed, I used to make about Rs. 200-250 a day, now I only make about Rs. 100-150 a day.

— Sadir Ali, Tughlakabad Village

- 16% of respondents noted that they had taken a loan since last winter. Of these 19% were landfill workers and 7% small godown owners. Half of these loans were for general household expenses including medical expenses and children's schooling while the other half of the loans were

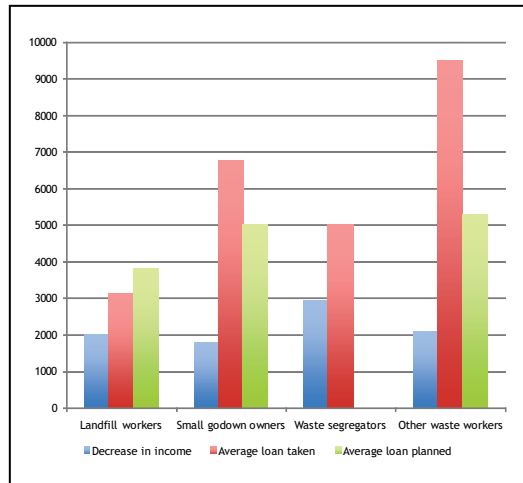


for sending money to their villages. Only 3% noted that they are planning to take loans right now. Of these 58% are landfill workers and 8% small godown owners. Respondents noted that 83% of these planned loans would be for household expenses including medical expenses and children's schooling. The graph below shows a comparison of change in monthly income and amount of loans taken and planned grouped by occupational category. None of the waste segregators noted plans to take loans. Landfill workers are planning to take even more loans on average than they have in the past year suggesting the severe extent of financial constraints faced by them.

- Overall respondents reported having reduced their consumption of meat/fish by 0.7 times per week. Only 42% responded that they were able to eat as much meat/fish now as they wanted as compared to 76% last year. Among landfill workers, only 18% were able to eat as much meat/fish now as compared to 49% last year; Among waste segregators, 25% are now able to eat as much meat/fish as opposed to 55% last year. The graph below compares the percentage of respondents who were not able to eat as much meat/fish as they wanted this year as compared to last year. As the graph shows, in general all waste workers noted a decrease in meat/fish consumption this year but the difference was particularly acute for landfill workers. [Text box:]

When we can't make a living to survive here anymore, then we'll see what we need to do instead, where we need to move to. We'll have to work hard. We won't steal and live. Before we used to work hard as well but were able to eat well at least. Now we work even harder and are not able to eat as well. Before we used to be able to fill our stomachs, now we eat only half of that.

Salman
Tehkhand Village



- Over 23% felt that there was a difference in the way they celebrated festivals this year as compared to last. Of those who felt there was a difference, 23% were landfill workers. Over 77% cited that they had less work/income this year than last as the primary reason for not being able to celebrate festivals as well as last year.

4.4 One of the most immediate impacts of decreased incomes has been the enlistment of previously non-working family members into the workforce and decreased school attendance for children.

- Almost 10% of the respondents noted that a previously non-working member of the family had started working in the last 3 months. All respondents noted the Okhla landfill or lack of money as the reasons for enlisting a previously non-working member into work. Only 5% of new workers are working on the landfill, 55% on other waste work (*pheri*, cycle *pheri* and door-to-door collection) while 40% entered non-waste related work.

I have not gone to school since the landfill closed. I am 12 years old. When I was in school, I was in class 4. I now work on the landfill. Both my parents work on the landfill also. Since the landfill closed, they started to earn less money, so I had to start working to help my family. There's no point of me going to school now. Who would earn if I went to school? There are 8 people in my house: three younger brothers, my mom, my dad, my older brother and his wife. I want to go back to school. If I don't make enough money here, I'll go back to my village in Assam in a couple of months.

— Rokibul
Tughlakabad

- Overall respondents noted a 5% decrease in the percentage of children attending school between last winter and now. 67% of those whose children had stopped attending school cited having not enough money and having to enlist children as income earners as the reasons for their children stopping schooling.

4.5 Women in general work more than men. Women and men experience income instability differently, women experiencing greater instability than men.

- Women in general reported working more than men (5.84 days/week for women versus 5.60 days/week for men and 24 days/week for women versus 23 days/week for men).
- Among landfill workers, men reported a 23% decrease in income over the past year and women reported a 33%

decrease. Among waste segregators, men reported a 23% decrease in income and women a 19% decrease.

- Male waste segregators reported being able to make the maximum daily income much less frequently (every 9.78 days) than women (every 4.60 days).
- Among landfill workers, men reported making the minimum daily income less frequently than women (every 4.59 days for men and every 3.70 days for women). The frequency of minimum daily income among waste segregators also varied widely between men and women (every 14.10 days for men and every 2.80 days for women).

Chapter 5

Policy recommendations

The Okhla landfill provides a crucial source of livelihood to Delhi's urban poor in the informal waste sector. The closure of the landfill and the diversion of waste into the

What can I ask those who have set up this plant? All we can ask is "Malik, why is this happening to us and why are you doing this to us? We all have stomachs no matter if we are rich or poor. Rich people have the means to fill their stomachs but we poor people don't. If you can provide us the means, then please do. Otherwise, *jai ram ji ki.*" That's all we can say, no? What more can I say to them?

— Sanjay
Tehkhand Village

WtE facility has negatively impacted a large number of waste pickers who depended on waste as their only source of income. Based on the findings from the survey, Chintan recommends the following:

- Although India has taken some steps in providing a policy framework for

incorporating waste pickers into solid waste management programs, cities need to do much better at following the spirit of waste picker inclusion laid out in these policies. Several examples of these already exist across India, ranging from doorstep waste collection, recycling through local MRFs, waste collection for institutions, and space for waste trading depots.

- All solid waste management programmes in India should plan for managing the 60 percent organic portion of solid waste, which is an environmental and a public health problem. This could be managed using waste-to-energy technologies such as bio gas and other methane based technologies.
- Wastepickers must be allowed to access dry waste through doorstep collection, Material Recovery Facilities (MRFs) at the landfill and other mechanisms. Wastepickers are already providing a solution to one portion of the waste stream. Only wastes not used by them should be considered for any other technological solution options.
- Spaces such as MRFs must be allocated through city master plans and zonal plans for waste pickers to segregate

recyclables. In fact, wastepickers, because they provide a crucial service to the city, should be included in urban planning processes and programs to ensure their voices are heard.

- Although WtE plants have become a CDM favorite, these should not be adopted blindly without regard to the socio-economic context. Even in terms of achieving environmental goals of decreased greenhouse gas emissions, Chintan has shown the informal sector waste worker community in Delhi alone far exceeds the annual emissions reductions from any proposed or currently functioning WtE facility .

About this Study:

Waste-to-Energy (WtE), the process of creating energy from waste, has gained broad appeal domestically and internationally with programs such as the Clean Development Mechanism (CDM) providing funding for many WtE projects across the world. In India alone, 31 such facilities are expected to be funded, even as their technological appropriateness remains questionable. On the other hand, in countries such as India, a large number of people depend on collecting, segregating and recycling solid wastes to maintain their livelihoods and provide a crucial environmental and public health service to the city. The Okhla landfill is one such place that used to provide a means of livelihood to over 450 adults in the surrounding neighbourhoods, of which only 150 remain at the time of the publication of this report. To this end, this report summarizes the results of a socio-economic impacts assessment survey of waste pickers directly and indirectly linked to the Okhla landfill informal waste economy, nine months after the WtE plant began operations. Based on these findings, we provide some key policy recommendations to ensure that this particular segment of the urban poor is not pushed further into poverty.

Chintan Environmental Research and Action Group

238, Sidhartha Enclave, New Delhi - 14, India

Email: info@chintan-india.org

Phone: +91-11-46574171 or 46574172

Website: www.chintan-india.org



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