

Awareness Among Urban Inhabitants About Waste Management and Its Impact on Environment

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INTRODUCTION

The problem of waste disposal threatens to become a serious problem of pollution with growing magnitude of waste production. The non-biodegradable contents can be of serious concern as they stay for long in the environment. The decaying matter provides suitable material for harmful insects (mosquitoes and flies) to thrive and rapidly causing diseases. The WHO has warned about the possibility of yellow fever spreading in India. Yellow fever, which causes high mortality, is transmitted by the same mosquito which spread dengue fever. Unprotected waste is the carrier of many kinds of deadly diseases like cholera, diarrhoea, dysentery and tetanus. The epidemic of plague in Surat in September 1997 was mainly due to the growth of rodents at waste disposal sites. Waste can be managed in better ways by composting, recycling, vermicomposting and can be turned into manure and biogas.

Berry (1997) found that in all the localities of Ludhiana, majority of respondents in low, middle and high income group were aware of fact that the unprotected garbage leads to various kinds of diseases. Suri (1996) appreciated the role of the common rag pickers who do great favour by picking up all sorts of polythene from the refuse and selling to recycling units. The present study deals with a survey undertaken to study the waste management practices among the people of two cities in Punjab.

MATERIALS AND METHODS

The present investigation was carried out in two cities namely Ludhiana and Barnala of Punjab State. Three localities were selected randomly from each city. Twenty five households from each locality were selected randomly. Thus a total sample size of 75 from each city was obtained. The data were collected through personal interview in which satisfaction from existing waste disposal facilities, suggestions for effective waste disposal practices and perceived effect of waste on health and environment etc. were studied.

RESULTS AND DISCUSSION

Problems Faced With Existing Waste Disposal Practices Inside and Outside the Homes Data in Table 1 revealed that total of 56.6% respondents were satisfied with the existing waste disposal practices within the home. It was found that in 26% families, children were throwing waste here and there, 18.6% households foul smelled from the waste whereas 14.6% families did not clean bins regularly and waste accumulated outside their house. Only 28% households were satisfied with existing waste disposal practices outside the home. Most annoying problem was accumulated waste in the streets (65.3%) followed by animals gathering around the waste, waste spreading foul smell, trouble due to blockage during rainy season, bins are located far away and not cleaned regularly (49.3, 46.6, 38.0 and 14% respectively). Karwasra (1997) also reported of similar problems in his study.

Community Waste Disposal Facilities

Table 2 depicts that majority of the families (51.3%) had the nearby municipal disposal site. Regarding the mode of waste collection these two cities, 78.2% families were collecting waste in baskets followed by use of spade and trolley and with hydraulic machine into the trolley (53.3 and 16% respectively). The municipal dustbins used by the majority of the families (83.3%) were of metal which were covered and movable. In Barnala 33.3 percent of families and in Ludhiana 58.6 percent of families considered the MC bins to be a hygienic way of disposing bins. Whereas, 66.7 percent families of Barnala and 41.3 percent families of Ludhiana considered that MC bins were a source of dirt and stench because the bins are open.

Effects of Waste Material on the Environment and Health

It can be clearly seen in Table 3 that problem of foul smell and breeding of mosquitoes due to water pollution was stated by 65.3 percent respondents followed by degradation of water and diseases as reported by 37.3 and 18% respon-

Table 1: Problems faced with existing waste disposal practices inside and outside the home

<i>Parameter</i>	<i>Barnala</i>	<i>Ludhiana</i>	<i>Total</i>
Satisfaction with existing waste disposal practices inside the home	42 (56.0)	43 (57.3)	85 (56.6)
Problems faced			
1. Children throw the waste here and there	22 (29.3)	17 (22.6)	39 (26.0)
2. Foul smell of the waste	16 (21.3)	12 (16.0)	28 (18.6)
3. Bins not cleaned regularly	14 (18.6)	8 (10.6)	22 (14.6)
4. Waste accumulates outside the house	11 (14.6)	11 (14.6)	22 (14.6)
Satisfaction with existing waste disposal practices outside the home	3 (4)	39(52)	42(28)
Problems faced			
1. Waste accumulated in the street	65 (88.6)	33 (44.0)	98 (65.3)
2. Waste spreads foul smell	54 (72.0)	16 (21.3)	70 (46.6)
3. Animals gather around the waste	51 (68.1)	23 (30.6)	74 (49.3)
4. Trouble due to blockage during rainy season	37 (49.3)	20 (26.6)	57 (38.0)
5. Bins are far located	15 (20.0)	6 (8.0)	21 (14.0)
6. Number of bins are lesser than requirement	9 (12.0)	2 (2.6)	11 (7.3)
7. Bins are not cleaned regularly	13 (17.3)	8 (10.6)	21 (14.0)

* Multiple responses (Figures in parentheses indicated the percentages)

Table 2: Community waste disposal facilities

<i>Parameter</i>	<i>Barnala</i>	<i>Ludhiana</i>	<i>Total</i>
1. <i>Municipal disposal site:</i>			
Near by	41 (54.6)	36 (48.0)	77 (51.3)
Far away	34 (45.3)	39 (52.0)	73 (48.7)
2. <i>Mode of garbage collection</i>			
With basket into the trolley	51 (68.0)	59 (78.6)	11 (78.2)
With hydraulic machine into the trolley	-	4(5.3)	4 (16.0)
With spade into the trolley	33 (44.0)	47 (62.0)	80 (53.3)
3. <i>Municipal dustbin</i>			
Movable metal dustbin: (Covered)	50 (66.7)	75(100)	125 (83.3)
Immovable concrete dustbin: (Uncovered)	25 (33.3)	44 (58.6)	25 (100)
4. <i>Municipal corporation bins hygienic way of disposing</i>			
Yes	25 (33.3)	44 (58.6)	69 (46.0)
No	50 (66.6)	31 (41.3)	81 (54.0)

Figures in parentheses indicate the percentages

dents. As regards foul smell and diseases due to air pollution 69.3 and 51.3 percent respondents agreed to the fact. A World Bank study suggested that the polluted air in the Indian cities is causing premature death of about 40000 persons per year. The extent of water pollution can be gauged from the state of our rivers which, for most, part of the year, are hardly distinguishable from vast urban gutters (Jagmohan 2000). Almost half the respondents reported that foul smell is also caused due to seepage of waste in soil. Mehta and Marwaha (1999) analysed that industrialization in Ludhiana had lead to an adverse impact on groundwater quality. The city had 1311 industries, out of which 104 were reported to be generating 3601 tones of hazardous waste per year. This waste is discharged into the environment. Ninety

four percent of the homemakers had knowledge that waste is a breeding place for mosquitoes and flies and to avoid it cleaning is adopted by 35.3 percent of the respondents. Large number of respondents believed about that unprotected waste can lead to various diseases and were aware about spread of malaria, dysentery, hepatitis, cholera, etc.

Half the respondents suggested that waste should be put into polythene bags and majority of them considered that waste disposal is a problem.

Waste Management Practices

Most respondents (80.6%) had knowledge about manure preparation and 39.3% had knowledge that waste can be turned into biogas

Table 3: Awareness regarding adverse effects of waste material on the environment and health

<i>Parameter</i>	<i>Barnala</i>	<i>Ludhiana</i>	<i>Total</i>
<i>Type of Pollution</i>			
Water Pollution :			
Foul smell	48 (64)	50 (66.6)	98 (65.3)
Breeding of mosquitoes	53 (70.6)	45 (60.0)	98 (65.3)
Degradation of water	26 (34.6)	30 (40.0)	56 (37.3)
Water borne diseases	14 (18.6)	13 (17.3)	27 (18)
Air Pollution :			
Foul smell	54 (72.0)	50 (66.6)	104 (69.3)
Air borne diseases	44 (58.6)	33 (44.0)	77 (51.3)
Soil Pollution :			
Foul smell	37 (49.3)	41 (54.6)	78 (52.0)
Soil borne diseases	22 (29.3)	17 (22.6)	39 (26.0)
Infiltration rate decreases	12 (16.0)	8 (10.6)	20 (13.3)
Breeding Place for Mosquitoes & Flies	68 (90.6)	73 (97.3)	141 (94)
<i>Steps to check it</i>			
DDT or kerosene spray	28 (37.3)	22 (29.3)	50 (33.3)
Cleaning	23 (30.0)	30 (40.0)	53 (35.3)
Burning	16 (21.3)	18 (24.0)	34 (22.7)
Covering	1 (13)	17 (22.6)	18 (12.0)
<i>Diseases</i>			
Dysentery	16 (21.3)	12 (16.0)	28 (18.7)
Diarrhea	52 (69.3)	50 (66.6)	102 (68)
Typhoid	39 (52.0)	36 (48.0)	75 (50.0)
Hepatitis	51 (68.0)	48 (64)	99 (66.0)
Malaria	63 (84.0)	62 (82.6)	125 (83.2)
Cholera	49 (65.3)	37 (49.3)	86 (57.3)
Gastroenteritis	8 (10.7)	6 (8.0)	14 (9.3)
Measles	17 (22.6)	15 (20.0)	32 (21.3)
Tetanus	19 (25.3)	14 (18.6)	33 (22.0)
<i>Waste should be put into polythene bag</i>	47 (63)	39 (52)	86 (57.3)
Waste is a problem:			
Sorting it	46 (61.2)	39 (50.3)	85 (56.7)
Disposing it	67 (89.3)	62 (82.6)	129 (86.0)

*Multiple responses (Figures in parentheses indicate percentage)

(Table 4). 80.6% families knew that compost can be prepared by waste. Method of recycling homogenous waste was known to 77.3% of respondents. Knowledge about treatment with microorganisms, by high temperature, vermicomposting, and fermentation were some methods

known to 38, 22.3, 12.68 and 9.3% respondents respectively. Only 11.3 percent of the respondents were aware of landfilling, incineration and the process of pyrolysis was not known to any of the respondents. The solid waste plant will convert all solid waste from the urban and rural areas to

Table 4: Waste management practices

<i>Parameter</i>	<i>Barnala</i>	<i>Ludhiana</i>	<i>Total</i>
<i>Waste can be turned into:</i>			
Manure	61 (81.3)	60 (80.0)	121 (80.6)
Biogas	34 (45.3)	25 (33.3)	59 (39.3)
<i>Better Ways to Manage Household Waste:</i>			
By recycling	61 (81.3)	55 (73.3)	116 (77.3)
By Composting	65 (86.6)	56 (74.6)	121 (80.6)
By treatment with microorganism	35 (46.6)	22 (29.3)	57 (38.0)
By fermentation	8 (10.6)	6 (8.0)	14 (9.3)
By vermicomposting	11 (14.6)	8 (10.6)	19 (12.6)
By high temperature treatment	26 (34.6)	7 (9.3)	33 (22.0)
<i>Awareness of Other Technologies of Waste Disposal:</i>			
Landfilling	10 (13.3)	7 (9.3)	17 (11.3)
Incineration	-	-	-
Pyrolysis	-	-	-

*Multiple responses (Figures in parentheses indicate the percentages)

Table 5: Suggestions for effective waste disposal practices

<i>Parameter</i>	<i>Barnala</i>	<i>Ludhiana</i>	<i>Total</i>
Proper and adequate placement of bins	65 (86.6)	45 (60.6)	110 (73.3)
Regular and proper disposal of garbage by municipal corporation	58 (77.3)	40 (53.3)	98 (65.3)
Proper disposal of waste in bins by people	43 (57.3)	22 (29.3)	65 (43.3)
Effective management of waste at community level	34 (45.3)	25 (33.3)	59 (39.3)
Effective Management of waste at individual level	25 (33.3)	16 (21.3)	41 (27.3)
Importation of education to people to aware them regarding environmental problems of waste	40 (53.3)	47 (62.6)	87 (58.0)
Door to door collection of waste done by municipal corporation	36 (48.0)	24 (32.0)	60 (40.0)
Regulation of laws regarding disposal of waste	11 (14.6)	43 (57.3)	54 (36.0)

*Multiple response (Figures in parentheses indicate the percentages)

organic fertilizers, which will help preserve soil fertility. The manure prepared by such plants will yield 20-25 percent extra (Anonymous 2000).

Suggestions for Effective Waste Disposal Practices

It can be seen in Table 5 that all the families felt, the need for effective disposal facilities. Three forth of respondents suggested proper and adequate placement of bins. Other suggestions given were: regular and proper disposal of garbage by municipal corporation, proper disposal of waste in bins by people, effective management of waste at community level as well as individual level, importance of education to people to aware them regarding environmental problems of waste, door to door collection of waste done by municipal corporation and regulation of laws regarding disposal of waste.

KEYWORDS Household Waste. Waste Disposal Facilities. Waste Effects. Waste Management

ABSTRACT Present study was conducted in two cities i.e. Barnala and Ludhiana of the Punjab state. Sample size of 75 from each city was obtained. Results of study revealed that 56.6 percent respondents in both the cities were satisfied with existing waste disposal practices inside home. Only 4 percent in Barnala and 52 percent in Ludhiana were satisfied

with existing waste disposal practices outside home. Most respondents (54.6 percent) in Barnala had nearby disposal site and in Ludhiana, 50.3 percent had disposal far away. In Barnala 33.3 percent and in Ludhiana 5.6 percent of respondents think that municipal committee bins are hygienic way of disposing bins. Most respondents were aware of adverse effects of waste material on environment. Majority of respondents (83.2%) were aware about malaria. Majority of respondents (57.3%) in both cities think that waste should be put into polythene bags. 86 percent respondents think that waste disposal is a problem. In Barnala 86.6 percent and in Ludhiana 74.6 percent of respondents had knowledge about composting. Incineration and process of pyrolysis is not known to anyone. Most of respondents suggest that there should be proper and adequate placement of municipal bins.

REFERENCES

- Anonymous: Solid waste plant to make a clean city of Jalandhar. Indian Express March 11 (2000).
- Berry, A.: *Management of Household Garbage in Ludhiana city*. M.Sc. thesis, Punjab Agricultural University, Ludhiana, India (1997).
- Jagmohan: Slum of the mind. India Today 25(5): 48-49 (2000).
- Karwasra S.: *Acceptability of Solid Waste Disposal System. A Case Study*, M.Sc. thesis, Chaudhary Charan Singh Agricultural University, Hisar, India (1997).
- Mehta M and Marwaha S.: Water Pollution in Ludhiana 'Alarming'. The Tribune Feb 13
- Suri, B.: Polythene problems. The Tribune June 1 (1996).
- World Health Organization: Yellow fever may hit India. The Times of India, 12-11-96 (1996).

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