



IMPROVING CHILD WASTE PICKER HEALTH: INDIVIDUAL AND INTERNATIONAL INITIATIVES - OBSERVATIONS AND EVALUATION IN GUWAHATI CITY

Dr.Lakhimi Gogoi

Assistant Professor, Department of Geography ,
Narangi Anchalik Mahavidyalaya,Guwahati, Assam ,India

ABSTRACT :

Guwahati the only city of Assam, with a population of 809895 (2001) is faced with multitude of problems- solid waste being one of them. The authorities responsible for the management of waste are unable to keep pace with the growing population size, diversified activities and expansion of the city. What we find therefore, is a large segment of rag pickers, informally and by default contributing towards waste management at the cost of their health by collecting recyclable materials such as paper, plastics, metals and the like for their livelihood.

The main objectives of the study are to understand the health implications related to waste handled unscientifically by the scavengers. The methodology adopted for the study is based on primary data covering all households engaged in and around the dump site in West Boragaon, Guwahati. Findings reveal significant correlation between various ailments and exposure of scavenger to an unhealthy/ polluted environment of their surroundings and the activities they pursue for their livelihood. The diseases they suffer from mostly are asthma, malaria, eye irritation, dysentery and stomach ailments.

Keywords: *Environment ,health ailments, Open dump, scavenger,west boragaon.*

I.Introduction:

Solid waste comprises all the wastes arising from human and animal activities that are normally solid, discarded as useless or unwanted. Solid waste management may be defined as the discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of wastes in a manner that is in accord with the best principles of public health,



economics, engineering, conservation, aesthetics, and other environmental considerations that are also responsive to public attitudes[1].

The domestic waste putrescible may include all household human and animal faeces from sources such as pet's faeces, soiled disposable napkins and occasionally human excreta. These are sources of pathogenic organisms that can affect the scavengers who depend on recyclable materials for their livelihood and other waste workers [2]. Brash [3], reported that the New Zealand practice of co disposal of toxic and hazardous materials with the other refuse, increases the likelihood of exposure to toxic and hazardous compounds. People living and working in the vicinity of solid waste processing and disposal facilities are also exposed to environmental health and accident risks[4].

According to Elliott *et al*[5],lag period of ten years are generally assumed for cancers to develop as a result of cancer-inducing agent exposure, and 5 years for lymphatic and hematopoietic cancers. Fire periodically breaks out in open dumps, generating smoke and contributing to air pollution. Dump managers in some cities deliberately set periodic fires at the dumps in order to reduce the volume of the wastes, creating room for more wastes and thus extend the life of the dumps [6]. Human scavengers may also cause intentional fires since metals are easier to spot and recover among ashes after the fires than among piles of mixed waste. Pruss *et al*,[7], reported that fire at a sanitary landfill can arise from hot ashes in a vehicle delivering wastes, a cigarette thrown down by worker, the sun rays through the fragment of glass on the surface. Landfill fires emit a variety of pollutants that have the potential to affect the health of people exposed to the smoke .The incomplete combustion of refuse burning emits particulate matter,



carbon-monoxide which is a common by-product of the incomplete combustion of fuels such as paper, cardboard and wood, acrolein, formaldehyde and other pollutants depending on the composition of waste[7]. The left over food and kitchen wastes attracts birds, rats, flies and other animals to the dump. Animals feeding at the dump may transmit diseases to human living in the vicinity. This paper highlights the implication of solid wastes exposure factors (smoke, dust and odour) on the health status of West Boragaon dumpsite workers and scavengers.

Large quantities of waste are often left uncollected in Guwahati city and these may accumulate on open lots clog drains and channels causing flooding.

Open dumps generate various environmental and health hazards. The decomposition of materials produces methane, which can cause fire and explosions and produce strong leachates, which pollute surface and ground water. It ruins the natural beauty of the land[4]. The West Boragaon dumpsite constitutes health hazard even to all passers-by due to the obnoxious smell oozing from the activities of micro-organisms on the uncontrolled waste during the wet season. In the same vein, the ensuing smoke that fills the air from the uncontrolled burning of solid waste during the dry season constitutes serious environmental pollution, adversely affecting solid waste workers and pickers. Toxic and hazardous wastes when burnt with other solid waste like asbestos fiber may introduce potential carcinogenic fiber to the smoke plume.

By inference therefore, the effect of the open burning of solid waste at the West Boragaon disposal site can constitute a serious health hazard on the residents near the dumpsite.

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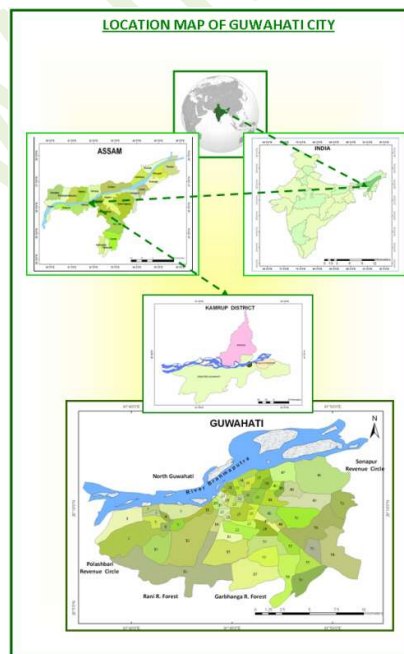
Large quantities of waste are often left uncollected in Guwahati city and these may accumulate on open lots clog drains and channels causing flooding. Open dumps generate various environmental and health hazards. The decomposition of materials produces methane, which can cause fire and explosions and produce strong leachates, which pollute surface and ground water. It ruins the natural beauty of the land[4]. The West Boragaon dumpsite constitutes health hazard even to all passers-by due to the obnoxious smell oozing from the activities of micro-organisms on the uncontrolled waste during the wet season. In the same vein, the ensuing smoke that fills the air from the uncontrolled burning of solid waste during the dry season constitutes serious environmental pollution, adversely affecting solid waste workers and pickers. Toxic and hazardous wastes when burnt with other solid waste like asbestos fiber may introduce potential carcinogenic fiber to the smoke plume.

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II. Study Area:

Guwahati city, the capital of Assam is located on the south bank of river Brahmaputra towards the south eastern side of Kamrup district. The absolute location of the city extends from $91^{\circ} 38' E$ to $91^{\circ} 51' E$ longitude and from $26^{\circ} 5' N$ to $26^{\circ} 12' N$ latitude (**Map.1**).

In the northern side the city is bounded by mighty river Brahmaputra and in the southern side the city is surrounded by hillocks which is the extension of Khasi hills. In the west and the south west there are the Rani Reserve Forest, Deepar Beel wetland and the alluvial tracts of the Brahmaputra plain. The city is situated on an undulating plain with varying altitudes of 49.5 m to 55.5 m above mean sea level. The city covering a municipal area of 216 square kilometer .With the rapid growth of population the city is unable to keep pace with proper management of municipal solid waste.

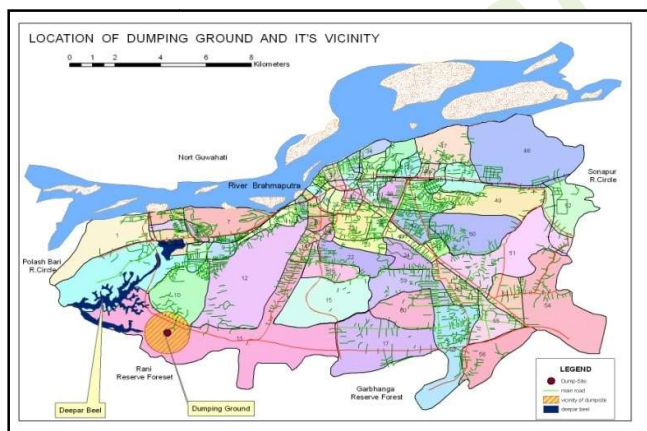


Map. 1

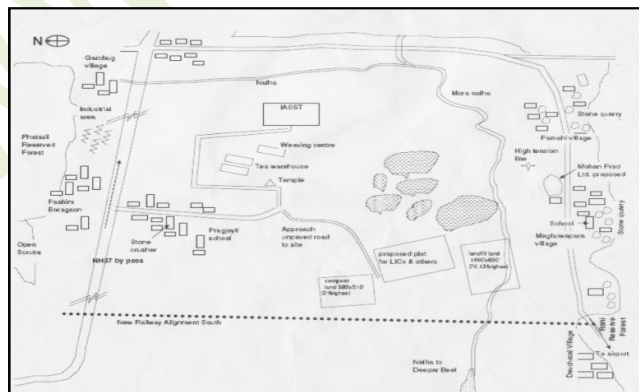


Working in a private public partnership model collect, carry the infectious medical wastes, toxic industrial solid wastes and domestic wastes and disposes it in open space dumpsite which is located at West Boragaon.

West Boragaon is the study area in present study and it covers the 24.12 hectare area. It is situated in capital city Guwahati in Assam. The longitude and latitude of the study area is $91^{\circ} 38' 0''$ E to $91^{\circ} 41' 0''$ E longitude and from $26^{\circ} 5' 0''$ N to $26^{\circ} 8' 0''$ N latitude. The India's largest river Brahmaputra passes in the northern side of the study area and Ramsar site wetland Deepar beel is situated within 1.5 kilometre of the area (Map.2 a,2b).



Map. 2 (a)



Map. 2 (b)



II.Objective of the Study:

The main focus of the study is -

- (1) Livelihood of scavengers around the dumpsite.
- (2) Occupational Health hazard.
- (3) Effect of solid waste handling on scavengers.

III. Methodology:

Data were gathered through the use of structured questionnaires and oral interview [7] covering all households engaged in scavenging around the dump site in West Boragaon. The questionnaires covered occupational information and occupational health hazard. Occupational health information was included in order to determine the effect of solid waste on scavengers.

IV. Result and Discussion:

The percentage description of sex of workers is presented in Table 1.

Table 1: Percentage frequency of workers by sex

| Sex | No. of Scavengers | | | Percentage |
|--------|-------------------|-------|-------|------------|
| | Child(Belo | Adult | Total | |
| Male | 16 | 22 | 38 | 47 |
| Female | 19 | 23 | 42 | 53 |
| Total | 35 | 45 | 80 | 100 |

There are more female workers (53%) than male (47%) at the dumpsite.

There are more scavengers at the West Boragaon Dumping site and most of them are females (Figure 1).

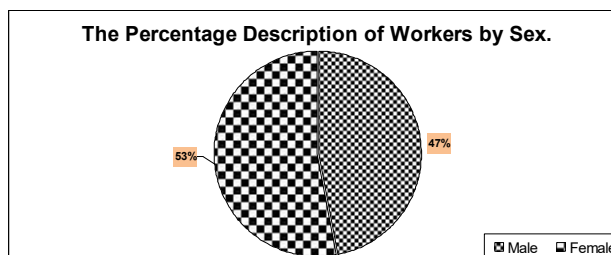


Figure 1.



Women make up a majority of waste pickers in West Boragaon dumpsites (fig. 2) and the hazards of their work lead to infant mortality and deformity. This can be attributed to the culture and social values of scavengers' women which are considered debasing and hazardous to women health.

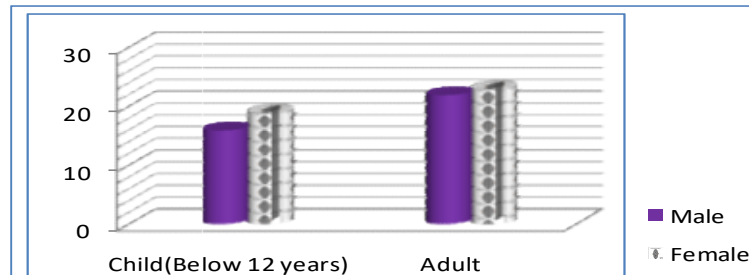


Figure 2. Description of workers by age .

The percentage frequency description of the length of years of service on the job is presented in Table2.

Table 2: Percentage frequency of years of exposure of the workers

| No. of Years | Frequency | Percentage |
|--------------|-----------|------------|
| 1 | 3 | 7 |
| 2 | 4 | 13 |
| 3 | 8 | 20 |
| 4 | 10 | 27 |
| 5 | 15 | 33 |
| Total | 40 | 100 |

The percentage of respondents suffering from different ailments is presented in Table 3. The duration of years of exposures indicates the numbers of years the workers have been working at the site. The workers who have spent four years gave the highest number (40%) followed by those with three years, while those with 1 year gave the least number (10%)(Figure 3).

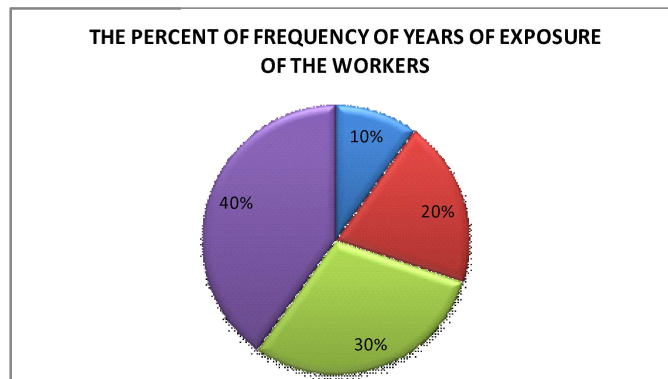


Figure 3. The percentage frequency of years of exposure of the workers.

During the field survey it has found that out of total population 40 % people came more than five years.30% people came more than two years , 20% people came more than two years and 10 % people came within one year. The people live here has been suffering different kinds of diseases.The diseases and percent of affect in different people are presented in table 3. From the study it is highlighted that back pain presented highest percentage (96%) .

Due to carry the heavy bag with scrap metal. According to Leton and Nweke [2]in their findings on the survey on the health risks of domestic solid waste scavenging at fifteen (15) different dumpsites in Port Harcourt, Rivers State, Nigeria, bending position and carrying of heavy loads of scavenged items cause backache, pains in the arms and legs, stiffness of joints. Fatigue presented the second highest percentage(94%) as a result of the effect of sun, rain, the influence of smoke, dust and odour. The dry atmosphere and waste carrying trucks makes the area dusty. The burning of solid waste polluted the air in the West Boragaon area. Exposure to smoke particles can reduce the ability to breathe, and reduce resistance to diseases. Existing respiratory conditions may also be aggravated. Those with greater pulmonary sensitivity may show a much



greater reduction in lung function than the others [6]. Most of the respiratory diseases are attributed to exposure to smoke and dust. Smoke from incomplete combustion contains formaldehyde. Low atmospheric concentration of formaldehyde causes eye irritation, coughing and irritation of the lungs [3]. In West Boragaon dumpsite area eye irritation presented 88%, cold and coughing presented 92 %.

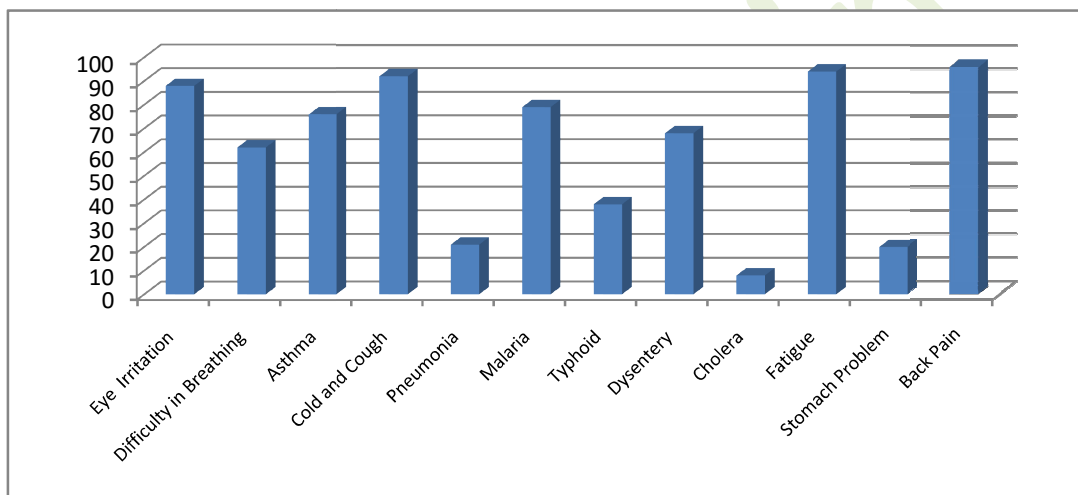


Figure 4. The percentages of research diseases on West Boragaon dumpsite workers.

Discomfort increases rapidly with increase exposure and asthmatic symptom may occur due to development of allergic sensitivity. The findings in this study are in accord with that reported by Huisman [8], on the health studies of waste pickers in Bangalore, Manohar, and New Delhi where tuberculosis, bronchitis, asthma, pneumonia, dysentery, parasitizes and malnutrition are the most commonly experienced diseases among the scavengers. Tones et al [9] reported 23% chronic cough, wheezing 25%while 3% had active pulmonary tuberculosis in their study on children scavengers. The correlation between the exposure factors and the research diseases is presented in Table 4.



Table 4: Correlation between the exposure factors and the research diseases

| | Eye Irritation | Difficulty in Breathing | Asthma | Cold and Cough | Pneumonia | Malaria | Typhoid | Dysentery | Cholera | Fatigue | Stomach Problem | Back Pain | Odour |
|-------------------------|----------------|-------------------------|--------|----------------|-----------|---------|---------|-----------|---------|---------|-----------------|-----------|---------|
| Eye Irritation | 0.000 | | | | | | | | | | | | |
| Difficulty in Breathing | -0.245 | 0.000 | | | | | | | | | | | |
| Asthma | -0.231 | 0.592** | 0.000 | | | | | | | | | | |
| Cold and Cough | -0.118 | 0.561** | 0.026 | 0.000 | | | | | | | | | |
| Pneumonia | -0.118 | -0.026 | 0.161 | 0.371 | 0.000 | | | | | | | | |
| Malaria | -0.238 | -0.011 | -0.118 | -0.129 | -0.042 | 0.000 | | | | | | | |
| Typhoid | -0.312 | -0.341 | -0.229 | -0.443 | -0.173 | -0.007 | 0.000 | | | | | | |
| Dysentery | 0.118 | -0.004 | -0.026 | -0.003 | -0.171 | -0.421 | -0.251 | 0.000 | | | | | |
| Cholera | -0.112 | -0.431 | -0.518 | -0.258 | -0.146 | -0.128 | -0.116 | -0.109 | 0.000 | | | | |
| Fatigue | 0.510** | 0.312 | 0.401* | 0.513** | 0.326 | 0.314 | 0.216 | 0.312 | 0.412* | 0.000 | | | |
| Stomach Problem | 0.245 | -0.046 | -0.042 | -0.312 | -0.210 | 0.179 | -0.421 | 0.401* | -0.132 | 0.453* | 0.000 | -0.453 | 0.562** |
| Back Pain | 0.245 | -0.118 | -0.044 | -0.136 | -0.518** | -0.162 | -0.318 | 0.002 | -0.341 | 0.532** | -0.352 | 0.000 | -0.162 |
| Odour | -0.119 | -0.319 | -0.178 | -0.116 | -0.167 | -0.049 | -0.221 | 0.142 | -0.026 | 0.551** | 0.438* | 0.118 | 0.000 |

*= Significant at 85%
 **= Significant at 95%

Positive correlations have been found among some diseases and unscientific waste disposal. The improper disposal of municipal solid waste makes the area filthy. Odor, smell, smog, breeding of fly and mosquito makes the area more hazardous. The cause of typhoid, malaria, cholera and dysentery may be attributed to the flies and mosquito [10], which finds their breeding space on the solid wastes containing 68% vegetable/putrescible [11], which are left to decompose for months. Insects and rodents proliferate in garbage dumps, which can transmit plagues, typhoid, cholera, skin diseases and malaria with the breeding of mosquitoes in rain water stagnant in garbage dump [12]. In the study area, a positive correlation has been found in difficulty in breathing and asthma, cold and cough; fatigue and eye irritation, difficulty in breathing, back pain, stomach problem, odor, cold and cough. From the correlation, it was observed that fatigue is a very important ailment which affects the mental health of the scavengers. The poor mental health of those scavengers leads to the unsocial activities among them and nearby people also.

Smoke-filled air from dump fire causes poor visibility to road users around West Boragaon dumpsite and this has the potential to cause road accidents. In addition, gas emission from the activities of micro-organisms on the



decomposable wastes makes the dumpsite unbearable to the nearby residents. Answers to oral interview with some of the scavengers and the dump site workers reviewed that scavengers suffered many diseases for which they bear hospital bill themselves. The situation with the dump workers is not much better as their health needs are seldom taken care of by the government.

V. Conclusion:

Improper disposal of solid wastes poses potential risks to health. Direct health risks concern mainly the dumpsite workers who need protection from hazards of dumpsite burning, dust, odour and skin contact with the wastes. The open dump solid wastes disposal practice at the West Boragaon dumpsite is not in accord with the best principles of public health and environmental protection. Scavenging plays a vital role in resource recovery/reuse but in the process endangers lives.

There is no formal sector programmed for reduced health hazards on scavenger. Assam State Government needs to consider the option of zero waste, which will involve the population in sorting process from source of generation before collection of waste by the Guwahati Municipal Corporation and other agents. Material recovery facilities can be installed in every loading station with conveyance, sorting and processing facilities which can enable the recovery of secondary materials such as paper, carton, glass, etc, from the solid wastes. This will, in effect, reduce the health danger faced by the scavengers at the dumpsite, and eliminate fire incidences that may emanate from packages of flammable materials with other items. Government should formulate policy regulation and enforcement measures to control waste burning at the dumpsite in order to safeguard the health of workers, residents and passers-by.



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