Domestic Waste Disposal and Management in Lunglei District Mizoram

C. Lalengzama[1],* & F. Zorameni[2]

[1]Department of Social Work, Higher and Technical Institute Mizoram (HATIM), Lunglei
[2] Social Worker, Lunglei
*Corresponding Author: teachongthu@gmail.com

Abstract

Waste may include any form of material that are non-useful and non-ordered form and which are not in a proper place and may be in a wrong place as they are already discarded which is not and sometimes it does not possess economic value and are not useful for the owner and waste generator. Solid wastes are substance in non-liquid form which longer have no value for the owner and is often referred to as rubbish, garbage and trash as synonym. Domestic wastes are wastes that are generally generated by household. Most of the wastes are kitchen waste, garbage from household activities and human excreta it may in solid or liquid. India is the second most populated nation in the world and the administration is ironically without enough resources or adequate systems to manage solid waste which is mainly due to unbalanced growth of urban population and poor services on waste management. Mizoram is one of the states in India where the process of urbanization resulted in rapid increase of waste disposal. Waste disposal has become an emerging problem for the people as there are no proper waste management system and proper place to dispose household waste. The paper discussed the nature and process of domestic waste disposal system and the traditional way of management in Mizoram which is mainly open dumping near the village. It also highlights the challenges faced by households in domestic waste disposal within the community.

Keywords: *Domestic Waste, Waste Management, Waste Disposal, Open Dumping, Solid Waste*

Introduction

Waste may include any form of material that are non-useful and non-ordered form and which are not in a proper place and may be in a wrong place as they are already discarded (Stokoe and Teagu 1995) and sometimes it does not possess economic

value and are not useful for the owner and waste generator (Lilliana *et al.* 2013).Solid waste are non-liquid substance which longer have no value for the owner and is often referred to as rubbish, garbage and trash as synonyms (Zhu *et al.* 2008). However, waste is used as a resource if it is recycled and dumped in the right place as a land fill. Waste is created from a variety of sources including our daily activities. Solid waste includes wastes that are generated from residence, store and other commercial activity, industries and construction work.

Domestic wastes are wastes that are generally generated by household. Most of the wastes are kitchen waste, garbage from household activities and human excreta it may in solid or liquid. Household waste may also be classified based on its source viz., municipal waste, industrial waste and hospital waste as infectious waste. Industrial wastes are regarded as hazardous and hospital waste as infectious. So there is a dire need for proper disposal and management system. However, the present study will focus on domestic solid waste and its management by household. Domestic solid waste management comprehends all the activities of management from generating waste till its disposal. Municipal Solid Waste usually contains waste produced at home such as leftover food, paper, plastics, textiles, glass, metals, wood, landscape and sometimes other household wastes like batteries, medicines and electronic gadgets are also found among Municipal Solid Waste (Annepu 2012; Kamara 2006).

Waste Management and disposal method

Waste management provided by government and urban local bodies are public necessity. Waste management is the systematic organized method of directing of waste till its disposal without causing problem to health and environmental balance (Kofoworola 2007). Solid Waste Management includes all activities connected to control generation, collection, transport, processing and disposal of waste which is carried out in accordance with public health consciousness (Sujauddin *et al.* 2007). Therefore, the main aim of waste management is to reduce and minimize harmful effects of waste on public health and environment. However, solid waste management practices have another prospect for domestic and commercial institutions, for urban and rural areas, and based on the administration of a nation. The local government is usually responsible for the wastes that are non-hazardous in the meantime hazardous waste are usually the responsibility of the waste generator which may also include authorities from the government and there will always be standard procedure for its disposal (Annepu 2012).

The term waste disposal means discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste on land or water. The nature of disposal and place of disposal will determine whether it is harmful for the community (El-Fadel *et al.* 1997). Beside these other kinds of disposal method which is systematized and environmental friendly could be observed such as Recycling, incineration, Re-Use,

Landfill and, and Composting. Open dumping sites need proper management if not properly managed.

Recycling mainly refers some waste that can be used as raw material where Re-Use includes a process conversion of waste materials into usable resource through a variety of processes which includes Biological reprocessing, Energy recovery, Paralysis and Resource recovery (Annepu 2012), Land fill and open-dumping includes Open dumps or open land fill, operated Landfill, Sanitary land fills and Composting (Visvanathan and Tränkler 2003).

India is the second most populated nation in the world and the administration is ironically without enough resources or adequate systems to manage solid waste which is mainly due to unbalanced growth of urban population and poor services on waste management. In 2011, the waste generated increased to 0.5 kg/day from 0.44 kg/day in 2001 which is driven by changing lifestyle and purchasing capacity of the people (Annepu 2012). Sometimes it may be because of heavy expenditure and lack of resources. Unmanaged solid waste affect public health causing environmental pollution resulting in climate change (Sharholy *et al.,* 2008).

Overview of Solid Waste Management in Mizoram

In 2011 Census, total population of Mizoram is 1,097,206 where male are 555,339 and female are 541,867 respectively which is only 0.09 percent of India in 2011. Due to the rapid increase in population and urbanization, more waste is produced and disposed. Waste management became emerging problem for the people as there is no proper waste management system even by the government. Moreover, there are no proper places to dispose and there are no awareness in regards to the effects of waste and the causes. The people were not aware about the health and environmental effects due to improper disposal of waste. Mizoram is in a process towards development as well as in terms of waste disposal and its management. Therefore, waste has become problem and issue for the people as well as for the government, as the people are not provided a regular service to dispose waste (GOM 2017).

The government of Mizoram took initiative in regards to waste management from 1970's in Aizawl, the government placed the trailer in the public places where people throw their waste and it is used to dispose in a restricted area by contractor which ended in 2009. A new project had begun which is called Public private partnership, where the government did not dispose the waste but the people by their own which is organized under the guidance of the village council which are disposed in the dumping ground near Tuirial village which is around 5 km from Aizawl city. Wastes are mainly burned in the dumping site and no other method of waste management is used. Presently Aizawl produce 159.8 tons of waste every day and wastes management is generally taken up by State Investment Programme Management and Implementation Unit (SIPMIU).

Table 1.1: Profile of respondents

Sl. No.	Particular	No of Respondents	Percentage
I	**Gender**	**n=85**	
1	Female	47	55
2	Male	38	45
II	**Age**		
1	Youth	36	42
2	young adult	10	12
3	Adult	12	14
4	Elderly	27	32
III	**Educational Status**		
1	below middle	31	36
2	High school	23	27
3	Higher Secondary	15	18
4	Above graduate	16	19
IV	**Denomination**		
1	Baptist	58	68
2	Presbyterian	8	9
3	UPC(NE)	6	7
4	UPC(MZ)	2	2
5	Salvation army	1	1
6	ECM	5	6
7	Seventh day	5	6
8	Others	0	0

Source: Computed

Table 1.2: Family Profiles

Sl. No.	Particular	No of Respondents	Percentage
I	**Family Occupation**		
1	Govt. servant	37	44
2	Business	6	7
3	Manual Labor	3	4
4	Farmer	3	4
5	Skilled labor	36	42
6	Others	0	0
II	**Socio-economic category**		
1	BPL	26	31
2	AAY	2	2
3	APL	57	67
III	**Size of Family**		
1	Small	12	14
2	Medium	43	51
3	Large	30	35

Source: Computed

Table 2.1: Types of waste disposed

Sl. No.	Particular	No of Respondents	n=85	
		Regular	Sometimes	Never
1	Aluminum	0 (0)	3 (4)	82 (96)
2	Glass	18 (21)	43 (51)	34 (40)
3	Plastic	29 (34)	38 (45)	18 (21)
4	Paper	81 (95)	4 (5)	0 (0)
5	Food waste	10 (12)	35 (41)	40 (47)
6	Toilet waste	0 (0)	0 (0)	85 (100)
7	Cloths	2 (2)	65 (76)	18 (21)
8	Parcel	45 (53)	36 (42)	4 (5)
9	Polythene	78 (92)	4 (5)	3 (4)
10	Sanitary pads	79 (93)	6 (7)	0 (0)
11	wood/leaf	41 (48)	35 (41)	9 (11)
12	Bones	79 (93)	6 (7)	0 (0)

Source: Computed   *Figure in parentheses are percentages*

Table 2.2: Frequency of Disposal

	Frequency of waste disposal					
Sl. No.	Particular	No of Respondents(n=85)				
		once in a week	twice in a week	thrice in a week	more than 4 times	not utilized
1	Door to Door collection (UD&PA)	20 (24)	0 (0)	0 (0)	0 (0)	65 (76)
2	Dumping site	4 (5)	6 (7)	16 (19)	59 (69)	0 (0)
3	Burning	6 (7)	3 (4)	3 (4)	0 (0)	73 (86)
4	Backyard dumping site	0 (0)	1 (1)	0 (0)	2 (2)	80 (80)
5	Manure decomposition site	1 (1)	0 (0)	0 (0)	1 (1)	83 (98)

Source: Computed   *Figure in parentheses are percentages*

Table 2.3: Place of waste disposal

Sl. No.	Particular	Place of waste disposal	
		No of Respondents n=85	
		Yes	**No**
1	Door to Door collection (UD&PA)	17 (20)	68 (80)
2	Dumping site	79 (93)	6 (7)
3	Backyard dumping site	10 (12)	75 (88)
4	Manure decomposition site	4 (5)	81 (95)

Source: Computed   *Figure in parentheses are percentages*

Table 2.4: Tool used for storage of waste

Sl. No.	Particular	No of Respondents	n=85		Mean
		Regular	**Sometimes**	**Never**	
1	Garbage Bag	14 (16)	15 (18)	56 (66)	1.5
2	Plastic Container	80 (94)	1 (1)	4 (5)	2.9
3	Tin container	2 (2)	6 (7)	77 (91)	1.1
4	Polythene	76 (89)	9 (11)	10 (12)	2.6
5	Sack	3 (4)	3 (4)	79 (93)	(1.1)
6	Cement bag	3 (4)	7 (8)	75 (88)	(1.1)
7	Parcel	6 7	4 5	75 88	1.2

Source: Computed   *Figure in parentheses are percentages*

Table 2.5: Household waste Management

Sl. No.	Particular	Management of household waste			**Mean**
		No of Respondents	n=85		
		Regular	**Sometimes**	**Never**	
1	Backyard dumping site	6 (7)	2 (2)	77 (91)	
2	Manure decomposition site	2 (2)	0 (0)	83 (98)	

Source: Computed   *Figure in parentheses are percentages*

Table 2.6: Awareness level

Sl. No.	Particular	No of Respondents		n=85		Mean
		strongly agreed	agreed	Disagree	Strongly disagree	
1	Pollute environment	21 (25)	62 (73)	2 (2)	0 (0)	(3.1)
2	Pollute river water	14 (16)	69 (81)	2 (2)	0 (0)	(3.1)
3	Affects health	14 (16)	66 (78)	5 (6)	0 (0)	(3.1)
4	Fire	14 (16)	65 (76)	6 (7)	0 (0)	(3.0)
5	Increase malaria	7 (8)	72 (85)	6 (7)	0 (0)	(2.9)
6	Cholera/diarrhea	5 (6)	72 (85)	7 (8)	1 (91)	(2.9)
7	Initiative taken by village council	0 (0)	69 (81)	16 (19)	0 (0)	(2.8)
8	Initiative taken by UD&PA	0 (0)	77 (91)	8 (9)	0 (0)	(2.8)
9	Initiative taken by YMA	0 (0)	77 (91)	8 (9)	0 (0)	(2.9)

Source: Computed   *Figure in parentheses are percentages*

Table 2.7: Challenges Faced

Sl. No.	Particular	No of Respondents		n=85		Mean
		Strongly Agree	Agree	disagree	Strongly disagree	
1	Initiative of VC members are not good enough	3 (4)	73 (86)	8 (9)	0 (0)	(2.9)
2	It increase house fly	26 (31)	54 (64)	5 (6)	0 (0)	(3.2)
3	Fire	15 (18)	58 (68)	12 (14)	0 (0)	(3.0)
4	Landslide	3 (4)	64 (75)	18 (21)	0 (0)	(2.8)
5	Cough and cold	6 (7)	62 (73)	17 (20)	0 (0)	(2.8)
6	Cholera/diarrhea	5 (6)	56 (66)	14 (16)	0 (0)	(2.8)
7	Cause Pollution in the community	24 (28)	55 (65)	5 (6)	0 (0)	(3.2)
8	Unhygienic smell for neighborhood	23 (27)	56 (66)	6 (7)	0 (0)	(3.2)
9	Irregular door to door	3	79	3	0	(3.0)

	collection by UD&PA	(4)	(93)	(4)	(0)	
10	Need proper Dumping site	7	73	5	0	3.0
		8	86	6	0	
11	Lack of proper place for waste Disposal	3 (4)	56 (66)	16 (19)	0 (0)	(2.8)

Source: Computed   *Figure in parentheses are percentages*

Table 2.8: Efforts taken by NGOs and other Social Institutions

Sl. No.	Particular	No of Respondents	n=85			
		Highly Satisfactory	Satisfactory	Unsatisfactory	Highly unsatisfactory	Mean
1	Sanitation committee	38 (45)	6 (7)	38 (45)	3 (4)	(2.9)
2	YMA	40 (47)	1 (1)	37 (44)	7 (8)	(2.8)
3	UD&PA	35 (41)	3 (4)	42 (49)	5 (6)	(2.8)
5	MUP	3 (4)	10 (12)	56 (66)	16 (19)	(2.0)
6	MHIP	2 (2)	12 (14)	54 (64)	17 (20)	(1.9)
7	VC	31 (36)	42 (49)	8 (9)	4 (5)	(2.7)
8	COMMUNITY	7 (8)	68 (80)	13 (15)	17 (20)	(2.1)
9	CHURCH	5 (6)	12 (14)	52 (61)	16 (19)	(2.0)

Source: Computed   *Figure in parentheses are percentages*

Table 2.9: Effect of improper waste disposal

Sl. No.	Particular	No of Respondents (n=85)			Mean
		Regular	Sometimes	Never	
1	Fire	8 (9)	59 (69)	18 (21)	(2.1)
2	Landslide	0 (0)	5 (6)	80 (94)	(2.9)
3	Diarrhea	2 (2)	33 (39)	50 (59)	(2.5)
4	Glittering of waste in the street	3 (4)	64 (75)	18 (21)	(2.2)
5	Block of drainage	15 (18)	38 (45)	32 (38)	(1.2)
6	It produce bad smell	66 (78)	15 (18)	4 (5)	(2.1)
7	Spoil crops	17 (20)	39 (46)	29 (34)	(2.6)
8	Pollute spring well	10	8	67	(1.2)

		(12)	(9)	(79)	
9	Communicable diseases	17	34	34	
		(20)	(40)	(40)	(2.2)

Source: Computed   *Figure in parentheses are percentages*

Waste management and disposal in Lunglei district is taken up by Urban Development and Poverty Alleviation Department. Sanitation programme named 'door to door collection' which begun in the year 1997. A specific government vehicle is assigned to collect domestic waste from assigned sanitation point at different community on specified days. The collected wastes were disposed the waste 18 km way from Lunglei town. There is no proper management system and burning in the dumping site is the only option. Collection of waste under Public-Private Partnership began in Lunglei with a non-governmental organization as the government services are not enough.

The awareness level of the people is still low and management systems are not known by the people. As the services of the government is not regular the waste generated by households are dumped in nearby cliff in their own locality. Domestic waste disposal has been an issue and its management has been a challenge faced by the government The Municipal Solid Wastes (Management and Handling) Rules, 2000 was introduced which marked development but was not satisfactory in the process of implementation.

Methodology

The universe of the study comprises all the waste producing households in Mizoram. The present study is both exploratory and descriptive in nature as there is no research conducted in areas of domestic waste disposal and management within Mizoram. Lunglawn community is purposefully selected for study as it is a community where the researcher observed coexistence of community open dump site and door to door collection programme of the government. Disproportionate stratified random sampling method was used to select household. Households are classified into far and near to local dumping site in the community. Mix method is used for data collection. Quantitative method is employed where a pre-tested questionnaire is used to collect quantitative data. PRA method is also used to understand the field setting. Besides transect walk and observations were also used to identify the local dumping site and nature of waste disposal. The quantitative data collected was processed with the help of Microsoft Excel and are analyzed with the help of percentages and average.

Results and Discussion

1. **Structural Bases of Respondents:** The structural bases of respondents in the present study are studied by analyzing the profile of respondents and family profile.

Four variables are taken to study the Profile of respondent viz., Gender, Age, Educational qualification and religious denomination (See Table No 1.1). Female respondents (55%) are higher

as compared to male respondents as the available respondents at home are mostly women. The age of respondents are classified as Youth (below 30), Young adult (31-40), Adult (41-50) and Elderly (51 and above). Youth comprises the highest rate by 42% and is followed by elderly with comprising 32% and adult and young adult 14% and 12% respectively. The educational status of the respondents is not so high as 36% of the respondents are below middle school. As study is conducted in areas where Baptist denomination constituted the largest, 68% of the respondents also belong to Baptist.

To study the Profile of family three variables are taken for studies viz., family occupation, Socio economic condition and size of the family (See Table No 1.2). The family occupation in the present study was divided into Government Servant, Business, Manual Labor, Skilled Labor, Farmer and others. Most of the families are depending on government servant (44%) and skilled labor (42%). To understand the household economy, the socio-economic condition is studied where most of the household belongs to Above Poverty Line (67%) followed by Below Poverty Line (31%). The Size of family is analyzed to understand the strength and background of the respondents. More than half of respondent's family belongs to Medium family (51%) followed by large family (35%) and small family (14%).

1.1. Household Solid Waste Disposal and management system: To understand the household's Solid Waste disposal and management system in the present study the following variables are studied viz., Types of waste, Frequency of Disposal, Place of waste disposal, Material used for storage of waste, Awareness level, challenges faced, efforts taken by NGOs, and effect of waste disposal.

1.1.1. Types of waste: The types of waste in the present study are classified into aluminum, glass, plastic, paper, food waste, toilet waste, cloths, parcel, polythene, sanitary pads, wood/leaf and bones (See Table No 2.1). The different classification of waste disposed by the respondents is rated as regular, sometimes and never. Among the types of waste Paper (95%), Parcel (53), Polythene (92%), wood/ leaf (93), sanitary pad (48%), Bones (93%) are regularly disposed by the respondent's household as they are daily waste that are disposed and utilized. Glass (51%), Plastic (45%), Cloth (76%) disposal are rated as sometimes because they are only disposed when they lose their value. Aluminum (96%), Food wastes (47%) and Toilet Waste (100%) is rated as never disposed by the respondent's family because aluminum are valuable product that can be sold and food waste are never disposed as

they are mainly utilized it for animal husbandry also majority of the respondent use septic tank so toilet waste are not meant to dispose. Recycling is absent in the process of local solid waste disposal.

1.1.2. **Frequency of Disposal:** The frequency of waste disposal in the present study is observed according to the frequency of household waste disposal at UD&PA, Local Dumping site, burning, backyard dumping site and manure decomposition site (See Table 2.2). The frequency of disposal of waste is rated as once in a week, twice in a week, thrice in a week, more than four times in a week.

In the present study 24% of the respondent household disposed their waste through the door to door collection service of UD&PA. The department of Urban Development and Poverty Alleviation collect waste from the community once in a week since 2000and the name of the service is called door to door collection. In the mean time 76% of the respondent's household do not utilized the service because of the irregularity and some place in the community was not reached by the service.

The entire respondent households in the present study utilized local dumping site. 69% of the respondent household disposed their waste more than four times a week, 16% household disposed thrice in a week, 6% household disposed twice in a

week, 4% household disposed once in a week. Dumping waste nearby houses has been a tradition from the past as there were no proper waste management systems in the state. So, the local dumping site are quite useful and the only option for the community.

Burning is also regarded as one way of managing waste organic waste viz., leaf, Wood, and garden waste. Burning waste services are not available as 86% of the respondent declared that they do not utilize burning of waste. But the household burning their waste in their own convenience and in their own place were observed.

The respondent households in the present study do not prepare proper backyard dumping site (80%) which may be due to lack of space and availability of nearby local dumping site.

Only few households in the present study are aware of the technique for utilizing decomposing waste for manure and most of the household in the present study have not utilized manure decomposition site.

1.1.3. **Place of waste disposal:** The place of waste disposal observed in the present study is classified as Door to Door collection of UD&PA, Local Dumping site, Back yard dumping site and manure decomposition site (See Table no.2.3). Majority of the respondent household in the present study disposed their waste local in

dumping site (93%). Door to Door collection of UD&PA is utilized by only 20% of the respondent households. Backyard dumping (12%) and manure decomposition (5%) are almost absent.

1.1.4. **Tools used for storage of waste:** The tools used for storage of waste observed in the present study is categorized as garbage bag, plastic container, Tin Container, polythene, sack, cement bag, parcel. The frequency of use of tools for storage is rated with three point scale as regular (3), sometimes (2) and never (1) (See Table 2.4). Among the material used for storage of waste Plastic Container (94%), Polythene (89%) is regularly used by the respondent household as they are cheap and easy available. Garbage Bag (66%), Tin container (91%), Sack (93%), Cement bag and Parcel (88%) are rater as never used by the respondents for storage of waste because garbage are costly to effort and others are very rare and they are utilized for another purposes. Among the tools observed Plastic container (2.9) and polythene (2.6) are commonly used whereas other tools viz., garbage bag (1.5), tin container (1.1), sack(1.1), cement bag(1.1), parcel (1.2) which are not even used sometimes.

1.1.5. **Household waste management:** Simple management of household waste is observed viz., Backyard dumping site and Manure decomposition site which is rated as regular, sometimes and never (See Table No.2.5). The household waste management of Backyard dumping site (91%) and Manure decomposition site (98%) are rated as never used by the respondent household for managing waste which might be because people are not aware of it. But a few cases are observed in the present study which gives a notion that household level management have started in terms of waste disposal.

1.1.6. **Awareness level:** The statement of the respondent is taken in the present study to know the awareness level in regards to solid waste disposal system and its effect. The respondents are given a statement and a problem to rate using four point scale under a criteria viz., strongly agree (4), agree (3), disagree (2) and strongly disagree(1) (See Table no.2.6). The respondents in the present study agreed to the effect of improper waste disposal viz., Pollute environment (3.1), Pollute river water (3.1), Affects health (3.1) and Fire (3). The awareness level of respondents on effect on environment and health issues is high where the respondents do not believe that there is relationship between poor waste disposal system and spread of malaria (2.9), cholera/diarrhea (2.9). However, the initiative taken by the Young Mizo Association (2.9) and Village Council (2.8) of the respondent locality is also rated as

unsatisfactory. In the mean time even the concerned government department i.e. Urban Development and Poverty Alleviation (2.8) is also rated as unsatisfactory which is mainly on the door to door collection which is irregular.

1.1.7. Challenges Faced due to waste disposal system: The challenges faced due to waste disposal system in the present study are categorized as Initiative of Village Council are not good enough. It increases house fly, Fire, Landslide, Cough and cold, Cholera/diarrhea, Pollute the community, Unhygienic smell for neighborhood, Irregularity of UD&PA, Dumping site is useful or important, irregular door to door collection by UD&PA there is no place of proper waste disposal, It produce an unpleasant smell. These statement and identified problems are rated with four point scale as strongly agree (4), agree (3), disagree (2) and strongly disagree (1) (See Table no.2.7). The respondents in the present study agreed that It increase house fly (3.2), Fire (3), Cause Pollution in the community (3.2), Unhygienic smell for neighborhood (3.2), Need proper Dumping site (3), irregular door to door collection by UD&PA(3). Where Landslide (2.8), Cough and cold (2.8), Cholera/diarrhea (2.8) are not believed to be associated with improper waste disposal. Surprisingly Lack of proper place for waste disposal (2.8) is regarded not

as a problem which may be because of the dependency on local dumping site from time immemorial where there is no replacement service and even the topography support easy dumping of waste nearby.

1.1.8. Efforts taken by NGOs and Other Organization: The efforts of different NGOs and other Organizations are analyzed to understand the level of participation in cleanliness as an organization. Different organizations in the present study observed are Village Sanitation Committee (2.9), YMA (2.8), MHIP (1.9), MUP (2), VC (2.7), UD&PA (2.8), and Church (2). It is surprising to see that all the organizations were rated as unsatisfactory in their contribution towards cleanliness.

1.1.9. Effect of local waste disposal: The effect of the improper local waste disposal system in the present study observed are Fire, Landslide, Diarrhea, Glittering of waste in the street, Blockade of drainage, spoil crops, Pollute spring well, produce bad smell and communicable diseases. These effects observed are rated with a three point scale as regular (3), sometimes (2) and never (1) (See Table No 2.9). Fire (2.1), Landslide (2.9), Diarrhea (2.5), Glittering of waste in the street (2.2), spoil crops (2.6), produce bad smell (1.2) and communicable diseases (2.2) are the effect that are faced sometimes. It is disturbing to find that Blockade of drainage (1.2) and Pollute spring well (1.2) are rated as

an incident that never occurs in the community due to improper waste disposal. This is mainly because the dependency on spring well is decreasing and are not used for domestic purposes. Where blockade of drainage is not seen as the area of research did not have much drainage system.

Conclusion

The present study attempts to highlight domestic waste disposal system and management in Mizoram. Most household disposed their waste through the door to door collection service of UD&PA that is available only once a week which is irregular. In the meantime, some of the household do not utilized the service because of the irregularity and some place in the community was not reached by the service. The entire respondent households in the present study utilized local dumping site. Dumping waste nearby houses has been a tradition from the past as there were no proper waste management systems in the state. So, the local dumping sites are quite useful and the only option for the community. But some of the household burn their waste in their own conveniences usually near their house and majority do not prepare proper backyard dumping site.

For storage and collection Plastic Container and Polythene are regularly used as they are cheap and easy available in the community. Garbage Bag, Tin container, Sack, Cement bag and Parcel were not utilized in greater frequency for storage of waste because garbage are costly to effort and others are very rare and they are utilized

for another purposes. In the meantime, simple management viz., Backyard dumping site and Manure decomposition site of household waste have started but a greater frequency is not which might be because people are not aware of it. But a few cases are observed in the present study which gives a notion that household level management have started in terms of waste disposal.

The awareness level in regards to solid waste disposal system and its effect are also studied where there is a high level of awareness on how improper waste disposal have effect on environment pollution, pollution of river water, community health and Fire. The awareness level of respondents on effect on environment and health issues is high where the respondents do not believe that there is relationship between poor waste disposal system and spread of malaria, cholera/diarrhea. However, the initiative taken by the Young Mizo Association and Village Council of the respondent locality is unsatisfactory. In the meantime, even the concerned government department i.e. Urban Development and Poverty Alleviation is also viewed as unsatisfactory this is mainly on the door to door collection which is irregular and once a week is not enough.

Due to the improper disposal of waste the respondent house hold face challenges like Increase of house fly, Fire, pollution in the community, Unhygienic smell for neighborhood, Need proper Dumping site and irregular door to door collection by UD&PA. Whereas landslide, Cough and cold, Cholera/diarrhea are not

believed to be associated with improper waste disposal. Surprisingly Lack of proper place for waste disposal is regarded not as a problem which may be because of the dependency on local dumping site from time immemorial where there is no replacement service and even the topography support easy dumping of waste nearby.

There are problems of Fire, Landslide, Diarrhea and Glittering of waste in the street, spoil crops, produce bad smell and communicable diseases sometimes due to the improper disposal of waste. It is disturbing to find that Blockade of drainage and Pollute spring well are happening as an incident that never occur in the community due to improper waste disposal. This is mainly because the dependency on spring well is decreasing and are not used for domestic purposes. Where blockade of drainage is not seen as the area of research did not have much drainage system.

The efforts of different NGOs and other Organizations are analyzed to understand the level of participation in cleanliness as an organization. Different organizations in the present study observed are Village Sanitation Committee, YMA, MHIP, MUP, VC, UD&PA, and Church. It is surprising to see that all the efforts of organizations were unsatisfactory in their contribution towards cleanliness. So, there is a need for awareness regarding the role of NGOs in the community towards proper waste disposal system.

The household in the community closer to the local dumpsite are not satisfied with the location of the local dumpsite as it is too close to their house which is believed to be causes of different forms of sickness and even they have to encounter the unpleasant smell. Sometimes the waste especially paper and polythene are often scattered by wind which effect cleanliness. Most solid wastes are disposed on the local disposal site in an open dumps zone. Disposal of solid waste on the land without management and chemical treatment for germs is danger to human health and destruction to the environment.

Dumpsites are known for their unpleasant smell and view and the conditions are even worse in the summer and monsoon as this speed up the rate of growth of bacteria and germs which are mainly in household biodegradable organic waste which is the main causes and spread of viral infections and increase in communicable diseases in the community around dumpsite. The residents located nearby local dumping site are more affected by the local dumpsite as compared to the far household. Sometimes, they are victims of fire, communicable disease, pollution of spring well and river water, cholera/diarrhea, block of drainage, increases of house fly, spoil crops and the unpleasant smell. However, it was also observed that households locating far from local dumping site within the community are also suffering from unhygienic bad smells from the dumpsite. With increase in population and other essentials, there is a rapid increase in the amount of waste generated by household and the waste are disposed through door to door collection services of the government and mainly at local dumping site which are the only

option. Moreover, due to inefficient services of the government the household domestic waste hardly gets collected and managed. There is a need for waste management system from the government as it poses a threat to the environment causing health challenges and environmental imbalances.

Suggestion

The present finding indicated that there is a dire need for domestic waste management system in Mizoram. Government should set up dumpsites properly managed minimizing its harmful effects on the environment. The government should revise laws and administration regarding the management process of domestic waste to avoid pollution on the environment and health hazards. The door to door collection services of the government must be revised and improved so that the people will not be push to resort to local dumping site.

Municipalities must set up dumpsites in areas where settlements are far away to avoid the negative effects and that dumpsite must be monitored. Moreover, the people need to be educated through awareness, mass media and social networking site about the effects of dumpsites on health and show ways and methods of management.

References

Annepu, K. 2012. Sustainable Solid Waste Management in India. An unpublished dissertation of Master of Science in Earth Resources Engineering. Department of Earth and Environmental Engineering Columbia University.

El-Fadel, M., Findikakis, A.N. & Leckie, J.O. 1997. Environmental Impacts of Solid Waste Landûlling, *Journal of Environmental Management* 50(1), pp. 1–25.

Government of Mizoram. 2017. Department of Urban and Poverty Alleviation Lunglei.

Guerreroa, L.A., Maasa, G & Hogland, W. 2013. Solid waste management challenges for cities in developing countries, *Waste Management* 33, pp. 220–232.

Kamara, A.J. 2006. 'Household participation in domestic waste disposal and recycling in the Tshwane metropolitan area: An environmental education perspective'. Unpublished dissertation in University of South Africa.

Kofoworola. 2007. Recovery and recycling practices in municipal solid waste management in Lagos, Nigeria, *Waste Management* 27, pp. 1139–1143.

Sharholy, M., Ahmad, K., Mahmood, G., & Trivedi, R.C. 2008. Municipal solid waste management in Indian cities: A review. *Waste Management* 28, 459–467.

Stokoe & Teagu. 1995. Integrated Solid Waste Management for Rural areas – A planning tool kit for Solid Waste Manager, *Food and Agriculture Organization of the United Nation,* retrieved from *http://www.nal.usda.gov/.*

Sujauddin, M., Huda. S. & Hoque, A.R. 2007. Household Solid Waste

Characteristics and Management in Chittagong, Bangladesh. *Waste Management*. 28, pp. 1688-1695.

Visvanathan, C. & Tränkler, J. 2003. Municipal Solid Waste Management in Asia- A Comparative Analysis. Workshop on Sustainable Landfill Management. pp. 3–5.

Zhu, W.L. 2008. Review and interpretation status and prospects of association mapping in plants: *The Plant Genome* 1 (1) pp. 5-20.