Existing kitchen waste disposal and management system at Mymensingh district

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Abstract: A total of 72 households were interviewed following a survey schedule in rural and urban region (at Mymensingh district) to know the existing kitchen waste disposal and management system. Kitchen waste generation varied significantly (p<0.01) between the urban and rural study areas. The average kitchen wastes production in the urban and rural areas was 3.21 and 2.57 kg/day/household, respectively. About 61.11% respondents disposed kitchen waste in the dustbin in urban areas whereas no respondents dispose their kitchen waste in the classified dustbin in rural areas and most of them stored their waste in the pit (61.1%). A greater part of the respondent did not maintain any fixed time for kitchen waste disposal in both areas. But one large variation was observed that people of urban areas liked to dispose their kitchen wastes at noon whereas rural people preferred to dispose it in the evening. All of the urban wastes of Mymensingh sadar were dumped at open ground in Char Ishwardia whereas only a few portion of kitchen wastes were used as compost and large portion were thrown here and there in rural areas.
Key words: Kitchen waste, disposal, management.

Introduction

Kitchen waste may be defined as the damaged, defective and non-edible materials such as vegetables wastes, fruit and egg shells, digestive and respiratory organ of fish, scales and bones, food materials, feathers of birds and residue etc. It is evident that a huge amount of recyclable kitchen, industrial and organic wastes remains unutilized. An estimated amount of 3700 tons of solid wastes were produced and generated per day in Dhaka city. According to corporation daily taking experience, 50g of solid wastes produced per person (Rahman and Ali, 2000). Bangladesh is a developing country with a population of 14 core 52 lakh in the year of 2004 (BBS, 2005). Every day about 10,742 tons solid wastes have been generated in Bangladesh and per capita waste generation is 0.49 kg (Hannan, 2004). There were about 25 million urban populations in Bangladesh generating about 6000 tons of garbage daily. The poor people of Bangladesh face a great problem for their kitchen waste management and unfortunately they don't have any appropriate technology and enough money as well for better kitchen waste management. Kitchen waste management is a problem both in urban and rural areas of Mymensingh municipality. The households and commercial wastes play a harmful role to the environment of the urban community of Mymensingh. When the wastes are thrown in the dustbin they are rotten and produced bad odor. Many microorganisms work on kitchen waste and cause many harmful diseases. Rotten kitchen waste produces and creates global warming. Waste decomposition frequently pollutes the open waster sources (river, pond, lake, etc). Sometimes it pollutes the ground water through leaching or percolation with rainwater. It causes O_2 deficiency in water and becomes harmful for the fish, bacteria, fungi and other living organisms. At present, these kitchen wastes are somehow being managed to dispose and dump, which is causing environmental pollution day by day and becoming health hazard. Till to date little attention has been given on this vital issue in Bangladesh to overcome this problem. However, better waste management practices like reuse and recycling of waste which insuring sufficient organic source and safe economic cost against problems caused by environmental pollution. Some partial study was conducted by Hoque et al. (2006) and Islam et al. (2006) on waste generation and disposal approach, but no study was conducted with kitchen waste disposa and its management in Mymensingh district. In this context, the study was conducted to know the existing kitchen waste management system in urban and rural areas of Mymensingh district.

Materials and Methods

The present study was conducted in urban and rural areas of Mymensingh district. In urban region, three wards (wards 19, 20, 21) of Mymensingh Pourashava were selected. The area of those wards were Bolashpur and Vatikashor; Kawatkhali, and BAU Campus whereas Boira, Sutiakhali and Digarkanda villages were selected at random from the rural areas for the study purpose. The data were collected through a pretested interview schedule. The schedule was carefully designed keeping the objectives of the study. Data were collected on amount of kitchen waste generation, disposal place, disposal time and condition of dustbins in these areas. Moreover existing kitchen waste management system and various problems related to it were carefully included according to respondent comments. After completion of the field survey, the data obtained from all the respondents were coded, compiled and tabulated. Then the collected data were analyzed using MSTAT-C package program developed by Russel (1986).

Results and discussion

Table 1 and 2 showed the basic information of Mymensingh district.

General characteristics of the respondent

The age of the respondent varied from 21-55 years with the mean value 36.58, which indicated that middle aged people are mostly involved in kitchen waste disposal and management practices both in urban and rural areas. A large number of respondents were educated upto secondary level with middle family where the average family size is 5.67 (Table 3). These results coincided with the findings reported by Islam et al. (2007).

Total volume of kitchen waste production
Kitchen wastes generation from different urban and rural study areas
The average waste generation in urban study areas varied significantly (p<0.05). The highest amount of wastes (3.59 kg) generated at BAU campus, while the lowest (2.89 kg) was recorded at Bolashpur and Vatikashor (Table 4). The respondents of BAU areas were relatively higher income group. They were also higher educated than the respondents of other areas.

These might be cause of more kitchen wastes generation of respondents of BAU campus than the other two regions. On the other hand, wastes generated in the rural areas also varied significantly (p<0.05) among the study areas. The lowest (2.1kg) waste generation was recorded in village Digarkanda, while the highest amount of wastes (3.19 kg) was recorded incase of village Boira (Table 4). It might bedue to difference in education, income, family size and occupation of the respondents of these areas.

Table 1. Some basic information of Mymensingh sadar area (Banglapedia, 2003)

Sl. No.	Type of information	Value	Sl. No.	Type of information	Value
1	Area	388.45 km^2	8	Literate level	37%
2	Union	14	9	University (Public)	1
3	Mouja	136	10	College	33
4	Villages	173	11	High School	50
5	Population	566000	12	Primary School	150
6	Male	52%	13	Madrasha	21
7	Female	48%	-	-	-

Table 2. Basic information of Mymensingh municipal area (BBS, 2001)

Sl. No.	Type of information	Value	Sl. No.	Type of information	Value
1	Area	21.73 km^2	5	Male	51.91%
2	Ward	21	6	Female	48.09%
3	Mohallah	85	7	Literate level	60.40%
4	Population	226000	-	-	-

Table 3. General characteristics of the respondent

Characteristics	Categories	% respondent	Mean	SD	Observed ranged
Age	Young (21-35)	39	36.58	11.87	21-55
	Middle (36-50)	56			
	Old (>50)	5			
Level of education	Illiterate (0)	8.25	7.60	3.47	0-14
	Primary (5)	21.75			
	High School (8)	46.75			
	SSC (10)	7.65			
	HSC (12)	9.35			
	Graduate and above	6.25			
Family size	Small (2-4)	26	5.67	2.98	2-9
	Medium (5-8)	58			
	Large (above 18)	16			

Table 4. Kitchen waste generation from different urban and rural study areas

Areas	Urban areas	Rural areas	
	Average Kitchen waste (kg/d/household)	Areas	Average Kitchen waste (kg/d/household)
BAU	3.59**	Boira	3.19**
Kawatkhali	3.14**	Sutiakhali	2.5**
Bolashpur and Vatikashor	2.89**	Digarkanda	2.1**
Mean	3.21**		2.57**

** Significant at 0.01 level of probability

Table 5. Time of disposal waste

Time interval	Urban		Rural	
	Frequency of respondents	Percent	Frequency of respondents	Percent
No fixed time	16	44.44	18	50
Morning	7	19.45	7	19.45
Noon	10	27.78	3	8.33
Evening	3	8.33	8	22.22
Total	36	100.00	36	100.00

Table 6. Condition of dustbins

Study areas	Frequency	Condition (%)		
		Good	Fair	Bad
Bolashpur and Vatikashor	25	20	32	48
Kawatkhali	20	30	20	50
BAU campus	35	71.43	14.29	14.28

Waste generated in urban and rural areas were compared. The result showed that there was a highly significant (p<0.01) variation between the urban and rural study areas in respect of waste generation. From the recorded data the higher amount of wastes was recorded in urban areas (3.21 kg) than that of rural areas (2.57 kg). These results were more or less similar with the findings of Hoque *et al.* (2006).

Disposal place of waste and prefer waste collection system by household respondents

Storing site for generated solid waste is too much crucial for both solid waste management system and environment protection. Environments are polluted by the haphazard and open storage system of kitchen waste. People have been storing their solid waste on the dustbin, pit, open and drain side, vacant plot and road side and some of the respondent don't know where their waste being stored. Figure 1 and Figure 2 showed that about 61.11% respondents disposed kitchen waste in the dustbin, 22.22% on the road and drain side and 11.11% on the open spaces and 5.56% in the pit in urban areas (Figure 1). On the other hand, in rural areas, there was no dustbin and most of the people disposed their waste in the pit 61.1%, 16.67% on the road side and 22.22% on open spaces (Figure 2). This result is in close vicinity with the findings of Islam *et al.* (2006).

Figure 1. Waste disposal system in urban areas

Figure 2. Waste disposal system in rural areas
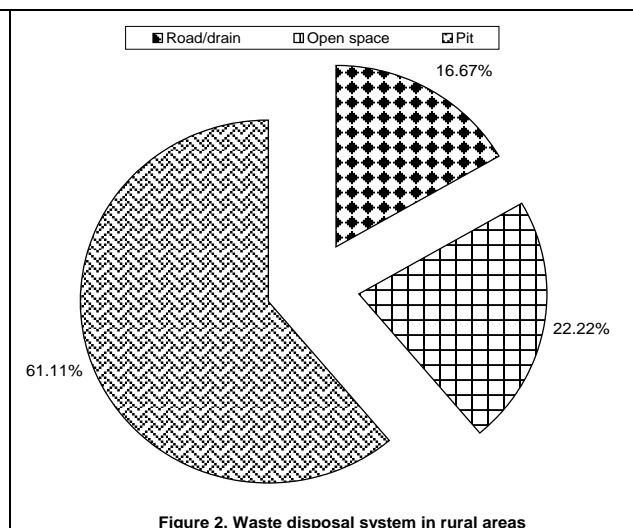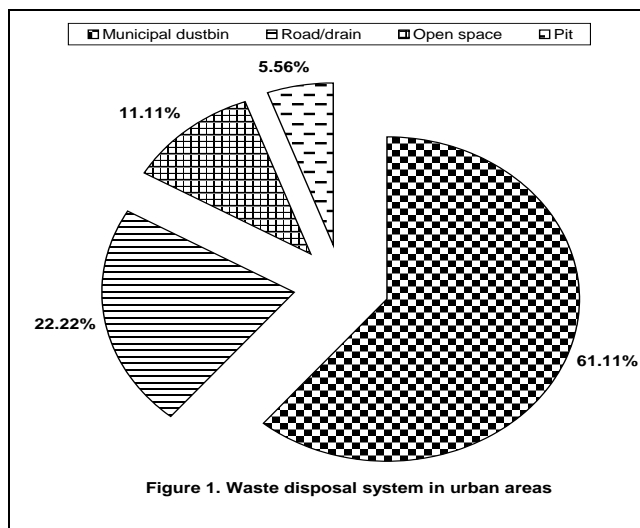
Waste disposal time

From the study it was clear that respondents were likely to dispose their kitchen waste at different times of the day. Table 5 showed that most of the respondent did not have any fixed time for their kitchen waste disposal in both areas. But one large variation was observed that people of urban areas preferred to dispose their kitchen wastes at noon whereas rural people interested to dispose it in the evening.

Condition of dustbin

The condition of dustbin is classified in three categories as good, fair and bad. The overall condition of dustbin is not good. Most of the dustbin of Kawatkhali, Balaspur and Vatikashor are in bad condition (completely broken or partially broken). On the other hand, BAU campus has 35 dustbins and most of them (71.43%) are in good condition (Table 6).

Fate of existing kitchen waste management system
Transfer and transport of wastage

Mymensingh Pouroshova mainly used waste carrying vehicles (Truck and Trolley) for collecting and transporting the wastes from the waste storing site to the final dumping site. According to the official procedure, they worked 8 hours/day but they were not involved in the solid waste management system full time. Most of the cases, human power vehicles are used for transporting solid waste from the onsite storage to the final dumping site.

Final dumping

The proper dumping of wastes derived from any source depends on management practices. The existing waste dumping site by the waste management body, the municipality, is on the open ground. 100% wastes are finally dumped on the open ground in the dumping place of Char Ishwardia. It is only one dumping zone of Mymensingh municipality areas having three acres and ten decimal areas which were used for landfill since 1993. On the other hand, kitchen waste, feed wastage of rural areas is used as manure and land fill purpose. Anikwe and Nwobodo (2002) stated that the long term dumpling of municipal wastes can influence soil properties and productivity of municipal waste dump sites but still may be used for farming provided that ecotoxological risks associated with its usage are continuously assessed and controlled.

Problem of waste management system

All the existing disposal structures were open. So, poor children, women and men regularly search almost all waste disposal places for polythene bags, metals, woods or branches of trees. On the other hand, dog was severe to spread the waste materials to its surroundings. Similarly, foxes, cat, crows, different types of birds, even cows often spread waste materials

to the surrounding areas. These causes pollution to the environment which may provide a panic situation for the life of people

The researcher identified the following constraints to manage the waste materials that are generated by the urban and rural dwellers of Mymensingh.

1. Inadequate knowledge among the householders to generate and dispose the daily waste materials in a sound way.

2. Indiscriminate throwing and dipping of city waste materials without the use of municipality dustbins.

3. Different types of animals like dogs, cats, crows and other birds engage to disperse the waste materials form the site of disposal.

4. Dispersing waste materials in the urban areas at the time of little and huge rainfall.

5. A Very few supply of toxicants and medicines to manage the hazards of waste disposal and dumping locations.

6. Inadequate technical support and funding from the authority of waste management concerns.

7. Irregular supervision of the waste generating and dumping sites.

Recommendation

1. Use a separate pot for different kinds of waste in both rural and urban areas.

2. Creating mass awareness among the people of all strata to generate and dispose the daily waste materials in a sound way.

3. Dustbin in a suitable location with required frequency.

4. Intensively waste materials collection from houses, market bazaars, industrial areas, hospitals, clinics and so on.

5. Finally heaping should be followed than throwing waste here and there.

Acknowledgement

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