



People perceptions about using polythene bag and its impact on environment at Mymensingh in Bangladesh

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ABSTRACT

The study was conducted at the municipal area of Mymensingh Sadar upazilla during July to November 2017. Plastic bag (polythene bag) wastes pose serious environmental pollutions and health problems in humans and animals. The situation is deranged in underdeveloped countries like Bangladesh. The aim of this survey was to evaluate the using pattern of polythene bags and their environmental impacts at Mymensingh municipal area of Bangladesh. Two semi-structured questionnaire were used to collect data from 200 randomly selected consumers and 100 retailers. The results indicated that about 35% consumers used 5-10 plastic bags per week. The results also indicated that the larger proportion (65%) of the retailers used 50-100 plastic bags per week. Low price was the main reasons of using polythene bags for consumers (42%) and lack of alternative materials were the main reasons for the widespread utilization of plastic products for retailers (31%). Among the practices used for disposal, door to door deposition (53.5%) was practiced widely by almost all the residents of the study area. Consumer claimed that air pollution (91%) and blockage of sewage lines (88.5%) were the main problems on environment and others problems were deterioration of natural beauty of environment (64%), human health problems (62%) and soil fertility reduction (48.5%). On the other hand retailers thought that air pollution (94%) and blockage of sewage lines (97%) were the main problems of polythene waste on environment and other problems were deterioration of aesthetic beauty of environment (64%), human health problems (76%) and soil fertility reduction (53%). The findings of the study also implied that the trend of using polythene bags is increasing day by day though some awareness of the respondents about the harmful effects of plastic products. In order to abate the problems associated with polythene bag wastes, it is recommended to aware the public not to use polythene bags and to use alternative materials (bags).

INTRODUCTION

Polythene bags are a common and easiest way of carrying different products from shopping mall, market, industry in Bangladesh. Almost all traders like to sell and supply polythene bags with their sold products. Polythene bags are manufactured from high-density polyethylene (HDPE) and aimed to be used once. After being used users generally leave it in dustbin or throw to a convenient place in Bangladesh. In Mymensingh city there is a lacking of proper waste management system and effective sewerage system is largely absent here. Illiterate citizens and incognizant traders, buyers sometimes throw their used bags to open space and roadside, ponds in Mymensingh municipal area. From the open spaces disposed bags may be scattered and be carried away by

wind, creating an environmental nuisance in environments.

Using polythene bags is not new at all. Plastic bags have been introduced in 1970's (Williamson, 2003) and gained an increasing popularity amongst traders and consumers. It is estimated that around 500 billion plastic bags are used every year worldwide (Spokas, 2007; Geographical, 2005). Developing countries like Bangladesh widespread use of polythene bags is a curse. Because Bangladesh is a vulnerable country to climate change and using polythene bags and throwing it in open spaces or improper dumping stations posing a great risk to environment.

Without special-treatment polythene is not readily-biodegradable, and thus, it is accumulates on

disposal site. Plastic-bags are indiscriminately-dumped into millions of landfills worldwide, which occupy trillions of hectares of lands and emit dangerous-methane and carbon-dioxide-gases, during their-decomposing-stages, as well as highly-toxic leachates from these-landfills (Simmons, 2005). Disposal ways of polythene bags lead to create serious environmental problems. Deterioration of aesthetic beauty of an environment is a problem caused by polythene bags accumulation in a place (Anthony, 2003). Blockage of sewerage systems is very common problem in urban areas due to plastic pollution. In Mymensingh municipality it is a common scenario of sewerage channels blockage and city area go under water after a slight raining. Blockage of sewerage systems create foul smells and favorable habitats for mosquitoes and other vectors that could spread a large number of diseases such as encephalitis, dengue fever and malaria (Ellis *et al.*, 2005). Polythene bags reduce percolation of water and proper aeration in soil if plastic bags enter into agricultural fields. Some Impacts of the polythene bags on agriculture are: soil fertility reduction, nitrogen fixation reduction, loss of nutrients in the soil to a greater extent, imbalance in flora and fauna on soil etc. These negative impacts in fact decrease soil fertility to a large extent and thus reduce agricultural productivity.

Animals and sea creatures are at a risk by discarded polythene bags. If they get contact with polythene bags there is a chance to create suffocation or may lead to death. Plastic clogs their intestines and leads to slow starvation. Gradually our water bodies become a shelter to more bags due to open dumping or improper management that find their way there through our sewers and waterways. Every bag that's washed down a drain during rainfall ends up in the water flows. Considering human health polythene bag is dangerous. In several poor and developing countries, these bags are largely used to carry food items. It can cause serious health problems due to chemical reactions in plastic materials and food items that lead to generate some carcinogenic agents (Narayan, 2001).

This research investigates the damaging impacts of polythene bags on the environment and agriculture and we also surveyed perception of consumers and

retailers on polythene bags using and knowledge about it.

MATERIALS AND METHODS

The methodology for this study includes site selection, observation and data collection through questionnaire survey and interviews in formal and non-formal ways. Secondary data was collected from different sources like published books, journals, newspaper etc. Individual people were visited personally by the researcher for data collection. To collect the data, semi-structured questionnaires were prepared in native language Bengali and then translated it into English. During field visit, conversations were held with the selected respondents to explain the aims of the study. Those respondents who were interested but unable to response the questionnaires by themselves were helped by data compiler. The study was conducted in Mymensingh city area belongs to the Mymensingh sadar upazila (latitude: 24°45'0.00"N longitude: 90°25'0.12"E) in Mymensingh District. The Mymensingh town is situated on the bank of the Old Brahmaputra river. Preliminary information was attained about the study area by preliminary investigation. During the survey period, the aim and scope of study were carefully maintained. 300 interview schedules were prepared for the survey. 100 interview schedule for retailers and 200 for the consumers. Before finalizing the schedule it was pre-tested for judging the suitability to respondents and necessary correction and modification were done accordingly. The study was conducted using the stratified random sampling technique from July 2017 to November 2017. On site sampling was started from July 2017 and the primary data collection was finished by the end of September 2017. After completion of each interview, it was checked to be sure that information had been properly recorded. After collection of data it was estimated and converted to percentage.

Analysis of data

The information obtained from all of the respondents were coded, compiled and tabulated after completion of the field survey. The response to the questions in the questionnaire was transferred to a master sheet to facilitate tabulation

for statistical analysis. The collected data for this study were analyzed by basic statistics such as number and percentage distribution. The relationship between two variables was also investigated from the schedule. In addition, a number of graphs were used to clearly focus of the situation.

RESULTS AND DISCUSSION

In the study both male and female consumers were selected for data collection where 123 (61.5%) respondent was male and 77 (38.5%) was female. Majority of the retailers were male 99 (99%) and 1 (1%) female was found in the study area. The occupations of the respondent (consumers) were identified into 5 categories such as student, private job, business, govt. job and housewife. Among them, major respondents were student 64 (32%) and minor was private job 20 (10%). Other respondents were 24% housewife, 18% business and 16% Govt. job. The study was found that among 100 retailer respondents, 42% used polythene bag always, 50% used polythene bag sometimes and 8% used polythene bag seldom in the study area. Among the consumer respondents, 32.5% used polythene bags always, 52.5% used polythene bags sometimes and 15% used polythene bags seldom.

Lots of activities were done after using polythene bags. The majority of them (50%) respondents reused some and thrown them away, 30.5% respondents thrown them away after finishing their work, 17% respondents reused all them, 2% respondents sold them and 3% respondents done others after one time use.

Relation between occupation and brought own shopping bag during shopping

The relationship between occupations of the respondent and brought own shopping bag during shopping is shown in figure 1. It was found that amount of brought own shopping bags for students was lower than others and amount of brought own shopping bags for housewife was higher than others. Housewives are more involved in shopping comparing with others. They love to bring own shopping bag during shopping. So that they are

highest in number to carry own shopping bag during shopping.

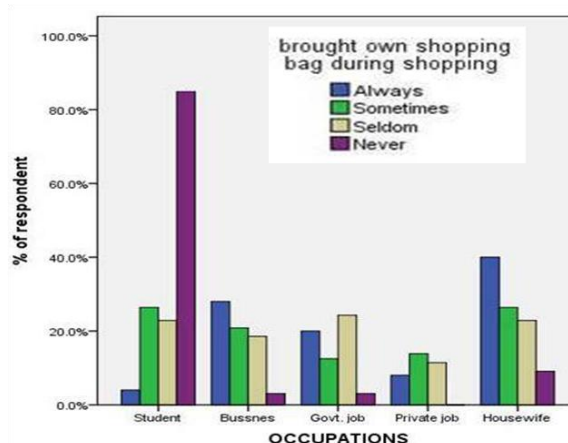


Figure 1
Relation between occupation and brought own shopping bag by respondent during shopping.

Relationship between gender and number of polythene bags used per week

The relationship between gender and number of polythene bag used per week is shown in figure 2. In this study it was found that male use higher number of polythene bags than female. But in case of female respondents they hold highest ranked polythene users showing in graph (i.e. 20 polythene bags per week). It was due to a great number of female respondent were housewife who usually handle all family matters.

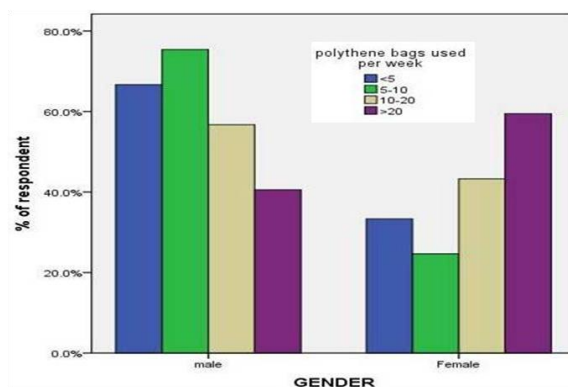


Figure 2
Relationship between gender and number of polythene bags used per week.

Relationship between occupation and number of polythene bags used per week

From figure 3, it was found that the students were used <5 bags per week, businessmen were used 10-20 bags, govt. job holder were used 10-20 bags, private job holder were used 5-10 and housewife were used >20 polythene bags when it came to consider the relationship between occupation and number of polythene bag used per week. The reason behind that relation was probably students were less involved in shopping than other and housewife was more involved in shopping.

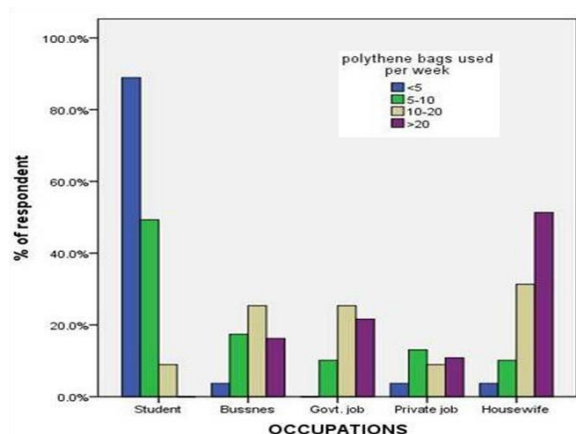


Figure 3
Relationship between occupations and number of polythene bags used per week.

Dispersion of polythene bags after use by respondents

Dispersing of polythene waste was the most important for the environment in the survey area. The major dispersion method after using polythene bags was door to door deposition (53.5%). Other methods were open dumping (43.5%), burning (0.5%) and others activities (2.5%). Door to door deposition is very familiar. People dumped their waste in front of house in suitable places and the staff from municipality authority came in the morning and collected them into their truck/van. Then they dispersed them in open place or certain area in the city. People who disperse their polythene waste in open dumping that made problem in the city. Adane and Muleta (2011) were found that open dumping to surrounding areas (59.56%) was a practice widely used by

almost all the residents of the Jimma city, Southwestern Ethiopia. Only 13.5% of respondents are served with door-to-door collection of polythene waste, while the rest dispose of their waste at community collection points, in open spaces, and in waterway (Boadi and Kuitunen, 2005).

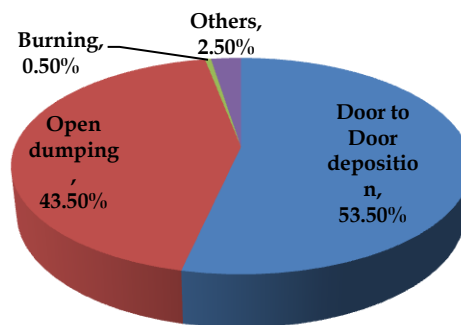


Figure 4
Ways of dispersion of polythene bags after use.

Relationship between shop type and number of polythene bags used per week

In figure 5, relationship between shop type and number of polythene bags used per week is shown. Grocery used more polythene bags at the rate of 50-100 than departmental shops because of greater amount of consumers, fish market used more polythene bags at the rate more than 100 per week than vegetable market because of higher amount of trade.

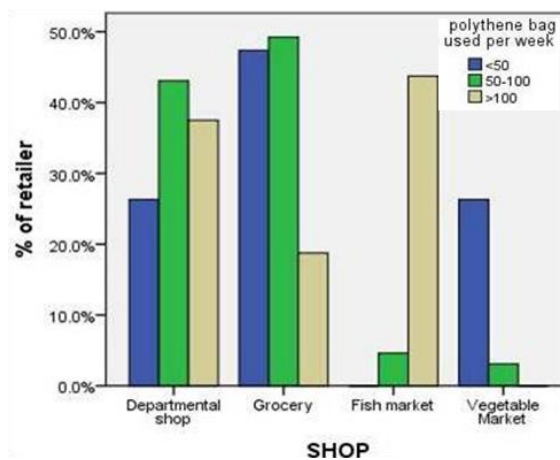


Figure 5
Relationship between shop type and number of polythene bags used per week.

Reasons of using polythene bags of the retailers

Some of the reasons behind widespread usage of polythene bags were found in the study area (Table 1). Among them lack of alternatives materials (49%) was the major reasons for increasing usage of polythene bags and other reasons were low price (42%), easy availability (13%) and light weight (2%), respectively. During the survey, we also observed many retailers distributing polythene bags for free to their customers for carrying sold products. Adane and Muleta (2011) were found that low price (69.13%) and easy availability (66.08%) were the main reasons for the huge usage of polythene bags.

Table 1
Reasons of using polythene bags by the retailers.

Reasons	Frequency	Percentage (%)
They are cheap	36	36.0
They are light in weight	2	2.0
They are easily available	13	13.0
Lack of alternatives materials	49	49.0
Total	100	100.0

Polythene bags banned in Bangladesh

In Bangladesh polythene was banned on 1 January 2002 by the government of Bangladesh. About 85% retailers were aware about polythene bags that it is banned and 15% retailers did not know (Figure 6).

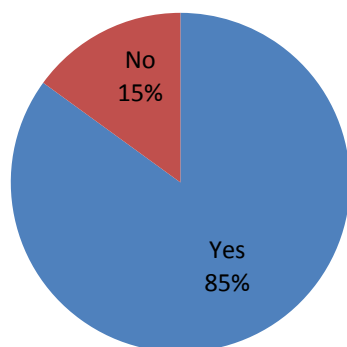


Figure 6
Retailer's knowledge of polythene bags ban.

Opinion on environmental impacts of polythene bags by the respondents (consumers and retailers)

People opinion on negative impact of polythene waste on environment is shown in table 2. They were given their opinion by agree, disagree and not concern. The majority of the respondents agreed with air pollution (91%) and blockage of drain system (88.5%) whereas 48.5% agreed with soil fertility reduction. On the other hand majority of not concern was soil fertility reduction (44%) for environmental impact of polythene bags. Another not concern issues were human diseases (32%) and deterioration of natural beauty (30%). A very few percent of respondent disagreed with all the environmental problem. Bilal et al. (2016) stated that blockage of sewage and drainage system leading to less durable road pavements 52.5%, human health problems 28.6% and animal deaths 10.3%. Adane and Muleta (2011) were stated that major problems were animal death (72.60%), blockage of sewage lines (70.43%), deterioration of natural beauty of an environment (62.60%) and human health problems (51.73%). In 2005 flooding occurred at Mumbai in India, that killed over 1000 people and at least 1000 animals and livestock, due to plastic bags clogged the city's storm drains and prevented the monsoon rains from leaving the city (Smith, 2009). Moreover, the blocked storm drains also created pools of stagnant water, allowing mosquitoes and other insects to breed more easily within a city, and transmit a variety of lethal diseases such as dengue, malaria, yellow fever and several forms of encephalitis (Boadi and Kuitunen, 2005; Rayne, 2008). Therefore, proper attention should be paid to effective disposal of polythene bag wastes in order to avoid clogging of drainage systems of the city. This, in turn, would help to avoid flooding problems which have been observed in many cities having no proper plastic waste disposal (Smith, 2009).

Table 2
Opinion on environmental impacts of polythene waste by the respondents.

Environmental impact	Agree (%)		Disagree (%)		Not concern (%)	
	C	R	C	R	C	R
	Burning of polythene waste can cause air pollution	91	94	2	1	7
Buried in soil can cause soil fertility reduction	48.5	53	7.5	3	44	44
It can causes human diseases for open burning of polythene	62	76	6	4	32	20
It can blockage the sewage (drain) system for unplanned deposition	88.5	97	6.5	0	5	3
It is deteriorate the natural beauty of Environment for open dumping	64	64	6	4	30	32

“R” stands for “Retailers” and “C” stands for “Consumers”.

Sources of environmental knowledge for retailers and consumers

Survey findings showed that about 99 retailers were known at least one environmental problem among 100 respondents. From 99 people, they were aware about environmental problems from different sources. The major sources of awareness of environment problems were media (78%) and others sources were own experience (8%), school or university (13%). 198 consumer respondents were aware about environment problems from different sources. The major sources of awareness of environment problems were school or university (50%) and others sources were media (41%), own experience (5.5%), friends or family (2.5%).

CONCLUSION AND RECOMMENDATION

The study provides the opinion, views and information on current status of polythene bags usage and its environmental effects in Mymensingh municipality areas. The study showed that almost 10-20 bags are obtained per week at the consumer level of using and almost 50-100 polythene bags are obtained at retailer level. The reasons of using polythene bags are lack of alternatives materials and easy availability. Departmental shop, grocery, fish market and vegetable market are the common sources of obtaining polythene bags. Bringing own polythene bags is the common way to reduce using polythene in the study areas but they are not interest to bring the own shopping bags during shopping always.

Activities after polythene bags use are considered as reusing of polythene bags is safe for the environment. Dispersing of polythene bags waste is very important issue to be considered in the study area. Door to door deposing and open dumping is common ways of dispersion in the study area. The environmental problems such as air pollution, blockage of sewage systems, human and animal diseases, soil fertility reduction and aesthetic beauty deterioration are occurred frequently in the study area. School or university and media are the common way to know the problems of polythene waste. To overcome certain problems following recommendations should be followed. People should be started carrying their own shopping bags during shopping. People should be increased using paper bags, cloth bags, natural fiber bags and others environment-friendly alternative materials. Various campaigns should be organized to increase awareness among consumers and retailers. People should be reduced indiscriminate use and disposal of polythene bags in order to minimize the excessive accumulation in the environment.

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