

IMPACT OF PLASTIC BAGS ON A SUSTAINABLE AND HEALTHY ECOSYSTEM

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Abstract

In the past few decades, plastic products have been very popularly used by individuals for shopping purposes because of their ease, low cost, and convenience of use, but their very hazardous negative impact is never analysed by the consumer. The impact of discarded plastic bags on agriculture is negative in a variety of ways, threatening both our food supply and our quality of life. Plastic usage has caused a variety of diseases in several human and animal organs. Cancer, eye discomfort, visual pollution, and others are a few examples. The consumer plays a critical role in terms of opting for the usage and disposal standards of eco-friendly products over other products.

In this study, an effort has been made to learn more about consumer behaviour, attitudes, and awareness regarding plastic pollution, toxic gases from plastic production and disposal, their effects on the lives of living things, and the risks associated with the use of plastic bags by humans, as well as how consumers perceive the awareness of plastic bag access. It is conducted at the **Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India**, during 2020, using a research questionnaire survey with a sample size of 100 participants. An interview schedule was used as a tool for the collection of information through interviews with respondents.

Keywords: Health hazards, Human behaviour, Non-biodegradable, Plastic bags, Shopping bags, Sustainable development.

1. Introduction

Plastics are now a necessary part of everyday life, with the global annual output growing at a rate of around 5% over the last two decades. In India, waste management is a major problem. According to the Central Pollution Control Board's (CPCB) annual reports for 2017–18, more than 60% of all plastic waste produced in India is recycled (9.4 MT/year, or 26,000 T/day), while the other 40% is disposed of in the environment. Plastic bags were first made available in the 1970s and have since become widely used by consumers and businesses to carry groceries and other items (Clapp & Swanton, 2009). Despite the fact that they are to responsible for the environmental and agricultural land degradation that has accidentally depleted the earth's vital resources, particularly petroleum (Sugii, 2008). Plastic bags are produced using fossil fuels, which release toxic gases that are harmful to the planet's many life forms (Institute for Lifecycle Environmental Assessment, 1990; Lajeunesse, 2004).

Regimes for breaking down plastic are harmful to the environment and to human health. Since plastic bags take a very long time to decompose, they have a substantial negative impact on the environment. Due to the low cost of virgin resin compared to alternative flexible packaging

and recyclers' dislike of it, non-biodegradable bags clutter landfills and produce long-lasting litter that is especially dangerous to animals living far from human population centres. Reproductive organs, the stomach, and several skin problems are among the plastic usages that are most strongly linked to serious risks to both animal and human organs. Cancer, eye discomfort, visual pollution, and other health issues may be caused directly or indirectly by them. Plastic bags in the ocean damage agricultural land and are a significant and growing source of pollution worldwide. Plastic bags have a negative influence on agriculture in a number of ways, endangering both our food supply and quality of life. If they are not properly disposed of, they can harm the environment by producing waste and clogging storm drains. The use of plastic bags may facilitate the occurrence of malignant diseases because of the unchecked accumulation of carcinogenic substances, claims Simons (2005). Fig. 1 depicts the pollution from plastics.

Previous research has shown that many people do not take use of the possibilities available simply because they do not put up the extra effort. Paper bags, cloth/jute bags, woollen bags, and cardboard boxes are just a few of the environmentally friendly options that are now readily accessible and can be used in place of plastic bags. These alternatives offer several long-term advantages over non-biodegradable bags. Jute bags are frequently suggested as an environmentally beneficial substitute for plastic bags. Paper bags do not harm the environment because they are biodegradable, recyclable, and reusable in their whole. It has been suggested that the natural fibres of paper and its recyclability creates a positive image of the paper bags (Though, 2007; PBWG, 2002). Bio-degradable bags that can be easily destroyed by bacteria or other living creatures. Another option to non-biodegradable plastic bags is biodegradable plastic bags, but because they contain hazardous ingredients, they do not come without environmental drawbacks. Therefore, it is important to carefully evaluate the alternatives to plastic bags before using them to ensure that they are soil- and environment-friendly (Though, 2007).

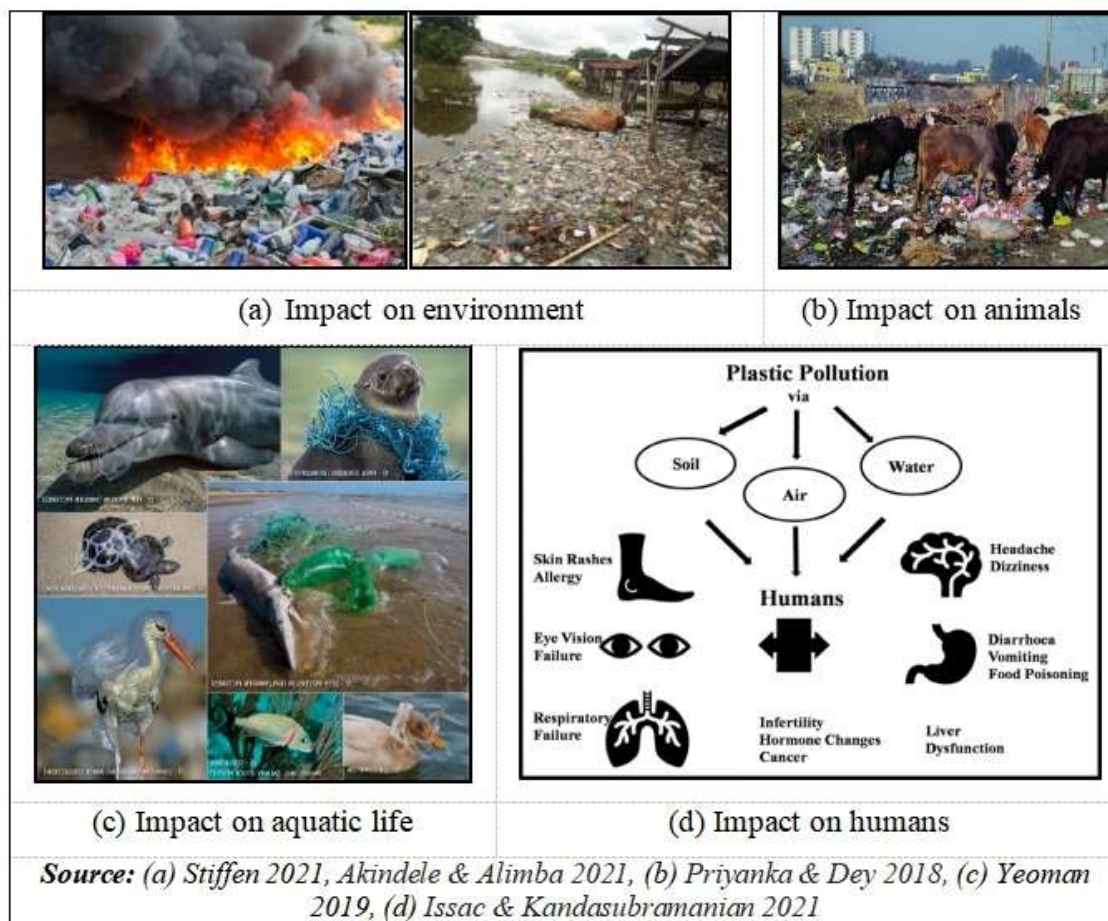


Fig. 1 Impact of plastic pollution on environment and living creatures

2. Materials and Methods

This research was conducted in the Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya, Uttar Pradesh, India during 2020. The study's sample size was 100 participants, including both consumers and professionals. 100 people made up the overall sample size, which was chosen at random from both urban and rural locations according to the researcher's reach and convenience. An effective method for acquiring data for research purposes was found to be an interview schedule.

A detailed survey was performed with the consent and comfort of respondents. Various questionnaires were done during the survey, including ones about the use and dependency on plastic bags, the hazards and types of hazards associated with plastic bag usage, and awareness about recyclable plastic bags. Participants were also asked about the use of plastic bags over eco-friendly bags such as paper bags, cloth bags, jute bags, woollen bags, etc. The primary goal of the survey was to determine the level of public awareness about the harmful effects of plastic bags on the environment, human health, and animal health. Fig.2 illustrates the whole structure of this study.

According to Hamenya (2019) awareness is the state or ability to perceive, to feel, or to be conscious of health. In a broader sense, it is the condition or quality of knowing something. In this study, awareness about plastic bags and their impact on health was evaluated using simple parameters. The level of awareness of the effects of plastic on health was evaluated using the binary (Yes/No) technique. The level of awareness was determined using a preference scale.

2.1 Data Collection

Data has been collected from interviewees among common peoples by asking questions from the questionnaires. The first section of the three-section questionnaire for this study encompassed general awareness level about impact of pollutants on human health. The second section of the questionnaire asked questions concerning the respondents' knowledge of poisonous gases produced by plastic, their knowledge of and experience with plastic product purchases, including if they were aware of the product's environmental friendliness. The questionnaire's final section asked respondents on their level of knowledge regarding the effects of hazardous gases on human health.

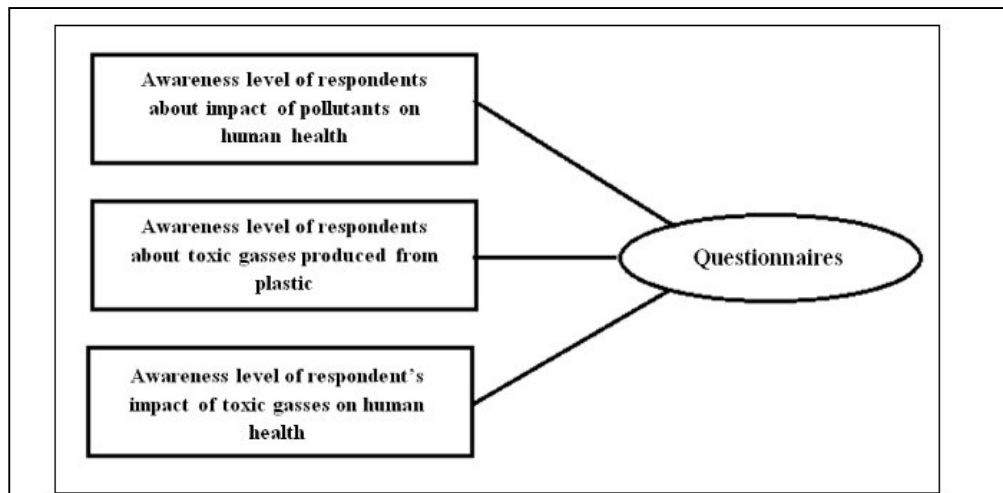


Fig. 2 A three-stage questionnaires model

2.2 Statistical Analysis

The data was examined using descriptive statistics. Data is collected using a three-stage questionnaire model. The responses were recorded during the questionnaire's scheduled time. The data was coded, tabulated, and statistically calculated in terms of frequency and percentage.

Frequency: The frequency of a parameter is determined by the number of respondents who marked in it.

Percentage: Percentage is the ratio of obtained score and total score multiplied by 100.

$$\text{Percentage (\%)} = \frac{\text{Obtained Score}}{\text{Total Score}} \times 100 \quad \dots \text{Eq. (1)}$$

3. Result & Discussion

As discussed earlier, this survey was conducted in the Acharya Narendra Deva University Of Agriculture And Technology, Kumarganj, Uttar Pradesh, India. The results obtained are discussed below.

3.1 Awareness level of respondents about impact of pollutants on human health

According to a survey on respondents' levels of awareness, 22% of respondents were aware of the hazardous effects of using plastic materials, and 30% were aware that plastic is non-biodegradable and so has an immediate impact on one's health when used (see fig. 3). Additionally, it was discovered that 30% of individuals were aware that leaving agricultural land fallow makes it dangerous to consume. Only 18% of people are aware that plastic harms agricultural crops because it releases poisonous substances into the soil, depleting it of fertility and making crops risky to grow. It illustrates the need to collect and recycle plastic bags in order to shield people from the harmful impacts of using them as carry bags.

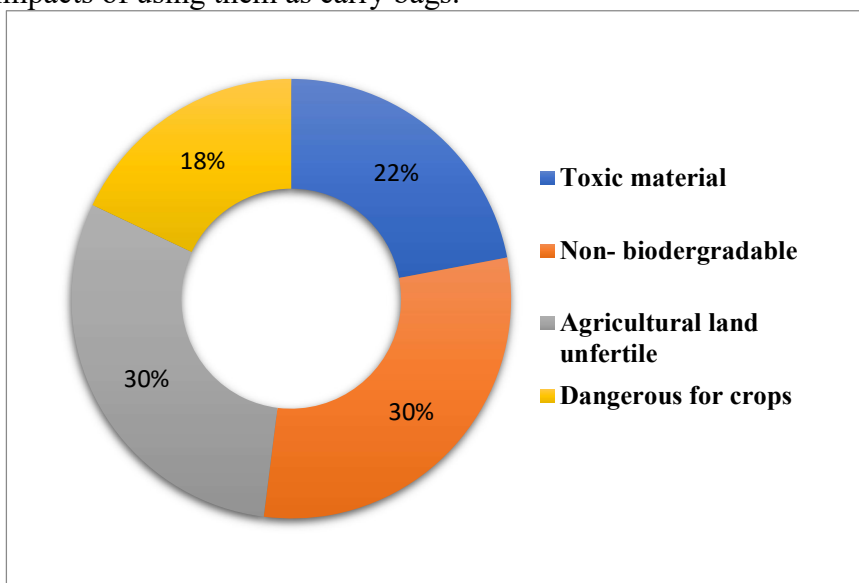


Fig. 3 Awareness level of respondents about impact of pollutants on human health

3.2 Awareness level of respondents about toxic gasses produced from plastic

According to a survey on respondents' knowledge of harmful gases made from plastic, the majority of respondents (45%) were aware of the poisonous gas carbon dioxide (CO_2) made from plastic that contributes to respiratory sickness owing to air pollution brought on by plastic smoke. The fact that plastic emits carbon monoxide (CO), which is dangerous when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other essential organs of oxygen, was known to almost 30% of the responders.

Plastic-produced carbon monoxide emits black smoke, causing individuals to lose consciousness and suffocate. Plastic-produced carbon monoxide emits black smoke, causing some people to lose consciousness and suffocate. Only 10% of respondents are aware that the sulphur dioxide (SO_2) released by plastic causes respiratory issues, especially lung infections, and 12% are aware that the nitrogen dioxide (NO_2) present in plastic damages the respiratory system and results in respiratory diseases like asthma and chronic lungs infections. Only a small percentage of individuals (approximately 3%) are aware that the carbon disulfide (CS_2) that is created when plastic is broken down can infect the skin, kidneys, blood, heart, and liver.

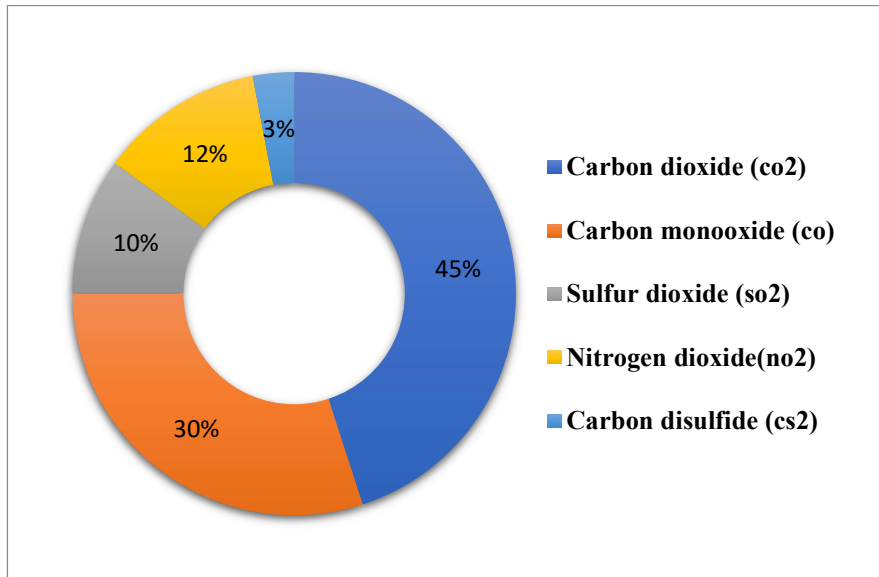


Fig. 4 Awareness level of respondents about toxic gasses produced from plastic

3.3 Awareness level of respondents impact of toxic gasses on human health

The respondents' level of awareness about the impact of toxic gases on human health was surveyed, and it was discovered that (shown in fig. 5) 27% of people know that regular use of plastic causes skin allergy, a quarter of the respondents (25%) were aware of lung infection caused by plastic, 10% of respondents were aware of eyes infection caused by burning the plastic, and 17% of people were aware of infection caused by use of plastic in Gastrointestinal Tract (G.I.T).

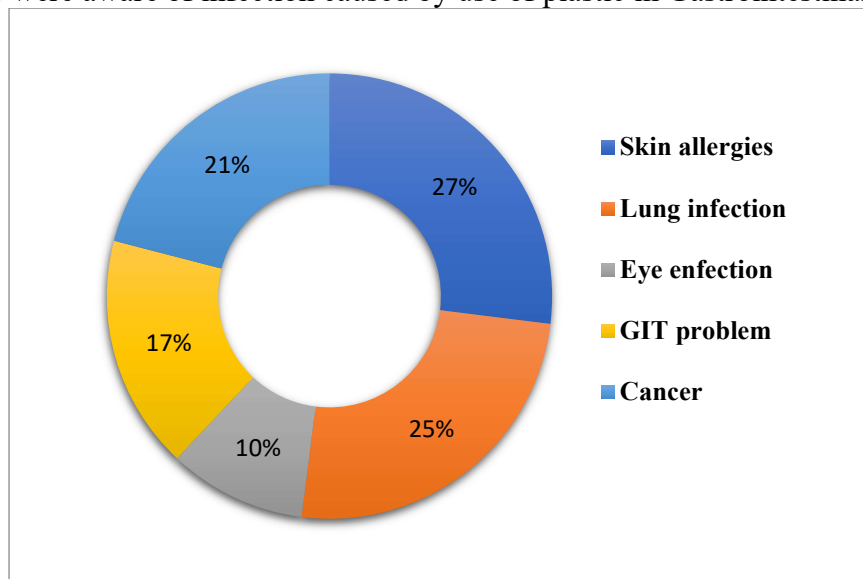


Fig. 5 Awareness level of respondents impact of toxic gasses on human health

Conclusion and Suggestions

It is imperative to study the impact of non-biodegradable bags with survey results which come from the consumers who are the actual users. This study discussed the hazards of using plastic bags and their effects on the environment, animals, and people's health. Results from this survey accurately reflect the attitudes, behaviours, and awareness of both experts and consumers, as well as rural and urban respondents.

Hence these results may be employed in the credible impact on people's awareness over inappropriate assumptions which do not represent the real picture. It is observed from the results of study that people are still not much aware regarding environment pollution and health issues caused by manufacturing and usage of plastic bags.

The usage and disposal scenario of different types of bags assume significance over other products. The use of eco-friendly bags such as paper bags, cloth/jute bags, woollen bags, and cardboard boxes is more important than the use of plastic/non-biodegradable bags. The use of eco-friendly, sustainable alternatives to plastic bags should be encouraged, as should the imposition of a hefty tax on all plastic shopping bags supplied by supermarkets and retail outlets.

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Tables

3.1 Awareness level of respondents about impact of pollutants on human health

S No	Awareness level	Frequency	Percentage
1	Toxic material	22	22%
2	Non- biodegradable	30	30%
3	Agricultural land unfertile	30	30%
4	Dangerous for crops	18	18%
	Total	100	100

3.2 Awareness level of respondents about toxic gasses produced from plastic

S. No	Toxic gasses	Frequency	Percentage
1	Carbon dioxide (CO ₂)	45	45%
2	Carbon monoxide (CO)	30	30%
3	Sulfur dioxide (SO ₂)	10	10%
4	Nitrogen dioxide(NO ₂)	12	12%
5	Carbon disulfide (CS ₂)	3	3%
	Total	100	100

3.3 Awareness level of respondents impact of toxic gasses on human health

S. No	Problems	Frequency	Percentage
1	Skin allergies	27	27%
2	Lung infection	25	25%
3	Eye infection	10	10%
4	GIT problem	17	17%
5	Cancer	21	21%
	Total	100	100