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## RESEARCH ARTICLE

# A SURVEY ON ENVIRONMENTAL CONSCIOUSNESS AMONG THE RESIDENTS OF HISAR CITY (INDIA)

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### ABSTRACT

In household marketing, males prefer using more polyethylene carry bags as compared to females. Plastic, one of the most preferred materials in today's industrial world is posing serious threat to environment and consumer's health in many direct and indirect ways. In various methods applied in residences to protect from mosquitoes, people mostly use repellent mats, which emit harmful gases. While on journey, people mostly prefer to use their own water bottles to quench their thirst. More people are not in favor of bursting crackers on the eve of festivals and marriages. Males are more conscious about using inverters, rather than generators, indicating that they are more conscious about the air and noise pollution. Males found to be more aware about the usefulness of unleaded petrol as compared to their female counterpart. For recreation trips, mostly people prefer visiting religious places and hill stations. Less people found to be interested to visit National Park/Sanctuary. Less people found to be aware about ozone layer and impact on health. It seems cleanliness consciousness is peaking up in city like Hisar.

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## INTRODUCTION

The exploitation of natural resources by humankind has been continuing since the dawn of the civilization on the earth. However, the exploitation has increased many folds in the last few decades, owing to rapid industrialization and population growth globally [15]. This has exerted considerable pressure on various environmental systems and subsystems of our planet. One of the manifestations of the pressure on our environmental system is the problem of pollution, which is threatening the survival of human beings on earth [25]. Due to over-exploitation, many species of plants and animals are at the verge of extinction [24].

When something is added to the environment, which is very harmful, poisonous, or fatal to the animals, people surrounding it and other living things is called as pollution. Pollution is the result of undesirable changes in our surroundings that have harmful effects on plants, animals, and human beings. This occurs, when only short-term economic gains are made at the cost of the long-term ecological benefits for humanity. No natural phenomenon has harmed to this extent than have been made by humankind itself. During the last few decades we

have contaminated, our air, water and land to the extent of degradation, in a big way on which life itself depends [21].

Pollutants include solid, liquid, or gaseous substances present in greater than natural abundance produced due to human activity, which have a detrimental effect on our environment. The nature and concentration of a pollutant determines the severity of detrimental effects on human health [21]. An average human requires about 12 kg of air each day, which is nearly 12 to 15 times greater than the amount of food we eat. Thus, even a small concentration of pollutants in the air becomes more significant in comparison to the similar levels present in food. Pollutants that enter water have the ability to spread to distant places especially in the marine ecosystem.

It is not only the duty of the government but also of the people to take active role for protecting the environment, so protecting our environment is economically more viable than repairing when completely damaged.

In India, pollution and environmental degradation have reached to alarming dimensions due to lack of awareness and right kind of education, deforestation, and industrial development without

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environmental safeguards and sustainable way of execution of projects and planning [13]. Fortunately, public concern, rooted in the country's part has revived. To boost the existing environmental protection movements, greater emphasis is urgently needed for environmental education, people participation, population control, and cost-effective pollution control measures.

Huge funds are being earmarked for the process maintaining and conserving environment. It is realized that in order to achieve better results, people participation, and environmental education are essential in programs like afforestation, energy conservation, and wild life protection. The lack of consciousness about the ill-effects of various pollutants, lack of sincere implementation of pollution control rules, lack of fulfilling social responsibility to preserve the quality of environment, are some of the major fields need to be supervised.

The role of mass media such as newspapers, radio, television, etc is also very important to make people aware regarding environment. There are various institutions, which are playing positive role towards environment to make people aware regarding environment, like BSI (Botanical Survey of India, 1890), ZSI (Zoological Survey of India, 1916), and WII (Wildlife Institute of India).

WII is an autonomous institution under the ministry of forest and climate change government of India. It carries out wildlife research in areas of study like biodiversity, endangered species, wildlife policy, wildlife management, wildlife forensics, and spatial modeling [10].

The global concerns taken up by the international organizations, like holding of the first UN conference on Human Environment in 1972 at Stockholm, which founded the United Nations Environment Program (UNEP). In Brazil in 1992 *Earth Summit* at national capital, Rio de Janeiro was organized at the eve of 20<sup>th</sup> anniversary, where representatives from 160 countries congregated to discuss the burning issue.

Another important summit regarding *Sustainable Development* in 2002 at Johannesburg (SA) was organized to discuss the issue. Proceedings of all these conferences were covered by print and electronic media of international community in a big way, disseminating information to whole of the world, making an appropriate waking call.

National Environmental Awareness Campaign (NEAC) was launched in mid 1986 with the objective of creating environmental awareness at the national level. In this campaign, nominal financial assistance is provided to NGOs, schools, colleges, universities, research institutes, women and youth organizations, army units, government departments etc. from all over the country for conducting awareness raising and action oriented activities. Thirty-four Regional Resource Agencies (RRAs) appointed by the Ministry are involved in conducting, supervising and monitoring the NEAC activities. During NEAC 2013-2014, 11754 Organizations participated from across the country.

However, the implementation of any environmental plan for a particular region can be effective only if the populace of the region is properly aware and conscious of the existing problem. Without the cooperation and involvement of the people, no environmental plan for a region could be successful. It is therefore, becomes imperative to find out the awareness / conscious level of the people, and then devise appropriate strategies for the implementation of environmental plan. The initial objective of the present study is to estimate the environmental conscious level of the residents of Hisar city. However, it is pertinent to draw a distinction between environmental awareness and consciousness. Environmental awareness can better be considered as merely the level of knowledge about the environment possessed by an individual. A person can be called environmentally conscious only if he can derive relevant inferences from the knowledge he possesses and thus modify his actions in view of the knowledge he has attained. The present study aims:

### Objectives

1. To conduct a survey to estimate the environmental consciousness level of the residents of Hisar city
2. To compare the consciousness level among the age, gender, and education level of different sections of the society in study area

## METHODOLOGY

### Study area

Hisar city (Shown in Fig. 1)

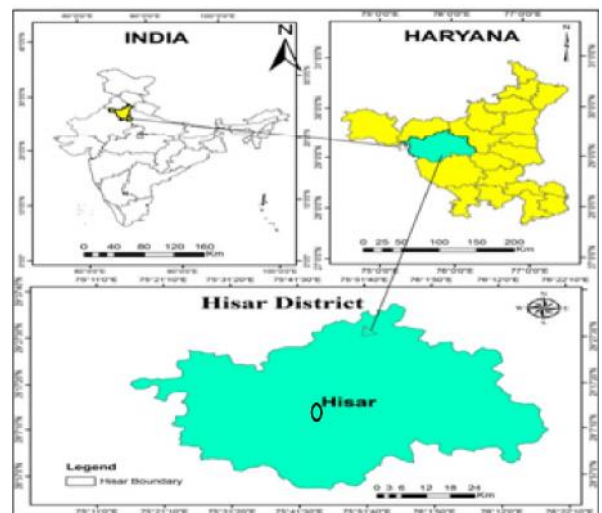


Fig. 1 Location of study area

### Location

Hisar city lies in 29° 08'56" N latitude and 75° 44'12" E longitude, and situated in the western part of Haryana state (INDIA) and is one of the largest cities in the state. City is considered hub of higher education because of presence of three major Universities like CCS Haryana Agricultural University (CCS HAU), Guru Jambheshwar University of Science and Technology (GJUS&T), and Lala Lajpat Rai

University of Veterinary and Animal Sciences (LUVAS)-Hisar-(India)125001.

**Population of Hisar urban/metropolitan**

Total=307024  
Male=166494  
Female=140530

**Major Sources of pollution**

1. Transport
2. Urban local bodies
3. Household waste
4. Plastic carry bags
5. Industries
6. Use of firecrackers on festivals

**Sample selection**

A sample of one hundred houses was selected following the method of simple random sampling. During the survey, questions pertaining to environmental consciousness were asked, recording age, sex, and education level of the respondents. One mark was allotted to the response indicating the presence of environmental consciousness in the subject and zero mark to the response lack of environmental consciousness in the subject.

Following this system, total scores for environmental consciousness of each of the subject were calculated. A scale was devised to indicate the consciousness level of the subject. This is as follows:

**Table 1** Scoring of consciousness level of an individual in study area

Scores	Environmental consciousness level
<3	Poor
3-5	Moderate
>5	Good

The following tables show how the number of individuals has been selected for survey work according to the age, gender, and qualification.

**Age**

**Table 2** Range of age of the subject

S. No	No. of individual	Years
1	45	<40
2	35	40-50
3	20	>60

**Gender/sex**

**Table 3** Gender of the subject

S. No.	Numbers	Gender/sex
1	55	Male
2	45	Female

**Qualification**

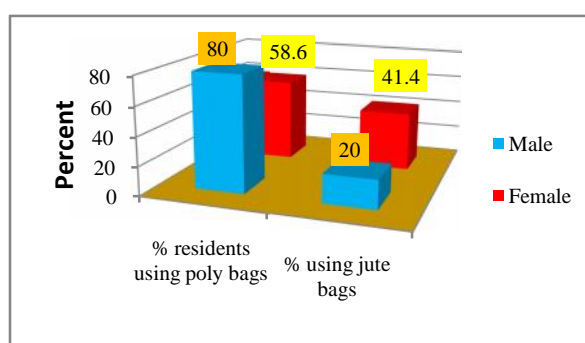
**Table 4** Qualification of the subject

S. No.	Number of individual	Qualification
1	10	Post graduate
2	60	Graduate
3	20	Matriculate
4	10	Under Matriculate

**RESULTS AND DISCUSSION**

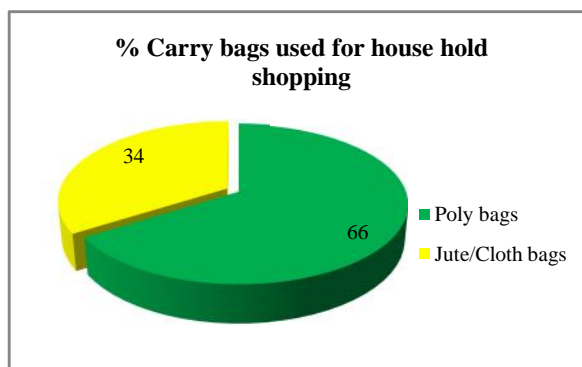
The environmental consciousness level among residents for each question in a questionnaire was calculated and described as follows:

The percentage of males and females in residential areas of Hisar city, using polyethylene and jute/cloth carry bags for household shopping/marketing has been depicted in Fig. 2 and 3. As per this survey report, more number of male (80%) preferred to use polyethylene carry bags as compared to female counterpart (58.6%) and jute/cloth carry bags 20% by male and 41.4% by female, a significantly higher number, conspicuous gender pattern in environmental consciousness among adolescents has been found [7]. It is imperative to organize community level educational program for different sections of the society for household garbage management consciousness [12].



**Fig. 2** Carrying of goods in poly bags/cloth bags for household marketing

Reason as described by some of the female respondents, polyethylene bags might contaminate eatables. Over all use of polyethylene carry bags is 66% and jute/cloth carry bags 34% (Fig. 3). This is happening despite the fact that for the last few years, the use of polyethylene bags has been banned throughout the Haryana state, promulgating through a legislative law. Because of poor implementation, law could not be enforced in true letter and spirit and material is still being used clandestinely.



**Fig. 3** Carrying of goods in poly bags/cloth bags for household marketing

The impact of plastic bags on the environment is enormous. As of August 2010, between 500 billion and 1 trillion plastic bags are being used each year worldwide. Approximately 100,000 sea turtles and other animals die every year because they either mistake the bags for food or are strangled in them (Fig. 4a 4b), says Natural Environment. In Australia, 50 million garbage

bags end up as litter yearly, and the "plastic soup" patch floating in the Pacific Ocean is twice the size of the continental United States. It is roughly 80 percent plastic, according to The Independent, British newspaper.



Fig. 4a, 4b Polyethylene being swallowed by animal, causing impaction in ruminants (Source: Surgery section, TVCC, LUVAS-University-Hisar (India)-125004

While some governments are taking steps to reign in plastic bags, other countries are seriously lagging behind. In 2008, China started to ban stores from offering free plastic bags; previously, China had been using 3 billion plastic bags a day, according to Tree hugger [19]. One of the most substantial efforts has taken place in Ireland, where a tax has been issued on each plastic bag. Paying the equivalent of 20 cents tax per plastic bag used in a store has led to a 95 percent decrease in usage.

Male and female of study area use various materials as given in option for the protection from mosquitoes in their houses. Mosquitoes are big menace all over the world. More people die because of malaria and dengue than cancer and other dreaded diseases. Four alternate materials are given in the list of option. Fewer people use mosquito net as depicted in Fig. 5 and 6. Only 23.3% male and 18.5% female make use of mosquito net and on an average 20% people make use of mosquito net. 16.6% males and 25.7% females make use of insecticide spray in their houses for the protection from mosquitoes. Maximum use of repellent mats are in use for this purpose in these days to the level of 56.6% by males and 48.5% by females and on an

average 51% as compared to all other alternatives available in the market. Very few people make use of appliances (6% only), which are electrically charged and very minute current from chargeable battery is made to flow through the metallic mesh sufficient to kill a mosquito when it touches the electrically charged mesh. Females prefer to use this appliance (7.1%) as compared to male counterpart (3.3%), Fig. 5.

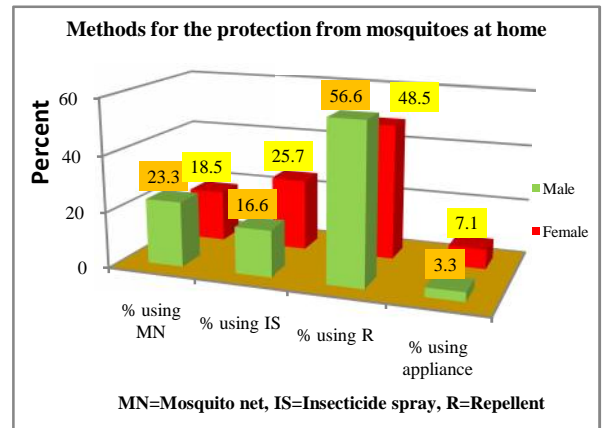


Fig. 5 Methods for protection from mosquitoes in residences

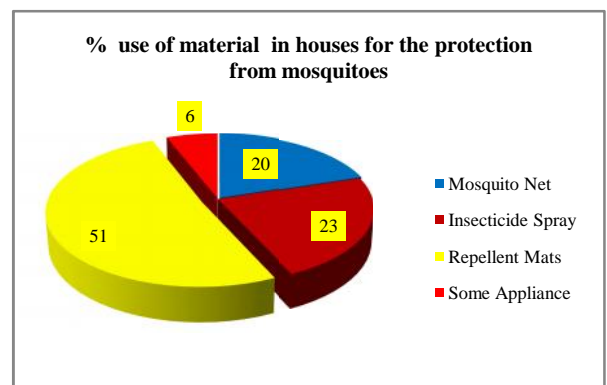


Fig. 6 Methods for protection from mosquitoes in residences

Pesticides are chemicals or biological substances used to kill or repel targeted organisms. All pesticides are poisons. In many cases, they are designed to impact the immune, reproductive, or nervous system of insects. Health effects of pesticides can cause both acute and chronic problems. Acute health effects appear shortly after exposure to these pesticides and can include skin and eye irritations, headaches, dizziness, nausea, weakness, difficulty in breathing, mental confusion and disorientation, seizures, coma, and even death. Chronic health effects may not be apparent until months or years after exposure. Such health ailments include nervousness, reproductive immune system disorder, and even cancer [1].

All pesticides are associated with some risk of harm to human health and the environment. Every pesticide on the market must be registered with the Environmental Protection Agency (EPA). This registration does not guarantee the safety of the product even when used as directed. In fact, the EPA has officially stated that no pesticide can be considered safe and federal law prohibits manufacturers from making claims that EPA registration of their products means they are safe [4] [6].

Residents of the study area were enquired about the use of water purifier. Eighty percent of the respondents replied affirmatively and twenty percent were not having the water purifier (Fig. 7). The quality of water, whether used for drinking, domestic purposes, food production or recreational purposes has an important impact on health. Water of poor quality can cause disease outbreaks and it can contribute to background rates of disease manifesting themselves on different time scales. Initiatives to manage the safety of water do not only support public health, but often promote socioeconomic development and well-being as well.

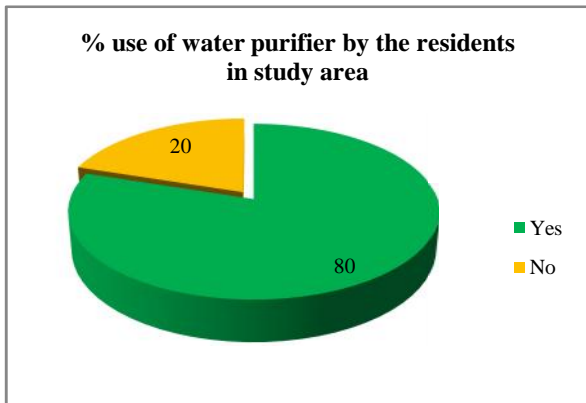


Fig. 7 Use of water purifier by the residents in study area

The impacts of environmental pollution on freshwater quality are numerous and have existed for a long time. Industrial development, the advent of intensive agriculture, the exponential development of human populations and the production and use of tens of thousands of synthetic chemicals are among the main causes of water quality deterioration at local, national, and global scales. The major issue of water pollution is the interference with actual or planned water uses.



Fig. 8 a) Filth under the bridge of canal, b) Canal bottom with lot of scattered plastic waste c) domestic and industrial sewage sludge is being disposed in open water channel,

Water pollution is the contamination of water bodies (e.g. rivers, canals, aquifers, and groundwater). This form of environmental degradation occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to remove harmful compounds.

Fig 8 a) depicts accumulation of plastic and other form of waste material under the bridge of canal flowing at the skirt of the city. Canal is the only source of water for drinking and other domestic consumption purposes for population of the city, b) Whole range of canal bottom is showing scattered filth and waste material, which is enough to contaminate flowing water; c) Domestic and industrial Sewage sludge water is being disposed directly into open channel water which will be used for growing vegetables. Raw sewage water available from cities is a mixture of domestic, commercial, and industrial activities. Currently more than 450 cities in India generate more than 17 million cubic meters of raw sewage water per day [2].

Water pollution [8, 9] affects the entire biosphere – plants and organisms living in these bodies of water. In almost all cases, the effect is damaging not only to individual species and population, but also to the natural biological communities [21].

4.4 The percentage of male and female residents using different methods to meet out their water requirement during journey is shown in Fig. 9 and 10. This is indicated in these figures that 80% female prefer to use their own water bottle on the way and 73.3% male also have the same opinion. 11.4% female feel to buy a soft drink during journey and 10% male also think so (Fig. 9, 10).

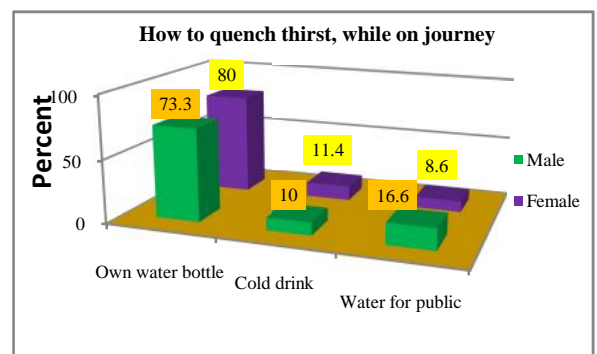


Fig. 9 how do you quench your thirst, while on journey?

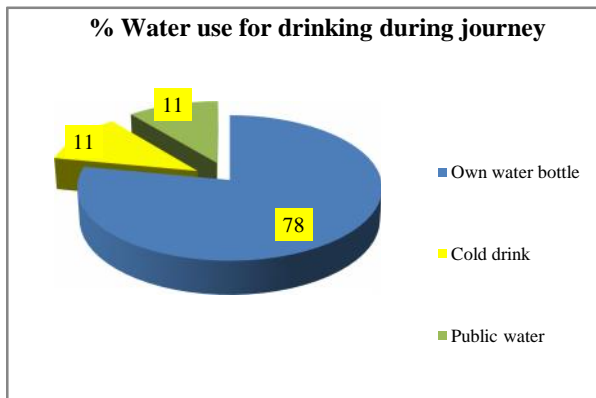
Male counterpart may go for public water (16.6%) in comparison to cold drink (10%), but female would prefer cold drink (11.4%) in comparison to public water (8.6%). Female counterpart seems to be more conscious about the quality of drinking water as compare to male. Water is major source of so many diseases and health ailments (Table 5) [9].

One of the most severe and ubiquitous causes of environmental degradation is the discharge of organic wastes into watercourses. A serious side effect of water anoxia is the release of toxic substances from particulates and bottom sediments in rivers and lakes. Other pollution effects from domestic sewage discharges into watercourses and aquifers include the build-up of nitrate levels in rivers and groundwater [5].

**Table 5** Global morbidity and mortality rates of main diseases related to water

Disease	Number/Year or Reporting Period	
	Cases	Deaths
Cholera - 1993	297,000	4,971
Typhoid	500,000	25,000
Giardiasis	500,000	Low
Amoebiasis	48,000,000	110,000
Diarrhoeal disease (under 5 years)	1,600,000,000	3,200,000
Dracunculiasis (Guinea Worm)	2,600,000	-
Schistosomiasis	200,000,000	200,000

Source: [9]



**Fig. 10** Use of water during journey hours

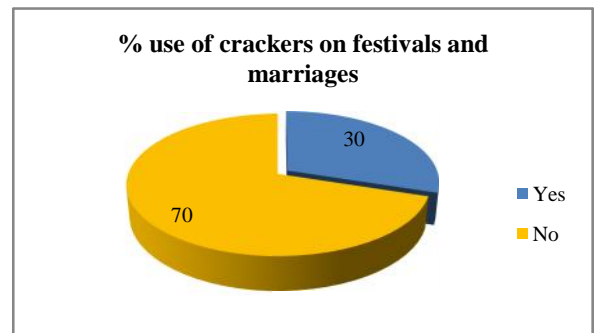
**Table 6** Category of respondents in favor/not in favor of bursting crackers on festivals

Categories	Out of 100	% In favor	% Not in favor
male	30	26.7	73.3
female	70	25.7	74.3

Thirty male and 70 female responded in environmental consciousness survey drive, how many are in favor or disfavor of bursting crackers at the eve of festivals and marriages? As per depiction in Table 6, 26.7% male and 25.7% female were in favor and 73.3% male and 74.3% female disregarded the idea on the ground, it's a sheer wastage of money and at the same time polluting the environment and risky as well. On an average 70%, people are not in favor of bursting crackers at the eve of festivals and marriages, only 30% favor the idea (Fig. 11).

For a country like India where festivities and celebration forms the core for recreation and cultural diversity, the instances for air and noise pollution are higher. *Diwali*, which is known as

festival of lights is not only about lighting *Dias*, its scope of celebration extends much beyond that to bursting a volcano of crackers. This may be justified as an annual occurrence, yet it cannot be denied as a major participant to air and noise pollution [13].



**Fig. 11** Use of crackers during festivals/marriages

Apart from the health concerns, firecrackers are undoubtedly a threat to environmental cleanliness and sustainability. The amount of waste generated during one season of *Diwali* from bursting crackers more than makes up for all year waste production from any large-scale establishment. The nature of waste generated by crackers can be heaps of garbage mainly paper and plastic, air suspended particulates, respirable particulate matter, gases like sulphur and nitrous oxide released into the air. The gases and effluents apart from being leading cause for irritation and respiratory disorders also release green house gases like carbon dioxide, methane, and carbon monoxide that majorly contribute to green house effect. With every family that mostly buys huge boxes of crackers, we just increase our carbon footprint instead of reducing it. Firecrackers make up a huge business, which demands huge investment in terms of money, labor, non-renewable resources such as coal, setting up large-scale industries and factories. The whole process just evolves to grow bigger and bigger to build a monster that would eventually engulf us in its flames of destruction.

Exposure to particulate matter for a long time can lead to respiratory and cardiovascular diseases such as asthma, bronchitis, lung cancer, and heart attacks. The suspended particulate matter (SPM) ranged between 102.6-170 $\mu\text{g}/\text{m}^3$ ,  $\text{SO}_2$  4.7-8.6  $\mu\text{g}/\text{m}^3$  and  $\text{NO}_x$  3-9.9  $\mu\text{g}/\text{m}^3$ , respectively [8]. The global burden of disease study for 2010, published in 2013, had found that air pollution was the fifth-largest killer in India and around 620,000 early deaths occurred from air pollution-related diseases in 2010. According to a WHO study, 13 of the 20 most-polluted cities in the world are in India [23].

Bursting of crackers is a significant irritant and displeasure to the ears. The class of living beings most adversely affected is the innocent domesticated cats and dogs, young babies and old people [3].

The percentage of male and female respondents using generators, inverters, or nothing in case of electricity disruptions, which is very common in summer season due to increased electricity load. This is depicted in Fig. 12 and 13. About 83.3% males and 64.2% females are in favor of using

inverter, 32.8% females are in favor of generator, 16.6% only male counterpart favors generator,

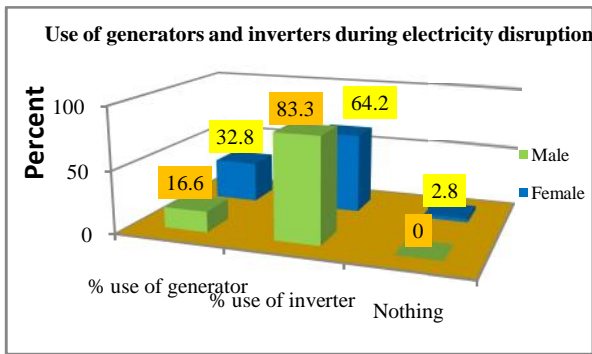


Fig. 12 Use of generators/inverters during electricity disruption

In addition, on an average 70% people used inverter and 30% used generator, irrespective of gender, Fig. 12. Inverter is economically more viable and it does not require much running cost, however, generator consumes fuel, pollutes air, and creates noise, which is obnoxious and irritating [13, 16]. The percent of male and female residents in favor or not in favor of using generator/inverter/ or use nothing, is depicted in Fig. 13.

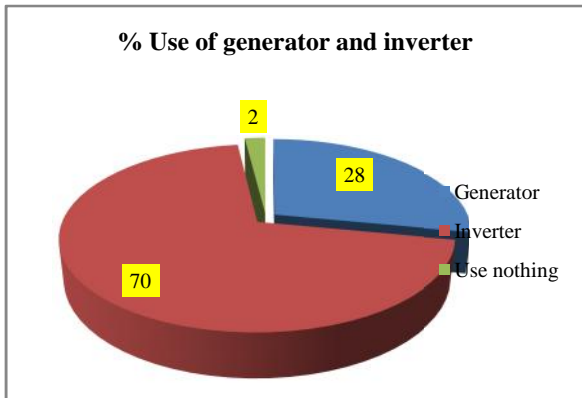


Fig. 13 Use of generators/inverters during electricity disruption

The Fig.14 depicts that 86.6% of males are in favor of using unleaded petrol for their vehicles, whereas 38.5% females are in favor of unleaded petrol. Fifty percent females expressed their opinion against unleaded petrol and male only 13.3%. Females about 11.4% were unaware about unleaded petrol and they expressed their ignorance.

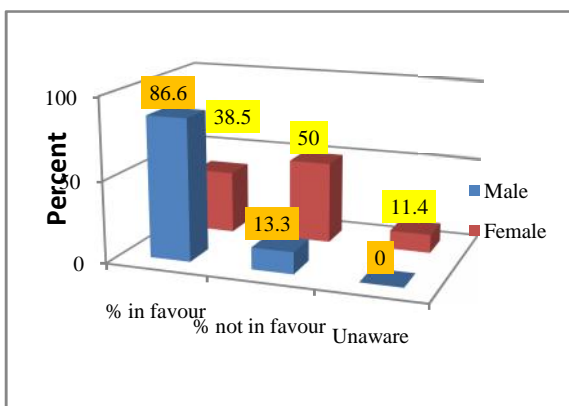


Fig. 14 Use of unleaded petrol in vehicles

On an average basis 58% people were in favor of use of unleaded petrol for their vehicles, 33% were not in favor and only 9% were found to be unaware about this as depicted in Fig. 15.

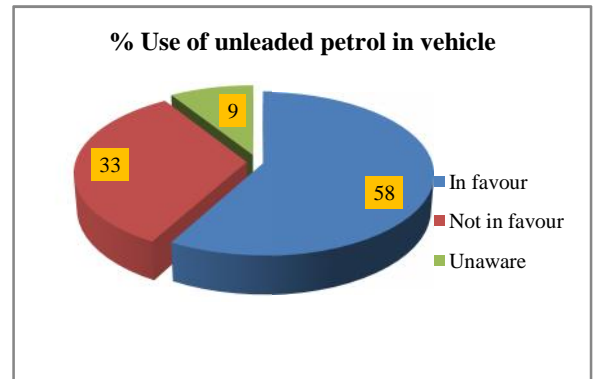


Fig. 15 Use of unleaded petrol in vehicles

The first legislated exhaust (tailpipe) emission standards were promulgated by the State of California for 1966 model year for cars sold in that state, followed by the United States as a whole in model year 1968. The standards were progressively tightened year by year, as mandated by the Environmental Protection Act (EPA). By the 1974 model year, the emission standards had tightened such that the de-tuning techniques used to meet them were seriously reducing engine efficiency and thus increasing fuel usage. The new emission standards for 1975 model year, as well as the increase in fuel usage, forced the invention of the catalytic converter for after-treatment of the exhaust gas. This was not possible with existing leaded gasoline, because the lead residue contaminated the platinum catalyst. In 1972, General Motors proposed to the American Petroleum Institute the elimination of leaded fuels for 1975 and later model year cars. The production and distribution of unleaded fuel was a major challenge, but it was completed successfully in time for the 1975 model year cars. All modern cars are now equipped with catalytic converters and unleaded fuel in highly developed countries [21].

Lead Affects both Local and Global levels. Leaded petrol is the highest source of atmospheric pollution. Lead is highly toxic and no level of lead is safe.

Health Impacts: Lead in the body is distributed to the brain, liver, kidney, and bones. It is stored in the teeth and bones, where it accumulates over time. Human exposure can be assessed directly through measurement of lead in blood, teeth, or bones. Lead has serious health impacts, impairs development of brain function in children, and lowers IQ; increases heart and respiratory diseases in adults among other associated diseases.

Leaded petrol has negative effects on a vehicle's engine and exhaust systems, such as the corrosion of various components, fouling of spark plugs, and contamination of engine oil by corrosive acids. It has been estimated that using unleaded petrol can extend engine life by 1.5 to 2 times. Unleaded petrol will allow for introduction of catalytic converters that will reduce other emissions (e.g. carbon monoxide, nitrogen oxide, hydrocarbons) [18].



The percent of male and female residents in favor or not in favor of choosing to close windscreen in the wake of dense emissions, wrapping their faces with cloth, or avoiding peak hour travelling is depicted in Fig. 17. Thirty percent of the people travelling in cars would prefer to close the windscreen to protect from air pollution due to traffic. Travelling on bike, 50% will try to protect from vehicular fumes by wrapping cloth on their faces as depicted in the Fig. 16 and 17. Twenty percent would prefer to avoid travelling in peak hours to protect from air and noise pollution.



Fig. 16 a and 16 b depicting people protecting from vehicular fumes by wrapping their faces with cloth

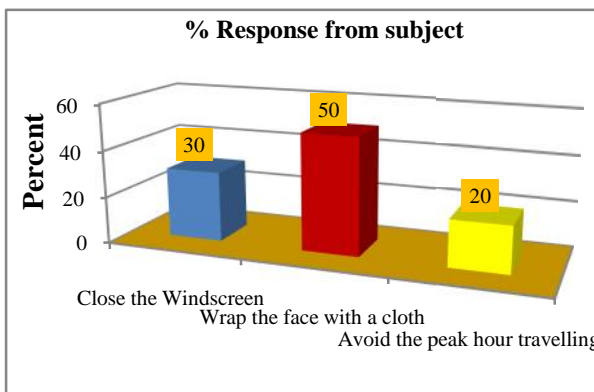


Fig. 17 Response of subject stuck in traffic jam

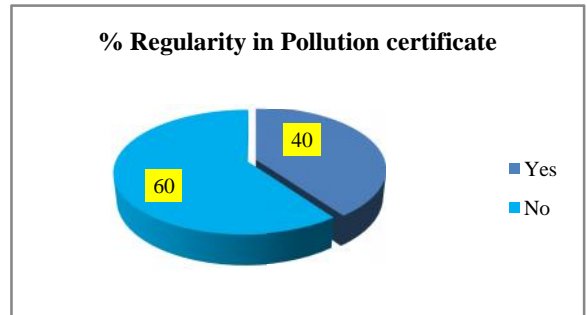


Fig. 18 Response of subject to regularity in pollution certificate updating

The percent of male and female residents going for obtaining pollution certificate in favor or not in favor is depicted in Fig. 18. Forty percent of the respondents were of the view to maintain regularity in renewing pollution certificate to keep a check on vehicular emissions. Sixty percent of the people still feel unconcerned, which is a serious matter and needs to be addressed.

The percent of male and female residents in favor to use dustbin or not in favor and just through chocolate wrapper on the roadside as depicted in Fig. 19. Ninety percent people felt quite concerned about the cleanliness of the city, six percent people were just ignorant, and for four percent it does not matter if thrown on roadside or dumped in some corner and felt unconcerned.

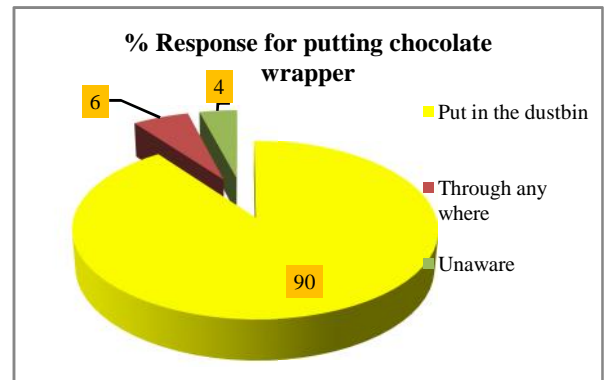


Fig. 19 Response of subject to cleanliness

Fig. 20 shows that 45% residents prefer going to religious place and 42% feel to visit hill station, 10% expressed their willingness to visit National Park/Sanctuary, and 3% would like to visit famous cit.

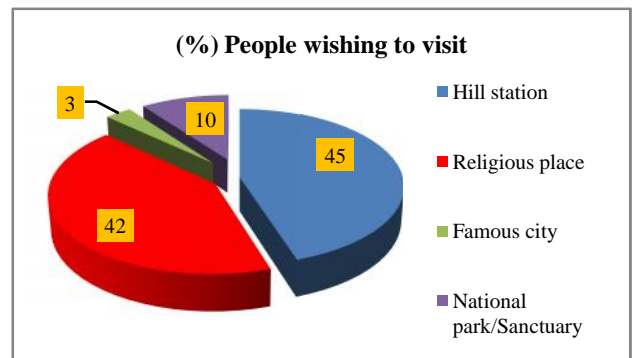


Fig. 20 Wishes of people for visiting places of their choice

Television is the single most powerful mode for dissemination of information and creating awareness among people. As per depiction in Fig. 21, 50% alone is the share of TV as compared to all other modes of communication like newspaper (37%), radio (10%), and magazines only 3% (Fig. 21).

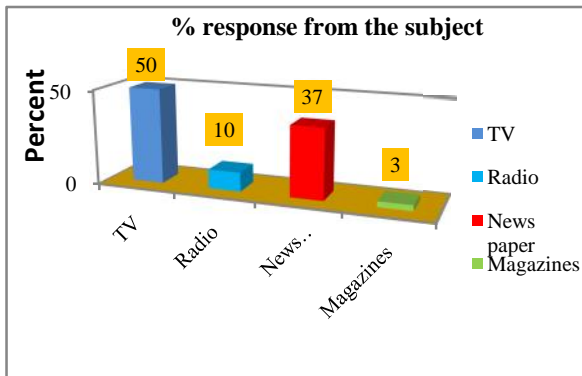


Fig. 21 Response of subject in gathering information from various sources of communication

It is not only that the average amount of time spent on watching television and reading the newspaper per day is a tremendous one, but it also seems that the environmental issues tackled in media are realized and reflected by viewers, readers and listeners at least to some extent. While those issues that are more or less neglected by Indian electronic media are not at all present in the public's consciousness and may be focused by newspapers only.

Furthermore, electronic media, in principle, are able to reach a vast percentage of India's complex society. Prerequisite for this is that environmental programs are especially designed for all major target groups (age, level of education, language, urban and rural population, and so on). In this context, the role of radio should not be underestimated, although the number of listeners and the amount of time spent on listening to the radio is obviously lower than the corresponding figures of television and newspaper.

Many people were aware of problems like air pollution (96%), water pollution (72%) and household (57%) or industrial and chemical wastes (34%) that are not properly collected and recycled or disposed. Air pollution was considered as the most serious problem by a vast majority of people (70%), followed by water pollution and waste. Media can play a positive role in creating awareness in society. Seventy percent people investigated were unaware about the existence of the ozone layer, while 30 percent were affirmative as depicted in Fig. 22.

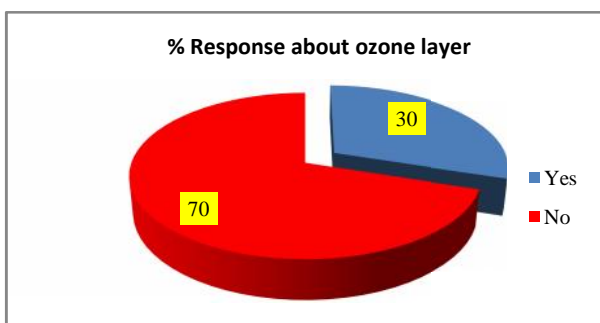


Fig. 22 Response of subject regarding awareness of common phenomenon of ozone layer

People are exposed to environmental pollution. Making people aware of the relatedness of environmental and social problems could push the issue of environment more towards the top of the agenda. Trying to find out on the knowledge of environmental problems that can be considered to be in a two way relationship with environmental awareness (both as prerequisite and as consequence of awareness of environmental problems), the results showed that there is still a lot of work to be done in informing people on the major ecological problems. This is especially true for those on a global level like global warming or depletion of ozone layer that only 30% of the interviewers were familiar with ozone layer.

Ozone layer acts as a barrier to check and absorbs the ultra-violet rays of sun (>90%) before reaching to earth. Thus, any damage to ozone layer or depletion of Ozone layer results in allowing escaping of ultra-violet rays to earth, causing harm to all form of life on earth.

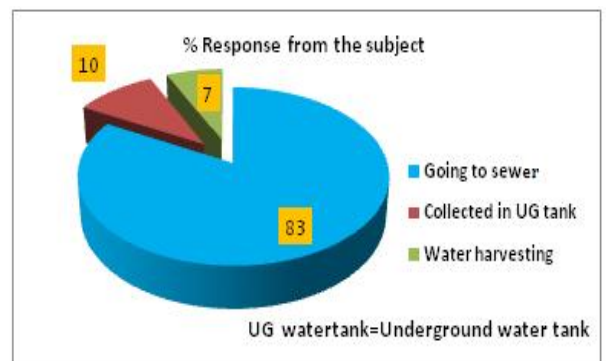


Fig. 23 Response of subject regarding awareness of water conservation

Very few people were aware how to utilize rainwater and make use of it in day-to-day life. Fig. 23 depicts that most of the rainwater (83%) flows in the sewer; very few people (only 10%) have constructed underground tanks for the collection of rainwater to use in summer days when water supply becomes restricted due to shortage of water. Even fewer (only 7%) are aware about rainwater harvesting technology.

Fig. 24 shows that 96% people handover the garbage generated in the kitchen to the municipality council workers team for processing as waste management. At least people are aware not to throw the garbage in the street corner. Best part is still missing, people are less aware about the garbage decomposition pit in the backyard for utilizing this material for gardening and ornamental plants.

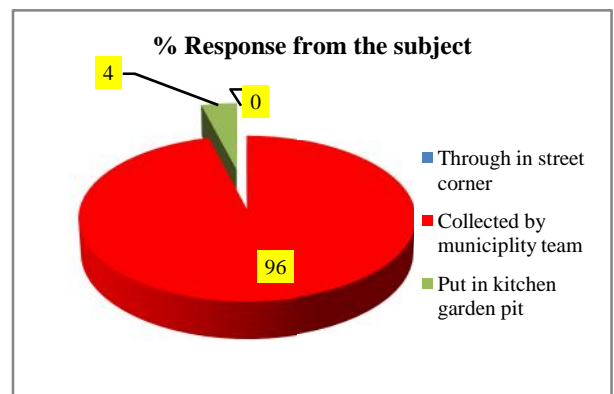


Fig. 24 Response of subject regarding waste management



Fig. 25 Garbage being managed by municipality council team of workers

On an overall study of one hundred samples of residents on which survey was conducted among the residents of Hisar city, scoring pattern reveals that 71 % of the subject fall under moderate category of environmental consciousness level, 4 % of them fall in poor category, whereas 25 % of the subject fall in good category of environmental consciousness level. This is depicted in table 7.

Table 7 Depiction of environmental consciousness level category wise

Score	Category	Environmental consciousness level
0-2	Poor	4 %
3-5	Moderate	71 %
6-8	Good	25 %

## CONCLUSION

- In household marketing males found to prefer using more polyethylene carry bags as compared to female counterparts. If we look at over all scenarios, people are less aware about the harmful effects of this material, which is considered corrosive and poisonous.
- Plastic, one of the most preferred materials in today's industrial world is posing serious threat to environment and consumer's health in many direct and indirect ways. Exposure to harmful chemicals during manufacturing, leaching in the stored food items while using plastic packages or chewing of plastic teethers and toys by children are linked with severe adverse health outcomes such as cancers, birth defects, impaired immunity, endocrine disruption, developmental and reproductive effects etc. Promotion of plastics substitutes and safe disposal of plastic waste requires urgent and definitive action to take care of this potential health hazard in future.
- In various methods applied in residences to protect from mosquitoes, people mostly use repellent mats. They seem to be unaware, how much harmful gases are being emitted by these materials affecting nervous system.
- While on journey, people mostly prefer to use their own water bottles to quench their thirst. This indicates that people are well aware about the quality of water they drink and they know how harmful can be infected water, which may carry harmful microorganisms causing various diseases and health disorders. The quality of water, whether used for drinking, domestic purposes, food production or recreational purposes has an

important impact on health. Water of poor quality can cause disease outbreaks and it can contribute to background rates of disease manifesting themselves on different time scales. Initiatives to manage the safety of water do not only support public health, but often promote socioeconomic development and well-being as well.

- More people are not in favor of bursting crackers on the eve of festivals and marriages; it shows people are well aware about air and noise pollution they create in addition to economical loss.
- Males are more conscious about using inverters, rather than generators, indicating they are more conscious about the air and noise pollution they create. Perhaps economical factor may also be the reason. However, in general, people are aware about the harmful effects of generator, and they avoid using it unless disruption is for a long spell of time.
- Males found to be more aware about the usefulness of unleaded petrol as compared to their counterpart.
- For recreation trips, mostly people prefer visiting religious places and hill stations. Less people found to be interested to visit National Park/sanctuary. Reason may be ascribed to that people are going for recreation and not for environmental point of view.

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