SOCIAL MARKETING OF ENVIRONMENTAL EDUCATION TO SCHOOL CHILDREN

By

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IN

HOME SCIENCE EXTENSION EDUCATION

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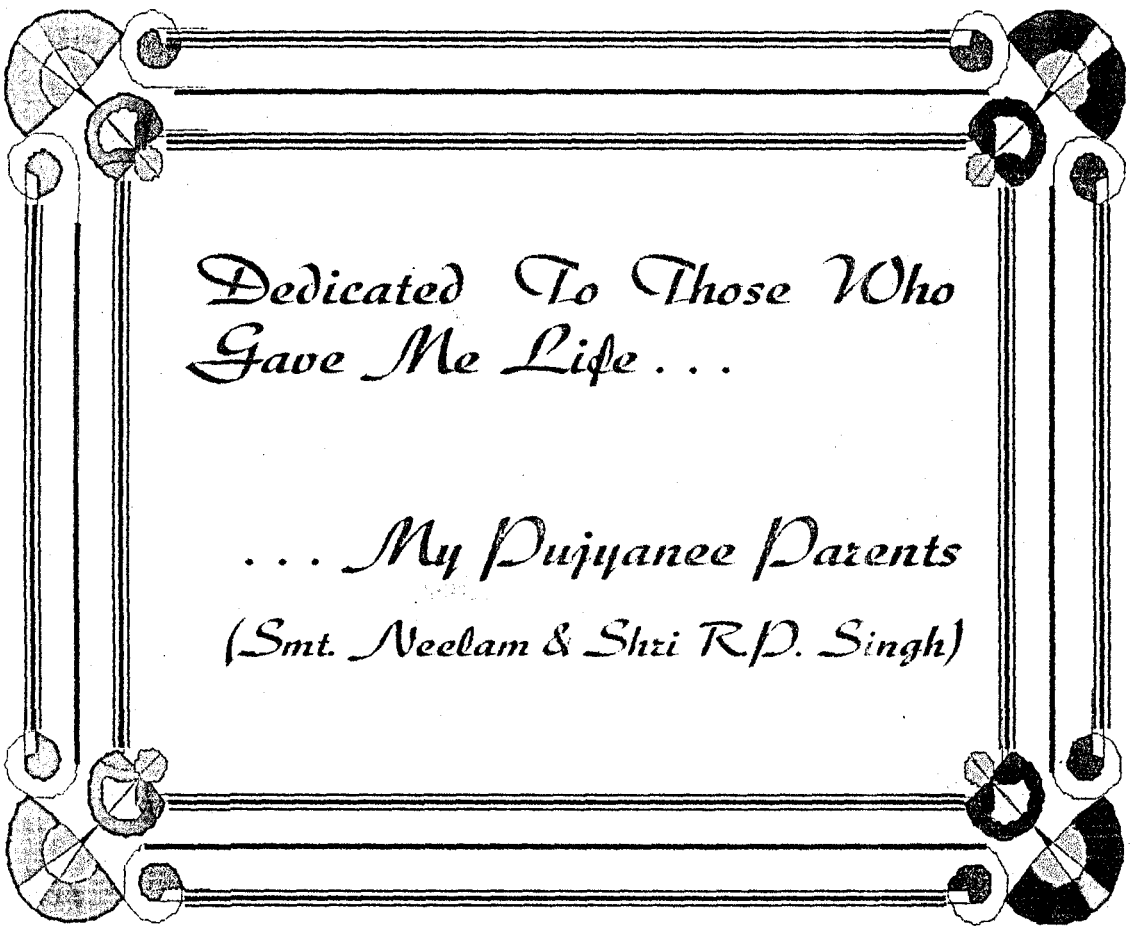
Dedicated To Those Who
Gave Me Life . . .
. . . My Pujyanee Parents
(Smt. Neelam & Shri R.P. Singh)

CERTIFICATE - I

This is to certify that the thesis entitled, "**Social marketing of environmental education to school children**", submitted for the degree of Master of Science in the subject of Home Science Extension Education, to the Chaudhary Charan Singh Haryana Agricultural University, Hisar, is a bonafide research work carried out by **Ms. Preeti Singh** under my supervision and that no part of this thesis has been submitted for any other degree.

The assistance and help received during the course of investigation have been fully acknowledged.

31/10/24

[Dr. (Mrs.) Lali Yadav]
MAJOR ADVISOR

CERTIFICATE - II

This is to certify that the thesis entitled, "**Social marketing of environmental education to school children**", submitted by **Ms. Preeti Singh** to the Chaudhary Charan Singh Haryana Agricultural University, Hisar, in partial fulfilment of the requirements for the degree of Master of Science in the subject of Home Science Extension Education, has been approved by the Student's Advisory committee after an oral examination on the same.

MAJOR ADVISOR

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Preeti Singh

HISAR **[PREETI SINGH]**
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LIST OF ABBREVIATIONS

AIDS	=	Acquired Immuno Deficiency Syndrome
CEE	=	Centre for Environmental Education
CPCB	=	Central Pollution Control Board
CV	=	Coefficient of variation
IQ	=	Intelligence quotient
IR	=	Irrelevant
MR	=	Most relevant
R	=	Relevant
WWF	=	World Wide Fund for Nature

Introduction

CHAPTER-1

INTRODUCTION

Man has lived for centuries in harmony with nature. Such symbiotic relationship with nature has shaped human development until the beginning of industrial era. Man's capacity to adjust with the natural and the man-made environment, and to transform the environment itself, has passed through various phases. The fundamental factor that distinguishes modern society from the past is the accelerating pace of changes caused in the environment by the scientific and technological developments. It is the human intervention in the natural processes, particularly during the last few decades, which has created ecological destabilization and environmental problems of serious magnitude. This increasing human intervention lead to the concern for spreading environmental education through social marketing.

Environmental education is a recent educational intervention to cope with the problem of environmental deterioration (Sharma, 1994). Environmental education encompasses all aspects of human life such as socio-economic, political, natural, man-built, biological, aesthetics and cultural and stress the inter-relationship and the dynamic nature of these component sub-

systems. It contributes to an appreciation of the importance of the environment in economic, social and cultural development.

The philosophy of environment conservation and environmental education needs people's participation which can come only if the hazards and impacts of such severe problems are made clear to the common masses. One will have to reach each sector of an individual's social life, giving birth to a phenomenon termed as "social marketing of environmental education" for attainment of this purpose. Thus, social marketing of environmental education is the need of the hour. This is because people need to be made aware of the hazards we are and we will be facing, as a result of growing environmental problems of varying magnitude. In the process of social marketing there occurs adaptation of methodology of marketing to social imperatives or subjects with the objective of achieving social change. Therefore, social marketing of environmental education, like any other aspect is viewed in terms of product, price, place and promotion through people's participation. This is much required because major environmental problems are associated with natural resources like air, water, soil, noise, biodiversity and garbage disposal systems on which the life sustains.

Pure air is vital for life on earth but it is hardly devoid of pollution in recent world. Air pollution is a very wide term which includes hazards like acid rains, smoke from industries, global warming, ozone depletion and smog formation.

According to Central Pollution Control Board, (1998), air pollution refers to the presence of any substance in the atmosphere in such a concentration that may tend to be injurious to human beings and other creatures, or to the planet itself.

Another component essential for survival of life on earth is water but despite the well known fact, careless practices and usage of water are leading to its pollution. Water pollutants can be broadly categorised into three i.e. domestic, agricultural and industrial. These may lead to harmful water borne diseases as malaria, filariasis, diarrhoea, guinea worms, yellow fever, sleeping sickness etc. According to an estimate nearly ten million people die every year because of polluted water. Thus water remains to be yet another component on which interest need to be aroused and education and training need to be imparted to the common public.

Yet another aspect of healthy environment is noise free living. Today noise has become almost an unavoidable factor on roads and streets of Indian metropolis with loudspeakers, tape recorders adding to the problem along with automobiles.

Noise is referred as unwanted and unpleasant sound. The sound which exceeds 140 d B is termed as noise. It has been reported that constant noise affects the hearing capacity of an individual. Exposure to constant noise may cause the blood vessels to contract, skin to become pale, muscles to con tract and adrenaline released into blood leading to tension and nervousness. It may even lead to difficult hearing or dumbness (Jain, 1993). Thus the menace of

noise pollution given less attention needs to be thoroughly considered for safe living.

Soils are a living community of microorganisms such as algae and fungi. They have been formed over an extremely long period, but now are being eroded at a rapid rate due to faulty human intervention.

Today soil has lost all its fertility acting as a dumping ground for waste products like domestic wastes, human wastes, animal wastes, industrial and agricultural wastes. Besides this salt and silt drained from irrigated lands also pollute the soil.

Garbage left open is visible in almost every third lane of a city, leading to infectious diseases. Products like plastics are not degraded in nature and hence remain for a long time in the environment. For many years waste has been burned as well as dumped into oceans, rivers or on land, contributing to air, water and soil pollution.

The above mentioned components however form a very tiny part of environmental problems, but starting with the less can only we imagine to head for more severe problems.

These problems require a systematic phase manner enquiry and deal by all concerned. This is more true in case of children of receptive age and stage who can have life long effects to deal with the problems of environment. Elders are though aware of the major environmental issues but fail in passing this valuable information to the up coming generation. As a result the researcher decided to work with the upcoming generation to inculcate in them

healthy environmental habits and practices. The study was planned particularly for students of standard tenth, they being the most potential, captive and viable audience and communicators. According to various child psychologists children in this age group retain most of what is taught to them. Moreover, because they are in the formative stage and the impressions created during this age continue long in life (Ravindranath, 1990). Also children in this age group have a strong peer influence, thus with the notion in mind that they will probably stimulate others peers also.

Moreover, their intimate relationship with their parents at home may also persuade them to adopt the right practices in use of various ecofriendly practices. In addition their knowledge about such critical issues will make them more aware and conscious citizens in future. Besides these, if they are given adequate knowledge by use of effective media and support material, it will make them wise consumers. Therefore, their perception about social marketing of environmental education was also considered important. Considering these issues the present study was carried out with the following specific objectives.

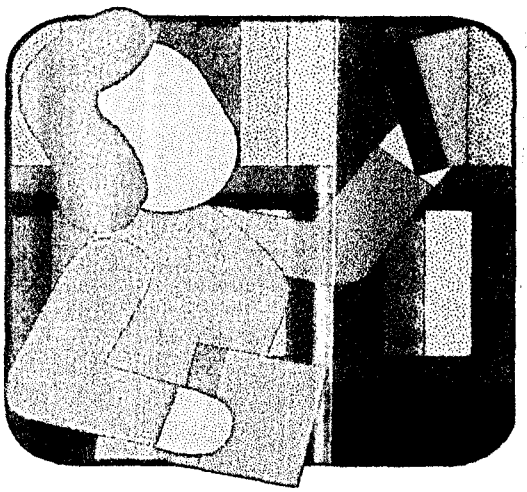
1. To identify the critical messages on environmental education.
2. To develop the intervention programme for social marketing of the critical messages.
3. To assess the knowledge of respondents before and after the intervention programme and isolate the factors affecting it.

Scope of the study

The present study was planned and taken up by the researcher keeping in mind the mandate of home science extension education discipline. Extension education since deals with the problems of hour at local regional and national level, and as environmental education is identified as one of the main problem of contemporary world, adequate information is needed on it which if not dealt judiciously at local level may lead to longer lasting harms. Thus, the study carried out can be very useful for educationist, policy planners and school administrators. It is anticipated that it will be useful for children, parents and common man as it would enable them to deal with the problem more consciously and effectively.

Limitations of the study

Environmental education in its totality is a very broad programme with a wide magnitude and engulfs numerous aspects however due to shortage of time only very few of them could be covered by the researcher. Also the study was limited to a smaller group of respondents and to only students of standard Xth. So, the problem of time, coverage of content and audience were some of the common limitations as faced by a single researcher. However, the study was carried out systematically and scientifically so having no limitations of methodology.



Review of Literature

CHAPTER-2

REVIEW OF LITERATURE

This chapter deals with the past researches being reported on the area of study. The researcher could lay hands on various studies carried out in the past however the most pertinent reviews have been included in this chapter. The review of literature have been presented under the following heads complimentary to the objectives of the present project.

2.1 Environmental education - importance and concept.

2.2 Environmental education - issues and problems.

2.3 Legislative action and environmental conservation.

2.4 Child as a communicator of environmental issues.

2.5 Factors associated with knowledge gain of the respondents

2.1 Environmental education - importance and concept

Doraiswamy (1988) defined environment as a resource bundle which can tilt the balance of life either for good or bad.

Ravindranath (1990) reported that environmental education necessitate development of consciousness which includes awareness about problems and issues related to environmental degradation, promotion of attitudes, values, problem solving and decision making skills.

Dighe (1993) revealed that adults concerned for the future of the environment should help young children in their care to become responsible care takers of the earth.

Gandhi (1994) said that environment is not a subject to be taught through singing or dancing. It is a serious science, the science of interrelated and interlocking crises, the cause of what we do and its effects.

Rebello (1994) commented that environmental education is an integral part of the education process which should be centred on practical problems and be of an interdisciplinary character building up a sense of values, contribute to public well being and concern itself with the survival of the human beings.

Selja (1994) cited that North American Association for Environmental Education defines environmental education as a life long process that encourages people to explore, raise questions, investigate issues and seek solutions regarding environmental and related social problems. The goal of environmental education is to create a citizenry that understands the size and complexity of today's problems and is willing and able to work towards solving these problems and preventing new ones.

Sharma (1994) said that environmental education is a recent educational intervention to cope with the problem of environmental deterioration.

Singh (1994) cited that a basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and built environment resulting from the interaction

of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, 'values', attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management and quality of the environment.

Hopkins (1996) reported that sustainability cannot be achieved without the support of people-knowledgeable and motivated, primarily through education and awareness to modify behaviour and lifestyles and to press for change by government and business.

Janaki (1999) reported that the canvas of environmental education includes four main, integrated components-awareness, real life situations, conservation and sustainable development. The fact that cannot be denied is that lack of awareness has led man to be harsh to nature. Awareness includes making the individual conscious about physical, social and aesthetic aspects of environment.

2.2 Environmental education - issues and problems.

Chopra (1988) revealed that a Soviet study has shown that smoking reduces a man's life span by 2250 days i.e. over six years. People who smoke nearly 20 cigarettes a day are twice as likely to have a heart attack as non smokers.

Dhar (1988) recorded that according to the WHO estimates, about 80 per cent of third world diseases are transmitted by dirty water. Infact, the level of contamination is such that if all the world's water were represented by one gallon the quantity of safe drinking water would be only two litres.

He further reported that industrial pollution results to only 10 per cent to 15 per cent of the total river pollution at an average but it is quite deadly due to the highly toxic substances dumped into the rivers.

Pandey (1988) cautioned that once the rich and varied spectrum of life forms of India now faces the danger of elimination. Ten per cent of its flowering plant species are said to be endangered. Among animals as many as eighty one species of mammals, forty seven of birds, fifteen of reptiles three of amphibians and a large number of invertebrates are striving hard to exist. There are many who disappeared before they could be salvaged like the two-horned rhinoceros of the sunderbans and the cheetah.

Nandy (1989) reported that India is using every year about 6000 million tonnes of its fertile top soil, about 174 million hectare of land is now agriculturally unsuitable.

Padmanabhamurthy (1989) viewed about the noise pollution studies conducted in India. Excess levels of noise than the permissible levels were observed during day and night. It was found that sensitive areas like hospitals, nursing homes, child care centres, maternity homes and educational institutions were more affected.

Singh *et al.* (1989) reported a study conducted by Rao and highlighted that higher the noise higher the incidence of deafness among students and teachers of schools which were built in noisy areas. Both of them tend to be more irritable and suffered from high blood pressure, ulcers and mental stress.

Koszarny and Gorynski (1990) indicated that noise level is increasing in school because of overcrowding of classes, low acoustic ability of school rooms, poor acoustic insulation ability of doors in the schools, inappropriate location of school and inadequate use of technical, protective means which affects mentally to the students as well as school teachers.

Das (1992) estimated that a large number of trees living for 50 odd years would clean the air of pollutants that can be done otherwise at a cost of Rs. 5 lakh. Thus plants can judiciously abate the air borne pollutants and so there is a need for categorising plants capable of mitigating air pollutants.

Pandey and Saleem (1994) reported that trees function as sinks of air pollutants owing to the fact that large surface area of their leaves absorb pollutants through their numerous stomatal operations. They are the best dust collector and average dust collection range from 1.44-5.33 gms/sq mt on leaf surface.

Singla *et al.* (1994) recorded that WHO Expert Committee on Environmental Sanitation (1950) recommended that it is insanitary to keep cattle and livestocks within the residential area, because it polluted the household area.

Banerjee (1995) reported that industry in the name of manufacturing a product, essential or luxury, gets the desired product but also leads to depletion of one or several raw materials, production of by-products and accumulation of huge quantity of waste products.

Muthuraman (1995) reported that pesticides are used for controlling the pests and increasing the yield. But increased use of pesticides has caused contamination of soil, air and surface and ground waters besides affecting the crop plants and produce.

Pathak (1995) suggested that noise can be reduced by the use of acoustic barriers. Trees and shrubs can provide such a barrier by reducing the intensity and changing the frequency spectrum of sound along its path. Trees and shrubs should be planted as close as possible to form a dense barrier and should be planted close to the source of noise and tree belt should be twice as long as the distance from the noise source to the receiver.

Sharma (1995) highlighted that it is not just the ears which noise assails. Subtle psychological and physiological effects are also suffered by the victims of noise pollution. In India 25 per cent of people suffer from ulcers and high blood pressure due to noise pollution.

Lakshmi and Karthikeyan (1995-96) said that in rural India about 80 per cent of the energy demand is met from fuel wood, cow dung and other organic matter. This reflects the fact that we are cutting down valuable trees and plants to obtain fuel wood.

Goyal (1996) revealed that mental as well as physical activities of homemakers are affected by level, frequency, duration and type of noise. Traffic noise caused most distraction in all the activities leading to decreased output and increased physiological stress on homemakers.

Malik and Sehgal (1996) pointed out that there is need to properly ducate the masses about the noise hazards, encourage architects to design ıomes with adequate insulation against noise pollution, buy household ıppliances with active noise cancellation technology and keep the audio ;ystems at low volume for prevention of noise. As trees are noise breaker so plantation in colonies, hospitals, schools, factories and other public places should be encouraged.

Bequette (1997) reported that the concentration of carbon dioxide in the earth's atmosphere has risen from 280 volumes per million at the beginning of industrial era to 360 volumes today which can be controlled only by reducing depletion of forests as the biosphere and atmosphere annually exchange enormous amounts of carbon. He further revealed that soil is the very root of humanity if it will disappear humanity will disappear.

Khanna and Ram Babu (1997) reported that the combined damages to human health and ecological functions of vegetation due to air pollution was Rs. 26,772 and Rs. 11,308 crore during 1980-90 and 1991-95 respectively.

Mani (1997) reported that composting is the best method of recycling agricultural and animal wastes into agriculture. There is great urgency for promoting this technique at all levels of scale through incentives and institutional efforts.

Mehta and Dave (1997) reported that vermiculture biotechnology is a handy solution to garbage management for fruitfully utilising organic waste.

This technique of manure production can therefore be adopted at household/ institutional or farm level with very little efforts. They further reported that our ecological balance is being disturbed mainly because of two types of wastes : industrial waste, usually being disposed in big rivers or sea and kitchen or garden wastes, accumulated in homes, institution and farms.

Rajadhyaksha (1997) found that one out of every three persons in Mumbai suffer from cough, sore throat and eye irritation to asthmatic attacks, bronchitis chest pain and dizziness due to air pollution.

Sabir (1997) said that proper garbage management involves imaginative and workable arrangements of disposal facilities and suitable use of available men and materials. In addition, community hygiene consciousness should be inculcated through the co-operation of concerned people and training programmes for all.

Sen (1997) reported that to tackle the respiratory problems of drivers from air pollution, Mridul Enterprise has introduced a Fast Air Purifying Respirator, an air purifier that works on the ionizing principle. It generates the ions that attack pollutant particles (which one positively ioned) present in air.

Wagle (1997) revealed that almost 70 per cent of available water in the country is not potable causing numerous types of illnesses.

Nagda (1997-98) reported that rapid urbanisation has eaten up nearly four million acres of agricultural land. Added to this is widespread industrial pollution caused by the fertilizer, paper, sugar and steel industries.

Liu *et al.* (1998) reported that animal fats, vegetable oils and detergents from restaurants (especially quick-service restaurants), dairy farms and food processing plants have led to an increase in oil and grease content in waste water which can cause problems as blockages in drainage systems and accumulation on interior pipe surfaces in treatment plants.

Sahay (1998) warned that main cause of water pollution in our country is our unmanageable rising population. Out of 3000 crore litres of sewage water generated per day in India, only about 200 crore litres is treated before discharging the sewage

Pati (1999) revealed that nearly 60,000 plant species or one in four of the world's total could become extinct or nearly extinct by the middle of next century leading to a tremendous loss to the world of medicine, modern allopathy as well as Ayurveda, Unani and Siddna which are heavily dependent on plant based drugs. Besides, the loss of these plants may rob the world of cures to AIDS, cancer, arthritis and many more, as yet intractable disease.

Sabri (1999) studied that FAOs findings indicate that annual deforestation rates increased from 2.0 million hectares during 1976-81 to 3.9 million hectare during 1981-90 in Assam and the pacific region and they have the fastest rate of deforestation and species extinction among the tropical regions of the world.

Chalabi and Hawker (2000) reported that roadside surface soil is a sink for vehicular lead accumulation.

• Dobosiewicz *et al.* (2000) revealed that air pollution depends on many factors such as power and direction of winds, afforestation rate of the area, kind and height of chimney stacks, traffic density and others.

Dogra (2000) recorded that at the workshop on National Population Policy (NPT)-2000 it was apprehended by the speakers that population of India will escalate to a mammoth 1236.5 million in 2011 and this alarming trend is enough to neutralise efforts to conserve the natural resources and environment.

• Gumrah *et al.* (2000) reported that lots of materials which are synthetic organic chemicals, hydrocarbons inorganic cations, inorganic anions, pathogens and dredged wastes has been identified as contaminants, can be found in groundwater because of more than thirty different potential sources.

• Lanchote *et al.* (2000) warned that the extensive use of herbicides in agriculture and the high persistence of many of them have required rigorous control of environmental contamination especially of ground water and drinking water sources.

• Mukarji (2000) reported that air pollution results from use of coal, the emission of methane being a major pollutant of water, by carrying over the suspended solids in the drainage system of storm water drainage and mine sump water, waste water from the coal preparation plants and mine water also add to the water pollution. Then land degradation is also a severe consequence of coal mining. Besides there is noise pollution through

blasting, movement of heavy earthmoving equipment, drilling and coal handling plants.

Sai Ram *et al.* (2000) pointed out that heavy metals such as carbon dioxide, nickel and iron are not biodegradable and the effects of these metals on microorganisms and other aquatic fauna are ecologically very significant.

Times of India (2000) reported that Pithoragarh and Dehradun districts in U.P. have been identified as among 12 of the most "Numerable districts" in the country as far as illegal trade in wild life is concerned.

The Hindustan Times (2000) an article reported that Environmentalists in Bhubaneshwar had warned that this summer would be particularly severe as over nine crore trees were uprooted in the October cyclone.

The Hindustan Times (2000) an article reported that Rajasthan may not have any ground water in the next 25 years because of current rate of indiscriminate exploitation of water.

The Hindustan Times (2000) reported that Asia's biggest garbage treatment-cum-organic fertilizer factory, with a handling capacity of 300 tonnes a day, was commissioned at Vilappilsala, Thiruvananthapuram on 24 July.

The Hindustan Times (2000) reported that Chirag Central Himalayan Rural Group - an NGO working in Nainital district of Kumaon hills has planted 4.5 million broad leaf trees in this region since 1989 and the survival rate of the plants is above 90 per cent all over.

The Hindustan Times (2000) an article reported that plastic bags of less than 20 microns in thickness will be banned in Bombay from August 15. Penalties will include a fine of Rs. 2000 for shopkeepers who give plastic bags and Rs. 500 for the user.

2.3 Legislative action and environmental conservation

Joshi (1988) said that the first major environment related law in the country was the water (Prevention and Control of Pollution) Act 1974 enacted by the Central Government to preserve the wholesomeness of water. He further reported that the Environment Protection Act, 1986 which came into force from November 19, 1986 lays down minimum national standards (MNS) in respect of seven industries for discharge of environmental pollutants. The industries covered by the MNS are caustic soda, man made (synthetic) fibres; oil refineries, sugar, thermal power plants, cotton textiles and composite waste mills.

Vohra (1988) revealed that during the last one and a half decade, the environmental movement has received legislative recognition in the shape of laws for the prevention of water and air pollution. The promulgation of the Environment (Protection) Act of 1986 is a particularly important development as it seeks to make the agencies responsible for the monitoring and control of pollution more effective by conferring greater powers on them they have hitherto enjoyed.

Nandy (1989) revealed that the National Forest Policy recommends that one third of total land in the country should be under forestry whereas

only 14.7 per cent of the whole land area is under forestry. This leads to many unavoidable situations like drought, soil erosion etc.

Gandhi (1994) revealed that two years ago the supreme court ordered environmental education to be made compulsory in schools and colleges but till date no move has been made.

Kaul (1995) reported that Indian legislation for the protection and conservation of natural resources includes the Environmental Protection Act (1986), the Wild Life Protection Act (1972) and the Forest Conservation Act (1980).

Swaminathan (1995) emphasised that the eighth plan lays emphasis on operation and maintenance of water supply systems and suggests to evolve an effective mechanism for ensuring proper operation and maintenance of existing assets through participation of the community, particularly the women and the NGO's.

Karthik and Dixit (1997) reported that on an average about 2000 tons of toxic substances are being dumped in our land every day by various industrial units without the requisite safe disposal facilities. Further it was reported that recently the Supreme Court banned the import of hazardous wastes for use in India. About 9000 industrial units will be affected as they are using the imported toxic wastes.

Mahajan (1997) reported that three binding principles were laid down by the Supreme Court of India with regards to enforce environmental laws, one - that no municipality in India can put forth lack of money as a ground

for not discharging its primary duty of looking after the health and safety of its residents. Two - that the absence of public conveniences and the prevention of industrial pollutants to the detriment of the citizen's health are violations of the human rights of decency and dignity which are non negotiable charges in a municipality. Three - that the officials who violate these duties by not ending the nuisance are subject to punishment of jail and/or fine under the Indian Penal Code.

Sud (1997) revealed that the National Water Policy adopted way back in 1987, recommended economic development and activities including agricultural, industrial and urban development should be planned with due regard to the constraints imposed by the configuration of water availability. There should be a water zoning of the country and the economic activities should be guided and regulated in accordance with such zoning.

Wasir (1997) reported that chronic exposure of children to the high level urban traffic noise has been reported to result in higher blood pressures. He further reported that industrial pollution can be controlled by strict legislation recommending the height of chimneys and provision of industrial filters for the exhaust that is produced in thermal power stations and other industries using coal, wood, kerosene or other fuels as energy source.

2.4 Child as a communicator of environmental issues

Rajput (1978) said that the environment in which the child lives, plays, handles and fights is surely the most familiar element which can be exploited for making child's learning more effective.

Verma *et al.* (1986) studied the role of child as an important source of passing information to adults of the family. Girl students of high classes were exposed to the improved home practices and were directed to communicate the same to their mothers. The findings revealed that there were sufficient gain in knowledge of their mothers.

Seth *et al.* (1988) conducted a study on selected senior class students and found that having better communication skills and knowledge they were competent to be animators.

Ravindranath (1990) reported that regarding environment consciousness has to be developed in children because they are in formative stage and the impressions created during this age continue long in life. Such patterns of behaviour are developed by observing, imitating, identifying and interacting.

Rao (1993) reported that environmental education at the school level goes a long way in fostering an ecofriendly attitude and children exposed to environmental education at school level often carry these experiences and thoughts into adulthood.

Rebello (1994) reported that young learners at school form an important class of communicators as far as environmental education is concerned. They can easily understand and appreciate the interaction of man and nature and the various ways of demonstrating these interrelationships.

Rockland (1995) reported in a study conducted that seventy four per cent of the students learn about the environment from television and 31 per cent from newspapers.

Evans (1996) revealed that there is evidence that a programme of environmental eduction received by children indirectly influenced their parents in recycling paper, plastics and tin cans. More parents recycled these materials after the children's programme than before it.

Campbell (1997) conducted a study on student's environmental attitudes by assessing on a pre and post test questionnaire. He concluded that the attitudes of the high school students showed a more positive environmental attitude at the end of the study than before it.

Mukherji (1997) reported that our 11 to 18 years old are a fabulous resource of energy, hard work, perseverance and good will. Their minds are open, fresh and raring to go. What's missing is awareness. So to harness this power the first step should be to make them aware of the problem at hand.

2.5 Factors associated with knowledge gain of the respondents

Jalota (1982), Mangat (1984), Bajaj and Nayak (1987), Khote and Nagare (1989), Yadav (1990), Nagpal and Yadav (1991), Lal and Pawar (1994) had observed a significant association of age with knowledge gain.

Age had no significant association with knowledge gain as reported by Sinha *et al.* (1988), Bhatti (1989), Kulkarni *et al.* (1990), Deshpande *et al.* (1994), Sharma (1995).

Family is the primary group wherein every member is directly associated with its activities. The type of family that is joint/nuclear determines the nature and extent to which a person can take decision of one's own and act as a major decision maker.

Kumari (1988), Sawant and Dalvi (1989), Kaushik (1989) and Lega (1989) reported that family type failed to show significant association with knowledge gain.

Bhatti (1989) while working on the acceptability of safe drinking water storage devices promoting environmental sanitation through action research revealed significant association of family type with knowledge gain of the respondents.

Katarya (1980), Chaudhary (1984), Candy (1988), Kumari (1988), Nagpal and Yadav (1991) reported non-significant relationship of family size with gain in knowledge.

Kausik (1989), Lega (1989), Sawant *et al.* (1989) and Sadagath *et al.* (1994) also found non-significant association of family size with gain in knowledge.

Bains (1970), Singh and Singh (1975), Khanna (1980) found non significant association of family size with gain in knowledge.

Bains (1970) found that there was no significant effect of age, family size and family type on gain in knowledge.

Khanna (1980) reported that size and type of family had no significant relationship with knowledge gained.

Jain (1993) reported the significance of parental occupation (mother's occupation and father's occupation), parental participation and monthly income with the knowledge gain of respondents while working for upgradation of environment with 120 children

Further she reported that parental religious believes were not associated with gain in knowledge of the respondents.

Kaushik (1989), Lega (1989), Nagpal and Yadav (1991) reported that family education status plays a positive and significant role in knowledge gain.

While Bhatti (1989) found non significant association of family educational status with gain in knowledge.

Past researches conducted by Murthy (1990), Nagpal and Yadav (1991), Godara (1997) reported that mass media exposure was significantly associated with knowledge gain.

Mathain and Manoharan (1993) reported a significant relationship between mass media exposure and gain in knowledge while working on radio listeners and their knowledge gain.

Madan (1994) while working on impact of educational media to promote environmental sanitation in rural Haryana reported significant association of family size with knowledge gain. Age, family type, family education status were found to be non significant.

Research Methodology

CHAPTER-3

RESEARCH METHODOLOGY

This chapter contains the steps and procedures adopted for conducting the present investigation. It has been discussed under the following sub-heads:

3.1 Locale of the study

3.2 Sampling procedures

3.3 Variables and their measurement

3.4 Tools and techniques of data collection

3.5 Analysis of the data

3.1 Locale of the study

Kanpur city of Uttar Pradesh was purposively selected to undertake the present investigation. The major reason for selection of Kanpur were that it being one of the tenth most polluted city of the country (Chandrika, 1993, March, 15th) and of researcher's familiarity with the socio-economic and environmental conditions of the area to carry out the study.

3.2 Sampling procedures

Simple random sampling technique was applied for the selection of respondents. A number of steps were taken to draw the ultimate sample of respondents. These are presented as under (Fig. 1).

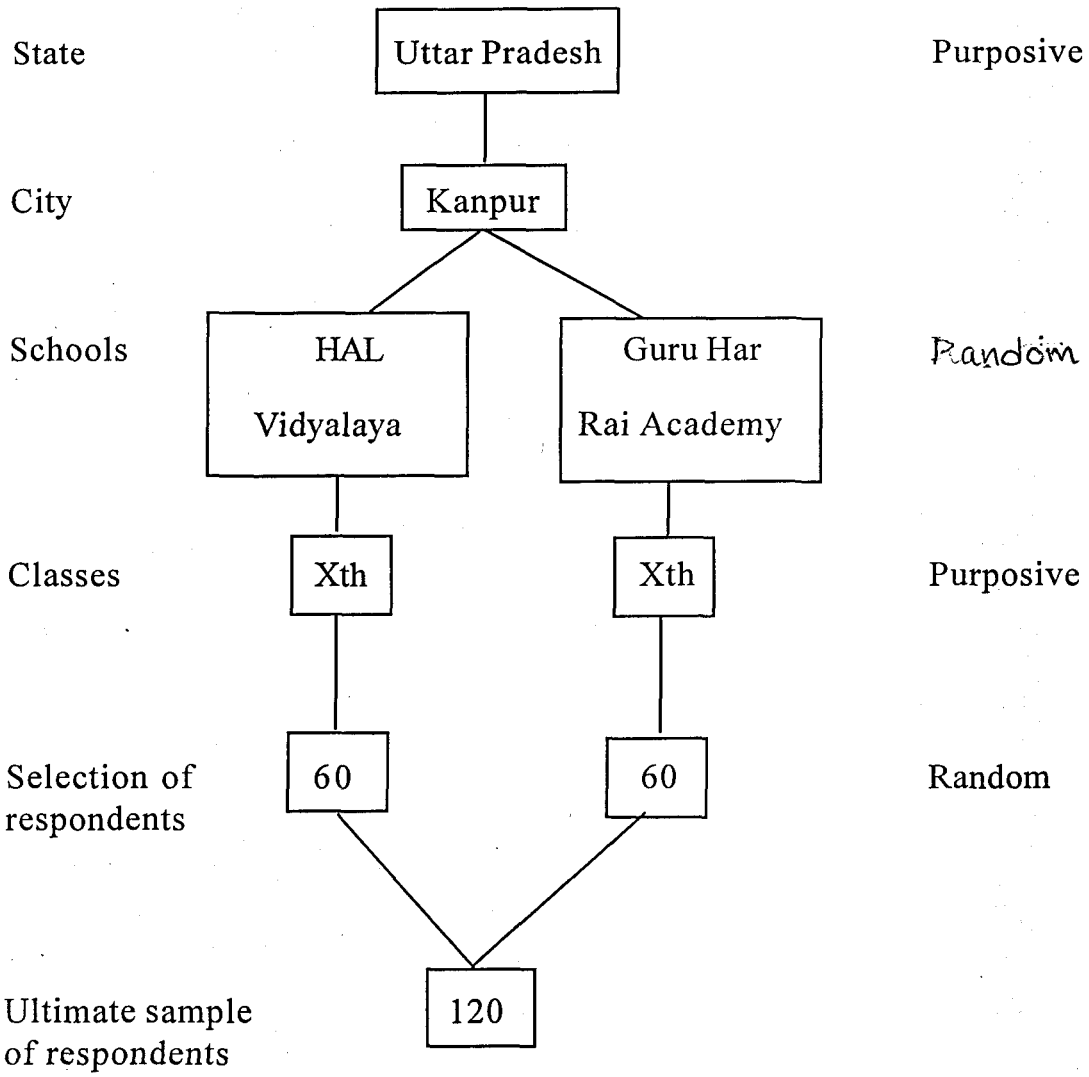


Fig. 1 Sampling procedure adopted for the study

3.2.1 Selection of schools

An exhaustive list of all the schools in Kanpur city was prepared wardwise and from that list, two schools were randomly selected from Ramadevi area. The two schools selected were HAL Vidyalaya (Government) and Guru Har Rai Academy (Private). These two schools are referred as S I and S II respectively in rest of the text.

3.2.2 Selection of class

Keeping in view the requirements of the study tenth class was selected purposively from both the schools.

3.2.3 Selection of the respondents

According to requirements of the study two types of respondents were selected. Selection of the respondents was done as per objectives of the study.

3.2.3.1 Objective I

A sample of thirty experts and professionals who were actively associated in the environmental education at colleges, school level was drawn at random. They acted as judges for identification of crucial messages on environmental education for Xth standard students.

3.2.3.2 Objective II and III

A sample of sixty students each from SI and SII was selected from both the schools with fair representation to both the sexes. Thus, a sample comprising of 120 Xth standard students constituted the ultimate sample of respondents.

3.3 Variables and their measurement

Considering the relevancy of variables to the topic, a set of nine variables was selected for the present investigation. It included eight independent variables and one dependent variable which are presented in Table 3.1.

Table 3.1 Variables and their measurements

S.No.	Variables	Measurements
Independent variables		
1.	Age	Chronological age in years
2.	Ordinal position	Schedule developed
3.	Habits	Schedule developed
4.	Interest	Schedule developed
5.	Home environment	
i)	Parental education	Schedule developed
ii)	Parental occupation	Schedule developed
iii)	Family income	Schedule developed
iv)	Family type	SES scale of Trivedi (1963)
v)	Family size	SES scale of Trivedi (1963)
vi)	House location	Schedule developed
vii)	House type	Schedule developed
viii)	House ownership	Schedule developed
ix)	Flat position	Schedule developed
x)	Parental participation	Schedule developed
xi)	Parental stimulation	Schedule developed
xii)	Parental religious believes	Schedule developed
6.	School environment	
i)	Scholastic achievement	Schedule developed
7.	Family education status	Scale of Narwal (1982)
8.	Mass media exposure	Schedule developed
Dependent variable		
1.	Knowledge	Schedule developed

3.3.1 Independent variables

The eight independent variables selected were age, ordinal position, interest, habits, home environment, school environment, family education status and mass media exposure. The measurement procedure adopted was as under :

3.3.1.1 Age

Age was operationalized as chronological age of the respondent in years at the time of data collection. Scores allotted were as under :

S.No.	*Category*	*Score*
1.	12-13 years	1
2.	14-15 years	2
3.	16-17 years	3

3.3.1.2 Ordinal position

It indicated the respondent's order of birth in the family. The scores allotted were as under :

S.No.	*Category*	*Score*
1.	Youngest child (4th born and above)	1
2.	Middle (2nd - 3rd born)	2
3.	Eldest child (1st born)	3

3.3.1.3 Interest

Interest can be defined as the relation between a person and anything which he/she believes will satisfy one of his/her desire - an objectified desire (Fairchild, 1961). According to the interests of the respondents they were

categorised into four classes and the following scoring pattern was adopted:

S.No.	*Category*	*Score*
1.	Academic interest	1
2.	Creative interest	2
3.	Environmental interest	3
4.	Other interest	4

3.3.1.4 Habits

Habit is operationalized as an acquired attitude or tendency to act in a specific way, which has become in a measure, largely unconscious and automatic (Fairchild, 1961). The habits of the respondents were categorised into three classes viz., mostly, seldom and never. The scores allotted are as under :

S.No.	*Category*	*Score*
1.	Always	2
2.	Seldom	1
3.	Never	0

3.3.1.5 Home environment

This variable was operationalised as total sum of different factors i.e. parental occupation, parental education, family income, family type, family size, house location, house type, house ownership and flat position, parental participation, parental stimulation and parental religious believes.

3.3.1.5.1 Parental education

Education of the parents of the respondents was operationalized as number of years of formal education attained by them. Accordingly the respondents parents were categorised as follows :

S.No.	*Category*	*Score*
1.	Illiterate	0
2.	Primary	1
3.	Middle	2
4.	Senior Secondary	3
5.	Graduate	4
6.	Post Graduate	5

3.3.1.5.2 Parental occupation

Parental occupation was described as the family's means of livelihood contributed by either of the parents. Quantification of occupation of fathers and mothers of the respondents was done on the basis of following pattern :

S.No.	*Category*	*Score*
Father	Service	1
	Business	2
	Others	3
Mother	Service	1
	Housewife	2

3.3.1.5.3 Family income

It was operationalised as total monthly income earned through all the sources of the respondents family. Categories were framed on the basis of range and scoring pattern was as follows :

S.No.	*Category*	*Score*
1.	Low (Below Rs. 5,000)	1
2.	Medium (Rs. 5,000-10,000)	2
3.	High (Above Rs. 10,000)	3

3.3.1.5.4 Family type

Type of the family refers to two classification of family as nuclear and joint. The basic grouping of mates and their children is called nuclear family and collection of more than one nuclear family on the basis of close blood ties and common residence is called as joint family (Dahama and Bhatnagar, 1990). The respondent's family were categorised on the basis of scale of Trivedi (1963) as :

S.No.	*Category*	*Score*
1.	Nuclear	1
2.	Joint	2

3.3.1.5.5 Family size

It was operationalised as the total number of members in the family living together at the time of data collection. According to the scale of Trivedi (1963) the respondents were divided into three categories on this variable by using the following scoring pattern :

S.No.	*Category*	*Score*
1.	Small family (upto 5 members)	1
2.	Medium family (5-10 members)	2
3.	Large family (> 10 members)	3

3.3.1.5.6 House location

House location was operationalised as the residing area of the respondents and its surroundings. It was categorised on the basis of density of population as under :

S.No.	*Category*	*Score*
1.	Crowded	1
2.	Semi crowded	2
3.	Low concentrated	3

3.3.1.5.7 House type

House type is operationalised as the building material of which house is built up of. For this purpose type of house was classified into two - Pucca (means house constructed with concrete and cement), Mixed (those built up of concrete and mud or bricks) and categorised as :

S.No.	*Category*	*Score*
1.	Pucca	1
2.	Mixed	2

3.3.1.5.8 House ownership

House ownership refers to the possession of the house in which the respondent resided i.e. whether it was owned or rented. It was categorised as:

S.No.	*Category*	*Score*
1.	Rented	1
2.	Owned	2

3.3.1.5.9 Flat position

Flat position indicated the exact location of the flat i.e. whether it is situated on ground floor, top floor or consisted of all the three floors. It's categorisation procedure adopted was :

S.No.	*Category*	*Score*
1.	Ground	1
2.	Middle	2
3.	Top	3
4.	Ground + Middle	4
5.	Ground + Middle + Top	5

3.3.1.5.10 Parental participation

It was operationalised as the extent to which parents of the respondent participated in healthy environmental practices. Range was calculated and then it was divided by three to categorise it into three classes as under :

S.No.	*Category*	*Score*
1.	Low (10-21)	1
2.	Middle (22-33)	2
3.	High (34-45)	3

3.3.1.5.11 Parental stimulation

Parental stimulation was operationalized as the encouragement and

motivation provided to the respondents by their parents. It was allotted the following scores:

S.No.	*Category*	*Score*
1.	Low (0-3)	1
2.	Middle (4-6)	2
3.	High (7 and above)	3

3.3.1.5.12 Parental religious believes

It was operationalised as the believes held by the parents regarding environmental practices more particularly regarding that of trees (based on the range method). It was also classified into three classes and categorised as under :

S.No.	*Category*	*Score*
1.	Low (0-4)	1
2.	Middle (5-8)	2
3.	High (9-12)	3

3.3.1.6 School environment

School environment comprised of scholastic achievements of the respondents and activities carried out at school and content analysis of Xth standard books for environmental education.

3.3.1.6.1 Scholastic achievement

Scholastic achievement was operationalised as the grades obtained in the previous class on the basis of which respondents were categorised into three classes :

S.No.	*Category*	*Score*
1.	Low (<50%)	1
2.	Middle (50-60%)	2
3.	High (>60%)	3

3.3.1.7 Family education status

It was operationalised as the total education received by each member of the family above 6 years of age. Scale of Narwal (1982) was used with somewhat modifications to study family educational status. It was computed as :

$$FES = \frac{\text{Total educational score of the family}}{\text{Number of family members}}$$

Accordingly the respondents were distributed in the three categories of this variable :

S.No.	*Category*	*Score*
1.	Low (0-2)	1
2.	Middle (2-4)	2
3.	High (4 and above)	3

3.3.1.8 Mass media exposure

Mass media exposure was defined as the extent to which the respondent was exposed to television, newspapers and other sources to obtain information regarding environment and its allied component. It was categorised into 3 classes according to the frequency of media used :

S.No.	*Category*	*Score*
1.	Mostly	1
2.	Seldom	2
3.	Never	3

3.3.2 Dependent variable

Only one dependent variable i.e., knowledge of the respondents was considered for the study.

English and English (1958) defined knowledge as a body of understood information by an individual or by a culture.

In the present study knowledge referred to the amount of information that the respondents had on various components of environment included in the inventory before and after the intervention programme. To categorise the respondents on the basis of knowledge, range method was used (minimum score obtained was subtracted from maximum obtained score and divided by three). Accordingly, the scoring pattern was as under :

S.No.	*Category*	*Score*
1.	Low (10-27)	1
2.	Middle (28-45)	2
3.	High (46-63)	3

3.4 Tools and techniques used for data collection

The data were collected in accordance with the specific objectives of the study by application of various scientifically tested techniques and

procedures. The data were gathered following a two step communication process.

3.4.1 Ist step communication

Data at Ist step communication were collected about critical messages on environmental education to be communicated to the child respondents. In accordance, an inventory was developed containing several messages on environmental education, for dissemination to the students of standard Xth. Various reviews and experts were consulted to prepare the above said inventory. The so prepared inventory was then subjected to 30 judges so as to identify the most crucial and urgent messages on environmental education to be introduced to the students of Xth standard as per relevancy. Also schedule was developed for having background information of the respondents and their respective schools. To assess the existing knowledge of the respondents on various critical message, an inventory was prepared which was pretested on a non sample of 30 respondents hailing from standard Xth from two schools of Hisar city of public and private sector respectively.

To develop the tool for social marketing of environmental education questions pertaining to four basic components of social marketing i.e., product, price, place and promotion were composed. Accordingly a final inventory was prepared for collecting the data on the sample respondents.

Construction of knowledge inventory

The inventory containing six messages further comprising of submessages under each message were constructed. The inventory constituted

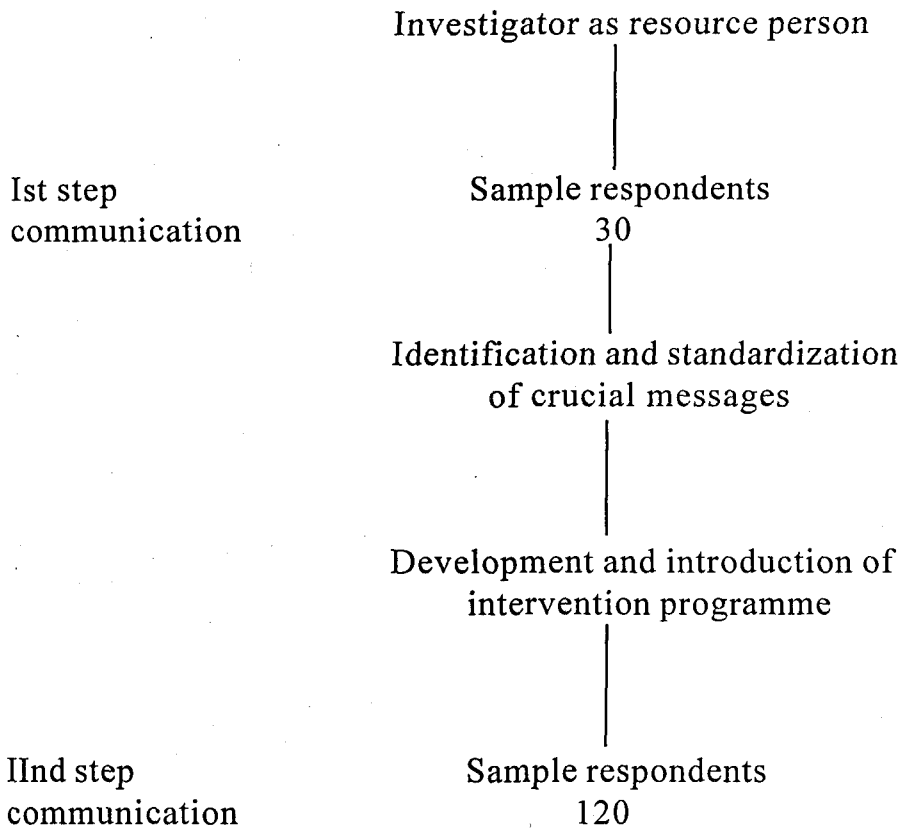


Fig. 2 : Schematic presentation of the two step communication process

a combination of true/false and multiple choice questions. All the items had a score of two for each correct response and one for each incorrect response. The inventory containing 48 questions were given to the respondents before and after the administration of the intervention programme.

3.4.2 IInd step communication

In the second step of communication, the intervention programme was developed, introduced and later data on the visual literacy of the programme were collected. Phase II comprised of two different stages :

3.4.2.1 Development of the intervention programme

Based on the critical messages identified by the judges an elaborate attempt was made by the researcher to procure media prepared by different institutions. Various institutions in Ahmedabad, Chennai and Delhi were either visited or communications were made to procure media on environment and its allied aspects. Accordingly the gaps in media preparation were identified.

Wherever the researcher could not lay hand on quality media related with a specific message being identified as crucial message, media were prepared keeping in view the visual literacy index of the respondents. Thus the intervention programme included a complete package of 3 books, 5 booklets, 9 posters, 1 chart, 3 flash cards, 2 pocket books, 1 video cassette and 2 simulating games for the study.

3.4.2.2 Introduction of the intervention programme

The intervention programme so developed was introduced in a 10 days session. The theme selected for each day was separate and was introduced to

the respondents by utilising various methods. Details are provided in Table 3.2.

First day

The theme selected for the first day was "Air pollution". Pre-exposure inventory was administered to the respondents to test their knowledge regarding air. Then the respondents were imparted knowledge regarding importance of air, causes and remedies to air pollution. Aids like posters, booklets were utilised.

At the end a post exposure inventory was administered to assess the knowledge gained by the respondents on different aspects related to air pollution.

Second day

The theme selected for the second day was "Water pollution". Investigator as a resource person delivered lecture and held discussion on importance of water and its hygiene. Post exposure inventory was administered at the end.

Third day

The theme selected for the third day was "Noise pollution". The component of noise was selected which was taught utilising posters, charts and booklets. At the end of the day post exposure inventory was administered.

Fourth day

"Soil pollution" was the theme selected for the fourth day. Uses of soil and harmful effects of chemicals on soils were discussed alongwith lecture.

Table 3.2 Work plan (details of the intervention programme in action)

Day	Message	Aid used		Method followed	Activity and demonstration	Question answer session	Self analysis session
		For discussion	For activity				
Ist	Air	1. Booklet 2. Leaflet 3. Newspaper and magazine cuttings	*Monitoring air pollution Filter paper Petridish	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activity 5. Question answer	Exposed the filter paper in different locations-on a busy road junction, at bus stop, in homes. Kept it exposed for about 3-4 hours. The amount of particulate matter collected on the paper is different depending upon the amout of pollution at these places.	1. Importance of air 2. Air pollution- It's causes and impact 3. Air borne diseases 4. Remedies to air pollution	Children are asked to think for a few minutes what type of air does their nearby surrounding provides them.
Iind	Water	1. Book 2. Booklet 3. Flashcards 4. Chart	Water conservation game Flash cards Bucket, mug	1. Introduction 2. Brief lecture cum discussion 3. Conservation game and play 4. Participatory activities 5. Question answer	Water conservation game is a game in which 8-10 players can play at a time, each starting with coming of 6 on a die and then moving according to instructions on the game. Based on the story of flash cards students are asked to perform a play. Take a bucket full of water which represents all water of the hydrosphere. Make a row of all the students. Ask a student to take out a mug full of water from the bucket – this is all the world's fresh water. Now student standing first in the row is asked to take out a spoonful of water from mug and quickly pass it on to others standing in the row, till it reaches the last student. By middle only the spoon is empty.	1. Importance of water. 2. Water pollution- It's causes and impact. 3. Water borne Diseases. 4. Remedies to water pollution. 5. Purification of water about	Children are asked to think over how much water do they waste in whole day. They are asked to check how many taps of school are leaking and then to realise they have done mistake by not reporting about the leaking taps

					Thus highlight to them the importance of water for all because nobody cares to utilise the resource effectively and spare some for others too.			
IIIrd	Noise	1. Book 2. Booklet 3. Posters	*Survey of traffic -Group of 2-3 children	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activities 5. Question answer 6. Memorising	Select 4-5 intersections in the city as sample junctions. One in a busy commercial area, other in a quiet residential area, still other on a highway. Ask group of 2-3 children to count the total number of vehicles passing the inter-section. The counting was done for 15 min every 2 hours beginning at 7:00 a.m. to 2:00 p.m. Then ask them to think about the total noise pollution caused by heavy traffic throughout the day.	1. Difference between sound and noise. 2. Noise pollution- It's causes and impacts. 3. Abnormalities caused due to noise pollution. 4. Remedies to noise pollution.	Respondents at the end of day are asked to sit silent for some-time and hear the noise other children make in recess and free periods and thus realise the amount of noise they create.
IVth	Soil	1. Book 2. Flashcards 3. Model	*Making a wormery -Glass jar -Different types of soil -Some worms -Water -Black paper	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activities 5. Question answer 6. Memorising	Take a big glass jar. Add to it different layers of soil in contrast and fill it upto 3/4th. Put some leaves and garden debris. Add a little water to make the soil damp. Put some worms in the jar. Cover it with a black paper and after some days we see tunnels made by the worms which leads to mixing of the contrast layers of soil with improvement in its quality.	1. Importance of soil. 2. Soil pollution- Causes and impact. 3. Soil borne diseases.	
Vth	Garbage Disposal	1. Book 2. Pamphlet 3. Flash cards 4. Posters 5. Articles	*Play	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activities 5. Question answer 6. Memorising	Play enactment by a group of children on importance of hygiene.	1. Hygiene and sanitation 2. Garbage disposal 3. Diseases borne due to improper disposal of garbage. 4. Proper system of garbage disposal 5. Effective compost	Students are asked to think that whether the system of garbage disposal at their homes is correct or faulty. They are also asked to pledge for the cleanliness of their surroundings

		during 4 days 1. Book 2. Booklet 3. Poster 4. Mini pocket book	1. Bookmark 2. Badge				
VIIth	Flora	1. Book 2. Booklet 3. Posters 4. Photographs	*Making a herbarium file	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activities 5. Question answer 6. Memorising	Students are asked to collect leaves of different types of plants - Medicinal plants - Sacred plants - Ornamental plants and make a file.	1. Meaning of flora 2. Importance of plants 3. Effect of deforestation 4. Plants of Importance	Students are asked to realise do they need plants in or around their homes. They are also taught the correct method of planting crops.
VIIIth	Fauna	1. Book 2. Booklet 3. Posters 4. Pictures	*Who am I?	1. Introduction 2. Brief lecture cum discussion 3. Demonstration 4. Participatory activities 5. Question answer 6. Memorising	Who am I is a game in which entire class can participate. One of the student is chosen and on his back, a fellow student pastes a slip bearing the name of some animal. Now he has to guess the name. He can ask questions From the class like - - Am I living - Do I have 4 legs - Do I have a tail - Do I have horns He can ask maximum of eight questions.	1. Meaning of fauna 2. Importance of animals 3. Our rare or endangered Species 4. Why conserve them 5. Animal products	Students are asked to think that how many things do they purchase that require killing of our animals. Then they are made to realise that every time they buy these products they are saying bye to one of our important species
IXth	Nuclear Wars	1. Book		1. Introduction 2. Brief lecture cum discussion 3. Participatory activity 4. Question answer 5. Memorising	Play – The phoenix. Students from class are chosen and asked to enact a play on the theme, already present in their English reader	1. Nuclear wars 2. Causes and consequences 3. Harmful effect on the world	Students are asked to imagine of a similar condition and what are their attitudes on the theme.
Xth	Summarising	Video cassette		1. Introduction 2. Playing the video cassette 3. Discussing each activity shown and things taught in the cassette	Demonstrating every creative game in the cassette and emphasizing those we made use of.	1. What have they seen? 2. What did they learnt from the the cassette? 3. What was the main aim of showing the cassette?	Do the things shown and told in the cassette were practiced by them till now at any instant of life or will they follow them now after.

Post exposure inventory was administered at the end of the day. Finally knowledge gain was worked out.

Fifth day

"Sanitation and garbage disposal" was the theme selected for dissemination to the respondents on fifth day. The researcher delivered lecture and held talks on garbage disposal with the respondents taking their response on the pre-exposure inventory, followed by lecture their post responses were recorded.

Sixth day

The theme selected for the sixth day comprised of a number of general issues which were dealt with separately in three days covering the topics of flora, fauna and nuclear wars. A pre-exposure inventory was administered to them on the issues mentioned above. Finally their responses were recorded for post-exposure.

Seventh day

"Flora" was the theme selected for seventh day. Their knowledge on the aspect of flora was pretested. Then the researcher utilised various aids to provide them the appropriate and maximum possible useful information. The post exposure inventory was then administered to check the knowledge gain.

Eighth day

"Fauna" was the theme selected for eighth day of the intervention programme. Pre-exposure inventory was administered followed by appropriate

lectures and discussions on the topic and their responses were again checked on the post-exposure inventory to detect the knowledge gain.

Ninth day

"Nuclear wars" was the theme selected for the ninth day of the intervention programme. Nuclear wars - their causes, harmful and long lasting effects were discussed. Pre-exposure and post-exposure inventory was administered and finally knowledge gain was worked out.

Tenth day

Finally on the last day of the intervention programme, the whole programme was summarised utilising a video cassette entitled "The Green Teacher".

The intervention programme was introduced by adopting the following steps :

1. The respondents hailing from the two schools were tested for the knowledge on various crucial messages on environmental education.
2. Based on the data, the developed intervention programme was introduced by following a ten days session in each school.
3. Due care was taken to introduce the programme according to the sequence of areas of environmental education and sequence in use of media.
4. The introduction of the everyday's programme included revising the previous day's discussions and briefing the highlights - what the respondents were introduced to a day before.

5. Use of each media on type of message was followed by the directed discussions with the respondents.
6. Every session ended with thanks to respondents and their teachers.
7. Finally, responses were collected regarding post knowledge.

In this second step of communication, the post-exposure knowledge of the respondents was recorded through a duly pre-tested structured interview schedule personally administered by the researcher to the respondents.

3.5 Analysis of data

The quantitative data were coded and tabulated to draw meaningful inferences. Statistical tools applied were as follows :

3.5.1 Frequency distribution was worked out to prepare a two way frequency table and percentages were worked out to study the profile of the respondents, and other variables included for the study.

3.5.2 Mean scores were worked out to get the comparison of knowledge gained on different selected messages of the intervention programme.

3.5.3 Coefficient of variation were worked out to measure the extent of variation for different messages by the judges. The following formula was used

$$C.V.\ (\%) = \frac{\sigma}{\overline{X}} \times 100$$

Where,

σ = Standard deviation

$\overline{X}$ = Mean

3.5.4 Paired 't' test was used to study the significance of the intervention programme.

$$t_{(n-1)} = \frac{d}{S//\overline{n}}$$

Where,

d = $\Sigma di/n$ = mean gain score

S^2 = $\Sigma(d_i-d)^2/(n-1)$

d_i = Gain in knowledge of i^{th} respondents

n = Total number of the respondents

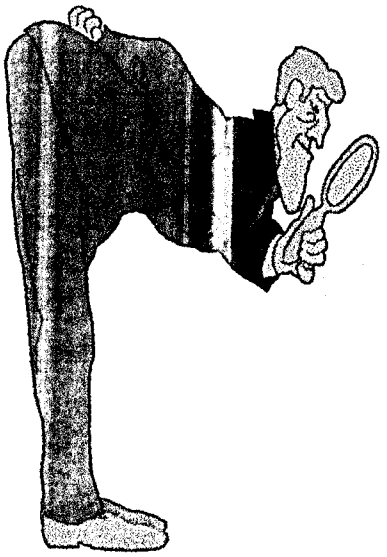
3.5.5 Chi square test was used to determine the association between dependent and independent variables making use of the following formula :

$$X^2_{(m-1)(n-1)} = \sum_{i=1}^{m} \sum_{j=1}^{n} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where,

O_{ij} = Observed frequency
E_{ij} = Expected frequency
m = Number of rows
n = Number of columns
i = i^{th} row
j = j^{th} column

Yate's correction was applied wherever frequency of a cell was less than five.



Results And Discussion

CHAPTER-4

RESULTS AND DISCUSSION

This chapter includes the results and discussions of the research project undertaken by the researcher. These results and discussions thereon have been presented under the following sections:

4.1 Background information of the respondents.

4.2 Social marketing of environmental education.

4.3 Identification and standardization of crucial messages on environmental education.

4.4 Development of the intervention programme.

4.5 Existing knowledge and associated factors.

4.1 Background information of the respondents

The information regarding background of the respondents family was gathered from the female heads of the families. As per requirement of the study on parent's occupation, parent's education, family size, type, income, location of household, house type, ownership of house, position of house, parental participation, parental stimulation, parental religious believes, school environment , family education status and mass media exposure was gathered by the researcher. The results pertaining to it are as under.

4.1.1 Age

Table 4.1 reveal that more than half of the respondents (58.3%) were in the age group of 14 to 15 years followed by 39 .1 percent who where in the age group of 12 to 13 years and only 2.5 per cent of them were in the age group of 16 to 17 years.

4.1.2 Ordinal position

Table 4.1 makes it clear that approximately half of the respondents (49.2%) were youngest in their families followed by 33.3 percent who were in the middle order and 17.5 percent were eldest .

4.1.3 Interest

Regarding interest of the respondents Table 4.1 indicates that 29.3 percent of the respondents showed more interest in academic activities followed by 19.2 percent of the respondents who showed more interest in creative activities. One fourth of the respondents (25.0%) showed interest in environmental activities followed by 26.7 percent who had other interests.

4.1.4 Habits

Data in Table 4.1 reveal that about half of the respondents (48.3%) had sometimes worked for environmental conservation as a part of their habits followed by 22.5 percent of the respondents who mostly worked for environmental conservation and 29.2 percent of them never having worked for the betterment of environment.

Table 4.1 Background information of the respondents

S.No.	Variable/parameter	Category	Frequency	Percentage
4.1.1	**Age**			
		12-13 years	47	39.1
		14-15 years	70	58.3
		16-17 years	3	2.5
4.1.2	**Ordinal position**	Youngest	59	49.2
		Middle	40	33.3
		Eldest	21	17.5
4.1.3	**Interest**	Academic	35	29.3
		Creative	23	19.2
		Environmental	30	25.0
		Other	32	26.7
4.1.4	**Habits**	Always	27	22.5
		Seldom	58	48.3
		Never	35	29.2
4.1.5	**Home Environment**			
4.1.5.1	**Parental education**			
	Mother	Illiterate	8	6.7
		Primary	12	10.0
		Middle	12	10.0
		Senior Secondary	22	18.4
		Graduate	60	50.0
		Post-graduate	6	5.0
	Father	Illiterate	0	0.0
		Primary	1	0.8
		Middle	3	2.5
		Senior secondary	3	2.5
		Graduate	104	86.7
		Post graduate	9	7.5

4.1.5.2	**Parental occupation**			
	Mother	Housewife	100	83.4
		Service	20	16.7
	Father	Service	109	90.8
		Business	10	8.4
		Others	1	0.8
4.1.5.3	**Family income**	Low (upto Rs. 5000)	2	26.6
		Medium (Rs. 5000-10,000)	64	53.4
		High (above Rs. 10,00)	24	20.0
4.1.5.4	**Family type**	Nuclear	106	88.4
		Joint	14	11.7
4.1.5.5	**Family size**	Small (1 to 5 members)	86	71.7
		Medium (6 to 10 members)	20	16.7
		Large (> 10 members)	14	11.7
4.1.5.6	**House location**	Crowded	45	37.6
		Semi crowded	59	49.1
		Low concentrated	16	13.3
4.1.5.7	**House type**	Pucca	115	95.8
		Mixed	5	4.2
4.1.5.8	**House ownership**	Rented	83	69.1
		Owned	37	30.8
4.1.5.9	**Flat position**	Ground	78	65.0
		Middle	23	19.1
		Top	8	6.7
		Ground + middle	9	7.5
		Ground + middle + top	2	1.7
4.1.5.10	**Parental participation**	High (10-21)	62	51.7
		Middle (22-33)	48	40.0
		Low (34-45)	10	8.3
4.1.5.11	**Parental stimulation**	High (0-3)	81	67.5
		Middle (4-6)	21	17.5
		Low (7 and above)	18	15.0

4.1.5.12	**Parental religious believes**	High (0-4)	14	11.7
		Middle (5-8)	87	72.5
		Low (9-12)	19	15.8
4.1.6	**School environment**			
4.1.6.1	**Scholastic achievement**			
		Low (<50%)	23	19.2
		Middle (50-60%)	86	71.6
		High (>60%)	11	9.2
4.1.6.2	**Profile of the school selected**			
4.1.6.3	**Activities pertaining to environmental education carried out in the schools selected**			
4.1.6.4	**Content analysis of Xth class syllabus**			
4.1.7	**Family education status**	Low (0-2)	15	12.5
		Middle (2-4)	33	27.5
		High (4 and above)	72	60.0
4.1.8	**Mass-media exposure**	Mostly	62	61.7
		Seldom	48	40.0
		Never	10	8.3

Figures in parenthesis denote percentages.

4.1.5 Home environment

4.1.5.1 Parental education

The data on educational profile of the respondents mother reveal that half of them (50.0%) were graduate followed by 18.4 percent who were educated upto high school. It was seen that 10.0 percent of the respondents mother were educated up to primary and middle level each. Only 6.7 per cent of the respondents mother were illiterate and post graduate (5.0%).

Whereas regarding the education of father of the respondents, 86.7 per cent were graduate, 7.5 percent holding a post graduate degree and only 2.5 percent of them were educated upto middle and secondary level each.

However, it was interesting to note that inspite of majority of the mothers having a graduate or post graduate degree (55.0%) were working has home makers only as compared to their counter parts.

4.1.5.2 Parental occupation

It was observed from Table 4.1 that of all the respondents only 16.7 per cent of the respondents mothers were engaged in service, remaining majority (83.4%) of them were reported to be housemakers.

The information regarding occupation of father revealed that a vast majority (90.8%) were in service. Only 8.4 per cent of the respondents' father were in business and only 0.8 per cent were engaged in other occupations namely labour, agriculture etc.

4.1.5.3 Family income

The data regarding family income indicated that more than half of the respondents (53.4%) were in middle income category, followed by more than one fourth of the respondents in low income category (26.6%) and one fifth in high income category (20.0%).

4.1.5.4 Family type

The table reveals that majority of the respondents (88.4%) hailed from nuclear families whereas only 11.7 percent of them belonged to joint families.

4.1.5.5 Family size

The data in Table 4.1 reveal that more than half of the families (71.7%) were small in size, followed by medium (16.7%) and large (11.7%).

4.1.5.6 House location

The information on house location was gathered based on the density of population. It was found that 37.6 per cent of the respondents were residing in crowded areas. Majority of the respondent population (49.1%) were residing in semi crowded areas and only 13.3 per cent reported residing in low concentrated areas.

4.1.5.7 House type

Regarding type of the house, it was seen that majority of the respondents (95.8%) had pucca houses. Only 4.2 percent of the respondents had mixed houses for their living.

4.1.5.8 House ownership

Table 4.1 shows that 69.1 percent of the respondents were residing in rented house. Only 30.8 percent of the respondents had their own house

4.1.5.9 Flat position

The data in Table 4.1 clearly depict that majority of the respondents (65.0%) were residing on ground floor, followed by middle floor (19.1%) and only 6.7 per cent were living on top floor. Some of the respondents also reported to reside in single storeyed and double storeyed apartments i.e. 7.5 and 1.7 per cent respectively.

4.1.5.10 Parental participation

Data in Table 4.1 reveal that parents of more than half of the respondents (51.7%) were engaged in healthy environmental activities

followed by 40.0 percent of the respondents whose parents were some what involved in such activities. However only 8.3 percent of the respondents parents showed low participation on environmental conservation activities.

4.1.5.11 Parental stimulation

Most of the respondents (67.5%) received high and healthy stimulation from their parents regarding environmental acts followed by 17.5 percent who were fairly stimulated and 15.0 percent who received no stimulation at all.

4.1.5.12 Parental religious believes

Majority of the respondents (72.5%) had their parents holding average scores on religious believes regarding various environmental aspects followed by 15.8 percent who had all most low scores regarding sacredness of trees and 11.7 percent whose parents were reported to be strong believers.

4.1.6 School environment

The school environment of the respondents was studied based upon their scholastic achievement, activities pertaining to environmental education carried out at the school and content analysis of Xth standard books for environmental education.

4.1.6.1 Scholastic achievement

Majority of the respondents (71.6%) had middle level of scholastic achievement followed by 19.2 percent having low level and 9.2 percent having high level of scholastic achievement.

The information regarding profiles of the schools selected, activities pertaining to environmental education carried out at the two schools and

content analysis of Xth standard books is provided in detail in Tables 4.1.6.2, to 4.1.6.4 respectively.

Table 4.1.6.2 Profile of the schools selected

Schools in consideration	Kind of institution	Total number of students	Total staff	Students in Xth standard
S I (H.A.L. Vidyalaya)	Government	1349	43	67
S II (G.H.R. Academy)	Private	1040	62	60

4.1.6.2 Profile of the schools selected

The data in Table 4.1.6.2 presents the profile of the two schools selected for the purpose of the study. Both the schools selected were affiliated to Central Board of Secondary Education (C.B.S.E.) pattern, however school I (H.A.L. Vidyalaya) was a governmental institution while school II (Guru Har Rai Academy) was a private institution.

The total strength of students in SI was 1349, of which 67 students were in standard Xth as compared to SII where the total number of students was 1040, of which 60 belonged to Xth standard.

The total staff strength in the two selected schools was 105 where in 43 teacher belonged to SI and 62 hailed from SII.

Since the sample of the study comprised of 60 students from both the schools thus, the students who were absent on the very first day were considered as absent till the end of the intervention programme.

In School I, seven students from standard Xth were absent on the first day. However, from Xth standard of School II no student was reported to be absent.

4.1.6.3 Activities pertaining to environmental education carried out in the schools selected

To study the school environment pertaining to the environmental education in the two schools efforts were made to find out the information on environmental education in the selected schools through activities carried out by the students, staff and all concerned in the school campus. The specific information so obtained is presented in Table 4.1.6.3.

The displays, discussions, use of teaching aids, special events and activities in school, use of dustbins, plantation, student's interests, teacher's initiation related to environmental education constituted the school environment. Table 4.1.6.3 shows the comparative status and stress laid on environment education in both the schools.

Display

Table 4.1.6.3 reveal that SI had no display boards inside the classroom depicting charts, photographs or article and slogans on environment.

Table 4.1.6.3 Activities pertaining to environmental education carried out at the schools selected

S.No.	Activities	S I	S II	Total
1.	Display in classroom	0	4	4
a)	Charts and photographs	0	2	2
b)	Articles and slogans	0	2	2
2.	Display outside classroom	3	6	9
a)	Charts and photographs	2	2	4
b)	Articles and slogans	1	4	5
3.	Discussion in classroom			
a)	According to book curriculum	✔	✔	
b)	Initiation from teachers	X	✔	
c)	Initiation from students	X	✔	
4.	Discussion outside classroom			
a)	Essays	X	✔	
b)	Debates	✔	✔	
c)	Drawing competitions	✔	✔	
5.	Teaching aids used			
a)	Charts	X	✔	
b)	Posters	✔	✔	
c)	Photographs	X	✔	
6.	Special events in the school			
a)	Cleanliness of class	X	✔	
b)	Cleanliness of school	X	X	
c)	Competition (debates/ speech/essay)	✔	✔	

7.	Activities			
a)	Herbarium file	X	✔	
b)	Collection of seeds	X	X	
8.	Health check up			
a)	Doctors	X	✔	
b)	Specialists	X	✔	
c)	Senior students	✔	X	
9.	Dustbins			
a)	In the class	✔	✔	
b)	Around the class	X	✔	
10.	Plantation sufficient			
a)	In the school	✔	✔	
b)	Around the school	3	X	3
11.	Students interest			
a)	Talk/lecture	15	20	35 (29.1)
b)	Discussion	20	30	50 (41.7)
c)	Activities	25	10	35 (29.1)
12.	Students intrested in special class on environmental education	46	58	104 (86.7)

Figures in parenthesis denote percentages.

Relatively SII had four display boards on which charts and photographs (2) along with articles (2) on environment were displayed inside the classroom on a regular basis with change in theme.

Main display board outside the Principal's office contained sufficient number of charts, articles and slogans in both the schools, however once again SII succeeded SI by exceeding the number of articles on environmental education.

Discussion

In both the schools discussions on environmental education were part of studies at Xth standard which might be on account of the facts that it was a part of course curriculum. However, it was observed that in SII the teacher's showed somewhat more interest in initiating deep discussions on the topics as compared to SI. The respondents from SI reported that environment related topics were practised in form of debates and drawing competitions as against SII which had more frequent essays, debates and drawing competitions on themes related to environment.

Special events

Respondents from SI reported that they do not have any special day for such competitions except for debates which are held once in two months while SII students had special days for cleaning their classes and special day i.e. Saturday for debates and last Friday of the month for essays and drawing competitions.

Activities

However, activities like preparation of herbarium file or collection of seeds were carried out at SII and not SI.

Health check up

Regarding health check up, respondents from SII reported positively and check up was reported to be carried out mostly by doctors and specialists (e.g. dentist) and rarely by senior students. While in SI only senior students were found to check the general hygiene of the students.

Maintenance of dustbins

Regarding maintenance of dustbins in and around the classes and schools, it was observed that SI had dustbins only in the class whereas SII had dustbins maintained in as well as around the class.

Plantation in schools

Trees are essential for fresh air so they must be planted in sufficient numbers in and around the schools. Therefore, information was also gathered on this aspect which revealed that SI had sufficient number of trees both inside and around the school while SII had sufficient number of trees only inside the school due to the fact that SII was located on GT road and had limited space outside the school.

Students interest

Coming on to the quantitative aspects of the environmental education in the two schools it was observed that majority of the respondents (41.7%) showed interest in discussion for carrying out such activities, followed by

29.1 per cent each who favoured talks or lectures and activities for delivering environmental education. Also a huge majority (86.7%) of the respondents reported to have interest in attending special classes on environmental education.

4.1.6.4 Content analysis of the syllabus of Xth standard

Table 4.1.6.4 represents a brief summary of their text books and the chapters involved related to environmental education.

The content analysis of the syllabus for Xth standard and environmental education was done to gain information about the stress laid on environmental education by the Board of Education.

Content analysis of English subject for standard Xth revealed that seven topics were covered in form of literature, poetry and drama. The major themes covered were cleanliness, personal hygiene (tooth), love for animals and birds, weather and use of arms as an hazard to environment.

In Hindi only a lecture was covered which focused on importance of animal.

The information in the Table 4.1.6.4 further revealed that five chapters have been dealt in biology and three in physics. The themes covered were man and energy, fuel, our planet-earth, agricultural tasks and food production, pre and post harvest management of crops, community and personal health and biosphere-structure and functions. The major emphasis in the topics were on use of wind, water and solar energy, biomass as a fuel, fossil fuels etc. Atmosphere, importance of ozone layer and soil, pollution,

Table 4.1.6.4 – Content analysis of syllabus for Xth standard and environmental education

Sr. No.	Subject	Topic/Area	Nature	Component highlighted	Style
1.	English (Literature reader)	L-3 Games at twilight	Games children play, and places where they play	The dirty, damp shed, full of wastes. Improper garbage disposal	Things or events described-bougainvillea the garden, trees
		L-4 The ultimate safari	An expedition in South Africa	Problems faced by refugees in Southern Africa. Fear of wild tigers.	Think of a similar situation in your country
	Poetry	P.1 This is going to hurt just a little bit.	The pain in your tooth	The pain one has to go through while dentist pulls off your rotten tooth	
		P.3 Gulzaman's son	A man's love for his sheep	Love animals because they unlike human beings are loyal.	Why did gulzaman loved sheep more than human beings?
		P.4 The frog and the Nightingale	Fateful ending of one who believes on others more than self.	- Wild life - Frog - Nightingale - Other birds	Write a short poem about two creatures
		P.5 The Rime of the Ancient mariner	Killing of a bird brought bad luck to a sailor	- The bird (Albatross) - Killing of animals and birds is harmful for us - Images relating to weather	

	Drama	D.2 The phoenix	Destruction of the world by nuclear wars	- Phoenix (the bird which burns itself to ashes every five hundred years and then is born again) - Latest technologies (computer and robot)	Why does the world come to an end? Where is man ultimately placed with invention of superficial-machines.
2.	Hindi Parag Part II	L.7 Gaura	Death of a cow in a country where people pray her	- Love of the author's for her cow - Envy of a milkman against Gaura-the cow. - Death of the cow	Write your experience of taming any bird or animal
3.	Science	Energy	Man and energy	-Uses of wind energy, water-wheels and solar energy - Advantages of solar energy	If not used carefully how long would our energy and coal reserve last in India, our population being 800 millions and coal reserve being 80 billion
A.	Physics	Ch. 2 Fuels	Different types of fuels	- Biomass as fuel - Fossil fuels	Give advantages of smokeless chulhas. Constituents of biogas. Pollution due to burning of fossil fuels. How are biogas plants boon to the farmers.
		Ch. 9 The earth system	Our planet earth	- Atmosphere - Importance of ozone layer - Pollution	Name some of the main pollutants and state their origin.

					layer.
B.	Biology	Ch. 5 Food production	Agricultural tasks and food production	- Importance of soil - Use of pesticide and fertilizers.	What is weeding? Why do we use Pesticide? Differentiate between fertilizers and manure? What are work animals?
		Ch. 6 Management of Food resource	Pre harvest and post harvest management of crops	- Pre harvest and post harvest care - Control of pests - Nriotic and biotic factors	What is used to control to control pests? Advantages and disadvantages of pesticides. Abiotic and biotic factors responsible for damage to food grains
		Ch. 7 Health	Community and personal health	- Diseases - Pollution related Diseases - Preventive measures	How can the health of a person be affected by environment give two examples? Can you stay well if your home is clean but neighbourhood is not? If you were the Chairman of the local municipality what Measures would you make to ensure community health -What is polluted air? -How are tobacco fumes

					Give examples of two incidents of large scale *pollution*? How can unregulated disposal of human, domestic and industrial waste pollute water Sources?
		Ch. 12 Biosphere	Biosphere - Structure and Function	- Food chain - Flow of energy	What is ecosystem? What happens if you disturb the food chain or food web? What is the role of Decomposers?
4.	Social Science	Ch. 10 The first world war	World war	- Outbreak of war - Consequences of war. - *Introduction of new* weapons	Immediate consequences Of Ist world war
A.	*History*				
		Ch. 12 The world from 1919 To the second world war	IInd World war	- Destruction of life. - Factories producing goods made of human skins and bones	An essay on destructive power of weapons developed after second world war. Comparison between nuclear weapons used in world war I and II.
B.	Civics	Ch. 1 Society and citizen	Society and citizen are interdependent	Society, family, individual and his duties to society	Discussion on the topic family is the first school of social virtues. How does schooling prepare a future citizen.

		Ch. 15 World problems	Problems the world is facing today War	Disarmament. No one is winner in a nuclear	Discussion on nuclear war and its effects. Why is disarmament necessary.
C.	Geography	Ch. 2 Climate	Types of climate in India	Climate Indian monsoons	Why do Cherrapunji receive highest rainfall in world?
		Ch. 3 Our national resource Base ; The Flora, Fauna and the soils	Flora and fauna	- Flora species - Fauna species - Their importance - Soils of India and their utility	Short notes on conservation of wild life. Conservation of soil. What makes the maintenance of ecosystem indispensable for human survival?
		Ch. 4 Land use and water Resources	Land use pattern in India and water resources	Water resources and their shortage Total land available today.	Why is it necessary to know the land use pattern of India? Why can't we make full use of available water resources?
		Ch. 9 Human resources	Population growth	- Population explosion - Crisis of resources	Present rate of population growth in India. High dependency ratio in India. Essay on population distribution in India pointing out geographical factors.

in particular use of pesticides and fertilizers, care during pre and post harvest management of crops, control of pest, abiotic and biotic factors, general and pollution related diseases, food chain and flow of energy were another factors discussed in the chapter.

It was observed that the course content covered in science subject including biology and physics has covered some very important aspects for healthy being. It was found that environment education through course content was sufficiently covered in science subject.

Social science subject also covered some very important topics like world war, society and citizens, problems of the world, climate, flora and fauna species, land use pattern of India and population growth under two chapters of history, two of civics and four of geography.

4.1.7 Family education status

Table 4.1 indicate that majority of the respondents (60.0%) had high educational status of the family, followed by 27.5 percent of the respondents having middle level of family educational status and 12.5 percent having low educational status of the family.

4.1.8 Mass media exposure

Table 4.1 reveal that more than half of the respondents (61.7%) reported frequent exposure to mass media sources followed by 40.0 percent who reported seldom exposure. Only 8.3 percent of the respondents reported nil exposure to the mass media sources.

The detailed information regarding media used by the respondents and exposure to messages pertaining to environment on T.V. is provided in Tables 4.1.8.1 and 4.1.8.2 respectively.

4.1.8.1 Information regarding media used by the respondents

The information regarding frequency of media used by the respondents is presented in Table 4.1.8.1. It was reported that T.V. was the most utilised mass media (85.8%) followed by newspapers (4.1%) and a combination of the two sources (10.0%).

Regarding the frequency of watching T.V. programmes , half of the respondents reported watching T.V. once (50.0%) daily. More than one third of the respondents (36.7%) watched twice a day. Only 13.4 per cent were reported watching it once in two to three days. Similarly, regarding the frequency of reading newspapers it was revealed that out of 4.1 per cent, 2.5 per cent read newspaper daily followed by 1.7 per cent who were occasional readers. None of them reported to be fortnight readers.

Further it was seen that 50.0 per cent of the respondents preferred to watch entertainment programmes, followed by 26.7 per cent who liked to watch knowledge and informational programmes and 15.0 per cent who preferred comedy programmes only. Only 8.4 per cent of the respondents reported to watch news for updating their knowledge.

The data regarding preferences of respondents for channels related to environment revealed that 25.0 per cent of them liked to watch Discovery

Table 4.1.8.1 Information regarding media used by the respondents

S.No.	Statements		Respondents	
			Frequency	Percentage
1.	**Media utilised**	T.V.	103	85.8
		Newspaper	5	4.1
		Combination of the two	12	10.0
2.	**Viewing frequency of T.V.**	Daily	60	50.0
		Twice a day	44	36.7
		Once in two-three days	16	13.4
3.	**Frequency of reading newspapers**	Daily	12	10.0
		Occasionally	6	5.0
		Once a fortnight	2	1.7
4.	**Preferences for T.V. programmes**	News	10	8.4
		Entertainment programmes	60	50.0
		Comedy serials	18	15.0
		Knowledge and informational programmes	32	26.7
5.	**Preferences for channels related to environment**	Discovery channel	30	25.0
		National Geographic Channel	2	1.7
6.	**Preferences for programmes related to environment related**	Untamed Australia	20	16.7
		Discovery Kids	4	3.4
		Animal Planet	6	5.0
		Amul Surabhi	2	1.7

Channel while only 1.7 per cent of them preferred National Geographic Channel over any other.

Data were also collected and tabulated on their preferences for various environment related programmes which revealed that 16.7 per cent of the respondents liked to watch Untamed Australia and 5.0 per cent of the respondents liked to watch animal planet followed by 3.4 per cent who went for Discovery kids and 1.7 per cent reported watching Amul Surabhi which is more or less concerned with environment.

4.1.8.2 Exposure to messages related to environment

Table 4.1.8.2 revealed the exposure of the respondents to different messages pertaining to environment on television. Each message was identified as seen, liked and adopted. A list of eight different messages was prepared and produced before them.

Regarding first message "Save electricity" 73.4 per cent of the respondents reported that they have seen it mostly, with 60.8 per cent of them adopting it.

"Reduce wastage of water" was second message selected. Majority of the respondents (80.8%) reported that mostly they have seen it with 75.0 per cent of them reporting seldom liking it and 75.0 per cent of them adopting it.

However, for third message "Grow more trees" one third of the respondents (75.0%) reported having seen it mostly with 87.5 per cent

Table 4.1.8.2 Exposure to messages related to environment on T.V.

(N=115)

Messages	Seen			Liked			Adopted	
	Mostly	Seldom	Never	Mostly	Seldom	Never	Yes	No
Save electricity	88 (73.4)	17 (14.1)	10 (8.4)	60 (50.0)	48 (40.0)	7 (5.8)	73 (60.8)	42 (35.0)
Reduce wastage of water	97 (80.8)	0 (0.0)	18 (15.0)	25 (20.8)	90 (75.0)	0 (0.0)	90 (75.0)	25 (20.8)
Grow more trees	90 (75.0)	0 (0.0)	25 (20.8)	10 (8.4)	105 (87.5)	0 (0.0)	18 (15.0)	60 (50.0)
Control pollution	108 (90.0)	0 (0.0)	7 (5.8)	55 (45.8)	52 (43.4)	0 (0.0)	109 (90.8)	6 (5.0)
Reduce recycle reuse	0 (0.0)	7 (5.8)	108 (90.0)	6 (5.0)	1 (0.8)	8 (6.7)	0 (0.0)	112 (93.4)
Reduce traffic	85 (68.4)	3 (2.5)	30 (25.0)	113 (94.1)	4 (3.4)	0 (0.0)	30 (25.0)	90 (75.0)
Wash your hands before eating	75 (62.5)	0 (0.0)	40 (33.4)	14 (11.7)	89 (74.1)	12 (10.0)	24 (20.0)	91 (75.8)
Keep food covered	72 (60.0)	0 (0.0)	43 (35.8)	23 (19.1)	92 (76.7)	0 (0.0)	103 (85.8)	12 (10.0)

Figures in parenthesis denote percentages.

Note : Though the original sample comprised of 120 children, but initially ten of them reported nil exposure to media (Table 4.1) yet five of them responded to the exposure to these messages. Thus the sample comprised of 115 children.

of them liking it most however only 15.0 per cent of them reported to have adopted it.

"Control pollution" was the fourth selected message for which 90.0 per cent of the respondents reported having seen it most of the times, followed by 45.8 per cent of them who liked it most and 90.8 per cent of them who adopted it using one way or the other.

Regarding fifth message - "Reduce Recycle Reuse" was the only message which was reported not to be seen by 90.0 per cent of the respondents and finally 93.4 per cent who reported not having adopted it even if some of them have seen the picturisation of the message.

Regarding sixth message "Reduce or pool traffic" it was again reported to have been seen by 68.4 per cent of the respondents followed by 94.1 per cent of the respondents who reported liking it most followed by only one fourth of the respondents (25.0%) who adopted it.

Regarding seventh message "Wash your hands before eating" 62.5 per cent of the respondents reported having seen it mostly followed by 74.1 per cent of them who reported seldom liking it and only one fifth of the respondents (20.0%) who adopted it.

However, for the last selected message i.e. "Keep food covered" 60.0 per cent of the respondents reported seeing it most of the times, followed by 76.7 per cent who seldom liked it yet 85.8 per cent of them adopting it.

4.2 Social marketing of environmental education

After having a brief account of their school activities and curriculum pertaining to environment it was noticed that neither of the two schools stressed on environment and its importance as such. The element of awareness was lacking. As a result the researcher decided to develop an intervention programme on environmental education for the respondents. For this purpose their views were recorded on the social marketing inventory in order to have an idea on the kind of opinions they held and type of service or help they would prefer to obtain such information.

A schedule was developed to get first hand information on the various factors affecting social marketing of environmental education. It comprised of the 4 P's i.e. product, price, place and promotion.

4.2.1 Social marketing of environmental education in terms of product

The first section comprised of eight questions pertaining to environmental education as a product (Table 4.2.1). A vast majority of respondents i.e. 70.0 per cent revealed that they would like to get environmental education as an educational package rather than any product while 30 per cent of them preferred to get it in physical form i.e. as a product.

Approximately, three fourth of the respondent's population i.e. 78.4 per cent agreed that success of all environmental education programmes, their marketing depends upon the quality of the products or services delivered.

Table 4.2.1 Social marketing of environmental education in terms of product

S.No.	Statements	Respondents	
		Frequency	Percentage
1.	Prefer to get environmental education as a		
-	Package	84	70.0
-	Product	36	30.0
2.	Success of all environmental education programmes, marketing, planning depends upon the quality of the product/service/information delivered	94	78.4
3.	The product should be in line with client's expectations	104	86.7
4.	Consumer involvement is necessary in designing process of any new information/product/service concerning environment that are targeted at them	105	87.5
5.	All information should be available to all categories of users, not restricted to a particular category	73	60.8
6.	Various agencies must spread new and latest findings according to changing demands of consumer	96	80.0
7.	Continuous assessment of environmental friendly technologies for determining if they are to be continued, modified or withdrawn	48	40.0
8.	Sustain traditional services by promoting or changing them so that they attract users	109	90.8

Further the product should be in line with client's expectations was revealed by 86.7 per cent of respondents.

For designing any new product, consumer's involvement is necessary for its successful implementation, was reported by 87.5 per cent of the respondents. When asked about dissemination and availability of such useful environmental information 60.8 per cent of them revealed that it should be available to all categories of users and not restricted to any particular category and that latest findings and researches about various environment friendly products should be passed on to the consumers timely was revealed by 80.0 per cent of the respondents. But 40.0 per cent of them also laid importance on the continuous assessment of environmental friendly technologies for determining if they need to be continued, modified or withdrawn.

However, one of the major response of 90.8 per cent of the respondents revealed that traditional services should be sustained by promoting or modifying them, because they are not harmful in most of the cases and it also attracts a vast population of consumers.

4.2.2 Social marketing of environmental education in terms of price

This section comprised of eight questions, seeking to elicit responses from the respondents on how important do they perceive the price of such education/information/service is (Table 4.2.2).

More than half i.e. 52.5 per cent of the respondents reported that price of such service is an important factor of consideration to them be it any

Table 4.2.2 Social marketing of environmental education in terms of price

S.No.	Statements	Respondents	
		Frequency	Percentage
1.	Price is an important factor	63	52.5
2.	Prefer to get such information when provided free of cost	98	81.7
3.	Environmental education should be extended at concessional rates	84	70.0
4.	Information when provided free of cost draws huge crowds and much attention	71	59.1
5.	All users should be charged equal whether internal or external i.e. concerned with any agency or not	88	73.4
6.	Nominal cost charging will lead to repeated use of services	52	43.4
7.	Environment friendly technologies should be provided at cheaper rates	105	87.5
8.	In terms of price you prefer to devote		
-	Time	54	45.0
-	Cost	32	26.7
-	Labour	9	7.5
-	Any other help	25	20.8

educational package, a product or any other service, while the rest 47.5 per cent are willing to pay any amount for receiving such information.

A huge population of respondents i.e. 81.7 per cent reported a favourable attitude towards getting such information free of cost and 59.1 per cent revealed that free of cost information will draw huge crowds and much attention while 70.0 per cent said that such information which is beneficial should be extended at concessional rates if not free of cost. If charged nominally, consumers will repeatedly use these services was revealed by 43.4 per cent of the respondents. Regarding cost price 73.4 per cent of them revealed that all users should be charged equally, without any discrimination of any one being associated or dissociated with any concerned agency working in this direction.

A major section of the respondents (87.5%) suggested that environment friendly technologies should be provided at cheaper rates than other technologies to encourage and motivate its use by the users.

The last question dealt with the actual price they were willing to devote to such agencies working in this direction. Majority of the respondents (45.0%) revealed that they can devote time, 26.7 per cent reported that they can pay in terms of cost, 7.5 per cent were willing to devote labour and 20.8 per cent reported to pay any other form of help.

4.2.3 Social marketing of environmental education in terms of place

The third aspect of the social marketing of environmental education deals with the place i.e. the place where the consumers would like to have such information/product/services etc.

This section contained four questions (Table 4.2.3). Regarding the access to such products/services, 55.0 per cent of the respondents reported that if such services are not within easy reach of the consumers, they won't attract them, be it supplied even free of cost.

However, approximately half (48.4%) of the respondents reported that they would prefer getting such services at their residence while 51.7 per cent of them said that it would be much better if these services are provided at schools/institutions. Some of the respondents i.e., 45.0 per cent of them reported that such lectures should be delivered at most common public place/ hall inviting huge crowds by suitable and timely publicity.

One of the major factor that needs to be added to social marketing of environmental education is the change in the communicational channels utilised as revealed by 56.7 per cent of the respondents.

4.2.4 Social marketing of environmental education in terms of promotion

Table 4.2.4 comprised of nine questions pertaining to promotion of environmental education. To promote the environmental education, one will have to promote its social marketing first, only then can the target of environmental education be achieved.

Regarding the promotion of all voluntary and non-voluntary agencies working in the direction of environmental awareness 99.1 per cent of the respondents were totally complying with the statement.

Table 4.2.3 Social marketing of environmental education in terms of place

S.No.	Statements	Respondents	
		Frequency	Percentage
1.	If access to environmental information products and services is not user friendly, it cannot attract customers even if free of cost	66	55.0
2.	You like to gain such environment related information		
-	at your residence	58	48.4
-	at your school	62	51.7
3.	Facts and lectures concerning environment should be delivered at public places inviting huge crowds	54	45.0
4.	Change in the communication channels should be practiced for awareness amongst general public	68	56.7

Table 4.2.4 Social marketing of environmental education in terms of promotion

S.No.	Statements	Respondents	
		Frequency	Percentage
1.	Government should motivate and encourage all voluntary and non-voluntary agencies working in the direction of environmental awareness	119	99.1
2.	Agencies working in direction of environmental education should be provided any incentives	98	81.7
3.	People doing something outstanding in this field should be awarded with rewards	44	36.7
4.	Necessary to inform the users about the utility and benefits of such information concerning environment when their usage is missing	62	51.7
5.	All the environmental information, products and services are upto the mark and do not need any marketing or promotional activity	12	10.0
6.	Effective promotional efforts will reduce the time taken to convince a user about a new environment friendly product	58	48.4
7.	Various visuals help in spreading environmental awareness and generating consciousness	109	90.8
8.	For the promotion of environmental services		
-	Interest of the consumer is a potent tool	98	81.7
-	Interest of the manufacturer is a potent tool	22	18.4
9.	There should be some rewards for		
-	Most hygienic locality of a city	72	10.0
-	Most green area of a city	7	5.8
-	Most pollution free area of a city	22	18.3

Majority of the respondents (81.7%) revealed that some incentives should also be provided to such agencies.

In order to promote environmental education at national level, our efforts should begin at basic level thus 36.7 per cent of the respondents reported that people doing something outstanding in this field should be awarded with some rewards.

At times when the usage rate declines it becomes the duty of all involved to inform and encourage the consumers about the benefits of such information as reported by 51.6 per cent of the respondents. Majority of the respondents (90.0%) reported that there is a need to update environmental educational services/packages etc. Whereas only 10.0 per cent of them agreed that the present system is upto date and do not need any promotional activity.

However, 90.8 per cent of the respondents reported that various visuals can help in spreading environmental awareness and generating consciousness.

When talked about the interest as a potent tool for promotion of environmental services, 81.7 per cent of the respondents reported interest of the consumer as more potent while 18.4 per cent of them reported the interest of manufacturers as more important and potent tool.

Finally for promoting such environmental services there should be some rewards or incentives for most hygienic locality of a city was reported by 10.0 per cent of respondent, 5.8 per cent reported that most green area of a

city should also be rewarded and 18.3 per cent of them revealed that due rewards and incentives should also be provided to the most pollution free area of a city, thus encouraging people to keep their localities clean and green.

4.3 Identification and standardization of crucial messages on environmental education

This section comprised of identification of crucial messages on environmental education and standardization of the selected messages.

4.3.1 Identification of crucial messages

Initially as many as fifty messages pertaining to environmental education were identified in consultation with review of literature, scientists, school teachers and researchers own observation for dissemination to the students of tenth standard (Table 4.3.1). These messages were then broadly categorised as preventive and remedial measures to conserve the environment. Broadly, they were categorised as Air pollution (M_1), Water Pollution (M_2), Noise pollution (M_3), Soil pollution (M_4), Sanitation and garbage disposal (M_5) and General issues (M_6).

First message selected was that of air pollution — its preventive and remedial measures, which comprised of five submessages under the former heading and six submessages under the latter.

Water pollution was another important aspect selected for dissemination to children and it contained three submessages under preventive and two under remedial measures.

Table 4.3. Identification of crucial messages on environmental education

S. No.	Identified messages		Identified sub components
M_1	Air pollution		Preventive measures
		1.1	Grow more trees
		1.2	Clean area green area
		1.3	Install effective chimneys
		1.4	Encourage gas vehicles
		1.5	Save oil, save environment
			Remedial measures
		1.6	Ban smoking
		1.7	Minimize smoke
		1.8	Anti pollution technology
		1.9	Use lead free petrol
		1.10	Use vehicle with catalytic convertor
		1.11	Pollution control certificate be made essential
M_2	Water pollution		Preventive measures
		2.1	Use water filters
		2.2	Laws against factories off wastes into rivers
		2.3	Stop use of drains for washing clothes
		2.4	Stop disposal of wastes into rivers
			Remedial measures
		2.5	Use water medicines to clean water
		2.6	Use of different methods to filter water (Janta water filter, using muslin cloth)

M_3 Noise pollution		Preventive measures
	3.1	Promote noise free vehicles
	3.2	Avoid music on full volume
	3.3	Reduce/pool traffic
	3.4	Locate industries far from residential areas
		Remedial measures
	3.5	Use of silencers in vehicles
	3.6	Effective application of laws
	3.7	Ban generators
	3.8	Avoid/minimize the use of crackers
M_4 Soil pollution		Preventive measures
	4.1	Grow more trees
	4.2	Check and prevent soil erosion
	4.3	Grow environment friendly technologies
		Remedial measures
	4.4	Minimize use of chemicals like-
	4.4.1	Fertilisers
	4.4.2	Pesticides
	4.4.3	Insecticides for
	4.4.4	Production
	4.4.5	Protection
	4.4.6	Processing
M_5 Sanitation and Garbage disposal		Preventive measures
	5.1	Ban polythene sheets
	5.2	Prefer bio-degradable waste for composting
	5.3	Good litering habits
	5.4	Proper, hygienic dustbins

		Remedial measures
	5.5	Recycling of waste
	5.6	Effective disposal system
	5.7	Utilise animal waste as manure and fuel
M_6 General issues		Preventive measures
	6.1	Stop nuclear wars
	6.2	Promote afforestation
	6.3	Conserve flora
	6.4	Conserve fauna
	6.5	Avoid open defecation
		Remedial measures
	6.6	Reduce air traffic
	6.7	Effective sewage
	6.8	Effective soakage pit
	6.9	Stress on low cost latrines

Noise pollution comprised of four submessages each under its preventive and remedial measures.

Next message identified crucial was that of soil pollution comprising of two submessages each under the categories of preventive and remedial measures.

Sanitation and garbage disposal was identified as another important message on which information should be imparted to the respondents. It comprised of four submessages under preventive measures and three under remedial measures.

However, a general or miscellaneous category was also developed containing five submessages of preventive and remedial measures.

4.3.2 Standardization of the identified messages

After identifying the most crucial messages for dissemination to the respondents an effort was made to standardize them, for this purpose coefficient of variation was calculated. Messages with coefficient of variation less than 25.5 per cent were selected as most crucial and urgent messages for timely dissemination to the respondents (Table 4.3.2). While those with coefficient variation more than 25.5 per cent were not considered as most crucial. However, considerable importance was also given to them in introducing the intervention programme. Amongst remedial measures of - Air pollution (M_1) - Install effective chimneys (M1.4), Grow more trees (M1.1), Save oil, save environment ($M_{1.5}$) and Clean area, green area (M1.2) were most crucial and encourage gas vehicle ($M_{1.4}$) as least crucial.

Table 4.3.2 Standardization of identified message on environmental education

S.No.	Identified messages	Judges consensus			
		MR	R	IR	C.V.(%)
M_1	**AIR POLLUTION**				
Preventive measure					
1.1	Grow more trees	28 (93.3)	2 (6.7)	0 (0.0)	8.52
1.2	Clean area green area	18 (60.0)	12 (40.0)	0 (0.0)	18.84
1.3	Install effective chimneys	18 (60.0)	12 (40.0)	2 (6.7)	7.51
1.4	Encourage gas vehicles	3 (10.00)	13 (43.3)	14 (46.7)	39.87
1.5	Save oil, save environment	25 (83.4)	5 (16.7)	0 (0.0)	13.17
Remedial measures					
1.6	Ban smoking	11 (36.7)	11 (36.7)	8 (26.7)	37.5
1.7	Minimize smoke	18 (60.0)	12 (40.0)	0 (0.0)	18.8
1.8	Anti pollution technology	18 (60.0)	12 (40.0)	2 (6.7)	7.51
1.9	Use lead free petrol	18 (60.0)	10 (33.4)	2 (6.7)	24.43
1.10	Use vehicle with catalytic convertor	19 (63.4)	9 (30.0)	2 (6.7)	24.04
1.11	Pollution control certificate be made essential	18 (60.0)	10 (33.4)	2 (6.7)	24.43

M_2	**WATER POLLUTION**				
Preventive measures					
2.1	Use water filters	10 (33.4)	16 (53.4)	4 (13.4)	12.41
2.2	Laws against factories disposing off wastes into rivers	18 (60.0)	12 (40.0)	0 (0.0)	18.84
2.3	Stop use of drains for washing clothes	3 (10.0)	12 (40.0)	15 (50.0)	41.4
2.4	Stop disposal of wastes into rivers	18 (60.0)	12 (40.0)	0 (0.0)	18.8
Remedial measures					
2.5	Use water medicines to clean water	12 (40.0)	13 (43.4)	5 (16.7)	32.12
2.6	Use of different methods to filter water (Janata water filter, using muslin cloth)	22 (73.4)	8 (26.7)	0 (0.0)	16.20
M_3	**NOISE POLLUTION**				
Preventive measures					
3.1	Promote noise free vehicles	18 (60.0)	12 (40.0)	2 (6.7)	7.5
3.2	Avoid music on full volume	21 (70.0)	7 (23.4)	2 (6.7)	22.9
3.3	Reduce/Pool traffic	28 (93.4)	2 (6.7)	0 (0.0)	8.5
3.4	Locate industries far from residential areas	18 (60.0)	8 (26.7)	4 (13.4)	10.9

Remedial measures

3.5	Use of silencers in vehicles	4 (13.4)	24 (80.0)	2 (6.7)	21.4
3.6	Ban generators	18 (60.0)	7 (23.4)	5 (16.7)	31.3
3.7	Avoid/minimize the use of crackers	20 (66.7)	6 (20.0)	4 (13.4)	28.3

M_4 SOIL POLLUTION

Preventive measures

4.1	Grow more trees	10 (33.4)	16 (53.4)	4 (13.4)	12.4
4.2	Check and prevent soil erosion	20 (66.7)	6 (20.0)	4 (13.4)	28.3
4.3	Grow environment friendly technologies	19 (63.4)	9 (30.0)	2 (6.7)	24.0

Remedial measures

4.4	Minimize use of chemicals like-				
4.4.1	Fertilizers	18 (60.0)	10 (33.4)	2 (6.7)	24.4
4.4.2	Pesticides	18 (60.0)	7 (23.4)	5 (16.7)	31.3
4.4.3	Insecticides	20 (66.7)	6 (20.0)	4 (13.4)	28.3
4.4.4	Production	24 (80.0)	6 (20.0)	0 (0.0)	14.2
4.4.5	Protection	21 (70.0)	7 (23.4)	2 (6.7)	22.9
4.4.6	Processing	4 (13.4)	24 (80.0)	2 (6.7)	21.4

M_5	**SANITATION AND GARBAGE DISPOSAL**				
Preventive measures					
5.1	Ban polythene sheets	22 (73.4)	5 (16.7)	3 (10.0)	25.0
5.2	Use biodegradable waste for composting	21 (73.4)	5 (16.7)	4 (10.0)	27.9
5.3	Good littering habits	10 (33.4)	12 (40.0)	8 (26.7)	37.4
5.4	Closed hygienic dustbins	23 (76.7)	3 (10.0)	4 (13.4)	26.8
Remedial measures					
5.5	Recycling of wastes	10 (33.4)	16 (53.4)	4 (13.4)	12.4
5.6	Effective disposal system at community and state level	19 (63.4)	9 (30.0)	2 (6.7)	24.0
5.7	Utilise animal waste as manure and fuel	24 (80.0)	6 (20.0)	0 (0.0)	14.2
M_6	**GENERAL ISSUES**				
Preventive measures					
6.1	Stop nuclear wars	28 (60.0)	8 (26.7)	4 (13.4)	10.9
6.2	Promote afforestation	28 (93.4)	2 (6.7)	0 (0.0)	8.5
6.3	Conserve flora	23 ((76.7)	3 (10.0)	4 (13.4)	26.8
6.4	Conserve fauna	25 (83.4)	5 (16.7)	0 (0.0)	13.1
6.5	Avoid open defecation	21 (70.0)	5 (16.6)	4 (13.4)	27.9

Remedial measures

6.6	Reduce air traffic	16 (53.4)	12 (40.0)	2 (6.7)	25.1
6.7	Effective sewage	2 (6.7)	10 (33.4)	18 (60.0)	42.3
6.8	Effective soakage pit	10 (33.4)	5 (16.7)	15 (50.0)	40.7
6.9	Stress on low cost latrines	6 (20.0)	10 (33.4)	14 (46.7)	44.5

Regarding remedial measures of "Air pollution", Anti-pollution technology ($M_{1.8}$), Minimize smoke from industries ($M_{1.7}$), Use vehicle with catalytic convertor ($M_{1.10}$), Use lead free petrol ($M_{1.9}$), Pollution control certificate be made essential ($M_{1.11}$) were the most crucial and Ban smoking ($M_{1.6}$) was standardized as least crucial.

Second message was that of "Water pollution" (M_2). Under its preventive measures use water filters ($M_{2.1}$) was identified as most crucial followed by stop disposal of wastes in rivers ($M_{2.4}$) and laws against factories disposing off wastes into rivers ($M_{2.2}$). However, stop use of drains for washing clothes ($M_{2.3}$) was not standardized as crucial message.

Under its remedial measures only use of different methods to filter water ($M_{2.6}$) was identified as crucial and use water medicines to clean water ($M_{2.5}$) received less significance by the judges.

"Noise pollution" was the third message covered by the researcher. Under its preventive measures promote noise free vehicles ($M_{3.1}$) was most

crucial followed by reduce or pool traffic ($M_{3.3}$), locate industries far from residential areas ($M_{3.4}$) and avoid music on full volume ($M_{3.2}$).

Regarding its remedial measures only use of silencers in vehicles ($M_{3.5}$) was standardized as most crucial, however avoid or minimize the use of crackers ($M_{3.7}$) and ban generators ($M_{3.6}$) were standardized as least crucial.

"Soil pollution" was identified as fourth message off its preventive messages. Grow more trees ($M_{4.1}$), Grow environment friendly technologies ($M_{4.3}$) were identified as most crucial and Check and prevent soil erosion ($M_{4.2}$) as least crucial.

However, under its remedial measures Minimize use of chemicals for production ($M_{4.4.4}$), followed by Minimize use of chemicals for processing ($M_{4.4.6}$), Minimize use of chemicals for protection ($M_{4.4.5}$) and Minimize use of chemicals for fertilizers ($M_{4.4.1}$) were identified as most crucial followed by Minimize use of chemicals like insecticides ($M_{4.4.3}$) and Minimize use of chemicals like pesticides ($M_{4.4.2}$) which were reported to be least crucial.

Fifth message was that of "Sanitation and garbage disposal", from its preventive measures only - Ban polythene sheets ($M_{5.1}$) was identified as crucial, rest all i.e. Closed hygienic dustbins ($M_{5.4}$), Use biodegradable waste for composting ($M_{5.2}$) and Good littering habits ($M_{5.3}$) were standardized as not so crucial for timely dissemination. However, amongst its remedial measures-Recycling of wastes ($M_{5.5}$), Utilise animal waste as

manure and fuel ($M_{5.7}$) and Effective disposal system at community and state level ($M_{5.6}$) all of them were categorised as crucial messages.

The last message comprised of general issues, from its preventive measure, Promote afforestation ($M_{6.2}$) was standardized as most crucial followed by Stop nuclear wars ($M_{6.1}$), Conserve fauna ($M_{6.4}$). However, Conserve flora ($M_{6.3}$) and Avoid open defecation ($M_{6.5}$) were considered as least crucial. Amongst its remedial measures, only Reduce air traffic ($M_{6.6}$) was identified as crucial, and Effective soakage pit ($M_{6.8}$), Effective sewage ($M_{6.7}$), Stress on low cost latrines ($M_{6.9}$) were identified as least crucial.

The data in the Table 4.3.2 reveals that the judges had more or less same responses for almost all the messages except for - Encourage gas vehicles ($M_{1.4}$), Stop use of drains for washing clothes ($M_{2.3}$), Use water medicines to clean water ($M_{2.5}$), Effective application of laws ($M_{3.6}$), Ban generators ($M_{3.7}$), Conserve fauna ($M_{6.4}$), Effective soakage pit ($M_{6.8}$) and Stress on low cost latrines ($M_{6.9}$). On these messages judges had more varied opinion thus viewing the particular message as irrelevant for further dissemination to students of standard tenth. Messages that were viewed as most relevant and urgent for dissemination were Grow more trees ($M_{1.1}$), Install effective chimneys ($M_{1.3}$), Anti pollution technology ($M_{1.8}$), Reduce/ pool traffic ($M_{3.3}$), Locate industries far from residential areas ($M_{3.4}$), Stop nuclear wars ($M_{6.1}$), and Promote afforestation ($M_{6.2}$) and the remaining being viewed as fairly significant by the judges for timely dissemination to the students.

4.4 Development of the intervention programme

4.4.1 Collection of media

Based on the judges opinion for disseminating the most crucial messages, it was decided to develop an intervention programme by consulting the experts and relevant literature. Thus the researcher made an attempt to lay hands on various institutions working for the upgradation of environment and environmental education and after this attempt some aids were procured by visiting various institutions. A detailed list is provided in Table 4.4.1.

4.4.2 Preparation of media

Considering the importance of the messages an attempt was made by the researcher to prepare media on those crucial topics on which aids could not be procured. A brief description of the aids prepared is provided in Table 4.4.2.

4.4.3 Introduction of media to the respondents

Table 4.4.3 presents the procedure followed for introduction of media to the respondents for environmental education.

For the message of "Air pollution" (M_1) booklets, books and posters were utilised using lecture and discussion and approximately 20 minutes were spend on this message covering various aspects.

Regarding the message of "Water pollution" (M_2), booklet, pamphlets, posters, chart, game and flash cards were utilised using lecture and

Table 4.4.1 Collection of media

S.No.	Media procured		Title	Source
Aids procured				
1. Posters	Air	-	Is this our environment	Paryavaran Bhawan Delhi
	Water	-	Water conservation game	CEE, Ahmedabad
	Noise	-	Global environment- Then and now	Paryavaran Bhawan Delhi
	Flora	-	Nature is in our hands	
		-	Save me to save your life	
	Fauna	-	Buy and bye	
		-	Find me if I'm around	WWF, Delhi
		-	Stop, don't buy trouble	
2. Booklets	Air	-	Think green	CPCB, Delhi
	Water	-	Save water	
		-	Paani ki Kahani	WWF, Delhi
		-	Save energy	
3. Books	Major pollutions		-Prakarti parichay (Vol. 1, 2 & 3)	
	Water	-	Paani - A book of facts and activities	WWF, Delhi
	Energy	-	Energy	
	Flora	-	Pallavi and the coral reef	
	General issues	-	A student's environmental *do it yourself manual*	
4. Newsletters				
		-	Nature news	WWF, Delhi
		-	Back to the wild	
5. Pocket books				
	Birds	-	Rare birds	
	Fauna	-	Handbook of endangered mammals of India	WWF, Delhi
6. Supplements				
		-	Stickers	
		-	Bookmarks	WWF, Delhi
		-	Badges	
		-	Video cassette	

Table 4.4.2 Preparation of media

S.No.	Media prepared		Title	Source
Media prepared				
1. Posters	Trees	-	Save trees they will save you	
	Soil	-	How to control pests without using pesticides?	
2. Booklet	Major environmental problems	-	An instant know how guide to pollution	
3. Chart	Water	-	How to detect water pollution?	
4. Flash cards	Water	-	Ek Chhoti si Bhool	
	Garbage disposal	-	Swachhta Aur Kuradaan, Bimarion Ka Kare Samadhan	
	Major environmental problems	-	Samajhdaar bunty	
	Fauna	-	Who am I? (Game)	

Table 4.4.3 Introduction of the intervention programme

S.No.	Message	Media used	Method	Time
M_1	Air	Booklet Book Poster	Lecture Discussion	20 min
M_2	Water	Booklet Pamphlets Poster Chart Game Flash cards	Lecture Discussion Simulating Games	20 min
M_3	Noise	Booklet Poster Books	Lectures Discussion Activity (Survey of traffic)	15 min
M_4	Soil	Booklet Book Poster Pamphlet Model	Lectures Discussion Activities	25 min
M_5	Garbage disposal	Booklet Book Flash cards Articles	Lectures Discussion Play	20 min
M_6	General issues			
A.	Flora	Booklet Book Poster Photograph	Lecture Discussion Preparing a herbarium file	25 min
B.	Fauna	Booklet Book Poster Game	Lecture Discussion Simulating games Debate	25 min
C.	Nuclear wars	Book	Lecture Discussion Essay writing	20 min
	Summarising	Video cassette	Playing it for children	30 min

discussion techniques spending approximately 20 minutes on different components of water.

The message of "Noise pollution" (M_3) was introduced using booklet, poster and books utilising lecture, discussion and other activities with an approximate 15 minute schedule.

"Soil pollution" (M_4) comprised of fourth message for which booklet, book, poster, and model were utilised. Techniques used were lectures, discussion and play for an approximate 25 minutes schedule.

Regarding the fifth message - "Sanitation and garbage disposal" (M_5) lectures, discussions and simulating plays were made use of and booklet, book, flash cards and articles were the aids utilised.

"General issues" (M_6) were dealt in three different sections - flora, fauna and nuclear wars. For flora booklet, book, poster and photographs were used and they were introduced through lectures, discussion and activities like that of preparing a herbarium file. Time spend on this message was 25 minutes.

Booklet, books, posters and game were media used for introducing the concept of fauna to the respondents techniques utilised were again that of lecture, discussion and an additional activity i.e. essay writing for a schedule of 25 minutes.

However, for teaching the respondents about the causes and consequences of nuclear wars only a book was made use of. Lecture, discussion and essay writing were once again practised for 20 minutes.

The complete intervention programme was then summarised utilising a video cassette which was of half an hour duration.

4.4.4 Visual literacy checklist

After administering the intervention package an effort was made to study the effectiveness of the aids used for disseminating the knowledge. A visual literacy checklist was prepared for this purpose, to study how effective each aid had been in promoting the given ideas.

Visual literacy of any material refers to how appealing, how attractive and how effective a visual material is, in presenting or communicating the intended information/message/idea to the target audience. It refers to the effectiveness with which the (aid) visual material conveys the message to the receiver as intended by the sender.

e.g. A poster is a visual aid which should convey the message at a glance.

There are eight basic components of visual literacy which enhance the effectiveness of any aid. They include unity, graphic, colour, style, text, shape, arrangement and balance.

Components of visual literacy of aids used for the intervention programme

Basically there are eight major components of visual literacy. To be very brief they are :

1. Unity : How limited the aid is to a single main idea.
2. Graphics : Graphics comprised of the pictures and visuals given with or without the text to make the information to be presented more appealing and interesting.

3. Colour : Colour not only enhance, and enriche the visual material but also influence moods and indicate movement. They were used to point out the similarities and differences, to highlight important information and details and to create a particular emotional response.

4. Style : Did the style of writing helped enhance the visual literacy of the supporting material?

5. Text : Was text the most important component? Is the textual material brief, concise and to the point to maintain the desired attention of the audience?

6. Shape : Is the shape of the graphics and aids appropriate and blend well?

ex - A poster should not be of irregular shape.

7. Arrangement : To enhance the visual literacy arrangement is one of the major component to be considered carefully. Are the graphics and text were arranged (orderly placed) in a sequential manner to attain the desired goal?

8. Balance : Balance can be defined as symmetrical arrangement of objects to achieve a proper effect. Are all the material/ information as text or graphics should be carefully placed and arranged to balance each other?

On all the messages pertaining to environmental education different and varied types of visual aids (booklet, chart, poster, flash card etc.) were

prepared and procured by the researcher. Then each aid was studied against the effectiveness of basic components of visual literacy.

Table 4.4.4 reveals how effective different components of visual literacy had been in disseminating and presenting a particular message on environmental education to the respondents.

Regarding book text was reported to be most relevant by a majority (95.0%) followed by style of presentation (90.0%) and sequence (86.7%). Also shape of the book was reported to be important by 78.4 per cent of the respondents followed by 61.7 per cent of them who equally valued balance and graphic for their relevance. Colour was reported to be relevant by only 30.8 per cent of the respondents and only 5.0 per cent of them reported unity as most relevant component of the books utilised.

It was found that in booklet text was reported to be the most relevant component by huge majority of the respondents (98.4%) followed by 95.8 per cent who supported colour and 84.1 per cent who reported sequence to be the most relevant aspect of booklet. Shape was reported to be relevant by 73.3 per cent of the respondents followed by 65.0 per cent who supported unity and 40.0 per cent who reported balance to be relevant. Only 15.0 per cent revealed sequence as an relevant factor followed by 10.0 per cent who opted for graphic.

The data reveal that sequence was reported to be the most relevant component by majority of the respondents (95.0%) followed by unity (90.0%) and shape (86.7%). Graphic and text were reported to be most

Table 4.4.4 Visual literacy checklist of the aids used

	Components/aids used		Book	Booklet	Flash cards	Poster	Chart	Games	Video cassette
1.	Unity	MR	6(5.0)	78(65.0)	108(90.0)	106(88.4)	98(81.7)	103(85.8)	68(56.7)
		R	40(33.4)	40(33.4)	10(8.4)	10(8.4)	22(18.4)	13(10.8)	39(32.5)
		IR	74(61.6)	2(1.7)	6(5.0)	0(0.0)	0(0.0)	4(3.4)	13(10.8)
2.	Graphic	MR	74(61.7)	12(10.0)	98(81.7)	110(91.7)	-	116(96.7)	76(63.4)
		R	34(28.4)	74(61.7)	22(18.4)	14(11.7)	-	4(3.4)	32(26.7)
		IR	12(10.0)	34(28.4)	0(0.0)	0(0.0)	-	0(0.0)	12(10.0)
3.	Colour	MR	24(20.0)	115(95.8)	62(51.7)	94(78.4)	28(23.4)	34(28.4)	28(23.4)
		R	13(10.8)	2(1.7)	42(35.0)	16(13.4)	64(53.4)	78(65.0)	79(65.8)
		IR	83(69.1)	0(0.0)	16(13.4)	10(8.4)	28(23.4)	8(6.7)	13(10.8)
4.	Style	MR	108(90.0)	18(15.0)	83(69.1)	74(61.7)	64(53.4)	33(27.5)	78(65.0)
		R	6(5.0)	46(38.4)	13(10.8)	46(38.4)	56(46.7)	48(40.0)	40(33.4)
		IR	0(0.0)	56(46.6)	24(20.0)	0(0.0)	0(0.0)	39(32.5)	2(1.7)
5.	Text	MR	114(95.0)	118(98.4)	88(73.4)	-	108(90.0)	-	38(31.6)
		R	12(10.0)	4(3.4)	32(26.7)	-	12(10.0)	-	49(40.8)
		IR	0(0.0)	1(0.8)	0(0.0)	-	0(0.0)	-	33(27.5)
6.	Shape	MR	94(78.4)	88(73.3)	104(86.7)	94(78.4)	108(90.0)	-	-
		R	12(10.0)	32(26.7)	12(10.0)	18(15.0)	12(10.0)	-	-
		IR	0(0.0)	0(0.0)	0(0.0)	8(6.7)	0(0.0)	-	-
7.	Sequence	MR	104(86.7)	101(84.1)	114(95.0)	-	118(98.4)	104(86.6)	74(61.7)
		R	12(10.0)	13(10.8)	6(5.0)	-	2(1.7)	6(5.0)	35(29.1)
		IR	0(0.0)	6(5.0)	0(0.0)	-	0(0.0)	10(8.4)	11(9.1)
8.	Balance	MR	74(61.7)	48(40.0)	83(69.1)	99(82.5)	57(47.5)	101(84.1)	48(40.0)
		R	22(18.4)	67(55.8)	37(30.8)	17(14.1)	63(52.5)	9(7.5)	50(41.6)
		IR	24(20.0)	15(12.5)	0(0.0)	4(3.4)	0(0.0)	10(8.4)	22(18.4)

Figures in parenthesis denote percentages.

relevant by 81.7 and 73.4 per cent, respectively. While 69.1 per cent of the respondents revealed style and balance to be the most relevant aspect of flashcards and only 51.7 per cent respondents reported colour to be the main appealing aspect of the flashcards utilised.

Visual literacy check list of posters reveal that graphics dominated as the most important aspect of posters (91.7%) followed by unity (88.4%) and balance (82.5%). While on equal number of respondents (78.4%) reported colour and shape as the most relevant aspect of flash cards as against 61.7 per cent who favoured style of presentation of the posters to be dominating.

Among charts utilised sequence was reported as the most relevant aspect of visual literacy which dominated as reported by a majority of the respondents (98.4%) followed by an equal number of those (90.0%) who reported text and shape to be dominating components. 81.7 per cent of the respondents revealed unity to be the important component followed by 53.4 per cent who reported style and 47.5 per cent who reported balance to be the most relevant component of chart utilised. However, a small section of respondents (23.4%) also reported colour as the major component of chart.

4.5 Existing knowledge and factors affecting it

4.5.1 Knowledge gain of the respondents for different messages on environmental education

As per requirements, knowledge on various messages on environmental education was calculated before and after administering the intervention

programme. Thereafter, an attempt was made to compute the knowledge gain of the respondents on these selected messages. Each message was calculated separately for the knowledge gain reported by each respondent (Fig. 3).

Table 4.5.1 Knowledge gain of the respondents for different messages on environmental education

S.No.	Environmental messages	Mean knowledge scores		
		Pre-exposure	Post-exposure	Knowledge gain
1.	Air	33.7	38.9	5.2
2.	Water	18.0	23.3	5.3
3.	Noise	20.2	22.2	2.0
4.	Soil	16.7	21.9	5.2
5.	Sanitation and garbage disposal	20.6	24.4	3.8
6.	General issues	29.5	32.9	3.4

Table 4.5.1 reveal that maximum knowledge gain was reported on the message of "Water pollution" (5.3) followed by an equal gain in knowledge reported for the message of "Air pollution" and "Soil pollution". However, for the message of "Sanitation and garbage disposal" knowledge gain was reported to be fairly sufficient (3.8) followed by that reported on "General

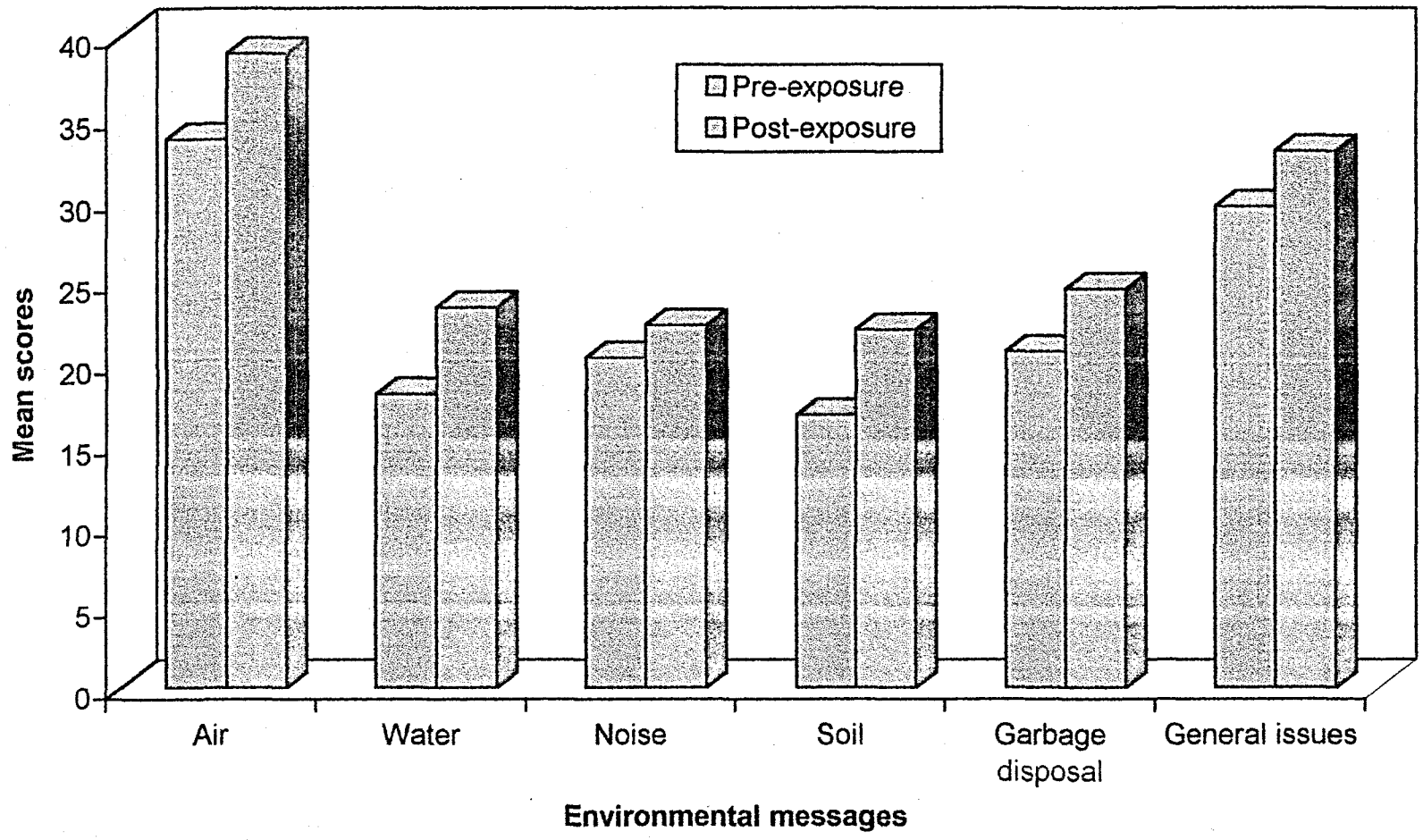


Fig. 3 : Knowledge gain of the respondents for different messages regarding environmental education

issues" (3.4). However, it is interestingly noticed that knowledge gain on the message of "Noise pollution" was reported to be least (2.0). This might be due to the fact that even today noise is not seriously considered as an environmental hazard and so people are less conscious about it.

4.5.2 Significance of the intervention programme

To assess the significance of the intervention programme 't' values were worked out for each message separately. The corresponding 't' values showed how successful the programme had been in making the respondents aware of the selected environmental messages at hand.

Table 4.5.2 reveal that the 't' value was highest (36.6) for the message of water pollution, so the programme was most successful for disseminating information to the respondents on this aspect. Sanitation and garbage disposal followed the message of water with 't' value of 26.0, thus giving significant results of the programme to the respondents concerning these messages. However, 't' values computed for air pollution was 24.5, which indicates that the intervention programme was also successful in disseminating this message to the respondents. The messages on general issues and soil had 't' values 21.5 and 20.8, respectively which is a clear indication of the programme's success. However, on the message of noise the 't' value was calculated to be least significant which reveal that the intervention programme was less successful on this message as compared to all other messages.

However, it is made clear from Table 4.5.2 that the intervention programme adopted for the study was found to be successful for all the messages that were selected for dissemination to the respondents.

Table 4.5.2 Knowledge gain and significance of the intervention programme

S. No.	Environmental variables	Knowledge gain (%)		
		Mean	Standard deviation	't' value
1.	Air	5.6	2.5	24.5*
2.	Water	5.1	1.5	36.6*
3.	Noise	7.0	8.7	8.7*
4.	Soil	5.9	1.4	20.8*
5.	Garbage disposal	4.1	1.7	26.0*
6.	General issues	3.4	1.7	21.5*

*Significant at 0.05 level of significance. ('t' tabulated = 1.98 at 119 d.f.).

4.5.3 Factors associated with knowledge of the respondents

In this section efforts have been made to find out the factors which affected respondent's knowledge with regard to the environment protection and environment care. Since respondents belonged to the families from various strata of the society characterized by differential level of education, income and occupations. Hence, it is worth an attempt to find the extent of

association between socio-personal and economic variables and the respondents level of knowledge.

The following tables show various categories of independent variables and dependent variable. The respondents environment score was divided into three categories low, medium and high. The range was calculated (maximum obtainable score-minimum obtainable score) and divided by three to categorise it into the above mentioned classes. Those falling between 10-27 were kept in lower group, between 28-45 in middle group and those in 46-63 in high. These were referred to as low, middle and high groups.

4.5.3.1 Age

Table 4.5.3.1 Age and knowledge of respondents on environmental messages

Chronological Age (years)	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
12-13	2 (1.7)	20 (16.7)	25 (20.8)	47 (39.1)
14-15	5 (4.2)	32 (26.7)	33 (27.5)	70 (58.3)
15-16	1 (0.8)	1 (0.8)	1 (0.8)	3 (2.5)
	8 (6.7)	53 (44.2)	59 (49.2)	120(99.9)

Figures in parenthesis denote percentages.
X^2 value obtained = 4.14 Tabulated 0.05 = 9.48
Degree of freedom = 4

The information in Table 4.5.3.1 explain that 14-15 years of respondents had better scores mostly falling under high (27.5%) and medium (26.7%) knowledge categories on environmental messages. Of those who were in 12-13 years majority hailed from high (20.8%) to medium (16.7%) knowledge categories.

Calculated chi-square value was 4.14 which was less than the tabulated value at 0.05 level of significance. Hence no association was reported between the two parameters of age and environment knowledge of the respondents.

However, age of the respondents showed no association with knowledge contradicting the studies of Jalota (1982), Mangat (1984), Bajaj and Nayak (1987), Khote and Nagare (1989), Yadav (1990), Nagpal and Yadav (1991), Lal and Pawar (1994).

4.5.3.2 Ordinal position

Table 4.5.3.2 explain that the respondents who were youngest in their families showed better scores, an equal number falling under high and medium (22.5%) knowledge categories. Further those who held middle ordinal position in their homes also had better scores falling under high (18.3%) and medium (14.2%) knowledge categories as compared to those who were eldest in their homes.

Calculated chi-square value was 2.08 which is less than the tabulated value at 0.05 level of significance. Hence no association was reported between the two parameters of ordinal position and environmental knowledge of the respondents.

Table 4.5.3.2 Ordinal position and knowledge of respondents on environmental messages

Ordinal position	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Youngest	5 (4.2)	27 (22.5)	27 (22.5)	59 (49.2)
Middle	1 (0.8)	17 (14.2)	22 (18.3)	40 (33.3)
Eldest	2 (1.7)	9 (7.5)	10 (8.3)	21 (17.5)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 2.08 Tabulated (0.05) = 9.48

Degree of freedom = 4

4.5.3.3 Habits

Data in Table 4.5.3.3 showed that an equal number of respondents hailed from high and medium knowledge categories (23.3%) followed by those who had high (17.5%) to medium (10.8%) knowledge on the messages selected.

Calculated chi-square value was 9.61 which is more than the tabulated value at 0.05 level of significance. Thus the two parameters of habits and knowledge of the respondents on environmental messages were found to be associated.

Table 4.5.3.3 Habits and knowledge of the respondents on environmental messages

Habits	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (11-34)	5 (4.2)	12 (10.0)	10 (8.3)	27 (22.5)
Middle (35-58)	2 (1.7)	28 (23.3)	28 (23.3)	58 (48.3)
High (59 and above)	1 (0.8)	13 (10.8)	21 (17.5)	35 (29.2)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 9.617* Tabulated (0.05) = 9.48
Degree of freedom = 4

It might be due to the fact that since habit become an internalized part of one's life they might put into practices regularly. Consequently this process of internalization might help them acquire more knowledge about environmental issues.

4.5.3.4 Interest

Table 4.5.3.4 showed that the respondents who had academic interest showed better scores following under medium (16.7%) and high (10.8%) knowledge categories. They were followed by the respondents having interest in other activities where the corresponding figures were 16.7 per

cent and 8.4 per cent respectively. The respondents having interest in environmental activities were following under high (15.0%) and medium (8.4%) knowledge categories.

Calculated chi-square value was 16.20 which is more than the tabulated value at 0.05 level of significance. Hence the interest of the respondents were significantly associated with the environmental knowledge.

Table 4.5.3.4 Interest and knowledge of respondents on environmental messages

Interest	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Academic	2(1.6)	20(16.7)	13(0.8)	35(29.1)
Creative	2(1.6)	3(2.5)	18(15.0)	23(19.1)
Environment	2(1.6)	10(8.4)	18(15.0)	30(25.0)
Other	2(1.6)	20(16.7)	10(8.4)	32(26.7)

Figures in parenthesis denote percentages.

X^2 calculated = 16.20* Tabulated (0.05) = 12.59

Degree of freedom = 6

It is an established fact that interest is the elementary stage in adoption of information. Therefore, it might have motivated the respondents to get more and more knowledge, adequate and relevant pertaining to environmental issues.

4.5.3.5 Mother's education

The information regarding mother's education and knowledge of the respondents on environmental messages is contained in Table 4.5.3.5. It is clear from the data that the respondents whose mothers received higher education showed better scores thus, falling under high (37.5%) and medium (17.5%) knowledge categories. They were followed by those whose mothers were educated upto middle level and who hailed from medium (16.7%) and high (10.0%) knowledge categories on environmental messages.

Table 4.5.3.5 Mother's education and knowledge of respondents on environmental messages

Mother's education	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (Illiterate-Primary)	6(5.0)	12(10.0)	2(1.7)	20(16.7)
Middle (Middle-Sr.Sec.)	2(1.7)	20(16.7)	12(10.0)	34(28.4)
High (Graduate-PG)	0(0.0)	21(17.5)	45(37.5)	66(55.0)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 38.87* Tabulated (0.05) = 9.48
Degree of freedom = 4

Chi-square value was calculated (38.87) which is significantly higher than the tabulated value at 0.05 level of significance.

Education of the mother being the most forceful agent of change had shown its significant association with knowledge of respondents. Mother being the closest member to the children in the family and main caretaker can provide them knowledge regarding environmental education if she is educated, more so if she is environmentally conscious. Since children imitate what elders do, especially what mothers do, thus the attitude and activities of mothers might affect their wards. The results get support by study carried out by Jain (1993).

4.5.3.6 Father's education

Information in Table 4.5.3.6 shows that most of the respondents whose fathers had higher education had better scores on knowledge as majority falling under high (47.5%) to medium (41.7%) knowledge categories. They were followed by those whose fathers were educated upto middle and senior secondary standard of education where the corresponding figures were 1.7 per cent.

The chi-square value was calculated (8.47) which is less than the tabulated value at 0.05 level of significance. Hence no association was reported between these two variables i.e. father's education and environmental knowledge.

Table 4.5.3.6 Father's education and knowledge of respondents on environmental messages

Father's education	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (Illiterate-Primary)	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.8)
Middle (Middle-Sr.Sec.)	2 (1.7)	2 (1.7)	2 (1.7)	6 (5.0)
High (Graduate-PG)	6 (5.0)	40 (41.7)	57 (47.5)	113 (94.2)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 8.47 Tabulated (0.05) = 9.48
Degree of freedom = 4

Similar results were reported in study carried out by Jain (1993).

4.5.3.7 Mother's occupation

Results regarding mother's occupation and knowledge of respondents are contained in Table 4.5.3.7. Respondents who had working mothers showed better scores falling under high (39.2%) and medium (37.5%) knowledge categories as compared to those whose mothers were in service where the corresponding figures were 10.0 per cent and 6.7 per cent respectively.

Chi-square value was computed (2.26) which is less than the tabulated value at 0.05 level of significance thus it is concluded that mother's occupation is not associated with environmental knowledge of the respondents.

Table 4.5.3.7 Mother's occupation and knowledge of respondents on environmental messages

Mother's occupation	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Housewife	8 (6.7)	45 (37.5)	47 (39.2)	100 (83.3)
Service	0 (0.0)	8 (6.7)	12 (10.0)	20 (16.7)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 2.26 Tabulated (0.05) = 5.99

Degree of freedom = 2

4.5.3.8 Father's occupation

Results regarding father's occupation and environmental knowledge of the respondents is presented in Table 4.5.3.8. It was seen that majority of respondents whose fathers were in service had better knowledge scores falling under medium (43.3%) and high (40.8%) knowledge categories, as

compared to those whose fathers were in business where the corresponding figures were 7.5 per cent and 0.8 per cent respectively.

Calculated chi-square value was 8.51 which is less than the tabulated value at 0.05 level of significance. Thus father's occupation was not associated with the knowledge of the respondents on environmental messages.

Table 4.5.3.8 Father's occupation and knowledge of respondents on environmental messages

Father's occupation	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Service	8 (6.7)	52 (43.3)	49 (40.8)	109 (90.8)
Business	0 (0.0)	1 (0.8)	9 (7.5)	10 (8.3)
Others	0 (0.0)	0 (0.0)	1 (0.8)	1 (0.8)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 8.51 Tabulated (0.05) = 9.48

Degree of freedom = 4

4.5.3.9 Family income

The data in Table 4.5.3.9 revealed that the respondents hailing from middle income families showed better scores i.e. 28.3 per cent and 21.7 per cent respectively on knowledge categories. They were followed by those

who were from low income families with high (12.5%) and medium (11.7%) scores on knowledge categories.

Calculated chi-square value was 1.83 which is less than the tabulated value at 0.05 level of significance. Thus, family income of the respondents was not found to be associated with their knowledge on environmental messages.

4.5.3.9 Family income and knowledge of respondents on environmental messages

Monthly income	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (Upto Rs. 5000)	3 (2.5)	14 (11.7)	15 (12.5)	32 (26.7)
Medium (6000-10,000)	4 (3.3)	26 (21.7)	34 (28.3)	64 (53.3)
High (Above 10,000)	1 (0.8)	13 (10.8)	10 (8.3)	24 (20.0)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 1.83 Tabulated (0.05) = 9.48

Degree of freedom = 4

4.5.3.10 Family type

The information in Table 4.5.3.10 explains that most of the respondents from nuclear families happened to fall under high (42.5%) and medium (40.8%) knowledge categories as compared to those hailing from joint families where the corresponding figures were 6.7 and 3.4 per cent respectively.

Calculated chi-square value was 3.20 which is less than the tabulated value at 0.05 level of significance. Hence type of family of the respondents is also not associated with their knowledge on major environmental messages.

Table 4.5.3.10 Family type and knowledge of respondents on environmental messages

Family type	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Nuclear	6 (5.0)	49 (40.8)	51 (42.5)	106 (88.4)
Joint	2 (1.7)	8 (6.7)	4 (3.4)	14 (10.3)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 3.20 Tabulated (0.05) = 5.99
Degree of freedom = 2

4.5.3.11 Family size

The data furnished in Table 4.5.3.11 revealed that most of the respondents from small families had better scores falling under high (37.5%) and medium (30.8%) knowledge categories on environmental education as compared to middle size family respondents.

The chi-square value was computed (3.04) which is less than the tabulated value at 0.05 level of significance. Hence, no association was reported between these two parameters of family size and environmental knowledge.

Table 4.5.3.11 Family size and knowledge of respondents on environmental messages

Family size	Knowledge categories			Total
	Low (10-27)	Medium (28-45)	High (46-63)	
Small (upto 5 members)	4 (3.3)	37 (30.8)	45 (37.5)	86 (71.7)
Middle (5-10 members)	2 (1.7)	9 (7.5)	9 (7.5)	20 (16.7)
Large (>10 members)	2 (1.7)	7 (5.8)	5 (4.2)	14 (11.7)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 3.04 Tabulated (0.05) = 9.48
Degree of freedom = 4

4.5.3.12 House location

The data in Table 4.5.3.12 indicated that most of the respondents residing in semi crowded areas reported to have better scores on knowledge about environmental messages falling under medium (25.8%) and high (20.0%) knowledge categories. They were followed by those who were residing in crowded areas falling under high (19.1%) and medium (16.7%) knowledge categories.

Table 4.5.3.12 House location and knowledge of respondents on environmental messages

House location	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Crowded	2 (1.7)	20 (16.7)	23 (19.1)	45 (37.5)
Semi crowded	4 (3.4)	31 (25.8)	24 (20.0)	59 (49.2)
Low concentrated	2 (1.7)	2 (1.7)	12 (10.0)	16 (5.0)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 11.07* Tabulated (0.05) = 9.48
Degree of freedom = 4

Calculated chi-square value was 11.07 which is more than the tabulated value at 0.05 level of significance. Hence, it was concluded that knowledge of the respondents on environmental messages was significantly associated with the location of their house.

The significant association between these two parameters might be attributed to the fact that those residing in clean areas have a greater understanding of the importance of clean and green environment and always take necessary steps to protect it.

4.5.3.13 House type

Table 4.5.3.13 House type and knowledge of respondents on environmental messages

House type	Knowledge categories			Total
	Low (10-27)	Middle (28-45)	High (46-63)	
Pucca	6 (5.0)	53 (44.1)	56 (46.7)	115 (47.1)
Mixed	2 (1.7)	0 (0.0)	3 (2.5)	5 (4.1)
	8 (6.7)	53 (44.1)	59 (49.1)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 3.06 Tabulated (0.05) = 5.99
Degree of freedom = 2

The findings presented in Table 4.5.3.13 revealed that the respondents residing in Pucca houses showed better scores as 46.7 and 44.1 per cent hailed from high and medium knowledge categories respectively as compared to those who resided in mixed houses where the corresponding figures were 2.5 and 1.7 per cent only.

Chi-square value was computed to be 3.06 which is significantly less than the tabulated value at 0.05 level of significance. Hence no association could be established between the two parameters i.e. type of house and knowledge of the respondents on environmental messages.

4.5.3.14 House ownership

Table 4.5.3.14 House ownership and knowledge of respondents on environmental messages

House ownership	Knowledge categories			Total
	Low (10-27)	Medium (28-45)	High (46-63)	
Rented	3 (2.5)	41 (34.1)	39 (32.5)	83 (69.1)
Owned	5 (4.1)	12 (10.0)	20 (5.4)	37 (30.8)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 5.79 Tabulated (0.05) = 5.99
Degree of freedom = 2

Data presented in Table 4.5.3.14 showed that respondents who were living in rented accommodation had better scores on knowledge indicating middle (34.1%) to high (32.5%) knowledge categories followed by those who were having their own homes and who showed medium (10.0%) and high (5.4%) scores on knowledge categories.

Calculated chi-square value was 5.79 which is less than the tabulated value at 0.05 level of significance. Hence, no association was reported between the two parameters of house ownership and environmental knowledge.

4.5.3.15 Flat position

The Table 4.5.3.15 indicated that respondents who resided on ground floor showed better scores as most of them were under high (33.4%) and medium (27.5%) knowledge categories. They were followed by those who resided on middle floor where corresponding figures were 11.7 and 7.5 per cent respectively.

Calculated chi-square value was 9.38 which is less than the tabulated value at 0.05 level of significance. Hence no association was established between the two parameters of knowledge of the respondents on environmental messages and their flat position.

Table 4.5.3.15 Flat position and knowledge of respondents on environmental messages

Flat position	Knowledge categories			Total
	Low (10-27)	Medium (28-45)	High (46-63)	
Ground (G)	5 (4.1)	33 (27.5)	40 (33.4)	78 (65.0)
Middle (M)	0 (0.0)	9 (7.5)	14 (11.7)	23 (19.16)
Top (T)	1 (0.8)	5 (4.1)	2 (1.7)	8 (6.7)
G + M	2 (1.7)	4 (3.4)	3 (2.5)	9 (7.5)
G + M + T	0 (0.0)	2 (1.7)	0 (0.0)	2 (1.7)
	8 (6.7)	53 (44.2)	59 (49.2)	120 (100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 9.38 Tabulated (0.05) = 15.507
Degree of freedom = 8

4.5.3.16 Parental participation

Data presented in Table 4.5.3.16 highlighted the fact that the respondents whose parental participation was high had better scores as of the total 27.5 per cent were falling under high and 22.5 per cent falling under medium knowledge categories respectively. They were followed by

those having medium level of parental participation where corresponding figures were 19.2 and 18.3 per cent respectively.

Table 4.5.3.16 Parental participation and knowledge of respondents on environmental messages

Parental participation	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (10-21)	3 (2.5)	3 (2.5)	4 (3.3)	10 (8.3)
Middle (22-33)	3 (2.5)	23 (19.2)	22 (18.3)	48 (40.0)
High (34-45)	2 (1.7)	27 (22.5)	33 (27.5)	62 (51.7)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 10.37* Tabulated (0.05) = 9.48
Degree of freedom = 4

Calculated chi-square value was 10.37 which is more than the tabulated value at 0.05 level of significance.

Hence, significant association was reported between the two parameters of level of parental participation and environmental knowledge. This might be attributed to the fact that the very psychological process of identifying

self by the wards with their parents is the contributory factor for their association.

In addition the wards also imitate their acts since they are closer to them than any other agency. Similar results were reported by Jain (1993).

4.5.3.17 Parental stimulation

Table 4.5.3.17 Parental stimulation and knowledge of the respondents on environmental messages

Parental stimulation	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (0-3)	3 (2.5)	8 (6.7)	10 (8.3)	21 (17.5)
Middle (4-6)	1 (0.8)	4 (3.3)	13 (10.8)	18 (15.0)
High (7 and above)	4 (3.3)	31 (34.2)	36 (30.0)	81 (67.5)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 8.70 Tabulated (0.05) = 9.48

Degree of freedom = 4

The data in Table 4.5.3.17 showed that respondents who received high parental stimulation showed better scores as most of them were falling under high (30.0%) and medium (34.2%) knowledge categories. They were followed by those who received fair parental stimulation where corresponding figures were 10.8 and 3.3 per cent respectively.

Calculated chi-square value was 8.70 which is less than the tabulated value at 0.05 level of significance. Thus, no association was established between parental stimulation and knowledge of the respondents on environmental messages.

4.5.3.18 Parental religious believes

The information furnished in Table 4.5.3.18 revealed that respondents whose parents were holding average religious believes showed better scores on environmental messages. It was seen that 34.2 per cent were falling under high and 33.3 per cent under medium knowledge categories followed by those whose parents held less value regarding sacredness of trees where the corresponding figures were 9.2 and 5.0 per cent respectively.

Calculated chi-square value was 2.58 which is less than the tabulated value at 0.05 level of significance. Hence, no association was reported between the two parameters of parental religious believes and environmental messages.

Table 4.5.3.18 Parental religious believes and knowledge of respondents on environmental messages

Parental religious believes	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (0-4)	2 (1.7)	6 (5.0)	11 (9.2)	19 (15.8)
Middle (5-8)	6 (5.0)	40 (33.3)	41 (34.2)	87 (72.5)
High (9-12)	0 (0.0)	7 (5.8)	7 (5.8)	14 (11.7)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 2.58 Tabulated (0.05) = 9.48

Degree of freedom = 4

4.5.3.19 Scholastic achievement

Data presented in Table 4.5.3.19 showed that respondents having medium level of scholastic achievement had better scores falling under medium (36.7%) and high (32.5%) knowledge categories followed by those having high level of scholastic achievement indicating high (15.0%) and medium (4.2%) knowledge categories on environmental messages.

Table 4.5.3.19 Scholastic achievement and knowledge of the respondents on environmental messages

Level of scholastic achievement	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (Below 50%)	5 (4.2)	4 (3.3)	2 (1.7)	11 (9.2)
Middle (50-60%)	3 (2.5)	44 (36.7)	39 (32.5)	86 (71.6)
High (60% and above)	0 (0.0)	5 (4.2)	18 (15.0)	23 (19.2)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.

X^2 calculated = 37.74* Tabulated (0.05) = 9.48

Degree of freedom = 4

Calculated chi-square value was 37.74 which is more than the tabulated value at 0.05 level of significance. Hence, significant association was reported between the two parameters of scholastic achievement and environmental knowledge of the respondents..

However, the association of scholastic achievement with knowledge could be attributed to the fact that the higher is the I.Q. level of the respondent, the higher is his/her retention and thus higher the capacity to

differentiate between good and bad acts relating to environment. Moreover, it is anticipated that if a student is good at studies he/she is like to have higher tendency to practise what is taught to them at their school.

4.5.3.20 Family education status

Data presented in Table 4.5.3.20 revealed that respondents hailing from families having high educational status had better scores falling under high (39.1%) and medium (18.4%) knowledge categories followed by those with medium level of family education status where corresponding figures were 19.1 and 6.6 per cent respectively.

Table 4.5.3.20 Family education status and knowledge of respondents on environmental messages

Family education	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Low (upto 2)	3(2.5)	8(6.6)	4(3.4)	15(12.5)
Middle (2 to 4)	2(1.6)	23(19.1)	8(6.6)	33(27.5)
High (4 and above)	3(2.5)	22(18.4)	47(39.1)	72(60.0)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 22.42* Tabulated (0.05) = 9.48
Degree of freedom = 4

Calculated chi-square value was 22.42 which is more than the tabulated value at 0.05 level of significance. Hence, significant association was reported between the two parameters of family education status and environmental knowledge of the respondents.

It might be attributed to the fact that higher is the educational qualifications of the family, the more knowledgeable would the family be regarding environment and allied aspect and thus the healthier practices would be inculcated among the respondents.

The results have followed the trend set by Kaushik (1989), Lega (1989), Nagpal and Yadav (1991).

4.5.3.21 Mass-media exposure

Table 4.5.3.21 Mass-media exposure and knowledge of respondents on environmental messages

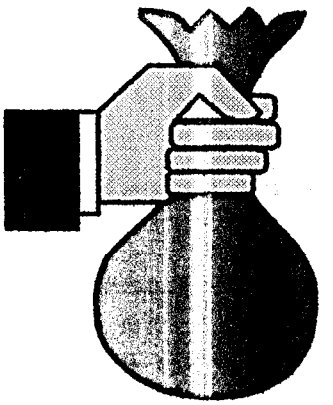
Mass-media exposure	Knowledge categories			
	Low (10-27)	Medium (28-45)	High (46-63)	Total
Mostly	2 (1.7)	27 (22.5)	33 (27.5)	62 (61.7)
Seldom	3 (2.5)	23 (19.2)	22 (18.3)	48 (40.0)
Never	3 (2.5)	3 (2.5)	4 (3.3)	10 (8.3)
	8 (6.7)	53 (44.2)	59 (49.2)	120(100.0)

Figures in parenthesis denote percentages.
X^2 calculated = 10.37* Tabulated (0.05) = 9.48
Degree of freedom = 4

Table 4.5.3.21 revealed that the respondents who were more exposed to mass-media showed better scores thus falling under high (27.5%) and medium (22.5%) knowledge categories. They were followed by those who had middle level of mass media exposure with corresponding figures of 19.2 and 18.3 per cent respectively.

Calculated chi-square value was 10.37 which is more than the tabulated value at 0.05 level of significance. Hence mass-media exposure was found to be associated with the knowledge of the respondents on environmental messages.

Mass-media being a major source of influence was found to have association with the knowledge level of the respondents. Similar results were reported by Murthy (1990), Nagpal and Yadav (1991), Madan (1994), Godara (1997) and Mathain and Manoharan (1993).



Summary And Conclusion

CHAPTER-5

SUMMARY AND CONCLUSIONS

It has always been an ardent quest of man to improve upon the quality of life through intervention with mother nature. Mother nature has provided a variety of fascinating situations to interact with which may be called as an ecosystem. The unbrindled human intervention in the natural processes has created a large number of ecological imbalances which have become a cause of serious concern over the last few decades.

Environment is important not only for physical well being but also for cognitive development of human beings. Environment is the best source for providing learning experiences to the child, helping perceptual, cognitive, social and emotional development. But today our environment is polluted to the extent that it is causing innumerable health hazards. Thus, there occurs a need to promote social marketing of environmental education related packages, services, products and technologies such that the extent of environmental degradation is minimized if not completely abolished. Social marketing of such environmental education packages would lead to awareness and consciousness on the part of the respondents towards their valuable environment. Present endeavour was to educate and involve the

students of Xth standard in conservation and protection of environment because it is believed that habits formed at this stage of life leave an unerasable imprint on our minds, moreover this age group is more exposed to peer group and subsequently exercises more influence on own gang which can help promoting the idea of environmental conservation to different minds. The present study was thus undertaken with the following objectives in mind :

1. To identify the critical messages on environmental education.
2. To develop the intervention programme for social marketing of the critical messages.
3. To assess the knowledge of the respondents before and after the intervention programme and isolate the factors affecting it.

Methodology

The study was carried out in two schools of Kanpur city of Uttar Pradesh by application of multistage sampling procedure. A set of eight independent and one dependent variable was selected as per relevance of the objectives of the study. The researcher developed scientific tools and collected the pertinent information as per specific objectives of the study. The data were collected following two step communication process. In the Ist step of communication, the critical messages pertaining to environmental education were identified with the help of professors and teachers who were selected by following scientific procedures and were requested to act as judges. The relevancy of the messages was judged in context with their

dissemination to Xth standard students. In the IInd step of communication process duly pretested inventory was used to collect the data from the respondents who happened to be school students; 60 each hailing from two schools (one private and one government). The two schools were selected purposively keeping in view the researcher's accessibility and familiarity with the area. In this step of communication data on profile of the respondents, their home environment, school environment; social marketing of environmental education as perceived by the respondents and pre exposure knowledge of respondents on crucially identified messages on environmental education were collected.

An intervention programme was developed and administered to the respondents by following specific methodology based upon the identified messages, past researches and researchers own experience with guidance of the advisor. Therefore, data were collected with the duly pretested schedule on knowledge gained by the respondents on different critical messages after having administered the intervention programme. Appropriate statistical tests namely chi-square and 't' tests were applied to draw meaningful inferences.

Findings

5.1 Background information of the respondents

Majority of the respondents (58.3%) were in the age group of 14-15 years, eldest of all siblings (17.5%) with interest is academic activities (29.13%), seldom involved in healthy environmental activities (48.3%) as

their habits, having middle level of scholastic achievement (71.6%) and frequent exposure to mass media sources (61.7%).

It was reported that most of them had graduate parents hailing from middle income families (53.4%) having small families (71.7%) mostly nuclear (88.4%), residing in semi crowded areas (49.1%) living in rented (69.1%) but pucca homes (95.8%) on ground floor (65.0%). Majority of them (60.0%) having high level of family education status, with parents actively involved in healthy environmental activities (51.7%) and stimulating their wards to do the same (67.5%). Regarding religious believes of the parents about sacredness of trees majority of them (72.5%) reported a positive attitude.

Profile of the schools selected

Both the schools selected for the study were affiliated to Central Board of Secondary Education, however, SI was a government institution, where the stress laid on environmental education and healthy environmental habits was far less as compared to that of S II. S II was a private institution where a number of events related to environment were carried out and days regarding environment were celebrated. Students in S II were actively engaged in healthy environmental activities yet the extent of involvement was lacking as seen from the researchers perspective.

Social marketing of environmental education

Regarding the aspect of social marketing of environmental education majority of the respondents (70.0%) preferred getting environmental

education as an educational package mostly at their schools (51.7%) with the help of various visuals (90.8%).

Identification and standardization of crucial messages on environmental issues

From the various messages i.e. air pollution, water pollution, noise pollution, soil pollution, sanitation and garbage disposal, general issues which were identified as crucial by the judges for dissemination to the respondents - seven sub messages i.e. install effective chimneys ($M_{1.3}$), grow more trees ($M_{1.1}$), anti pollution technology ($M_{1.8}$), promote noise free vehicles ($M_{3.1}$), locate industries far from industrial areas ($M_{3.4}$), promote afforestation ($M_{6.2}$) were identified as most crucial and urgent for timely dissemination to the respondents. Encourage gas vehicles ($M_{1.4}$), ban smoking ($M_{1.6}$), stop using drains for washing clothes ($M_{2.3}$), use water medicines to clean water ($M_{2.5}$), effective application of laws ($M_{3.6}$), ban generators ($M_{3.7}$), avoid using crackers ($M_{3.8}$), check and prevent soil erosion ($M_{4.2}$), minimize use of chemicals like pesticides ($M_{4.4.2}$), minimize use of chemicals like insecticides ($M_{4.43}$), use biodegradable waste for composting ($M_{5.2}$), good littering habits ($M_{3.3}$), closed hygienic dustbins ($M_{5.4}$), conserve flora ($M_{6.3}$), avoid open defecation ($M_{6.5}$), effective sewage ($M_{6.7}$), effective soakage pit ($M_{6.8}$), stress on low cost latrines ($M_{6.9}$) were the messages standardized as least crucial for timely dissemination to the respondents, remaining all being viewed as fairly crucial for timely dissemination.

Development and introduction of the intervention programme

A number of visual aids were procured and prepared on most crucial messages identified by the judges consensus. These included a complete package of 3 books, 5 booklets, 9 posters, 1 chart, 3 flash cards, 2 pocket books, 1 video cassette and 2 simulating games for the study. Visual literacy checklist of the aids utilised revealed that booklet, book and flashcards were found to be most effective in disseminating the selected messages to the respondents.

Knowledge gain and significance of the intervention programme

Maximum knowledge gain was reported on the message of "Water pollution" (5.3) and least on the message of "Noise pollution" (2.0). Further, the intervention programme was found to be successful showing significant results on all the messages. Relatively intervention programme was somewhat more useful for dissemination of information on message of "Water pollution" (t=36.6%) and least for that of "Noise pollution" (t=8.7%).

Factors associated with knowledge of the respondents

It was observed that habits ($X^2 = 9.617$), interests ($X^2 = 16.20$), mother's education ($X^2 = 38.87$), house location ($X^2 = 11.07$), parental participation ($X^2 = 10.37$), scholastic achievement ($X^2 = 37.47$), family education status ($X^2 = 22.42$), mass media exposure ($X^2 = 10.37$) were the parameters significantly associated with the knowledge of the respondents on environmental messages.

On the other hand the parameters of age ($X^2 = 4.14$), ordinal position ($X^2 = 2.08$), father's education ($X^2 = 8.47$), mothers occupation ($X^2 = 2.26$), fathers occupation ($X^2 = 8.51$), family income ($X^2 = 1.83$), family type ($X^2 = 3.20$), family size ($X^2 = 3.04$), house type ($X^2 = 3.06$), house ownership ($X^2 = 5.79$), flat position ($X^2 = 9.38$), parental stimulation ($X^2 = 8.70$), parental religious believes ($X^2 = 2.58$) showed no significant association with the knowledge of the respondents on environmental issues.

Implications

Based on the findings of the study some important implications have emerged out as under :

1. The average profile of the respondents was not much impressive on variables like habits, interest and scholastic achievements. On the other hand, these variables showed significant association with knowledge gain. Therefore, it may be implied that these variables should be improved for inculcating in them healthy and right environmental practices.

2. Most of the respondents could not receive effective parental stimulation with regards to environmental education. Thus, this variable can also be manipulated for getting better results at both the ends i.e. parents and their wards. So, an integrated educational programme can act as a source to educate both parents and their wards on the issue.

3. The results revealed that most of the respondents had frequent exposure to mass media but the adoption of healthy environmental practices was not upto the mark. This might be due to poor marketing of the idea. Thus, the

subject under study needs to be marketed and presented from a new perspective. Social marketing of environmental education should be of better quality covering all leading channels with major focus on 4 P's i.e. Product, Price, Place and Promotion for better results in future.

4. The relay of environment educational programmes on National Channel was very less as compared to Discovery Channel and National Geographic Channel which were totally devoted to environment and wild life issues. Thus, Doordarshan needs to expand its horizon and time for environmental aspects so as to reach most of the population.

5. Schools as such were found to place not much emphasis on environmental education. If at all any element of environment was included in their text books, it was mostly to teach the moral values to the students. Thus focus should be laid both on effective ways to deal with these issues and inculcating environmental education as a way of life among students.

Since the results of the intervention programme administered to the respondents were found to be quiet encouraging in terms of knowledge gain therefore, it is suggested that more pertinent educational programmes should be prepared and implemented.

It is suggested that simulating methods, lectures, discussions role play and aids which involve maximum number of senses should be utilised as they enhance the retention of the message to introduce environmental education among different sections of the society with different suitable approaches.

6. Voluntary student bodies like youth clubs should be formed for creating awareness, interest and ways to protect and conserve our environment.

Consistent efforts for the protection and conservation of environment should be made by organising frequent competitions, games. Focus should be laid on the latest and different problems in the field of environment. All possible solutions needs to be worked out by participation of people in the programme.

Special programmes like visits should be arranged to most ideal natural environments as well as degraded forests and denuded mountains for the students and teachers.

7. Problems of pollution are global and warrant intergovernmental regulation, national, local or regional. But it also needs a location specific deal by all concerned.

Finally - "You must teach your children that the ground beneath their feet is the ashes of our grandfathers so that they will respect the land. Tell your children that the earth is rich with the lives of our kin. Whatever befalls the earth, befalls the children of the earth. If men spit upon the earth, they spit upon themselves. This we know the earth does not belong to man, man belongs to the earth".

"In the end we will conserve only what we love, we will love only what we understand, we will understand only what we are taught".

Baba Dioum
Senegalese Poet

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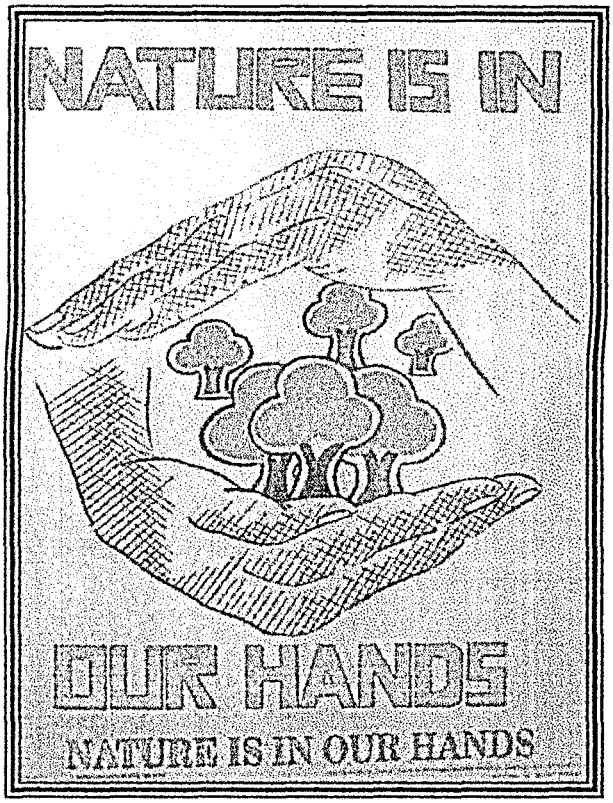
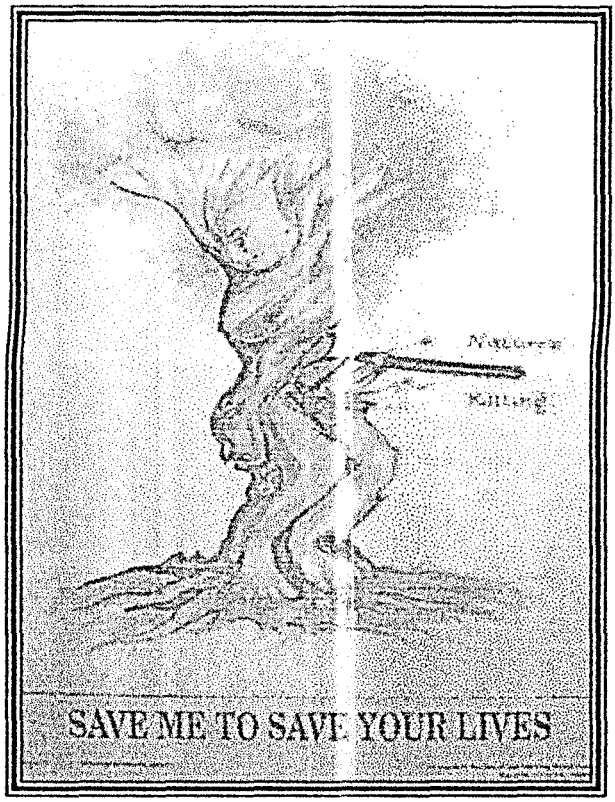
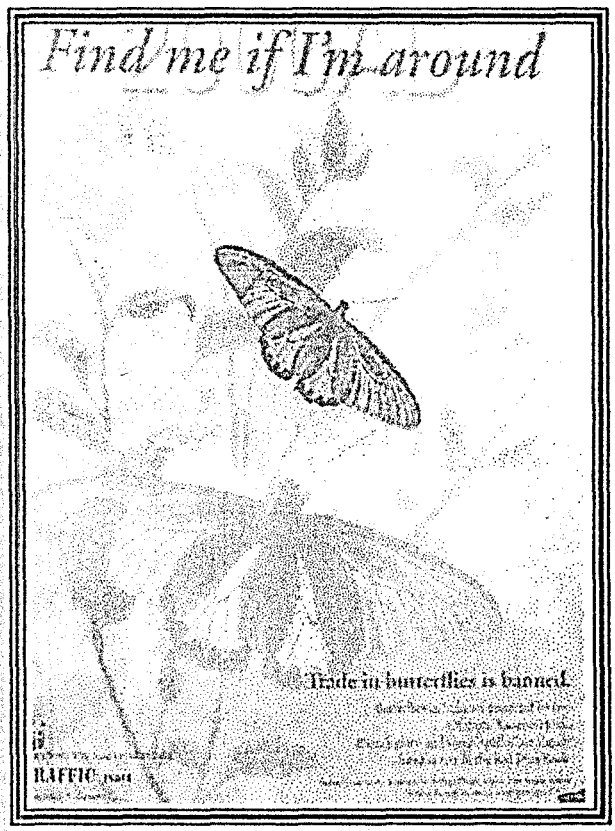
Collection of media

S.No.	Media procured		Title	Source
Aids procured				
1. Posters	Air	-	Is this our environment	Paryavaran Bhawan Delhi
	Water	-	Water conservation game	CEE, Ahmedabad
	Noise	-	Global environment- Then and now	Paryavaran Bhawan Delhi
	Flora	-	Nature is in our hands	
		-	Save me to save your life	
	Fauna	-	Buy and bye	WWF, Delhi
		-	Find me if I'm around	
		-	Stop, don't buy trouble	
2. Booklets	Air	-	Think green	CPCB, Delhi
	Water	-	Save water	WWF, Delhi
		-	Paani ki Kahani	
		-	Save energy	
3. Books	Major pollutions		-Prakarti parichay (Vol. 1, 2 & 3)	WWF, Delhi
	Water	-	Paani - A book of facts and activities	
	Energy	-	Energy	
	Flora	-	Pallavi and the coral reef	
	General issues	-	A student's environmental do it yourself manual	
4. Newsletters				
		-	Nature news	WWF, Delhi
		-	Back to the wild	
5. Pocket books				
	Birds	-	Rare birds	WWF, Delhi
	Fauna	-	Handbook of endangered mammals of India	
6. Supplements				
		-	Stickers	WWF, Delhi
		-	Bookmarks	
		-	Badges	
		-	Video cassette	







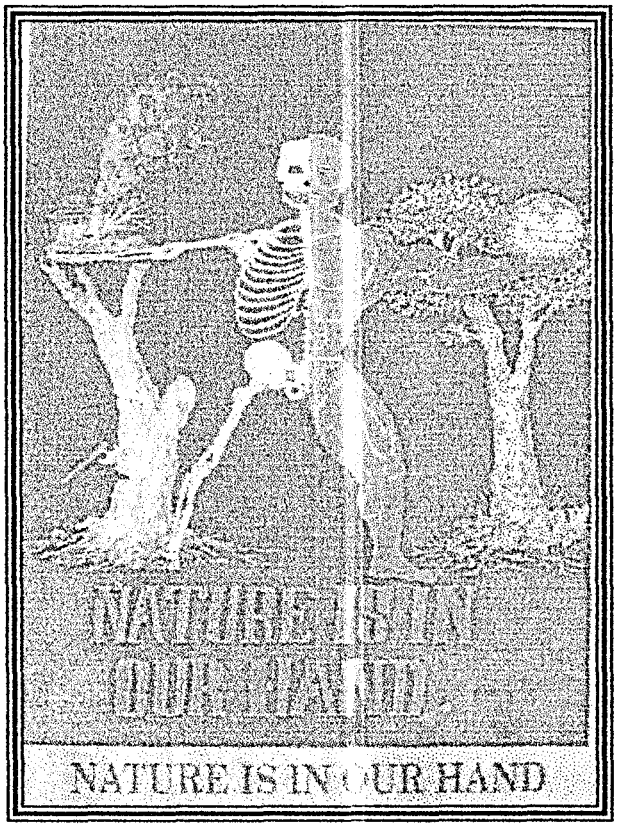
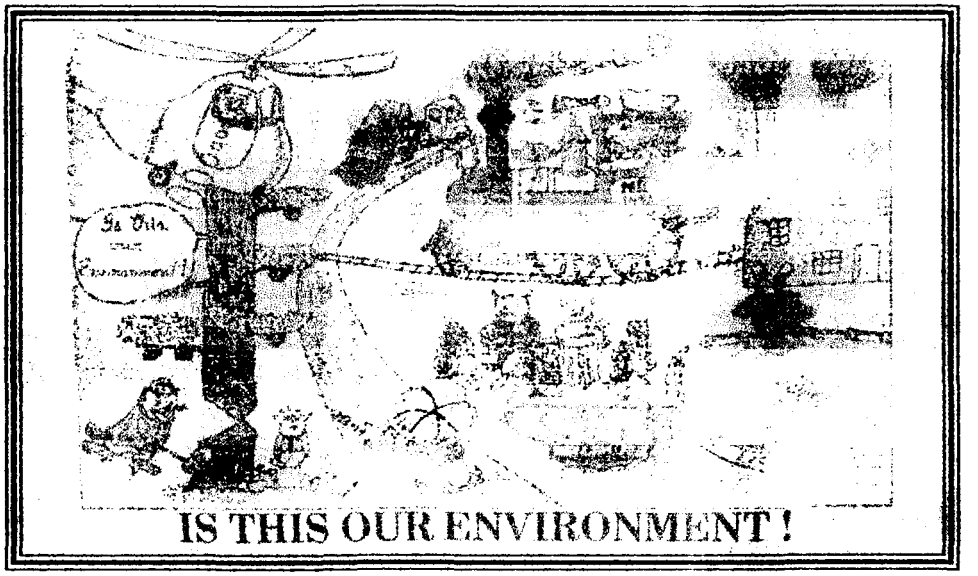
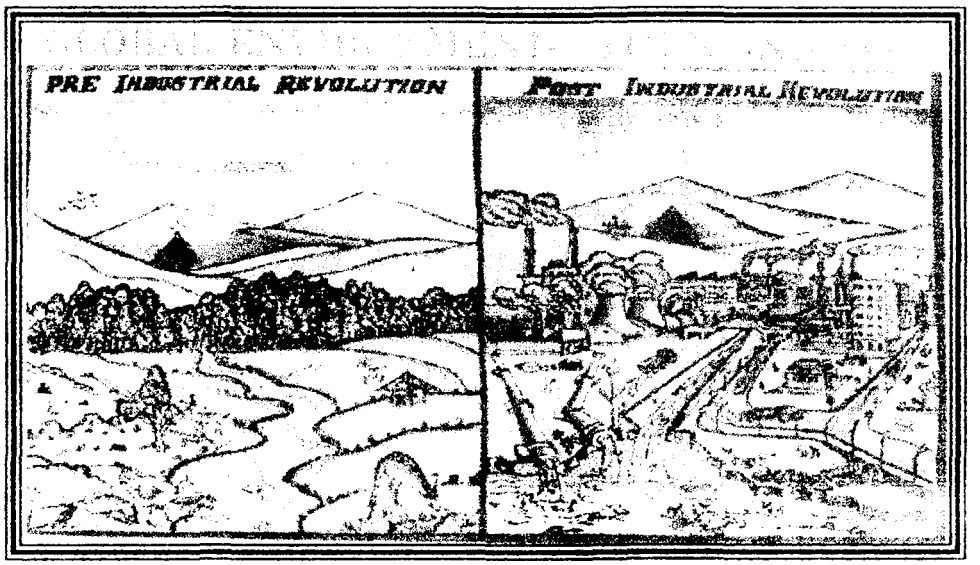


Plate 1: Posters procured on identified crucial messages on environmental education





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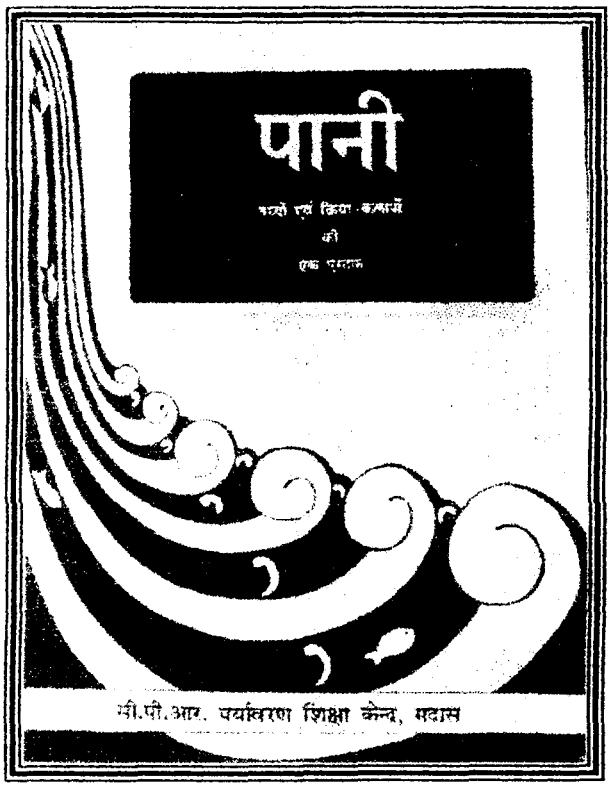
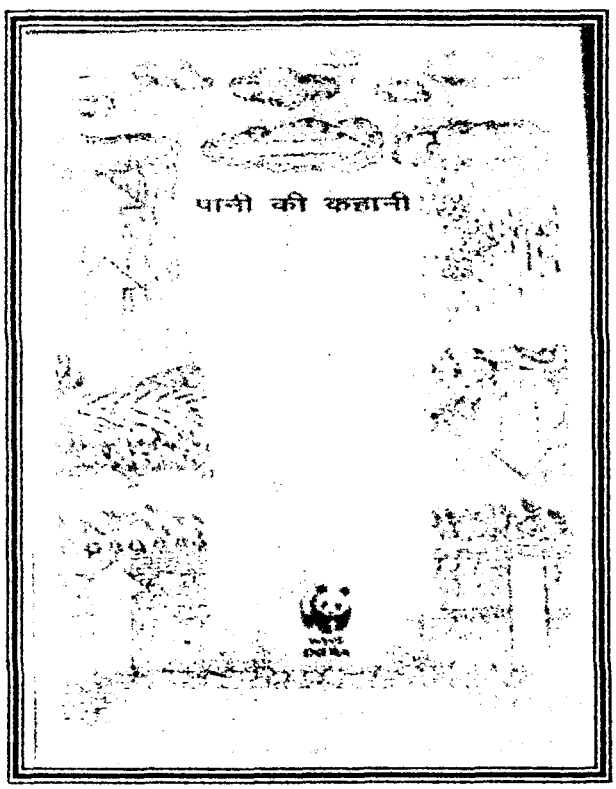




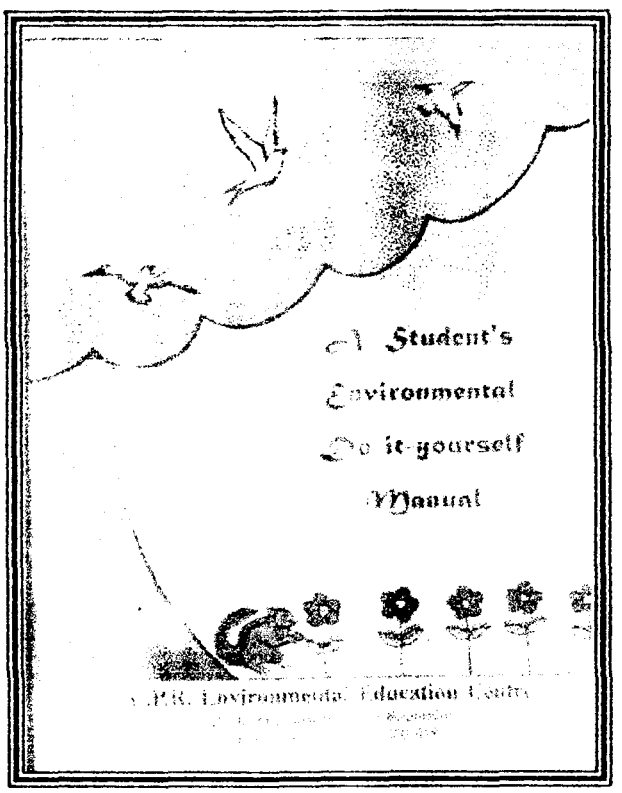
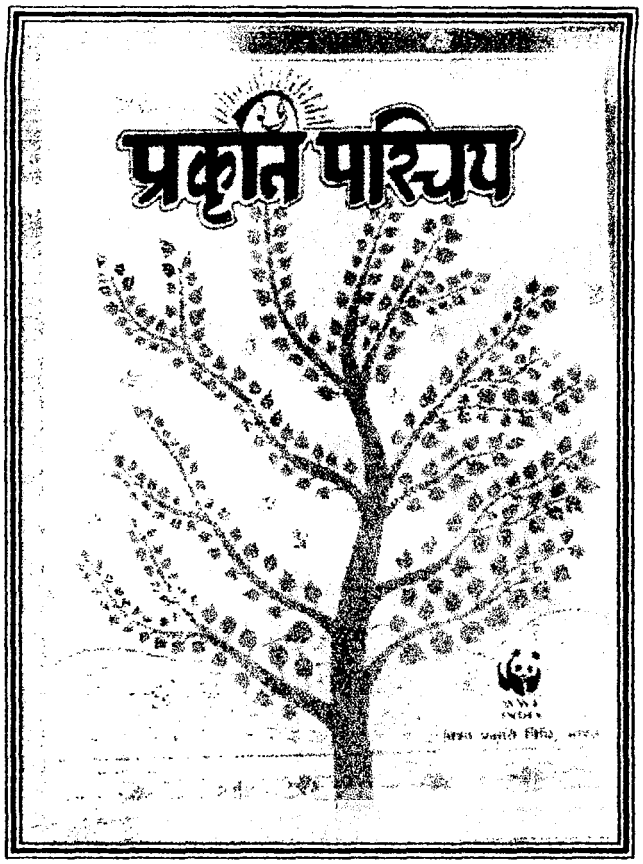
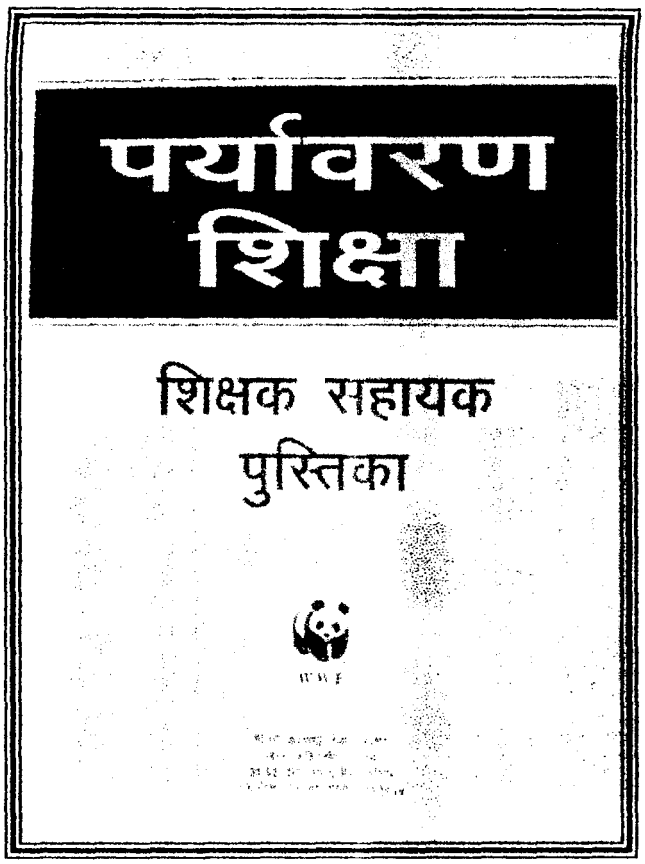


Plate 3:Booklets procured on identified crucial messages on environmental education





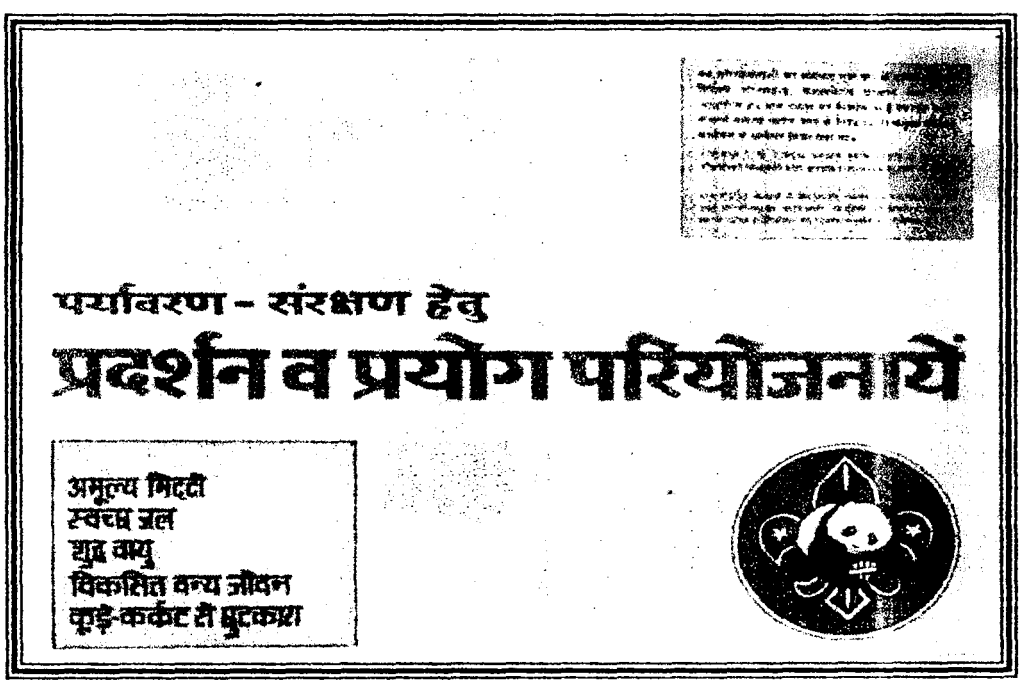


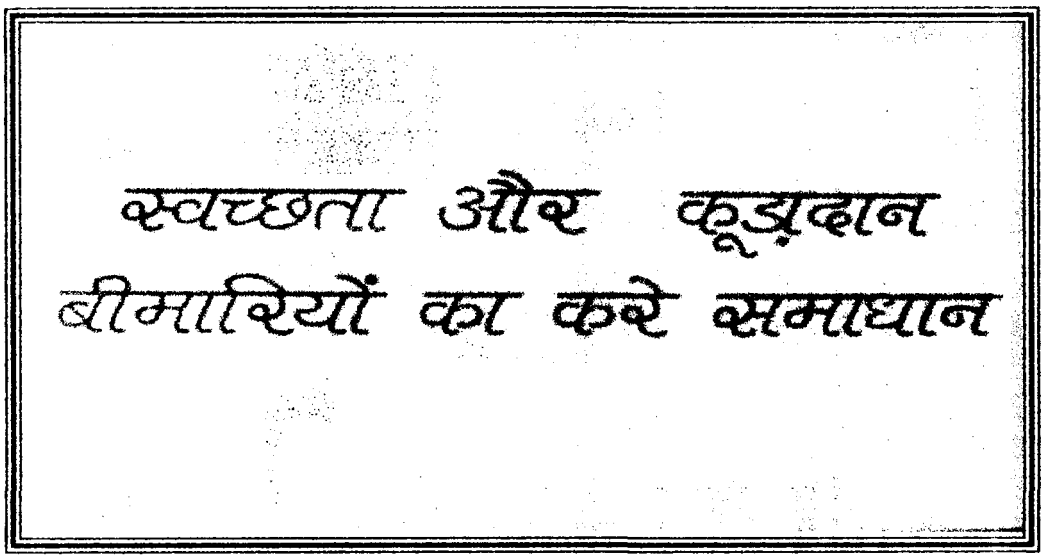
Plate 4:Books procured on identified crucial messages on environmental education

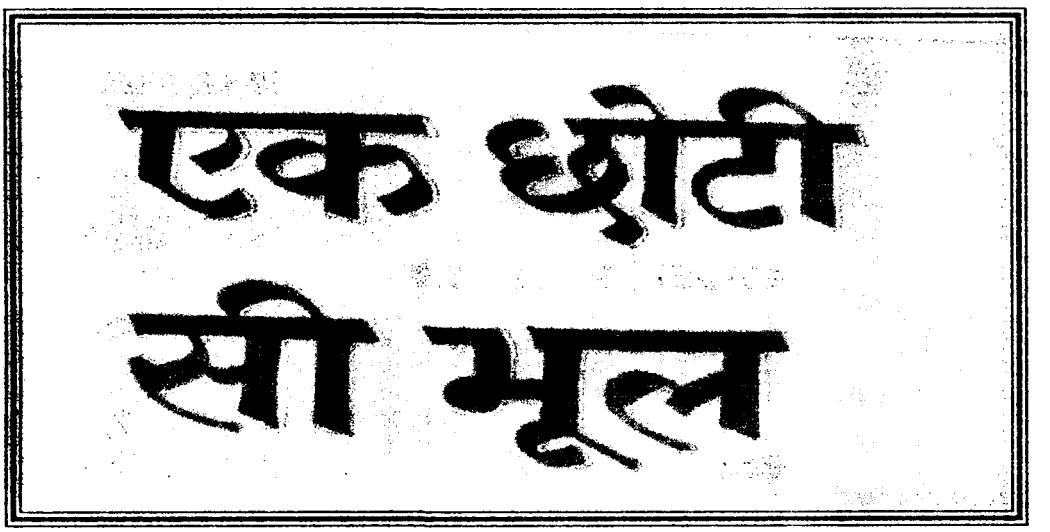
Preparation of media

S.No.	Media prepared	Title	Source

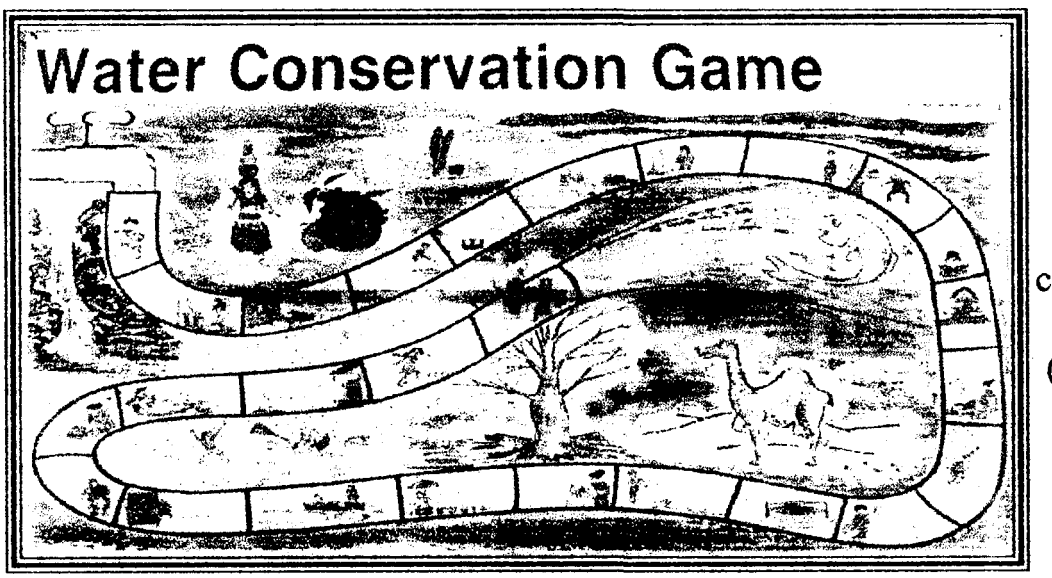
Media prepared

1. Posters	Trees	-	Save trees they will save you
	Soil	-	How to control pests without using pesticides?
2. Booklet	Major environmental problems	-	An instant know how guide to pollution
3. Chart	Water	-	How to detect water pollution?
4. Flash cards	Water	-	Ek Chhoti si Bhool
	Garbage disposal	-	Swachhta Aur Kuradaan, Bimarion Ka Kare Samadhan
	Major environmental problems	-	Samajhdaar bunty
	Fauna	-	Who am I? (Game)



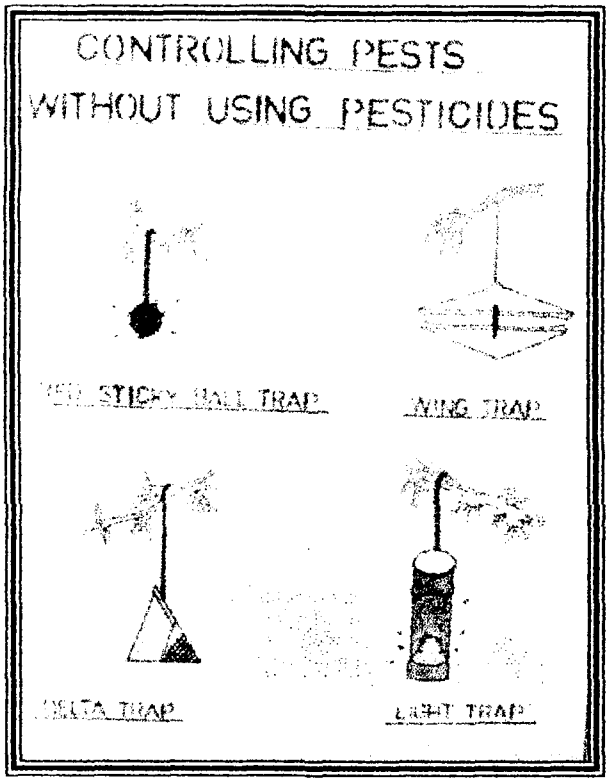


Flash CardsPrepared on identified crucial messages on environmental education

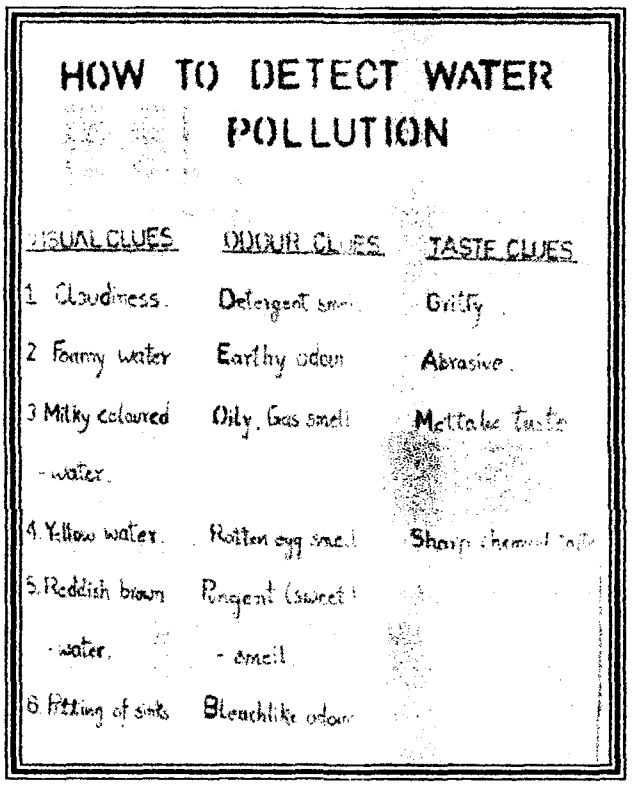


Water conservation game (Procured)

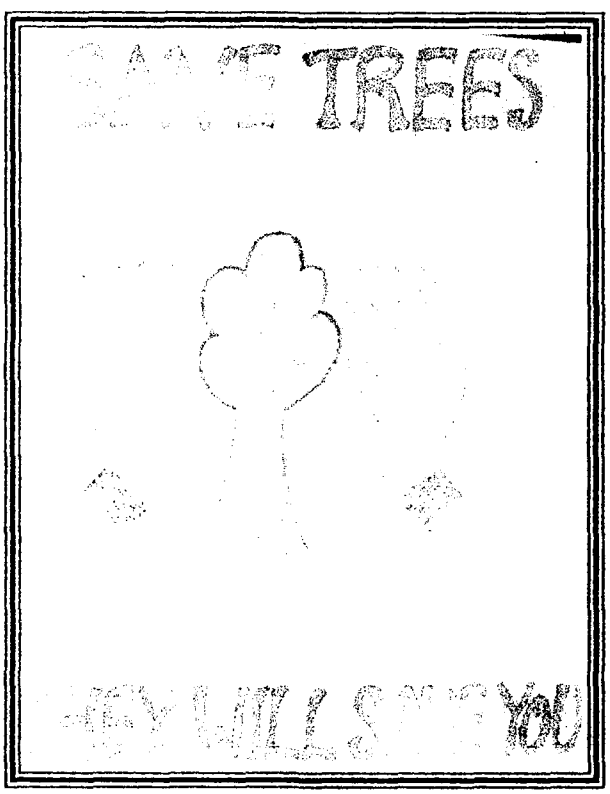
Plate 5: Media prepared and procured on identified crucial messages on environmental education



Poster



Chart



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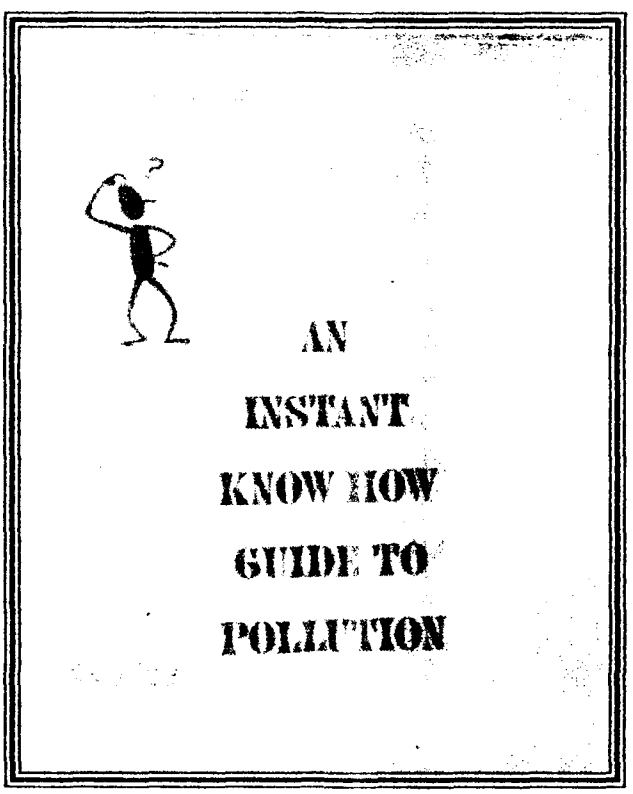


Booklet

Plate 6: Media prepared on identified crucial messages on environmental education

APPENDIX-I

Department of Home Science Extension Education
I.C. College of Home Science
CCS Haryana Agricultural University
Hisar-125 004, India

Dr. (Mrs.) Lali Yadav
Professor & Head

Dear Colleague,

I am writing to you in connection with a research project of one of my students that is working on "Social marketing of environmental education to school children". One of the objectives of the study is to identify critical messages for delivery to Xth standard students about environmental education so as to assess the knowledge of respondents. A comprehensive knowledge inventory is to be prepared for this purpose containing critical messages regarding environmental education. Therefore, different items have been prepared to cover different messages by laying hands on different relevant literature and experts on the subject.

Considering your long and rich experience, in the area, I am approaching you to act as judge to identify different critical messages to be delivered to school students. You are requested to judge each of the messages on attached inventory on a 3- point continuum for their suitability to be included as most critical messages in the knowledge inventory.

Please feel free to add or delete any number of items as per your judgement. If there are additional items, please also rate those on a 3-point continuum for their suitability to be included in the knowledge inventory.

I will be highly obliged and grateful to you for your kind help in this project for your valuable guidance.

With regards,

Sincerely yours,

Sd/-
(Lali Yadav)

MESSAGES ON ENVIRONMENTAL EDUCATION

MESSAGE	MOST RELEVANT	RELEVANT	IRRELEVANT
(M1) AIR POLLUTION			
PREVENTIVE MEASURES			
1.1 Grow more trees			
1.2 Clean area, green area			
1.3 Install effective chimneys			
1.4 Encourage gas vehicles			
1.5 Save oil, save environment			
REMEDIAL MEASURES			
1.6 Ban smoking			
1.7 Minimize smoke			
1.8 Anti pollution technology			
1.9 Use lead free petrol			
1.10 Use vehicle with catalytic converter			
1.11 Pollution control certificate be made essential			

MESSAGE	MOST RELEVANT	RELEVANT	IRRELEVANT

(M_2) WATER POLLUTION

PREVENTIVE MEASURES

2.1 Use water filters

2.2 Laws against factories disposing off wastes into rivers

2.3 Stop use of drains for Washing clothes

REMEDIAL MEASURES

2.4 Stop disposal of dead bodies and waste into rivers

2.5 Use water medicines to clean water

2.6 Use of different methods to clean water (Janta water filter, using muslin cloth)

(M_3) NOISE POLLUTION

PREVENTIVE MEASURES

3.1 Promote noise free vehicle

3.2 Avoid music on full volumes disturbing self and others

MESSAGE	MOST RELEVANT	RELEVANT	IRRELEVANT

3.3 Reduce traffic

3.4 Locate industries far from residential areas

REMEDIAL MEASURES

3.5 Use of silencers in vehicles

3.6 Effective application of laws

3.7 Ban generators

3.8 Avoid using crackers

(M_4) SOIL POLLUTION

PREVENTIVE MEASURES

4.1 Grow more trees

4.2 Check and prevent soil erosion

4.3 Grow environment friendly technologies

MESSAGE	MOST RELEVANT	RELEVANT	IRRELEVANT

REMEDIAL MEASURES

4.4 Minimize use of chemicals

Like

4.4.1 Fertilizers

4.4.2 Pesticides

4.4.3 Insecticides

For

4.4.5 Production

4.4.6 Protection

4.4.7 Processing

(M_5) *SANITATION AND GARBAGE DISPOSAL*

PREVENTIVE MEASURES

5.1 Ban polythene sheets

5.2 Prefer bio-degradable waste for composting

5.3 Good littering habits

5.4 Proper, hygienic dustbins

REMEDIAL MEASURES

5.5 Recycling of waste

5.6 Effective disposal system at community and national level

(M_6) GENERAL ISSUES

PREVENTIVE MEASURES

6.1 Stop nuclear war

6.2 Avoid open defecation

6.3 Effective sewage

6.4 Afforestation

REMEDIAL MEASURES

6.5 Reduce air traffic

6.6 Low cost latrines

6.7 Effective soakage pits

APPENDIX II

INTERVIEW SCHEDULE

GENERAL INFORMATION

Name of the student
Class
Age
Sex

Ordinal position

Scholastic achievement

Name of the school

Location of the school

Surrounding of the school

BACKGROUND INFORMATION

S. No.	Family member	Relation with head of the household	Education	Occupation	Monthly income
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					

Family type	:	Nuclear/Joint
Family size	:	Upto 5 members/5 to 10 members/ More than 10
House location	:	Crowded/Semi-crowded/Isolated
House type	:	Kutcha/Pucca/Mixed
House ownership	:	Rented/Owned
Flat position	:	Ground/Middle/Top/Ground + Middle/ Ground + Middle + Top

INTEREST

You have keen interest in

- Academic activities (Reading, writing)
- Creative activities (Painting, stitching)
- Environmental activities (Care of plants, cleanliness of surroundings etc.)
- Other activities (Sports, games)

HABITS

FOOD HABITS	Always	Seldom	Never
1. I grow some of my own food			
2. I am a vegetarian			
3. I eat locally grown fruits and in the right season			
4. I cook at home rather than ordering food from restaurants and hotels			
5. I see to it that food is cooked according to requirement to prevent wastage			

Energy use	Always	Seldom	Never
1. I turn off lights, fans and other electric appliances when not in use			
2. I do not switch on the light or fan if I can do without it			
3. I do not use an air conditioner or a room heater			
4. I avoid using electric applicances like shaver, hair dryer and water heater (which are not necessary)			
5. I avoid heating water with LPG or electricity and bath with tap water all through the year if possible			
TRANSPORTATION			
1. I can, but don't own an automated vehicle			
2. I avoid air travel even if I can afford it			
3. I get my vehicle serviced regularly and keep it tuned			
4. I share my vehicle with others and even share someone else's vehicle to go to same destination			
5. I ride a bicycle despite owning an automated vehicle			

GARBAGE DISPOSAL	Always	Seldom	Never
1. I carry a cloth bag while shopping and refuse to take a plastic bag			
2. I recycle paper and plastic			
3. I do not buy tetra packs			
4. I avoid buying products with unnecessary packaging			
5. I give my used clothes, footwears for reuse			
6. I write on both the sides of paper right from top to bottom			
7. I reuse envelops			
8. I take care not to waste water while shaving, brushing my teeth and bathing			
9. I carry a handkerchief while going out to dine and avoid using paper napkins			
10. I buy soft drinks packaged in bottles and not in tins			

CLOSENESS WITH NATURE			
1. I watch the sunrise and sunset twice a week			
2. I take time to look at the night sky once a week			
3. I am interested in preserving endangered plants and animals			
4. I go to natural areas often (once in two to three months) and spend 2-3 days there			
5. I am happy in the company of natural elements and creatures			

PERSONAL CONTRIBUTIONS TO IMPACT REDUCTION

	Always	Seldom	Never
1. I do not keep pets.			
2. I take care to reduce my impact on a natural place			
3. I avoid using products made from wildlife and their parts (leather, food, gifts etc.)			
4. I consider the environmental impact of a product before buying it			
5. I encourage developing good environmental habits in my friends and relatives			
6. I help conservation organisations through voluntary services, donations etc.			
7. I share my ideas, experience and feelings on environmental preservation with others			
8. I write about environmental issues to the local dailies			
9. I take a stand on environmental issues and fight for them			
10. I support locally made products			

Information regarding media used by the respondents

S.No.	Statements	
1.	**Media utilised**	T.V. Newspaper Combination of the two
2.	**Viewing frequency of T.V.**	Daily Twice a day Once in two-three days
3.	**Frequency of reading newspapers**	Daily Occasionally Once a fortnight
4.	**Preferences for T.V. programmes**	News Entertainment programmes Comedy serials Knowledge and informational programmes
5.	**Preferences for channels related to environment**	Discovery channel National Geographic Channel
6.	**Preferences for programmes related to environment related**	Untamed Australia Discovery Kids Animal Planet Amul Surabhi

Exposure to messages related to environment on T.V.

S. No.	Message	Seen			Liked			Adopted	
		M	S	N	M	S	N	Yes	No
1.	Save electricity								
2.	Reduce wastage of water								
3.	Grow more trees								
4.	Control pollution								
5.	Reduce, recycle, reuse								
6.	Reduce traffic								
7.	Wash hands before eating								
8.	Keep food covered								

PARENTAL PARTICIPATION

1.	Have you planted plants and trees in your home	Yes/No
2.	If yes, you have planted them in	Ground/Pots/Both
3.	Type of plants you have planted	Flowering/Leafy/Vegetable/ Cactus/All
4.	In pots, what types of plants have you planted	Indoor/Outdoor/Both
5.	Who care for those plants	Children/Parents/Others
6.	Is the home clean	Not at all/Not much/ Much/Very much
7.	Is the floor and roof area clean	Not at all/Not much/ Much/Very much
8.	Is the neighbouring area clean	Not at all/Not much/ Much/Very much
9.	Is their proper ventillation facility in the home	Yes/No
10.	Do you keep water buckets covered	Yes/No
11.	Is there any pit near your home	Yes/No
12.	You take bath in bathroom	Yes/No
13.	Do you have proper hygienic toilets	Yes/No
14.	Do you wash clothes in bathroom	Yes/No
15.	Do you clean utensils in sinks	Yes/No
16.	Do you throw garbage in dustbin	Yes/No

PARENTAL STIMULATION

1.	Are parents member of any voluntary association	Yes/No
2.	Do the parents look after the cleanliness of neighbourhood surroundings	Yes/No
3.	Are they involved in any environment friendly operation	Yes/No
4.	Do they smoke at home	Yes/No
5.	Do they encourage children to become members of such environmental association	Yes/No

PARENTAL RELIGIOUS BELIEVES

1. Are the trees or plants worshipped? Yes/No
   If yes
   - Pipal/Neem/Tulsi/Banyan/Any other

2. Why do we worship them

   - They provide us life
   - They are sacred
   - They are associated with gods

3. Do the trees give us fresh oxygen and consume carbon dioxide? Yes/No

4. Should we sleep under a tree at night Yes/No

5. Do the plants have medicinal value Yes/No
   If yes,
   - Neem/Tulsi/Marwa/Cinchona/Others

6. Are there some trees which should not be sown in the home Yes/No
   If yes,
   Banana/Pipal/Bargad/Any other

7. Is cutting of any tree unlucky Yes/No

   If yes,
   Banana/Pipal/Bargad/Tulsi/Any other

APPENDIX-III

SCHOOL OBSERVATION CHECK LIST

1. Name of the school :

2. Location of the school :

3. Name of the Principal :

1. Is there display board in a classroom? Yes/No

   If yes, how many - 1/2/3

2. In a classroom's display board is there any -

   - Chart related to environment
   - Articles related to environment
   - Photographs/pictures
   - Slogans on environment

3. Is there a common display board outside the Principal's office? Yes/No

   If yes, how many :

   On that display board is there any
   Charts related to Environment/Photographs/Pictures/
   Slogans written/Articles related to environment

4. Is there discussion (frequent) on topics related to environment Yes/No

5. If yes

   - Is it a part of book curriculum
   - Due to curiousity of the students
   - Due to the interest of teachers

6. Whether appropriate aids are being used while discussing the topics related to environment — Yes/No

7. If yes, which type :

   Drawing/Photographs/Puppets/Visits to the places/Any other

8. Is any environment related movie shown in the school? — Yes/No

9. Are there frequent essays/debates/drawing competitions being held on environment and its allied topics — Yes/No

10. Is there any day/period in a month in the school for

    - Cleanliness of school
    - Planting of trees
    - Social Service
    - Competitions related to environment (Essay, Drawing, Speech)

11. Are children of senior classes involved in delivering environment education to other students? If yes, what how :

12. Have you done activities like -

    - Collection of leaves
    - Cleanliness of school area
    - Collection of seeds

13. Activities like health check up done by -

    - Doctors
    - Teachers
    - Specialists
    - Senior Students

14.	Are there proper dustbins maintained in and around the schools	Yes/No
15.	Are there sufficient number of trees in the school?	Yes/No
16.	Do you have interest in environment *related activities*?	Yes/No
	If yes, you prefer talk/lecture/discussion/ other activities	
17.	Do you like a special course/ element of environmental education to be added in their curriculum	Yes/No

APPENDIX-IV

SOCIAL MARKETING OF ENVIRONMENTAL EDUCATION

I. Social marketing of environmental education in terms of product

S.No.	Statements	Yes/No
1.	Prefer to get environmental education as a	
-	Package	
-	Product	
2.	Success of all environmental education programmes, marketing, planning depends upon the quality of the product/service/information delivered	
3.	The product should be in line with client's expectations	
4.	Consumer involvement is necessary in designing process of any new information/product/service concerning environment that are targeted at them	
5.	All information should be available to all categories of users, not restricted to a particular category	
6.	Various agencies must spread new and latest findings according to changing demands of consumer	
7.	Continuous assessment of environmental friendly technologies for determining if they are to be continued, modified or withdrawn	
8.	Sustain traditional services by promoting or changing them so that they attract users	

II. Social marketing of environmental education in terms of price

S.No.	Statements	Yes/No
1.	Price is an important factor	
2.	Prefer to get such information when provided free of cost	
3.	Environmental education should be extended at concessional rates	
4.	Information when provided free of cost draws huge crowds and much attention	
5.	All users should be charged equal whether internal or external i.e. concerned with any agency or not	
6.	Nominal cost charging will lead to repeated use of services	
7.	Environment friendly technologies should be provided at cheaper rates	
8.	In terms of price you prefer to devote	
-	Time	
-	Cost	
-	Labour	
-	Any other help	

III. Social marketing of environmental education in terms of place

S.No.	Statements	Yes/No
1.	If access to environmental information products and services is not user friendly, it cannot attract customers even if free of cost	
2.	You like to gain such environment related information	
-	at your residence	
-	at your school	
3.	Facts and lectures concerning environment should be delivered at public places inviting huge crowds	
4.	Change in the communication channels should be practiced for awareness amongst general public	

IV. Social marketing of environmental education in terms of promotion

S.No.	Statements	Yes/No
1.	Government should motivate and encourage all voluntary and non-voluntary agencies working in the direction of environmental awareness	
2.	Agencies working in direction of environmental education should be provided any incentives	
3.	People doing something outstanding in this field should be awarded with rewards	
4.	Necessary to inform the users about the utility and benefits of such information concerning environment when their usage is missing	
5.	All the environmental information, products and services are upto the mark and do not need any marketing or promotional activity	
6.	Effective promotional efforts will reduce the time taken to convince a user about a new environment friendly product	
7.	Various visuals help in spreading environmental awareness and generating consciousness	
8.	For the promotion of environmental services	
-	Interest of the consumer is a potent tool	
-	Interest of the manufacturer is a potent tool	
9.	There should be some rewards for	
-	Most hygienic locality of a city	
-	Most green area of a city	
-	Most pollution free area of a city	

APPENDIX-V

KNOWLEDGE INVENTORY

AIR POLLUTION

		Pre-exposure	Post-exposure
1.	Do you know about sources of pure air	Yes/No	Yes/No
-	Air from plants and trees		
-	Air from clean area		
2.	Air is essential for		
-	Human beings		
-	Animals		
-	Plants		
-	All		
3.	Do you know about causes of air pollution		
-	Deforestation		
-	Fumes from vehicles		
-	Air traffic		
-	Smoke (from industries, fuels)		
-	Generators		
4.	Do you know why are trees useful for us		
-	They give us fresh oxygen		
-	They consume harmful carbon dioxide		
-	They provide us fresh and clean air		
5.	Do you know about harmful effects of smoking		
-	Breathing problems		
-	Cough		
-	Oral cancer		

	Pre-exposure	Post-exposure
6. Do you know about prevention from air pollution	Yes/No	Yes/No
- Afforestation		
- Proper tuning of vehciles		
- Proper ventillation facilities		
7. Do you know why is lead free petrol useful to us		
- Not harmful to plants		
- Reduces pollution		
8. Do you know about consequences of breathing polluted air		
- Breathing problems		
- Cough		
- Eye irritation		
- Head ache		
9. Do you know that effective chimneys at suitable height help reduce air pollution		
10. Do you know that gas vehicles are harmful, create pollution, hence their use should be discouraged		
11. Do you know that oil is a polluting agent so saving oil, saves environment		

WATER POLLUTION

1. Do you know about pure water sources		
- Rain water		
- Rivers		
- Lakes		
- Oceans		

		Pre-exposure	Post-exposure
2.	Water is essential for	Yes/No	Yes/No
-	Human beings		
-	Animals		
-	Plants		
-	All		
3.	Do you know about causes of water pollution		Yes/No
-	Industrial waste		
-	Damaged sewage		
-	Improper hygienic habits		
-	Use of same ponds by people and animals		
-	All		
4.	Do you know why is water filter used		
-	To purify water		
-	To kill microorganisms		
-	Both		
5.	Do you know about the following methods of purifying water		
-	Use of muslin cloth		
-	Janata water filter		
-	Zero B water filter		
-	Acquaguard water filter		
6.	How can you prevent water from getting polluted		
-	Proper hygienic habits		
-	Using handled utensils to fetch water		
-	Stop disposal of waste water into rivers		
-	Using medicines to clean public use wells		
-	Any other		

	Pre-exposure	Post-exposure
7. Do you know that using drinking water drains for washing clothes is harmful to health	Yes/No	Yes/No
8. Do you know that there are laws against factories disposing of wastes into rivers		

NOISE POLLUTION

1. Can you differentiate between sound and noise

- That which is pleasant to ear is sound, and unpleasant is noise
- Sound that exceeds 140 d B is noise
- Any other

2. Do you know about the causes of noise pollution

- Overcrowding
- Deforestation
- Increasing use of vehicles
- Full volume of audio video systems
- All

3. We can reduce or pool traffic by

- Using same vehicles for same destination
- Using bicycle or going by feet instead of using other vehicles

4. Why are industries located away from cities

- To reduce noise pollution
- To reduce air pollution
- Both

	Pre-exposure	Post-exposure
5. Do you know about how can we reduce noise	Yes/No	Yes/No

- Afforestation
- Using silencers in vehicles
- Avoid use of loud speakers
- Hearing audio, video systems at low volume
- Reporting against industries creating noise

SOIL POLLUTION

1. Do you know about the uses of soil	Yes/No	Yes/No

- Help growth of trees
- Help grow food

2. Which of the following is good for soil

- Chemical
- Manure
- Compost
- Any other

3. Causes of soil pollution

- Deforestation
- Soil erosion
- Vehicular fuel

	Pre-exposure	Post-exposure
4. Do you know that trees help reduce soil pollution	Yes/No	Yes/No
5. Soil erosion reduces the quality of soil		
6. Chemicals are harmful for soil		

7. Do you know about some environment friendly technologies

- Solar energy
- Wind mill
- Solar cooker
- Solar lantern

SANITATION AND GARBAGE DISPOSAL

1. Do you know that garbage left over can give birth to many diseases

- Fever
- Cough
- Malaria

2. Harmful effects of polythene

- Causes pollution
- Not biodegradable so prevails in environment

3. Biodegradable waste is useful because

- Recycled automatically
- Not cause pollution

4. Recycling of waste is useful

- Reduces pollution
- Can be reused

		Pre-exposure	Post-exposure
5.	Animal wastes should be utilised as	Yes/No	Yes/No
-	Manure		
-	Fuel		
-	Any other		
6.	Garbage disposal system at home should have		
-	Separate space in open		
-	Dustbin for dumping garbage		
-	Any other		
7.	Garbage disposal system at community should be		
-	Away from homes		
-	Closed, hygienic		
-	With recycling bins or facilities nearby		
-	Any other		

GENERAL ISSUES

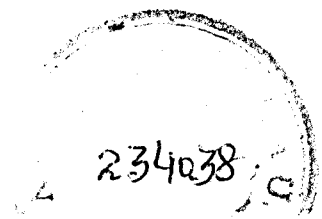
1.	Harmful effects of nuclear wars		
-	Long lasting harmful effects		
-	Cause different types of pollution		
-	Clain many lines		
2.	We should conserve flora for		
-	Beauty Aesthetic value		
-	Medicinal value		
-	Any other		

3. We should conserve fauna

- To sustain life
- They are useful to mankind
- Any other

4. Emphasize on renewable sources of energy like

- Solar cooker
- Solar lantern
- Wind energy
- Tidal energy



APPENDIX-VI

VISUAL LITERACY CHECKLIST OF THE AIDS UTILISED

S. No.	Components	Aids used	Book	Booklet	Flash cards	Poster	Chart	Games	Video cassette
1.	Unity	MR R IR							
2.	Graphic	MR R IR							
3.	Colour	MR R IR							
4.	Style	MR R IR							
5.	Text	MR R IR							
6.	Shape	MR R IR							
7.	Sequence	MR R IR							
8.	Balance	MR R IR							

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ABSTRACT

a)	Title of thesis	:	Social marketing of environmental education to school children
b)	Full name of degree holder	:	Preeti Singh
c)	Title of degree	:	Master of Science
d)	Name and address of Major Advisor	:	Dr. (Mrs.) Lali Yadav, Professor and Head, Department of Home Science Extension Education, CCS Haryana Agricultural University, Hisar-125 004, India.
e)	Degree awarding university/ institute	:	Chaudhary Charan Singh Haryana Agricultural University, Hisar
f)	Year of award of degree	:	2000
g)	Major subject	:	Home Science Extension Education
h)	Total number of pages in thesis	:	141
i)	Number of words in the abstract	:	Approximately 350

The exploitation of natural resources is one of the main cause of environmental degradation, which has direct bearing on the life style of people, on planet earth. Hence, it is important to generate awareness and consciousness among people, specifically the children who have been considered as vital and potential communicators. Social marketing is an upcoming area of study for effective communication of the idea. Keeping these issues in mind the present study was carried out with the following specific objectives :

i) To identify the critical messages on environmental education.
ii) To develop an intervention programme for social marketing of the critical messages.

iii) To assess the knowledge of the respondents before and after the intervention programme and isolate the factors affecting it.

The study was carried out in two schools of Kanpur city by applying multistage sampling technique. A set of eight independent and one dependent variable constituted the parameters for the study. Scientific tools were used to measure these variables and collect the data. The data were collected in two step communication : in the Ist step, most critical messages were identified by collecting data from thirty experts acting as judges for the present study. Also the respondents were tested for their pre exposure knowledge scores. In the IInd step an appropriate intervention programme was developed and administered to the respondents keeping in mind the most critical messages identified by the judges. Further, the respondents were tested for their post scores, knowledge gain and factors affecting knowledge of the respondents.

The study revealed that majority of the respondents (58.3%) were in the age group of 14-15 years, eldest of all sublings (17.5%), with interest in academic activities (29.3%), seldom involved in healthy environmental acts (48.3%) as a part of their habits, having middle level of scholastic achievement (71.6%) and frequent exposure to mass media scores (61.7%).

It was reported that most of them had graduate parents, hailing from middle income families (53.4%), having small families (71.7%) mostly nuclear (88.4%), residing in semi crowded areas (49.1%), living in rented (69.1%) but pucca homes (95.8%) on ground floor (65.0%). Majority of them (60.0%) had high level of family education status, with parents actively

involved in healthy environmental activities (51.7%) and stimulating their wards to do the same (67.5%) with average level of religious believes (72.5%).

It was revealed that students preferred to get environmental education as an educational package. Thus, an intervention programme was developed and administered to the respondents containing important messages on air pollution, water pollution, noise pollution, soil pollution, sanitation and garbage disposal and general issues.

The intervention programme was revealed to be successful for all the selected messages. However, knowledge gain was reported to be maximum for the message of "Water pollution" (5.3) and minimum for the message of "Noise pollution" (2.0). The results revealed that the parameters of habits, interest, mother education, parental participation, scholastic achievement, family education status and mass media exposure were significantly associated with the knowledge of the respondents on environmental messages selected for the study.

MAJOR ADVISOR DEGREE HOLDER

HEAD OF THE DEPARTMENT