CHAPTER - 1

INTRODUCTION

1.1 What is Environment?

The word ‘Environment’ is derived from the French word *‘Environner’* which means to encircle, around or surround. The biologist Jacob Van Uerkal (1864-1944) introduced the term ‘environment’ in Ecology. Ecology is the study of the interactions between an organism of some kind and its environment. As given by Environment Protection Act 1986, Environment is the sum total of land, water, air, interrelationships among themselves and also with the human beings and other living organisms. It refers to both abiotic (physical or non-living) and biotic (living) environment. (Indian Agricultural Statistical Research Institute, 2012).

1.1.1 Definition of Environment

The term "environment" comes from the French word *"Environ"* meaning *"where about"*, *"around"*, "surroundings." Environment literally means surrounding and everything that affect an organism during its lifetime. The environment is the complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual or organism and that ultimately determine its form and the nature of its survival. It includes natural forces and other living things, which provide conditions for development and growth as well as of danger and damage of an organism.

According to Oxford Dictionary, *“Environment is the surroundings or conditions in which a person, animal, or plant lives or operates.”*

“Environment is anything immediately surrounding an object and exerting a direct influence on it.” (Pascual, 1989)

“Environment as pervasive which pervades from one’s own home to workplace and throughout the socio-economic system involving the various fields of industry, agriculture, urbanization, transportation and so on. (Swarup, Mishra and Jauhari, 1992)

According to De and Bose, 1991 “Environment as the sum total of the conditions of all surroundings within which an organism or group of organism or an object exists.” (Noman, 2015)

Thus, Environment refers to anything that is immediately surrounding an object and exerting a direct influence on it. Environment regulates the life of the organisms including human beings. Its chief components are soil, water, air, organisms and solar energy.

The term environment can be used both at a large scale and at a small scale. At a large scale, it is the environment of the habitat in which an organism lives. Here it is reflected in the form of regional or global climatic conditions. At a small scale, it is immediate environment of the organism, which may be very different from the habitat. Hence it is reflected in the form of local climatic conditions or microclimate.

Environment not only includes air, water and land but also other physical surroundings like buildings, open spaces, land etc. and the living organisms like plants, animals and human beings with whom one interacts. Environment has a strong influence on the living organisms and in turn the living organisms affect and alter the environment. In fact, they interact, influence each other and maintain a balance in nature**.**

Our environment provides us with a variety of goods and services necessary for our day to day lives. These natural resources include, air, water, soil, minerals, along with the climate and solar energy, which form the non-living or ‘abiotic’ part of nature. The ‘biotic’ or living parts of nature consist of plants and animals, including microbes. Plants and animals can only survive as communities of different organisms, all closely linked to each other in their own habitat, and requiring specific abiotic conditions. Thus, forests, grasslands, deserts, mountains, rivers, lakes and the marine environment all form habitats for specialized communities of plants and animals to live in. Interactions between the abiotic aspects of nature and specific living organisms together form ecosystems of various types. Many of these living organisms are used as our food resources. Others are linked to our food less

directly, such as pollinators and dispersers of plants, soil animals like worms, which recycle nutrients for plant growth, and fungi and termites that break up dead plant material so that micro-organisms can act on the detritus to reform soil nutrients.

1.2 Human - Environment Interaction

We are influenced by two types of environment, natural environment and human environment. Natural environment or physical environment that is, land, air and water is created by nature. Human environment refers to changes that have been made by man on those natural elements. Both natural and human made environment influence our life styles. Our environment determines our characteristic life styles. One reason why people in different regions live differently is that they have influences of the environment. The way we dress, make our houses, prepare our food and all the other activities are governed by our environment.

The air we breathe, the rivers that provide us water for drinking and irrigation are all part of our natural environment. The cave was men's natural habitat. As man progressed, he made tools, discovered metals and started improving his environment. The houses, farms, canals etc., are all examples of man-made environment. Today, we are influenced both by our natural environment and man-made environment.

Similarly, environment is also influenced by human activities. About ten thousand years ago, when mankind changed from a hunter-gatherer, living in wilderness areas such as forests and grasslands, into an agriculturalist and pastoralist, we began to change the environment to suit our own requirements. As our ability to grow food and use domestic animals grew, these 'natural' ecosystems were developed into agricultural land. Most traditional agriculturists depended extensively on rain, streams and rivers for water. Later they began to use wells to tap underground water sources and to impound water and created irrigated land by building dams. We then began to use fertilizers and pesticides to further boost the production of food from the same amount of land. However, we now realize that all this has led to several undesirable changes in our environment. Mankind has been

overusing and depleting natural resources. The over-intensive use of land has been found to exhaust the capability of the ecosystem to support the growing demands of more and more people, all requiring more intensive use of resources. Industrial growth, urbanization, population growth and the enormous increase in the use of consumer goods have all put further stresses on the environment. They create great quantities of solid waste. Pollution of air, water and soil has begun to seriously deteriorate the environment. (Bharucha, 2005).

1.3 Concept of Environmental Degradation

The human beings, evolved more than two million years ago. They evolved with a large brain that enabled them to think, and use their judgment. Humans walked erect on two legs, which made their hands free to negotiate manual functions. As is with other animals, the survival of humans also entirely depended on their obtaining food from the environment. Being intelligent, human beings exploit environmental resources for many purposes other than just for procuring food. In the last few centuries, the exploitation of environmental resources has dramatically increased, leading to serious damage and degradation of the environment.

Since the beginning of the Nineteenth century, the explosive growth, expansion and needs of the world's population accompanied by new technological advances have modified our Mother Earth's landscape. Man has exploited the natural resources in such a way that it leads to over-exploitation and losing the balance in natural eco-system. Environmental degradation to a large extent occurred.

We know that, a living organism cannot live by itself. Organisms interact among themselves. Hence, all organisms, such as plants, animals and human beings, as well as the physical surroundings with whom we interact, form a part of our environment. All these constituents of the environment are dependent upon each other. Thus, they maintain a balance in nature. As we are the only organisms try to modify the environment to fulfill our needs; it is our responsibility to take necessary steps to control the environmental imbalances.

Environmental Degradation is the process by which our environment that is, air, water and land, progressively contaminated, over-exploited and destroyed. Degradation can be mainly grouped into (a) eco-system imbalance, (b) forest deterioration, (c) freshwater degradation (d) soil degradation (e) air pollution and (f) Global warming.

In other words, when the environment becomes less valuable or damaged, environmental degradation is said to occur. There are many forms of environmental degradation. When habitats are destroyed, biodiversity is lost, or natural resources are depleted, the environment is hurt. Environmental degradation can occur naturally, or through human processes. The largest areas of concern at present are the loss of rain forests, air pollution and smog, ozone depletion, and the destruction of the marine environment. Pollution is occurring all over the world and poisoning the planet's oceans. Even in remote areas, the effects of marine degradation are obvious. (Sharma, 2008).

1.3.1 Causes of Environmental Degradation

Singh (2015) in his blog described the following reasons for environment degradation:

1. **Land Disturbance:** A more basic cause of environmental degradation is land damage. Numerous weedy plant species, for example, garlic mustard, are both foreign and obtrusive. A rupture in the environmental surroundings provides for them a chance to start growing and spreading. These plants can assume control over nature, eliminating the local greenery. The result is territory with a solitary predominant plant which doesn't give satisfactory food assets to all the environmental life. Whole environments can be destroyed because of these invasive species.

2. **Pollution:** Pollution, in whatever form, whether it is air, water, land or noise is harmful for the environment. Air pollution pollutes the air that we breathe which causes health issues. Water pollution degrades the quality of water that we use for drinking purposes. Land pollution results in degradation of earth's surface as a result of human activities. Noise pollution can cause irreparable damage to our ears when exposed to continuous large sounds like honking of vehicles on a busy road or machines producing large noise in a factory or a mill.

3. **Overpopulation:** Rapid population growth puts strain on natural resources which results in degradation of our environment. Mortality rate has gone down due to better medical facilities which have resulted in increased lifespan. More population simple means more demand for food, clothes and shelter. You need more space to grow food and provide homes to millions of people. This results in deforestation which is another factor of environmental degradation.

4. **Landfills:** Landfills pollute the environment and destroy the beauty of the city. Landfills come within the city due the large amount of waste that gets generated by households, industries, factories and hospitals. Landfills pose a great risk to the health of the environment and the people who live there. Landfills produce foul smell when burned and cause huge environmental degradation.

5. **Deforestation:** Deforestation is the cutting down of trees to make way for more homes and industries. Rapid growth in population and urban sprawl are two of the major causes of deforestation. Apart from that, use of forest land for agriculture, animal grazing, harvests for fuel wood and logging are some of the other causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment.

6: **Natural Causes:** Things like avalanches, quakes, tidal waves, storms, and wildfires can totally crush nearby animal and plant groups to the point where they can no longer survive in those areas. This can either come to fruition through physical demolition as the result of a specific disaster, or by the long term degradation of assets by the presentation of an obtrusive foreign species to the environment. The latter frequently happens after tidal waves, when reptiles and bugs are washed ashore.

Regardless of their types, environmental problems have no respect for national borders and existent problems may trigger new ones. It is well-known that environmental problems have impacts primarily on human health and his economic, social, and cultural development.

1.3.2 Effects of Environmental Degradation

Rinkesh (2009) described the harmful effects of environment degradation which are as follows:

1. **Impact on Human Health:** Human health might be at the receiving end as a result of the environmental degradation. Toxic chemicals and harmful radiations have the potential of causing serious problems of human health. Asthma, pulmonary fibrosis, pneumoconiosis is caused due to air pollution. Long exposure to pollutants in the working place such as mines, textile mills, poultry, crackers, sand blasting and chemical industries cause respiratory diseases. Carcinogenic chemicals and ionizing radiations in the environment have been responsible for cancer. Millions of people are known to have died of due to indirect effects of air pollution.

2. **Loss of Biodiversity:** Biodiversity is important for maintaining balance of the ecosystem in the form of combating pollution, restoring nutrients, protecting water sources and stabilizing climate. Deforestation, global warming, overpopulation and pollution are few of the major causes for loss of biodiversity.

3. **Ozone Layer Depletion:** Ozone layer is responsible for protecting earth from harmful ultraviolet rays. The presence of chlorofluorocarbons, hydro chlorofluorocarbons in the atmosphere is causing the ozone layer to deplete. As it will deplete, it will emit harmful radiations back to the earth.

4. **Loss for Tourism Industry:** The deterioration of environment can be a huge setback for tourism industry that rely on tourists for their daily livelihood. Environmental damage in the form of loss of green cover, loss of biodiversity, huge landfills, increased air and water pollution can be a big turn off for most of the tourists.

5. **Economic Impact:** The huge cost that a country may have to borne due to environmental degradation can have big economic impact in terms of restoration of green cover, cleaning up of landfills and protection of endangered species. The economic impact can also be in terms of loss of tourism industry.

From this perspective, it is an obligation for nations to eliminate or at least, reduce the effects of environmental problems to harmless levels. On the other hand, this aim can only be achieved by determining the existent conditions and problems of natural reserves and then preparing long term environmental policies. In preparing environmental policies, public participation and awareness towards environmental matters are very important.

In the past three decades, protecting the global environment has emerged as one of the major challenges in international relations. No fewer than ten global environmental treaties have been negotiated as well as literally hundreds of regional and bilateral agreements.

1.4 Worldwide Endeavors to Protect Environment

The environmental movement might be said to have begun centuries ago as a response to industrialization. In the nineteenth century, the British Romantic Poets extolled the beauties of nature, while American writers praised the return to a simpler life, guided by the values implicit in nature. It was a dichotomy that continued well into the twentieth century. In the aftermath of the Second World War, the rise of the nuclear age introduced fears of a new kind of pollution from deadly radiation. The environmental movement gained new momentum in 1962 with the publication of Rachel Carson's book "The Silent Spring", which warned about the agricultural use of synthetic chemical pesticides. A scientist and writer, Ms. Carson stressed the need to respect the ecosystem in which we live, in order to protect human health as well as the environment. (Jaiswal, 2012)

In 1969, the first, iconic photos of the Earth from outer space touched the hearts of humanity with its simplicity and beauty. Seeing for the first time this "big blue marble" in an immense galaxy brought home to many that we live on One Earth — a fragile, interdependent ecosystem. And our responsibility to protect the health and well-being of that ecosystem began to dawn on the collective consciousness of the world. (United Nations Report, 2012)

With the ending of the tumultuous decade of the 1960s, its highest ideals and visions began to be translated into practical form. Among these was the environmental vision — now, quite literally, a global phenomenon. As universal concern about the healthy and sustainable use of the planet and its resources continued to grow, the following major conferences and proceedings took place at international level:

1. **The UN, in 1972, convened the United Nations Conference on the Human Environment, in Stockholm:** A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes. There are broad vistas for the enhancement of environmental quality and the creation of a good life. What is needed is an enthusiastic but calm state of mind and intense but orderly work. For the purpose of attaining freedom in the world of nature, man must use knowledge to build, in collaboration with nature, a better environment. To defend and improve the human environment for present and future generations has become an imperative goal for mankind-a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and of worldwide economic and social development. (Declaration of the United Nations Conference on the Human Environment, Stockholm, 1972, para. 6)

2. **United Nations Environment Programme (UNEP):** Picking up on the energy generated by the Conference, the General Assembly, in December 1972, established the UNEP, which leads the efforts of the United Nations family on behalf of the global environment. Its current priorities are environmental aspects of disasters and conflicts, ecosystem management, environmental governance, harmful substances, resource efficiency, and climate change.

3. **World Commission on Environment and Development (1987):** In 1983, the Secretary-General of the United Nations invited Dr. Gro Harlem Brundtland, a medical doctor, master of public health and former Prime Minister of Norway, to establish and chair a World Commission on Environment and Development. It prepared a report for General Assembly in 1987. It was based on a four-year study. It was entitled Our Common Future and also known as the Brundtland report.

The commission developed the theme of sustainable development "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. A world in which poverty and inequity are endemic will always be prone to ecological and other crises. Sustainable development requires that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all. Many of us live beyond the world's ecological means, for instance in our patterns of energy use. At a minimum, sustainable development must not endanger the natural systems that support life on Earth: the atmosphere, the waters, the soils, and the living beings. In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development; and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations." (Brundtland Report, 1987)

The wide-ranging recommendations made by the Commission led directly to the holding of the United Nations Conference on Environment and Development, which placed the issue squarely on the public agenda in a way, it had never been before.

4. **Meeting in Rio de Janeiro, in 1992, the "Earth Summit",** adopted a blueprint for the protection of our planet and its sustainable development. Three major agreements adopted in this summit were as follows:

   a. Rio Declaration on Environment and Development, a series of principles defining the rights and responsibilities of States

b. Agenda 21, a global plan of action to promote sustainable development

c. Statement of Forest Principles, a set of principles to underpin the sustainable management of forests worldwide

Two multilateral treaties were opened for signature:

1. United Nations Framework Convention on Climate Change (UNFCCC)

2. Convention on Biological Diversity

It called for several major initiatives in other key areas of sustainable development, such as, a global conference on Small Island Developing States; negotiations began for a Convention to Combat Desertification, and for an agreement on highly migratory and straddling fish stocks.

5. **General Assembly Special Session on the Environment (1997):** This assembly was called for by General Assembly resolutions 47/190 and 51/181. It is also known as the Earth Summit +5. It was held in New York, 23-27 June 1997. It was review of the implementation of Agenda 21.

6. **World Summit on Sustainable Development (2002):** It was convened by General Assembly resolution 55/199 of 20 December 2000. It was also known as Rio +10 and held in Johannesburg, 26 August - 4 September 2002. It reviewed progress in the implementation of Agenda 21 since its adoption in 1992.

7. **UN Conference on Sustainable Development (2012):** It was called by General Assembly resolution 66/197. It was also called as Rio+20. It was held in Rio de Janeiro, 20-22 June 2012

8. In **2015 United Nations Climate Change Conference**, was held in Paris, France. According to the organizing committee at the outset of the talks, the expected key result was an agreement to set a goal of limiting global warming to less than 2 degrees Celsius (°C) compared to pre-industrial levels. The agreement calls for zero net anthropogenic greenhouse gas emissions to be reached during the second half of the 21st century.

"A deal must have a "binding legal mechanism" and include a "five-year review so we can see how we are doing" against the targets, financial support for the poorest and most vulnerable countries and mechanisms to measure and verify progress." (Cameron, 2015)

The Prince of Wales issued an impassioned plea for action, warning that "in damaging our climate we are becoming the architects of our own destruction", while President Obama warned the world had almost run out of time to tackle climate change.

Narendra Modi, India's prime minister gave a hint of the rows to come as he used his speech to insist that rich nations must make the deepest cuts.

"We must build an agenda for speedy yet sustainable economic growth that is inclusive of all, is respectful of individuals, responsive to innovation and responsible towards the future generations." (Modi, 2015)

This is evident from these conferences and meetings held worldwide to protect environment that world has understood the urgent need to plan and implement strategies to save the environment and working towards it. In India, government had been making policies and schemes to control pollution and protect biodiversity even before independence.

1.5 Efforts by Indian Government to Conserve Environment

The government of India is working towards controlling pollution and doing many efforts in this direction. The central pollution control board has been improved to:

- survey pollution for prevention and control of pollution,
- submission of an environmental statement by the polluting units,
- adoption of clean technologies in small scale industries,
- mapping and analysis of environmental data,
- development of standards of industries,
- pollution control and monitoring,
- Economic instruments like enhancement of cess rates on water consumption, pollution control equipments, pollution abatement equipment, and biodiversity conservation.

Plan also ensured public participation, launching a new scheme as "Paryavaram Vahini", Environmental education, training and information. Government has enunciated policy statements on abatement of pollution and on conservation; attention was given to make pollution control laws during eighth plan period on implementing India's international obligations like Rio-agreements. (Ministry of Environment and Forests, 1993)

1.5.1 Steps Taken by The Government of India to Control Air Pollution

These efforts include:

- compulsory PUC (Pollution under control) certification of petrol driven vehicles which tests for carbon monoxide and hydrocarbons,
- permission to use only pure diesel with a maximum of 500 ppm Sulphur as fuel for vehicles,
- use of non-polluting compressed natural gas (CNG) only as fuel by all buses and trucks,
- compulsory mixing of 20percent ethyl alcohol with petrol and 20percent biodiesel with diesel.
- Appropriate policies are aimed to be designed and implemented to increase energy efficiency and thus limit the harmful effect of carbon combustion on the environment.

Despite many problems several environmental policies, institutions and laws were enacted as a result of five year plans. Eighth plan, though importance was given to environment overall developmental activities are much focused. Especially 9, 10 and11th plans covered major environmental protection activities. Thus India has made sincere efforts in protection and improvement of environment (Planning Commission, 2006)

The recent **Clean India Campaign** in the leadership of Prime Minister Narendra Modi is also influencing the youths of India to a much extent.

Government of India is also doing many efforts in the direction of educating people about environment. **Ministry of Environment, Forest and Climate Change (MoEFCC)** had launched a scheme to promote environment education and awareness in India.

The Environmental Education, Awareness and Training (EEAT)

This is a flagship scheme of the Ministry for enhancing the understanding of people at all levels about the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment. This scheme was launched in 1983-84 with the basic objective to promote environmental awareness among all sections of the society and to mobilize people's participation for preservation and conservation of environment.

EEAT Scheme has the following objectives:

1. To promote environmental awareness among all sections of the society;

2. To spread environment education, especially in the non-formal system among different sections of the society;

3. To facilitate development of education/training materials and aids in the formal education sector;

4. To promote environment education through existing educational/scientific/ research institutions;

5. To ensure training and manpower development for environment education, awareness and training;

6. To encourage non-governmental organizations, mass media and other concerned organizations for promoting awareness about environmental issues among the people at all levels;

7. To use different media including films, audio, visual and print, theatre, drama, advertisements, hoarding, posters, seminars, workshops, competitions, meetings etc. for spreading messages concerning environment and awareness; and

8. To mobilize people's participation for preservation and conservation of environment.

The objectives of this scheme are being realized through implementation of the following programmes launched over the years:

1. National Environment Awareness Campaign (NEAC)

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

2. National Green Corps (NGC)

National Green Corps is a major initiative of MoEFCC for creating environmental awareness launched in 2001-02 which aims at building cadres of young children working towards environmental conservation and sustainable development. The phenomenal response that NGC has received and has made the network more than 1, 00,000 Eco clubs across the country in 14 years, making it one of the largest conservation networks indicates its importance at grass root level in taking the environment awareness at mass.

The unique partnership between the MoEFCC, the state Government agencies along with the dedicated NGOs, working in the field of Environmental Education has contributed to the success of the programme. It is operated through Eco-clubs set up in schools registered as members of NGC; this programme exposes school children to in-depth field experiences, and provides opportunities to convert their ideas into creative action.

3. Seminars/Symposia/Workshops/Conference

The objective of the programme on “Seminars / Symposia/ Workshops/ Conferences” is to provide a forum to professionals, scientists, environmentalists, other groups of the society to share knowledge and experience on various aspects of environment. Under this programme, financial assistance is provided to universities, academic institutions/ colleges, non - governmental organizations, government departments etc. to

create mass environment awareness for organization of Seminars/ Symposia/ Workshop/Conferences on identified thrust areas related to environment or any emerging area impinging on technology, innovation in regard to environment.

4. Other Awareness Programmes

It is conceivable that concerned stakeholders, like NGOs and a host of other organizations, may propose awareness activities which are outside the purview of aforementioned programmes. Such activities need to be supported by the Ministry based on merits and their conformity with the requirements of the Ministry in its endeavors to promote environment protection. Such proposals are received in the Ministry from time to time.

A suggestive list of such, "Other Awareness Programmes", being supported by the Ministry includes:

- Awareness cum action programs in and around the protected area, in wildlife corridors, biodiversity hotspots, rivers and wetlands
- Awareness programs which focus on communities that are critical to conservation of forests/wildlife/environment
- Quiz Programmes/Competitions etc.
- Yatras based on the environmental issues
- Organizing appropriate awareness programmes on the occasion of mass congregations like industrial exhibitions, trade fairs, health melas, sport meets, conferences, training inter-school/college/university competitions etc.
- Any other programme/activity that promotes awareness about environment

Although we can say that there are many efforts are being carried out at national and state level, however, it is evident that efforts to create awareness for supporting environment conservation have reached a very small segment of society. While it is true that communities, who are directly

linked to using wilderness resources, intimately know and appreciate the value of the biological resources around them, this deals invariably with either species they use in their day to day lives, those they fear, or those they venerate. Species that they do not use or those that do not form a part of their daily lives, are essentially ignored and invariably may not even have local names. Further our modern educational processes have created a major 'gap' in knowledge of the value, threats and conservation needs of biological diversity. The nature of this lack of awareness has rarely been assessed and documented. This inevitably has led to an inability to fill this gap through formal education. (Bharucha, 2005)

1.6 Environmental Protection- Impediments

India to protect environment many legislative measures and policy instruments are undertaken. But administration and implementation is the main problem faced in India. Though poverty and underdevelopment are main impediments to environment protection measures in India, the rigidity in existing structures is another impediment. The gaps in policy implementation indicate the weakness in enforcement of policies. Ministry of environment and forest (MoEF) is still perceived as a new comer within the government administration. Despite of MoEFs claims that India has introduced plethora of environmental laws and mechanism, but they were noticed working unsatisfactorily. J.B.D Souza, a former municipal commissioner of Bombay remarked that there is a profusion of laws that do not serve their purpose and eventually create new problems. In India problems are found for every solution. To control pollution, it requires substantial expenditure to adopt appropriate technology, due to lack of technical and administrative and sufficient economic resources resulting in inadequate enforcement. The absence of the public participation is a great impediment (Priyadarshini and Devi, 2010)

As the earth's natural resources are dwindling, it is evident that something needs to be done. People often feel that managing all this is something that the Government should do. But if they go on endangering this environment, there is no way in which the Government can perform all these clean-up functions. It is the prevention of environment degradation in which public

must take part that must become a part of all their lives. Just as for any disease, prevention is better than cure. To prevent ill-effects on environment by our actions is economically more viable than cleaning up the environment once it is damaged. (Bharucha, 2005)

1.7 Need for Public Participation in Environment Protection

An individual can play a major role in environment management. People can reduce wasting natural resources and can act as watchdogs that inform the Government about sources that lead to pollution and degradation of environment. This can be made possible through mass public awareness. Mass media such as newspapers, radio, television, strongly influence public opinion. However, someone has to bring this about. If each of us feels strongly about the environment, the press and media will add to our efforts. Politicians in a democracy always respond positively to a strong publicly supported movement. Thus if an individual join an NGO that supports conservation, politicians will make green policies.

There are increasing needs for public participation due to the recent change in sources of environmental problems. Today, the sources of pollution have shifted from production to consumption processes. The Human Development Report of 1998 (UNDP) affirms this trend and states that growth in consumption and unbalanced consumption patterns are placing unprecedented pressure on the environment. In this light, the acceptance of pro-environmental behavior by general public, that is, to adopt sustainable life style, is an urgent issue in protecting environment. The participation of citizen can complement existent legal and economic instruments, which are facing shortage of institutional, managerial and financial capabilities for enforcement. The increase of participation of citizen means that legal frameworks would be more respected and economic mechanisms would be more accepted thus increase their effectiveness (Iizuka, 2000).

Public participation can be enhanced by creating awareness among people about environment and making them and knowledgeable about the current environment issues and inculcating in them good values related to environment.

1.8 Need for Studying Environmental Knowledge and Values

The researches on environmental knowledge and values at different levels will help in understating how people perceive environmental sustainability and how much efforts are required in this direction. As discussed earlier, studying environmental knowledge and values at college level is of prime concern. Finding out how much students know about environment and value their environment, which factors are responsible for their level of environment knowledge and values can help in understanding how our efforts towards environment education should be directed.

For the sake of our planet, obviously environmental awareness plays vital role in creating interest in environment. The need of the hour is to create environmental awareness and inculcate environmental sensitivity among the masses. For the awareness of society, it is essential to work at a gross root level. So the whole society can work to save the environment. If we want to generate the environmental values in our children, we have to know the responsibility towards environment and also we have to show our behavior as a like eco-friendly. Environmental awareness should be the integral part of any environmental curriculum encouraging children to take an active role in the protection to their environment in one way by which the critical balance between man and environment may be preserved. Through it young children are full of curiosity to learn about their environment. Among those compulsory environmental educations at all level in the education system is the most appropriate strategy towards environmental protection.

Many people simply believed that environmental knowledge and awareness were the keys. This theory was known as K-A-B (knowledge-attitude-behavior theory) and it assumed that when people are provided with information about environmental problems (awareness) and what they can do to decrease their impact on the environment, they accept that some kind of behavior is either correct or wrong (attitudes) (Hines, Hungerford, and Tomera, 1986-87; Hungerford and Volk, 1990; Heimlich and Ardoin, 2008). As a result, they will stop wrong behavior and start doing the ‘correct’ one. (Cincera, 2013).

According to some scholars, environmental values and attitudes are crucial for developing pro environmental behaviour. People seek union between what they suppose is right and what they actually do. Environmental values and attitudes, confronted by awareness of an issue and ascription of personal responsibility, lead to feeling of moral obligation and to responsible behaviour (Stern, Dietz, Troy, Guagnano, and Kaloff, 1999, Kals, Schumacher, and Montada, 1999, Stern, 2000, Kaiser, Hubner, and Bogner, 2005, Johnson, and Manoli, 2008).

Others, supposed, altruistic values may motivate us to behave in an environmentally responsible way (Stern, 2000, Straughan, and Roberts, 1999). Surprisingly, in some cases even egoistic values can play the same role. Some people buy organic food because of their compassion with animals (benevolence), or love for nature (universalism). Others may buy it because they believe it is healthy (safety) or simply think it tastes better (hedonism) (Aertsens et al., 2009).

Therefore, the knowledge about the environment and values related to environment can have effects on the environment supporting behavior. So to study environmental knowledge and environmental values is of prime concern in order to evolve strategies.

Environmental knowledge and values are of little practical interest unless they lead to (or explain in a methodological sense) actions or behaviors that mitigate their organization's impact on the environment. As Di Norcia (1996:784) put it, "An environmental ethic cannot be satisfied merely with the espousal of general care for nature. Commitment itself must result in performance of the appropriate ecologically beneficent practices."

Although we have hypothesized independent, direct effects of environmental knowledge and values on managerial actions to promote the environment, an interaction effect seems likely. This is to say that environmental knowledge in the presence of environmental values is likely to have a particularly strong influence on actions or behaviors to promote the environment. This may be most obvious in the case of environmental advocacy as managers may be relatively unwilling to promote environmental issues within their organization unless they can provide factual knowledge about the benefits of such actions to the firm (that is, knowledge) and they place personal priority on environmental performance (that is, values). (Fryxell, 2003)

Knowledge, values and attitudes, feelings, belief are influential factors in the cognitive and affective change process. They become the important components in their commitment to the path toward the modification of their environment related behavior.

1.8.1 Environmental Knowledge and its Role in Pro -Environmental Behaviour

Environmental knowledge is the total understanding of people about their relationship to the earth and the universe. This knowledge includes the spiritual, physical, emotional, and mental aspects of a person and related components of the earth and universe to these aspects.

Environmental knowledge is facts or information about the environment. It is about the way we all should live. It is information about the environment that will lead to a concern for your own environment. When you develop this concern, you will begin to act at your own level to protect the environment we all live in.

There is no question that increased knowledge must play an essential role in solving humanity's environmental problems. Knowledge can help limit and reduce population size (Ehrlich and Holdren, 1971; Ehrlich and Ehrlich, 1990), change patterns of overconsumption (Ehrlich et al., 1997), and develop more environmentally benign technologies (World Commission on Environment and Development, 1987; Holdren, 1990; Kane, 1996). These connections between knowledge and the environment are relatively uncontroversial. According to this view, the continued discovery of cleaner, low-pollution production methods will preserve environmental quality, despite increases in the scale of global output and consumption. A related, but distinct view is that we no longer need to worry about the possibility that the finiteness of natural resources will pose a drag on future economic growth. In this connection, there have been repeated discussions of an economic transition to a services-, or knowledge-, economy (Porat, 1977; Drucker, 1993; Chichilnisky, 1996; Chichilnisky, 1998). (Ehrlic et al., 1999).

The questions here arise are, 'Whether knowledge- growth will, in some sense, save the environment?' and 'If knowledge is growing, will it help the environment?'The productive use of knowledge—to serve environmental or other purposes—requires more than just knowledge- acquisition or discovery. The acquired knowledge must be put to good use. Appropriate institutions, such as new financial institutions to securitize the biosphere, have a vital role in meeting this challenge. Likewise, public policies, such as subsidies to research and development, are crucial for providing adequate incentives for the creation of knowledge and for countering forces of disinformation.

Ehrlich, et al. (1999) said in Ecological Economics that it is not a straightforward task to determine if knowledge explosion is actually occurring. Clearly there has been a recent information explosion, but if one accounts for the quality of such information and the extent to which it can or cannot be translated into human understanding, the evidence for a knowledge explosion becomes mixed. Even if knowledge explosion is taking place, this does not necessarily imply growth of environmentally beneficial knowledge.

So the environmental knowledge can help us to understand these issues and help to save the environment.

1.8.2 Environmental Values and their role in Pro -Environmental Behaviour

Progress in sustainable development is dependent upon the change in society's knowledge, attitudes and values related to the nature and the environment. With this kind of affective changes, the people would be willing to adopt environment friendly life styles commensurate with the earth's ecological capacity. Thus, the affective behavioral change is essential to develop and reinforce environment respecting moral values.

Every human being has a great variety of feelings for different aspects of his or her surroundings. The western, modern approach values the resources of Nature for their utilitarian importance alone. However true environmental values go beyond valuing a river for its water, a forest for its timber and non-wood forest products, or the sea for its fish.

Environmental values are inherent in feelings that bring about a sensitivity for preserving nature as a whole. This is a more spiritual, Eastern traditional value. There are several writings and sayings in Indian thought that support the concept of the oneness of all creation, of respecting and valuing all the different components of Nature. Our environmental values must translate to pro conservation actions in all our day to day activities. Most of our actions have adverse environmental impacts unless we consciously avoid them. The sentiment that attempts to reverse these trends is enshrined in our environmental values. (Indian Agricultural Statistical Research Institute, 2012)

Humans have an inborn desire to explore Nature. Wanting to unravel its mysteries is a part of human nature. However, modern society and educational processes have invariably suppressed these innate sentiments. Once exposed to the wonders of the wilderness, people tend to bond closely to Nature. They begin to appreciate its complexity and fragility and this awakens a new desire to want to protect our natural heritage. This feeling for nature is a part of our constitution, which strongly emphasizes this value.

The value system has been altered with time. Similarly, with the large tracts of forest that existed in the past, cutting a few trees was not a significant criminal act. Today this constitutes a major concern. We need a strong new environmental value system in which felling trees is considered unwise behavior. With the small human numbers in the past, throwing away a little household degradable garbage could not have been considered wrong. But with enormous numbers of people throwing away large quantities of non-degradable waste, it is indeed extremely damaging to the environment and our value system must prevent this through a strong environmental value education system.

While we do need economic development, our value system must change to one that makes people everywhere support a sustainable form of development so that we do not have to bear the cost of environmental degradation. Environmental problems created by development are neither due to the need for economic development, nor due to the technology that produce pollution, but rather to a lack of awareness of the consequences of unlimited and unrestrained anti-environmental behavior.

Looked at in this way, it deals with concepts of what is appropriate behavior in relation to our surroundings and to other species on Earth. How we live our lives in fact shapes our environment. This is what environmental values are about.

Each action by an individual must be linked to its environmental consequences in his/her mind so that a value is created that leads to strengthening pro-environmental behavior and preventing anti-environmental actions. This cannot happen unless new educational processes are created that provide a meaning to what is taught at school and college level. Every small child while growing up asks questions like 'What does this mean? They want an explanation for things happening around them that can help them make decisions and through this process develop values.

It is this innate curiosity that leads to a personalized set of values in later life. Providing appropriate 'meanings' for such questions related to our own environment brings in a set of values that most people in society begin to accept as a norm. Thus pro environmental actions begin to move from the domain of individuals to that of a community. At the community level, this occurs only when a critical number of people become environmentally conscious so that they constitute a pro-environment lobby force that makes governments and other people accept good environmental behavior as an important part of development.

Environmental values have linkages to varied environmental concerns. While we value resources that we use as food, water and other products, there are also environmental services that we must appreciate. These include Nature's mechanisms in cleaning up air by removing carbon dioxide and adding oxygen by plant life, recycling water through the water cycle of nature, maintaining climate regimes, etc. But there are other aesthetic, ethical values that are equally important aspects of our environment that we do not appreciate consciously.

While every species is of importance in the web of life, there are some which man has come to admire for their beauty alone. The tiger's magnificence, the whale and elephant's giant size, the intelligence of our cousins the primates, the graceful flight of a flock of cranes, are parts of nature that we cannot help but admire. The lush splendor of an evergreen forest, the great power of the ocean's waves, and the tranquility of the Himalayan mountains are things that each of us values even if we do not experience it ourselves. We value its being there on Earth for us. This is called its 'existence value'. The list of wondrous aspects of Nature's intricate connections is indeed awe-inspiring. This is also a part of our environment that we must value for its own sake. This is the oneness of Nature. We must equally look at our environment beyond the wild sphere. There is incredible beauty in some man-modified landscapes, the colored patterns of farmland or the greens of a tea or coffee plantation in the hills. Urban gardens and open space are also valuable and thus must be of prime concern to urban planners. These green spaces act as not only the lungs of a city, but also provide much needed psychological support. The mental peace and relaxation provided by such areas needs to be valued, although it is difficult to put a price tag on these values. Nevertheless, these centers of peace and tranquility give urban dwellers an opportunity to balance their highly man-modified environments with the splash of green of a garden space. (Bharucha, 2005)

Environmental values must also stress on the importance of preserving ancient structures. The characteristic architecture, sculpture, artworks and crafts of ancient cultures is an invaluable environmental asset. It tells us where we have come from, where we are now, and perhaps where we should go. Architectural heritage goes beyond preserving old buildings, to conserving whole traditional landscapes in rural areas and streetscapes in urban settings. Unless we learn to value these landscapes, they will disappear and our heritage will be lost. As environmentally conscious individuals we need to develop a sense of values that are linked with a better and more sustainable way of life for all people.

The most fundamental environmental sentiment is to value Nature herself. Appreciating the magnificence and treasuring life itself leads to positive feelings that are a manifestation of pro environmental consciousness. The one-ness of our lives with the rest of nature and a feeling that we are only a miniscule part of nature's complex web of life becomes apparent, when we begin to appreciate the wonders of nature's diversity.

Environmental values can simply be described as how sensitive the individual is to the environmental and environmental issues. When we talk about environmental values we know that there is no better measure of environmental responsibility than direct observation of young people, over a significant period, who are minimizing their environmental impact, reducing consumption and reusing and recycling materials.

Therefore, we can say that there is an urgent need of understanding the concepts of environment and developing environmental knowledge and values in people especially among youth as they are going to be the future policy makers and those who have to live in this environment for years.

1.9 Status of Environment Education in Colleges/ Universities

It was found that at the primary level, Environmental Education is given the requisite importance in primary school and an Environmental Study is considered to be a key subject. However, with the increase in class level, the significance of Environmental Education declines. Often, chapters related to the subject are taught by teachers at the end of the term; once they are done with the "real" syllabus. And sometimes, the students are told to just go through them and rote learns them for the examinations. This approach may work for subjects that are more theory oriented but for environmental education dialogue and project work are much more cardinal. (Kataria, 2013)

A study of undergraduate and postgraduate curricula even in subjects connected to environment such as biology and zoology shows that the value of environment and the need for its conservation have been inadequately dealt with. Formal professional education in conservation has few takers as

there are very few job opportunities. This has to be reversed. If jobs are created, young people committed to the cause would undoubtedly gravitate towards these professional courses on conservation. Education awareness and training will need not only a whole new approach but also a substantial increase in funding. The outcome and benefits however would far outweigh the costs, as the value of biological diversity is indeed priceless.

Interestingly the new wave for infusing Environment Education (EE) into curricular processes in schools and colleges in India has been triggered by the Supreme Court in response to MC Mehta's Public Interest Litigation. However, responses to this though positive, have been slow. It is as if Government wishes to appease the Court by putting out statements that it has responded to the Supreme Court's orders by instructing organizations such as the NCERT and SCERTs to introduce Environment Education in schools and the UGC in colleges. While some information on environment has begun to appear in textbooks, it is still poorly dealt with. Most of the 'gaps' in information is related to ecosystem studies and the species diversity and richness of our country. Biodiversity, especially in relation to the mega diversity status of India and the urgent need to conserve it, is conspicuous by its absence in school curricula and textbooks. At the college level the courses have not been altered to bring about a concern for environment conservation. Issues such as the loss of biodiversity and extinction of species are rarely included in the curriculum at undergraduate or postgraduate levels. A major gap is concepts related to sustainable development. Most importantly formal curricular processes have not been aimed at creating pro-conservation behavior. (Bharati Vidyapeeth Institute of Environment Education and Research, 2004)

In India, there are only 123 colleges which offer bachelor's degree programme and 288 colleges which offer master's degree programs on environment sciences. Further, only 20 colleges offer courses like Diploma, 24 colleges, P. G. Diploma and 27 colleges offer M. Phil. Also only 59 colleges offer Ph. D. and just 20 colleges offer some certificate courses. (Target Study, 2016).

Thus, we can see that ratio of colleges offering environment education courses are very few as compared to other courses. Moreover, all these are separate courses and degrees which are provided by universities and colleges in field of environment education but the environment education is not taught as core course and as a compulsory subject in universities till now.

1.10 Need for Environment Education at Colleges Level

In India, learning from nature is a tradition in most cultures in which people base their lives directly on natural resources. Modern school and college education in India tends to in fact negate learning from the students' own surroundings. While there have been efforts to use non formal learning tools in some special schools, this is not brought into standard methods of teaching in the formal Educational sector. One would expect that this environment is a great economic resource and one that is being rapidly lost, should generate a deep concern in people

Many NGOs and Government agencies in India have tried to generate an awareness of the value of environment; they have been unable to create a critical mass of individuals who could strongly lobby for biodiversity conservation. What then is the prime cause of the failure of our conservation NGOs and NGIs to bring about a mass conservation awareness movement? A green movement can only succeed in creating pro conservation policies if it has been able to work through a strong lobby force based on a significant proportion of human society. If this critical proportion of the population is not reached, there can be no strong desire on the part of elected representatives in Government to implement conservation action. It is evident that the NGO sector, which constitutes good models for creating conservation awareness, cannot be expected to reach every member of human society in India through an organized and homogenous strategy. Thus conservation consciousness in a society which consists of diverse stakeholders requires a totally different approach. If a large proportion of human societies have to be addressed through a common conservation education and awareness initiative, the most effective tool is undoubtedly school and college education. (Bharucha, 2005)

A study at Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER), Pune, both in rural and urban schools showed that information on environmental conservation rapidly percolates into the students' families and disseminates into local community thinking. Thus perhaps the most important tool for enhancing conservation awareness has remained essentially untapped in India. It has the potential to reach a large segment of India's population through an existing well-organized sector, which is essentially aimed at education and is responsible for the evolution of attitudes and behavioral changes in the country. College students are the opinion makers of tomorrow's society. They are also receptive to new ideas and are able to act for conservation if their concern is kindled. (Bharati Vidyapeeth Institute of Environment Education and Research, 2004)

Today, all the development concepts begin with the concern for environmental issues and the need for sustainable alternative to current practices. Every country is trying to make necessary changes in the infrastructures as a step toward sustainable development. Environment education is being talked about more and more in general but it remains a neglected course in favor of more traditional subject and specialization oriented requirements for higher education. Thus, the students remain ignorant of ecology, its impact of human beings and its vulnerability to human interference.

The myriad environmental problems facing our world today make the need for comprehensive and motivating environmental education even clearer. We believe that environment education is best developed and implemented in the educational institutions. But it is yet to become the integral part of curriculum at all levels of the education.

Environment education at college level is very critical because complex environmental changes require a well trained environmental workforce and educated citizens who have the knowledge and skills to actively participate in conserving the environment and natural resources. Environment education is also necessary for ensuring the health and welfare of the nation by protecting human health, providing quality education, creating employment opportunities, promoting sustainable development and protecting our natural heritage.

Various agencies and organizations are working to enhance formal environmental education programs that target students, teachers, and faculty, as well as non formal programs that target adults, communities, senior citizens, and other specific audiences outside the formal education system. These programs vary in scope and effectiveness, but all have contributed to the goals of environmental education. At the same time, it has been found that the field of environmental education faces many issues and challenges, such as limited resources to sustain programs over the long-term; gaps in program development and access to quality materials; as well as inadequate support for in-service and pre-service teacher training. In addition, because environmental education is not viewed as a national priority, universal guidelines do not exist to assure quality program development and implementation, and it is not often well integrated into state and local education reform efforts. (U.S. Environmental Protection Agency, 1996).

There are several principles that each of us can adopt to bring about environment conservation. This primarily comes from caring for our Mother Earth in all respects. A love and respect for nature is the greatest sentiment that helps bring about a feeling for looking at how we use natural resources in a new and sensitive way. Think of the beauty of a wilderness, a natural forest in all its magnificence, the expanse of a green grassland, the clean water of a lake that supports so much life, the crystal clear water of a hill stream, or the magnificent power of the oceans, and we cannot help but support the conservation of nature's wealth. If we respect this, we cannot commit acts that will deplete our life supporting systems. (Bharucha, 2005)

This love and respect for the nature and natural resources can be cultivated in people by making them knowledgeable and inculcating values for the environment. The best way to happen this is through educating them about environment. This will lead to their higher environmental knowledge and values which will further lead to their environment friendly actions and hence pro environmental behaviors.

Thus, a need was felt to study the environment knowledge and values of the undergraduate students so that their current level of environment knowledge and their values can be found and further actions can be taken to improvise them.

1.11 Research Questions

In the light of the above discussion, the following questions aroused:

- How much the undergraduate students are knowledgeable in relation to the environment?
- How much undergraduate students value their environment?
- Which factors affect the environmental values of students?
- Which factors affect the environmental knowledge of students?
- How the knowledge and values of undergraduate students regarding environment are related?

1.12 Statement of the Problem

To seek answers to these questions it was decided to undertake a study on "**Environmental Knowledge and Environmental Values of Undergraduate Students of The Maharaja Sayajirao University of Baroda"**

1.13 Justification of the Study

Human interaction with the environment started from the moment he appeared on earth. The early man afraid of lighting, thunder, dense forests and darkness, started worshipping different aspects of nature. His activities or interaction with the environment had very little impact on it. Gradually, he started making radical changes in the environment to suit his needs. The phenomena reached their summit so to say on a work-wide scale in the twentieth century.

The failure to understand the place and role of man in the environment, the absence of elementary knowledge of the biosphere among people in most countries of the world and the booming scientific and scientific revolution created serious imbalance. The modern development of science and technology led too often to a wasteful intensification of the exploitation of natural resources (United Nations, 2016).

The activities of human beings are always affected by human values. People's diverse environmental values and viewpoints influence how they interact with the environment and how they think natural environment should be treated. Although the environment crisis has been brought about by activities of human beings, it is in fact crisis of knowledge and values about environment. It is about the idea of realizing the values of the environment and accepting it. Human create cultural values based on nature (that is natural values). However, people used to believe that only humans had values while the environment did not. We recognize only cultural values not environmental values. Moreover, we often realized cultural values by damaging environmental values. Those behavior has caused a loss to the environmental values and damage to the natural basis on which human create cultural values, which has led to the problem of non- sustainability. It is under such circumstances that the issue of environmental values has arisen. (Yu and Lei, 2007)

Kumar (2011) stated that one in every seven persons on this planet lives in India. With 16 percent of the world's population and only 2.4 percent of its land area, there is a heavy pressure on the natural resources including land. Apart from them, human activities towards environment lead to unexpected gigantic hazard for the whole creature in the coming few years. Day by day human is consuming these natural resources in an unsustainable way. The main reason behind this is the non cooperative thinking with nature. Awareness and involvement of the civil society is a precondition of checking environmental degradation. So for that we should create environmental awareness among people for the sake of our green planet.

Each day people make decisions that affect the environment, whether they are getting ready to go to work, preparing dinner, or buying products for the house or garden. It's imperative, then, that the public learn and understand how their actions and lifestyle intersect with the environment.

Environmental educators believe that the earlier children begin to learn about sound stewardship principles, the better it is for them, their families, and society. Today's children will one day be responsible for making decisions that will shape the future health of the environment. To prepare

them for such responsibilities, they need a sound environmental education as a foundation upon which to make those decisions. Most important, environmental literacy helps develop and expand children's critical thinking skills, prepares them for citizenship, nurtures their appreciation of the natural world, and enhances their physical well-being**.** (Chepesiuk, 2007)

"Environmental literacy seeks to change human behavior so that humanity can create a sustainable and environmentally friendly quality of life. To do that, people need a wide range of skills that can help them understand, assess, and use environmental health (Chepesiuk, 2007)

Thus there is a need that people have high levels of environmental knowledge and values as low level of knowledge regarding environmental resource's scarcity can lead to its overuse and can diminish future opportunities. If large quantities of resources are used now, future generations will bear higher costs for exploiting the same resources. In other words, if the present uses of resources do not account for their *scarcity value*, scarcity in the future will increase, thus leading to extra costs to society to exploit the same resource.

The environment studies make us aware about the importance of protection and conservation of our mother earth and about the destruction due to the release of pollution into the environment. The increase in human and animal population, industries and other issues make the survival cumbersome. A great number of environment issues have grown in size and make the system more complex day by day, threatening the survival of mankind on earth. (Indian Agricultural Statistical Research Institute, 2012)

The researcher, while reviewing the literature found that there were studies mainly on environmental knowledge and attitudes of school children and teachers but very few on college students. Compared to India, more studies on environmental awareness and attitudes have been conducted abroad. The studies in India and abroad mainly focused on studying the environmental awareness, attitudes and behavioral practices of undergraduate students. Very few studies conducted abroad focused on environmental knowledge and values of the students.

In spite of the developing status of the environment awareness, the formal study of environment has so far not received adequate attention in our academic performances. There are no proper guidelines has come yet for environmental studies at college level. The environment course curriculum suggested by UGC as core course in all colleges has also not introduced in many universities including The Maharaja Sayajirao University of Baroda. Our research tries to understand the level of knowledge and values that college student's hold for natural environment. This study will help in understanding that whether students of our university have those values for environment protection and conservation or not. This study will help to find out that whether there is need of administering environment education at higher level of studies or not.

The purpose of this study is to propose an efficient and unbiased method of finding out environmental knowledge and values of the students and to identify factors influencing an individual's environmental knowledge and values. This study can assess the further need for adding environmental knowledge and inculcating the environmental values in students. Thus it will help the researchers in planning further studies about environment and environmental educational programmes. "A study of environmental knowledge and environmental values" is worth studying and will go a long way in solving many problems allied with environmental issues.

1.13.2 Justification of the sample of the study

Young people constitute a large part of the world's population. Youth have both special concerns and special responsibilities in relation to the environment. A number of environmental risks and hazards disproportionately affect young people, who have to live for an extended period with the deteriorating environment bequeathed to them by earlier generations. Young people will be compelled to engage in new forms of action and activism that will generate effective responses to ecological challenges. (United Nations, World Youth Report, 2003)

According to the sociologist Morris Messy, there are three periods during which values develop. And according to him age between13-21 is called the socialization period. In this period, we are largely influenced by peers and media and hence we develop as individuals and look for ways to get away from the earlier programming, we naturally turn to people who seem more like us. Universities can play a significant role in educating youths on sustainability. They can encourage their graduates to be socially and environmentally responsible professionals. Hence with reaching at graduation level students would have developed as individuals and there are very few chances of their values influenced by others. Thus to give them knowledge and inculcate values in them related to environment at this stage will stay with them for lifetime.

Alibeli and Johnson in 2009 also revealed that young and educated people are more concerned about the environment than the old and the less educated.

Young people constitute a large part of the world's population. Many, especially young children, are particularly vulnerable to environmental risks associated with, for example, access to clean and safe drinking water. In addition, young people will have to live longer with the consequences of current environmental decisions than will their elders. (United Nations, World Youth Report, 2003)

In politics, youth can help by making their influence felt as a constituency for the long term, calling political leaders to account for the long-range environmental consequences of their decisions.

Aside from having a greater stake in the more distant future, young people are especially well-placed to promote environmental awareness simply because they often have better access to information about the environment than do their elders. In part this is a matter of having being exposed to more environmental education in schools, at least in the developed world and perhaps more sporadically elsewhere. Aside from exposure in formal education, youth have lived all their lives in an era in which environmental issues have loomed large. (United Nations, World Youth Report, 2003)

Established anti-ecological ways of thinking and behaving are not ingrained in young people, and they can introduce fresh ideas and outlooks to issues. Because youth have a stronger awareness of the issues and a greater stake in long-term sustainability, the environment is one area in which they ought to take the lead. In many countries, a generation that came of age politically in the 1970s organized and established environmental movements and green parties. To combat "the graying of the greens", a new generation needs to come to the fore. They will face challenges as pressures are brought to bear in the opposite direction. The commercialization of every area of life affects young people too. In addition, technologies that increasingly distance people from the environmental effects of their consumption decisions are growing with globalization, acting as an impediment to environmental awareness. (Mani, 2012)

Also, aesthetic values are fully developed at the college stage. In a study, Gunthorp studied the growth trends in artistic appreciation in children of seven to eighteen years. A positive correlation was found between the aesthetic scores and chronological age, indicating increasing aesthetic maturity with psychological age and hence college students will be mature enough to be studied for aesthetic values of environment, values to keep environment clean and healthy. (Prasad, 2008)

There is no better measure of environmental responsibility than direct observation of young people, over a significant period, who are minimizing their environmental impact, reducing consumption and reusing and recycling materials. Nevertheless, there are other indicators that young people may be on the path to sustainability. These include:

- Their own reports of comparable behaviour out of college;
- Their expressed willingness to adopt measures like energy saving or to allocate resources for conservation;
- The position they place the environment in any list of concerns or values;
- Their expressed willingness to forego consumption and accept government regulation for environmental preservation; and finally,

- The extent to which they show concern for all life and not simply that of humans.

- The latter includes the desire to protect flora and fauna, a willingness to scrutinize the consequences of economic activity and a willingness to combine long-term with short-term planning.

Students just after school get freedom in college. This is the time when they have to decide at their own that what is right or wrong. The pressure of teacher watching you every time is not there in college atmosphere. So at this time what they say and do reflect their values.

College students have read enough about environment in their schools and also in their home from parents. So they are well aware about the environmental concerns and hence can better understand the need to save environment.

They explore environment the most. They see and visit the maximum areas than any other group. They touch college, home, cafeteria, garden, public transport, theatres, picnic areas, etc. While exploring all these areas they come in contact with media the most. They knowingly or unknowingly comes in contact with media like hoardings, boards, rallies, loudspeakers, and all other media and can understand the need to save the environment. They use electricity, vehicles, recyclable and non recyclable things. They are the youth of today and they keep power to change things. They have freedom, energy and decision taking power. So whatever they see and do affect environment. So after so much exposure to environment, it will be interesting to know that whether our youth actually value environment? How much they are conscious and worry about environment?

There had been some studies on environmental knowledge and attitudes of teacher's and primary students but to study of environmental values of undergraduate students of The Maharaja Sayajirao University has not been done yet. This study on undergraduate students is appropriate because many students leaves study after graduation and become important persons in the society and some join post graduation where they become more engaged in studying about more specific subjects.

Literature indicates a positive relationship between educational attainment and environmental concern. A number of authors suggest that education serves to heighten environmental concern and awareness because it can increase an individual's ability to appreciate complex and integrative large-scale problems (Hines, Hungerford and Tomera, 1987; Milbrath, 1989). That is to say, students develop a worldview, or a constellation of beliefs, attitudes, and perspectives about the importance of the natural environment and humans' relationship to it (Norton, 1991; Tomsen and Disinger, 1998).

As educators, colleges are in a unique position to inform future leaders about environmental issues. Colleges would be remiss if they simply developed sustainability projects designed to make their campuses green, without attempting to instill in their students an ethic of care for the environment. What is needed is a more comprehensive approach towards environmental education. (Longwell, R., 2011)

With our college having such a beautiful campus, it will be very interested in finding how many students truly appreciate this and would work to maintain such a positive attribute to our college.

Therefore, we planned this study to observe college student's environmental knowledge and values in relation to environment.

1.13.3 Justification of Variables

Over the past 20 years, a significant body of research has been developed concerning the variables of environmental attitudes and behaviors. A major impetus in this effort has been the high level of concern expressed by the public over environmental issues. (Ewert, and Baker, 2001). Kempton et al. (1995) suggest that concerns for environmental issues often emerge from three sources: religion, anthropocentric (human-centered) beliefs, and bio centric (biology-centered) beliefs.

It is interesting that this increased level of public concern has not often been associated with increased levels of pro-environmental behavior. De Young (1996) posits that behaviors can best be modified by employing more effective positive motivational techniques, coercive motivational techniques,

and overall information techniques. Other factors that may influence the relationship between environmental attitudes and behaviors have included the specific situation (for example, the local community), age, residence, family values, level of education, sex, ethnicity, and political ideology.

Numerous studies evaluating sex with respect to environmental concern have produced mixed results. Several authors have generally supported the belief that women tend to express greater concern over the state of the environment than do their male counterparts (Burger, Sanchez and Gibbons, 2001). Others have found men to be more responsive to environmental issues than women (Arcury, Johnson, and Scollay, 1986). Of the many variables studied, education has proven to be the most consistent in its relationship to levels of concern (Wall, 1995). Much of the research indicates that there is a significant relationship between level of education and expressed environmental attitudes and concern. Moreover, education is traditionally viewed as a function of the amount of schooling received (for example, high school versus university levels of education). Assessment of the type of education has been less defined in the literature.

Few writers have attempted to construct models of the factors that research suggests are related to environmental concern. Such models make a distinction between cognitive variables or the levels of understanding of environmental issues and how to take action; psycho-social variables that include attitude towards environmental issues; locus of control or feelings of efficacy - capacity to bring about change; and sense of responsibility to do something to reduce environmental degradation; and finally, demographic variables such as gender and level of educational attainment.

Psycho-social variables generally have stronger associations with responsible behaviour than do demographic variables. Of particular relevance to the study reported here is their finding that in the studies surveyed, “there appears to be no relationship between gender and responsible environmental behaviour". It was also argued that situational factors such as economic circumstances (relevant to both family incomes of rural and urban residents alike) may either reinforce or weaken the effects of psycho-social variables (Hines, Hungerford and Tomera, 1987).

The present study has been undertaken to study the environmental knowledge and values of the undergraduate students. Therefore, the above mentioned factors may affect the environmental knowledge and values of the students. The study highlights the environmental knowledge and values of the students in relation to the following variables:

1. Faculty
2. Year of study
3. Gender
4. Family type
5. Family size
6. Monthly Family income
7. Place of residence
8. Mother's education
9. Father's education
10. School board of Education
11. Medium of instruction in School
12. Participation in environment related activities
13. Environmental as a subject in school
14. Mass Media Exposure
15. Civic Responsibility

1. Faculty

A number of authors suggest that education serves to heighten environmental concern and awareness because it can increase an individual's ability to appreciate complex and integrative large- scale problems (Hines, Hungerford and Tomera, 1987 and Milbrath 1989).

That is to say, students develop a worldview, or a constellation of beliefs, attitudes, and perspectives about the importance of the natural environment and humans' relationship to it (Norton, 1991; Tomsen and Disinger, 1998).

Extending this perspective, Gouldner (1979) argues that education involves two streams of study: humanistic and technical. That is to say, higher education differentially prepares people either along comprehensive, but relatively unfocused, lines (humanistic) or highly technical and professional endeavors (technical). Although this can be an oversimplification, it may be reasonable to expect that individuals are attracted to various academic disciplines, in part, because of their own personal beliefs and psychological characteristics (De Young, 1996).

Different academic fields of study have different influence on environmental awareness and sensitivity. In other words, academic discipline could be an external factor that mediates the relationship between education, beliefs, and attitudes (Baronand Kenny, 1986; Guagnano, Stern, and Dietz, 1995).

Education and its more specific surrogate, academic major, may serve as a means to inculcate students with both a general perception of the natural environment and an understanding of how natural resources should be viewed from a disciplinary perspective (for example, arts vs. science). Although not directly focused on education, works by Tarrant and Green (1999) and Jackson (1986) point to the mediating influence of participation in outdoor recreation activities in the attitude-behavior relationship to environmental attitudes. In this case, one suggestion they put forth is that people choose outdoor recreation activities that are consistent and congruent with their personal belief system. The same paradigm might be in operation in the case of this current study with personal beliefs influencing the type of academic major engaged in. Thus, the ambient beliefs and attitudes the individual perceives as surrounding a particular professional environment and as exemplified through an academic major (for example, classmates, type of work, literature, professorial attitudes, etc.) may serve to attract particular students to particular academic majors.

In our study we have taken different faculties like arts, science, family and community sciences, technology, commerce, medicine etc. As we can understand that each faculty deals with different subjects and courses for their studies. The science and technology faculty's students study physics, chemistry, biology and other subjects which teach them about the physical and chemical reactions taking place in environment. Biology students are taught how human body influenced by chemical changes in environment and are more into understanding the causes and consequences of whatever happening in the environment in a scientific way. The students from other faculties may also be getting environment related knowledge from other sources like media around us, lots of campaign running to protect environment and various seminars and conferences organized by different faculties to educate students about need to protect environmental. Students get exposed to environment related knowledge differently in different faculties. Both education and academic major may act as mediating variables in the development of environmental knowledge and values.

So it will be interesting to know that how much influence a faculty or course content has on its student's knowledge and values related to environment.

2. Year of Study

We have taken undergraduate students from class first year, second year and third year. When a student enters in first year, he or she have just left school and when he is in second year, he is well exposed to the activities of college and when he is in third year, he is ready to enter in world of higher studies or family life. He has well exposed to all the subjects, teaching and experiences. So all these stages of college life may have effect on the knowledge and values related to environment.

While going to higher classes in college, students are influenced by many external factors, role models, and many personalities regarding their attitude and behavior towards environment. Teachers and college related role models become more influential than parents or other familial role models. Media are an important factor in influencing students regarding environment concerns.

It was also found that demographic factors such as gender and years of education may have some influence on one's attitude and pro-environmental behaviors (Fernandez Rodriguez, and Carrasquier, 2007; Tuncer, Ertepinar, Tekkaya, and Sungur, 2005, Uitto, Juuti, Lavonen, Byman, and Meisalo, 2011)**.** It is understood that older students possess more positive attitudes and pro environmental behavior in their final stages of their course compared to students in the earlier years (Fernández et al., 2007; Kollmuss and Ageyman, 2002; Scott and Willits, 1994; Zarrintaj, Sharifah, and Binti Abdul, 2011).

Year wise increase in knowledge and exposure can be possible especially for the students of those faculties offering Environment Education. In general also, one accumulates more experience, information and exposure as one move's further in studies and in life.

So as student will enter in higher class he or she is expected to understand better the need to save the environment. More he will explore surroundings, more he will face seminars and other environment related activities and hence may get more influenced by all these experiences. He can also get influenced by watching his seniors and teachers.

It will be interesting to find out that whether the level of environment knowledge and values increase with year of study or not.

3. Gender

Socialization and gender-role theories suggest women are raised to value and empathize with the needs of others more than men and as such behave in a more compassionate, nurturing, and cooperative manner in general (Stern, Dietz and Kalof, 1993).

Indeed, empathy is fundamental to the expression of environmental concern and behavioral intention, and more broadly to altruistic behavior. Thus empathy or the valuing of others has been suggested as influencing gender differences in environmental concern and behavior. (Keller, 1985).

As we can observe in our routine life, that women are more concerned about aesthetics in their life than men. They are more sensitive also on various social and environmental issues than men. This is a general nature we observe in men and women. In our home also we see that our mother is more concerned about maintaining hygiene in the house than father. So by seeing the mother the girl child automatically becomes more trained in this direction. Keeping clean home is the first step towards keeping environment clean. So when she goes out of her home she would like to keep her surroundings also clean and hygienic. And when they will be coming in contact with media like hoardings, rallies, etc. saying how to protect the environment, they may become more sensitive towards these environmental issues.

Boys may be less environmentally concerned than girls, possibly because they have in the past defined themselves more in terms of being prospective paid workers than girls. It has been hypothesized that women's greater involvement in child-rearing and education, cooking, cleaning and shopping encourages concern about the effects of contamination of air, soil and water on humans. The extension of women's greater nurturing role into the labor market, where they predominate in the human service industries such as teaching, social work, nursing, secretarial and sales work, away from direct control over production (in jobs such as manufacturing, management and finance), could be said to promote a caring ethic that eco feminist writers claim is central to an environmentally responsible consciousness. (Hampel, and Holdsworth, 1996)

On the other hand, boys also learn about environment from various mass media. So many knowledgeable things which these media cover are perceived by boys also. There more like to go on adventurous tour and get chance to experience nature more closely.

It was also found that boys have more utilization values than girls (Oerke and Bogner, 2010).They use resources to the fullest with minimum wastage which go in favor of environment.

Finally, eco feminist theory draws upon the evidence of men's economic and political power and women's domestic responsibilities, that they see reinforced in academic literature and popular culture, to explain women's allegedly lesser interest in power and status, and greater sense of connectedness with, and concern about, other things.(Hampel and Holdsworth, 1996). So it will be interesting to know if gender makes difference in knowledge or values for environment.

4. Family Type

Family is the basic and universal social structure of human society. It fulfils needs and performs functions, which are indispensable for the continuity, integration and change in the social system.

It determines the development of individuals, in that; it is a major source of nurturance, emotional bonding and socialization. In contemporary urban society, families present a peculiar combination of traditional and modern values. The new identities and changing value patterns also affect the attitude of the individual members of the family. (Bahadur, and Dhawan, 2008)

The type of family can be the reason for differences in the environmental awareness of children. Members of nuclear families are considered more responsible and have less financial needs which can help them to adopt environment friendly practices better. In joint families, there is sharing of responsibilities and less freedom of action towards environment.

In contrary to that in nuclear families, parents have no time to teach their child environmental values whereas in joint families the grand parents can tell them about cultural importance of plants and trees and they may develop more respect for environment. So it will be of interest to know how joint or nuclear family atmosphere affect environmental knowledge and values of the respondents.

5. Family Size

Although the inverse relationship between the number of siblings and children's environmental knowledge and values has not been well established, explanations for this relationship remain primitive. One

explanation, resource dilution, posits that parents have finite levels of resources (time, energy, money, etc.) and that these resources are diluted among children as sibling size increases. First, the availability of parental resources decreases as the number of siblings increases. (Downey, 2015)

The functional form of this relationship is not always linear, however, and depends on whether the resource is interpersonal or economic. Second, parental resources explain most or all of the inverse relationship between sibling size, educational outcomes and children's concern for environment. Finally, interactions between sibling size and parental resources support the dilution model as children benefit less from certain parental resources when they have many versus few siblings. Also as family size increases there will be increase in energy consumption in the family. (Marjoribanks, 2013).

Large family size may be characterized as less time for parental interaction with their children individually. There may be more emphasis on fulfilling basic needs of family than spending for environment friendly practices. Therefore it was of interest to study the effect of family size on environment knowledge and values of undergraduate students of The maharaja Sayajirao University of Baroda, Vadodara.

6. Monthly Family Income

"Socio-economic status differences in children's reading and educational outcomes are ubiquitous, stubbornly persistent and well documented" (Aikens and Barbarin, 2008).

The relationship between family income and environmental knowledge is due to a complex interaction of a number of variables, it appears to be generally accepted that family income impacts to a considerable extent on various aspects of students' learning experiences like families with high income can opt for more aesthetic aspect of human existence or "quality of life", such as better environment. Also, People under severe financial constraint often do not have the time, money or inclination to engage in measures to ensure ecological as well as economic sustainability. (Ahmar, and Anwar, 2013)

Higher incomes that, in turn, often translate into a heightened willingness and capacity to pay for increased environmental protection (Smith, 1995).

It can be said that more income can lead to better quality of life which can in turn result into better practices and behavioral patterns towards environment. Thus, in our study we will try to find out that whether family income affects the environmental knowledge and environmental values of the respondents or not.

7. Place of Residence

Rural life styles have close links with nature and its resources. Thus the environmental problems that manifest in rural areas of the country are largely due to over-use or misuse of resources mostly because of sheer poverty, ignorance and lack of alternatives. The denudation of vegetative cover due to expansion of agricultural activities, indiscriminate collection for firewood and the overgrazing by cattle and other livestock and consequent soil erosion are good examples of the impoverishment of environmental resources. The growing use of chemical fertilizers, insecticides, pesticides, weedicides and non-availability of systems for the disposal of community wastes leading to the contamination of water courses and creation of insanitary living conditions in the rural areas. (Raja, 2012)

The practices like keeping manure pits and catties near the homes, defecating in the open fields, leaving dead animals exposed, and lack of proper drainage make the surrounding worse. These practices prevailing in rural areas shows lack of knowledge related to environmental issues in the people of rural areas.

In comparison with people living in urban area, people living in rural area live in environments that are less heavily modified by human activity. They also depend more directly on the extraction or use of natural resources and are more likely to suffer the kinds of economic weaknesses that could lead them to favor economic development even at the expense of environmental protection.

On the other hand, as rural populations are much more dependent on the surrounding natural environment than the urban one, they may value the environment more than people living in urban area. Thus, it will be interesting to know that whether the place of residence make any difference in environmental knowledge and values of the respondents.

8. Mother's Education

Increased autonomy for mothers in India improves child welfare, specifically in terms of whether children attend school or participate in the activities carried out in school. In this context, the factors used to determine how much autonomy a mother possesses are her education and employment status, her education and income contributions relative to her spouse, and the extent of gender equity that prevails in the region in which she lives. (Luz, and Agadjanian, 2015)

Mothers are closer to their child. Mothers by their role itself affects child. They manage the home and its resources so we can say that in general, mothers are more concerned about local environmental problems than fathers. The reasons for such differences are based on role in the society: mothers prioritize welfare and health of family (which closely associates with the local environmental quality such as water, air and solid waste). Thus, more educated mother may provide environmental knowledge and concern better through conversation, books, magazines and opportunities to travel.

A well-educated mother may be more active and aware about the environmental concerns and the ways to protect and help environment compared to an illiterate mother. She will be more exposed to day to day environment. So she can better teach her children the environmental values.

Mothers' education also matters later in childhood. College-educated mothers are able to more appropriately tailor cognitively stimulating activities to their children's developmental level and they are more equipped to help kids do homework and study for tests. (Sutherland, 2015)

More educated mothers are more likely to be part of social networks containing knowledge, skills, and resources that are relevant to children's academic success and concern for environment. For instance, their relatives, colleagues, and friends are likely to also more educated, meaning mothers can easily pick up tips about the healthy environmental practices from them and pass on to their children. Plus, their children will be surrounded by highly educated role models; in their circles, and learn environment friendly practices.

Mother’s with different education levels and abilities may raise their kids differently. So, it’s well worth exploring how these differences play out role in gaining environment knowledge and values in their children.

9. Father’s Education

Children's development of early literacy begins at birth and relies on a range of environmental stimuli. Fathers can ensure that their children are exposed to the best environmental stimuli by participating at home and in early childhood education settings, which are often children's first significant experience outside of the family. In this way, fathers can be supported as they foster optimal early childhood experiences through which their children can develop cognitive abilities. For example, they can tell stories, read and select books related to environment with their children, and learn how to use household equipments efficiently. Fathers can provide opportunities for children to scribble and write, learn new vocabulary, identify letters and important words such as their names, and utilize relevant print within and outside the household Fathers can talk with their children about how to save environment (Gadsden and Bowman, 2007)

While father’s priorities economic and material well being of the family, the higher education can be associated with higher concern for environment since it is directly related to the access to information on environment and ability to process the information into knowledge. Thus they can better influence their children’s thinking process by their knowledge and following of eco friendly practices.

More educated father may be more disciplined in his values about environment and hence can more transfer his habits or behavior related to environment to his children. More education may lead to better job. Better job means having more economical “surplus” which may allow individuals to pay more attention to the “luxury good” for environmental quality. More income help parents to provide environmental knowledge and concern through conversation, books, magazines and opportunities to travel which can make children more knowledgeable about environment and teach them value environment more.

It can be said that more educated father may be more exposed to the environmental issues ans may be more aware about the alternative resources available to save the environment. This concern for environment may be expressed to their children through interactions and actions and their logic while growing.

Thus, it is of interest to find out that how environmental knowledge and values of the undergraduate students are influenced by level of their father's education.

10. School Board of Education

School boards have considerable influence over educational decisions and provide a key social and political connection to the schooling process. In India, though there is a provision of central authority, primary education is a state system and power officially resides with the states. Concerns about efficiency and local involvement are addressed through the delegation of authority from the legislative branch to the local school board. Although the powers and duties of the education system vary by state jurisdiction, governance structure governed by an elected or appointed board.

At the primary stage, in most States/Union Territories (UTs) integrated textbooks on environmental studies have been prescribed. In some states environmental concepts have also been integrated into language and mathematics, while in some others environmental studies has been bifurcated as 'science' and 'society' for which separate textbooks-cum-workbooks have been prescribed. In the NCERT curriculum, the teaching of language and mathematics has been woven around the children's immediate environment in Classes I and II and Environment Education (EE) have been reinforced as a component of the Art of Healthy and Productive Living (AHPL). In Classes III to V, separate textbooks for environmental studies have been provided. By and large, the textbooks of science and the social sciences in most States/ Union Territories include environmental concepts. Environmental concepts had been included in the NCERT curricula for the upper primary stage mainly through science and technology.

At secondary stage, the concepts of EE have been prescribed in the textbooks of most States/UTs through science and the social sciences whether taught as integrated or separate subjects. NCERT textbooks of science and technology and integrated social science include various concepts of EE. At higher secondary stage, majority of the concepts related to EE are found in the textbooks of biology, chemistry, physics, geography, economics, sociology and political science. This is true for NCERT and State/UT curricula. In conclusion, it can be said that EE is a compulsory part of the syllabus in schools throughout the country. EE in schools invariably aims at providing children with knowledge, attitudes and skills so that they are equipped to contribute meaningfully towards the betterment of the environment and accomplish the goal of sustainable development. (NCERT, 2005)

In India many states have their Education Boards. In our education system there are different education boards and they differ in their structure and functioning.

Central Board of Secondary Education is an eminent board of school education in India. The CBSE prepares the syllabi for Classes IX to XII for the students of affiliated schools. CBSE suggests its affiliated schools to follow syllabi of NCERT for the students from Lower Kindergarten (L.K.G) to Class VIII. It conducts India's two important board examinations: The All India Secondary School Examination for Class X and the All India Senior School Certificate Examination for Class XII, which is a school-leaving examination. Gujarat Secondary Education Board is board of school education in Gujarat state. As all the state boards and CBSE board are different in their structure, functioning and syllabus, their course's preference for environmental studies differ. School environment also matters a lot in framing their knowledge and values level for environment. Thus, there might be difference in the environment knowledge and values of the students.

11. Medium of Instruction In School

Indian society is essentially a multilingual, multiethnic and multicultural society. There are many languages spoken here and the communicative function of a particular language gets restricted to a particular region or to a particular community. For interpersonal interaction and mutual enrichment, and in order to join the mainstream of national life, it is obligatory for every Indian to learn a language other than his own mother tongue, a language that is commonly shared by a majority of people. Today, no language other than English is in a position to serve this purpose. (Gupta, 2010).

English has also acquired a new significance as an international language. In British ruled India, English had occupied a privileged position. It was the language of the government. In educational institutions, it was not only a compulsory subject, but the medium of instruction as well. But still today English continued as an important component of education, administration and law. It was also used for personal use among the elite class. The impact of English did not decrease even after the departure of the British. English along with vernacular languages is used in the legal system, regional administration in the armed forces, the national business at home and also in mass media.

English is primarily meant to provide access to the world of learning and scientific scholarship. The teaching-learning process of a second language is considerably different from that of the mother tongue. The habits in the mother tongue are acquired and confirmed quite spontaneously, and by the time, a child comes to the age when he becomes conscious that he is learning a language, he has already acquired it to a considerable extent. He can express his ideas and feelings to others and can understand theirs. Formal instruction in a native language is required only to teach him the written script of the language and to provide him experiences and the necessary vocabulary to be able to communicate in a wide variety of situations (Gupta, 2010). Thus, it can be said that mother tongue may facilitate learning better.

In The Maharaja Sayajirao University of Baroda, the English is the language of instruction in majority of faculties. The various seminars, campaign, conferences and lectures on environment are delivered in English generally.

An interesting observation was found in a study that students coming from the schools of vernacular language experiences psychological disturbance and find themselves difficult to get adjusted to English medium college. Further it is also noted that a student coming from vernacular language feels shy, nervous, less well mannered, underachievers, and gets easily distracted which in turn gets affected on their overall personality characteristics. Whereas students coming from English medium schools, is well behaved, disciplined, bold and gets adjusted very well with over all atmosphere of the institution as a part of life. (Pathan, and Shiakh, 2012).

There are studies on how medium of instruction in school affects the academic achievement. Similarly, it will be interesting to find out whether the medium of instruction in school affects their environmental knowledge and values.

12. Participation In Environment Related Activities

There can be many activities carried out at school level which focus on issues at a local, national and global level in the natural, built, social and cultural environments. The activities related to environment should encourage students to adopt behaviors and attitudes that are necessary for the sustainable management of the Earth's resources. Activities are part of a total curriculum plan. They should not be implemented in isolation or unconnected to the achievement of targeted outcomes.

Student's active involvement in the activities related to environment that is plantation, go green campaign, poster making, and competition on environment themes etc. in school helps them to think critically. By participation in environment related activities, students learn through the environment. They learn by implying a systematic exploration through a variety of activities. This may lead to development of a genuine concern for

and sensitivity towards protection and preservation of environment in them. So it is of interest to find out the difference in the environmental knowledge and values of the students who had participated in environment related activities at school level to those who had not participated in such activities.

13. Environment As a Subject In School

Environmental Education is a process of recognizing values and clarifying concepts in order to develop skills and added tools necessary to understand and appreciate the inter-relationship among man, his culture and his bio-physical surrounding. It creates an overall perspective, which acknowledges the fact that natural environment and man-made environment are interdependent. It should consider the environment in its totality and should be a continuous lifelong process beginning at the pre-school level and continuing through all stages. The environmental education helps us to know that how unchecked and unplanned development pollutes air, water and soil and thereby threatening our existence. Therefore, environmental education means the educational process dealing with man's relationship with his natural and manmade surrounding and includes the relations of population, pollution resources allocation and depletion conservation, transportation, technology energy, urban and rural planning to the total biosphere. (Singh, 2011)

In 2005, the Supreme Court of India directed all educational institutes in the country to make environmental education a compulsory component of primary and secondary education. In response to this, the NCERT took a number of initiatives to give stronger footing to the still nascent environmental education across affiliated schools all over India. The most important among all initiatives was the setting up of National Curriculum Framework 2005 which incorporated the study of the environment as a part of various subjects. An ingenious solution, it led to the development of detailed curriculum, guidelines and model syllabi for classes 1 to 10 that reflected the new environmentally conscious ideas.

Environmental education at primary, secondary and higher secondary levels has been approached in different manners in this National Curriculum Framework. At the primary stage, Environmental Education is imparted through EVS (Environmental Studies), which forms a common component of the syllabi of classes 1 to 5. For classes 6 to 10, the NCERT textbooks of science and social sciences include an extension of environmental concepts taught earlier through extra chapters focusing on the subject. For students of classes 11 and 12, the majority of the environment related concepts are found in the textbooks of biology, chemistry and geography, all elective subjects.(Kataria, 2013).

By studying environment education in school students learn about the environment. They get to know about the origin of ecosystem, the importance of our environment in making our life possible, etc. They get exposed to the actual world they live in. They get acquainted with the environment related issues and problems. They are taught to look at the environmental problems and concerns, analyses, evaluate, draw inferences and equip themselves to resolve them.

So it will be interesting to find out whether there is found difference in the environmental knowledge and values of the respondents who studied environment as a subject in school and those who have not.

14. Exposure to Mass Media

In the age of 'info-communication', modernization has been accelerated by mass media which may be gradually sweeping away spiritual reverence for the natural environment, and favors a consumerist attitude towards natural resources. The recent entry of cable TV and the internet in almost every house would further expedite the process of modernization with greater efficiency. Media imperialism, undoubtedly, is deleterious to the rich social and cultural foundation of society. Today, as environmental concerns escalate with the ever increasing rise in population, the need for turning the force of media to positive forum for environmental education is imperative. There is a proportional need to explore ways to heighten and deepen

environmental awareness to be able to tackle the problem successfully. This calls for micro-level evidence on the role of media in environmental education in, since various changes at the macro level could be a reflection of the changes at the individual level. It is possible that some of the changes, as a result of exposure to environmental education, might pervade Media and Public Culture the larger structure of society and bring about desirable change. (Tshering, 2007)

Mass media exposure can be the most influential means of acquiring awareness about the environment. Therefore, environmental awareness increases as mass media exposure increases. If awareness is of any utility, it will lead to proper environmental behavior. Today, media has become the most important source of information for everybody. Everyone comes in contact with media in his or her day to day to day life willingly or unwillingly. Media has the capacity to mould the thinking and behavior of people to a large. Media may play a major role in building environmental awareness and hence developing environmental values in people. So to study the effect of mass media in building environmental knowledge and values is worth to study.

15. Civic Responsibility

Civic Responsibility is defined as the "responsibility of a citizen". It is comprised of actions and attitudes associated with democratic governance and social participation. Civic responsibility can include participation in government, church, volunteers and memberships of voluntary associations. Actions of civic responsibility can be displayed in advocacy for various causes, such as political, economic, civil, and environmental or quality of life issues. (Ojumu, 2016)

An individual's environmental concern can be associated with his level of civic responsibility. Article 48a of Indian constitution expects "the state shall endeavor to protect and improve the environment and to safeguard the forests and wildlife in the country."

Article of The constitution expects that each citizen of the country must "protect and improve the natural environment, including forests, lakes, rivers and wildlife, and to have compassion for all living creatures."

Fundamental duties of a responsible citizen include to value and preserve the rich heritage of our composite culture and to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures. Thus, it can be said that being a responsible citizen mean having higher values for the environment. So it will be interesting to find out that how level civic responsibility in students affect their levels of environmental knowledge and values.

1.14 Objectives of The Study

Based on the above discussion, following objectives were framed for the study:

1) To study the level of environmental knowledge of the undergraduate students of The Maharaja Sayajirao University of Baroda.

2) To study the level of environmental values of the undergraduate students of The Maharaja Sayajirao University of Baroda.

3) To study the difference in environmental knowledge of undergraduate students of The Maharaja Sayajirao University of Baroda in relation to the following variables:

i. Faculty

ii. Year of Study

iii. Gender

iv. Family Type

v. Family Size

vi. Monthly Family Income

vii. Place of Residence

viii. Mother's Education

ix. Father's Education

x. Board of Education in School

xi. Medium of instruction in School

xii. Participation in environment related activities

xiii. Environmental as a Subject in School

xiv. Mass Media Exposure

xv. Civic Responsibility

4) To study the difference in environmental values of undergraduate students of The Maharaja Sayajirao University of Baroda in relation to the following variables

i. Faculty
ii. Year of Study
iii. Gender
iv. Family Type
v. Family Size

vi. Monthly Family Income

vii. Place of Residence

viii. Mother's Education

ix. Father's Education

x. Board of Education in School

xi. Medium of instruction in School

xii. Participation in environment related activities

xiii. Environmental as a Subject in School

xiv. Mass Media Exposure

xv. Civic Responsibility

5) To study the relationship between environmental knowledge and values of undergraduate students of The Maharaja Sayajirao University of Baroda.

1.15 Null Hypothesis of The Study

1) There will be no significant difference in the environmental knowledge of undergraduate students of The Maharaja Sayajirao University of Baroda in relation to the following variables:

i. Faculty
ii. Year of Study
iii. Gender
iv. Family Type
v. Family Size
vi. Monthly Family Income
vii. Place of Residence
viii. Mother's Education
ix. Father's Education
x. Board of Education in School
xi. Medium of instruction in School
xii. Participation in environment related activities
xiii. Environmental as a Subject in School
xiv. Mass Media Exposure
xv. Civic Responsibility

2) There will be no significant difference in the environmental values of undergraduate students of The Maharaja Sayajirao University of Baroda in relation to the following variables:

i. Faculty
ii. Year of Study
iii. Gender

iv. Family Type

v. Family Size

vi. Monthly Family Income

vii. Place of Residence

viii. Mother's Education

ix. Father's Education

x. Board of Education in School

xi. Medium of instruction in School

xii. Participation in environment related activities

xiii. Environmental as a Subject in School

xiv. Mass Media Exposure

xv. Civic Responsibility

3) There will be no relation between environmental knowledge and values of undergraduate students of The Maharaja Sayajirao University of Baroda.

1.16 Assumptions of The Study

1) Environment education can play important role in making undergraduate students environment conservation conscious.

2) The environmental knowledge and values are necessary for promotion of environmental conservation.

3) Knowledge is prerequisite for the formation of value

1.17 Delimitations of The Study

1) The study will be delimited to the undergraduate students of The Maharaja Sayajirao University of Baroda.

2) The study will be delimited to the study of environmental knowledge and values.

1.7 Operational Definitions

1.7.1 Environmental Knowledge:

Environmental knowledge is facts or information about the environment. In this study, it is defined as awareness or understanding of facts and concepts relating to the following:

- Multidisciplinary nature of environmental studies.
- Natural resources
- Ecosystem
- Biodiversity and its conservation
- Environmental pollution
- Social issues and the environment
- Human population and the environment

1.7.2 Environmental Values:

Environmental values can simply be described as how sensitive the individual is to the environment and environmental issues. In the current study, it is defined in terms of

- Respect for plants and animals
- Love for nature
- Likeliness towards clean and healthy environment
- Actions to follow eco friendly practices
- Choice to use energy saving devices
- Choice to recycle waste

- Belief towards pollution
- Belief towards saving trees
- Opinion towards pollution
- Honesty in paying environmental taxes
- Choices of fuel vehicles
- Actions to save water

1.7.3 Mass Media Exposure:

Mass media exposure can be operationalised as the extent to which an individual come in contact with the mass media and get influenced by it that is Television, Radio, Magazine, Newspaper and Internet.

1.7.4 Civic Responsibility:

Civic responsibility is defined as active participation of an individual in the public life of a community, with a focus on the common good (Gottlieb and Robinson, 2003). In the present study we portrays a responsible citizen as someone with a job, who votes, pays taxes, gives blood, and obeys the law. A second conception is participatory citizen, which describes someone who is involved in community affairs (for example boards, community events). Last, a social reformer is someone who strives to understand the causes of societal problems and addresses them at the root (Kahne, Westheimer, and Rogers, 2000).