

## Biodiversity Conservation and Role of Environmental Education in Schools and Colleges

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### Abstract

*Biodiversity of an ecosystem or of a geographical area includes various kinds of trees, plants, animals, birds, insects and even micro-organisms their genetic variability expressed and populations, their habitats, ecosystems and natural areas. Biodiversity plays a major role in many ecosystem services. In the modern era of technology and development with the progress of industrialization, urbanization and adoption of modern technologies in agriculture, environmental problems have become a concerning issue for human society. These environmental problems have affected the biodiversity of the ecosystem. For the conservation of biodiversity most developed countries have included the issue of environmental protection in their political agenda. Environmental education acts as an indispensable tool in the battle against the degradation of living environment and loss of biodiversity, through which the goals for awareness can be achieved easily. Consequently environmental education is being included in school curriculum right from the very beginning. The environmental education programmes are being conducted in various senior secondary schools and colleges. Students could be made aware of environmental problems and their effect on the biodiversity and how they can contribute in the conservation of biodiversity through proper guidance and counseling. The key to successful implementation of any awareness programmes at school level and college level needs the motivation of the students and teachers. The teachers should also make themselves aware of the environment, environmental problems and their impact on biodiversity. Teachers and students both can contribute towards the steps taken to aware others about conservation of biodiversity.*

**Keywords:** Biodiversity, conservation, Ecosystem, Environmental Education, Awareness.

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## Introduction

Biodiversity is a key resource at global, national and local levels for the sustained wellbeing of ecosystem. Biodiversity is the foundation of life on earth. Biodiversity includes assemblages of plant, animals and micro-organisms, their genetic variability expressed and populations, their habitats, ecosystems and natural areas, the mosaic of which constitutes the landscape which gives the richness to the natural environment. It is crucial for the functioning of ecosystems which provides us with products and services without which we couldn't live. Its innumerable plants, animals and microbes physically and chemically unite the atmosphere (the mixture of gases around the earth), geosphere (the solid part of the earth), and hydrosphere (the earth water, ice and water vapor) into the environmental system which makes it possible for millions of species, to exist. Currently the planet is inhabited by several million species in about 100 different phyla (Dirzo & Raven 2003). About 1.8 million have been described by scientists (Hilton-Taylor *et al.* 2008). Biodiversity: Three levels .Genetic diversity – genetic variability or diversity within a species, i.e. between the individuals of a species. 2.Species diversity - diversity between different species Example ; *Felis tigris* and *Felis domestica*. Ecosystem diversity – diversity within a region.

Whittaker (1972) described three terms for measuring biodiversity over spatial scales: alpha, beta, and gamma diversity. *Alpha Diversity* refers to the diversity within a particular area or ecosystem, and is usually expressed by the number of species (i.e., *species richness*) in that ecosystem. *Beta diversity*: a comparison of diversity between ecosystems, usually measured as the amount of species change between the ecosystems . *Gamma diversity*: a measure of the overall diversity within a large region. India is sharing 12.53 % of world's biodiversity. It is one of the twelve countries, which together account for more than 60 per cent of the world's biodiversity. About 1,39,000 species of plants, animal and microbes are recorded, more than 4 lakh species are yet to be identified. Although new species appear, existing species go extinct at a rate 1000 times that of species formation (Wilson 2003). The International Union for the Conservation of Nature estimates that 22% of known mammals, 32% of amphibians, 14% of birds, and 32% of gymnosperms (all well-studied groups) are threatened with extinction (Hilton-Taylor *et al.* 2008). Conservation of biodiversity is essential for the human survival, notably through health, food and industry. All forms of life-human, animal and plants, are so closely interlinked that disturbance in one gives rise to imbalance in the others. The

scientific knowledge of biodiversity conservation should not be restricted on paper that should be spread among the people through the mass communication, training, awareness programmes at the grassroots level. Consequently environmental education is being included in school curriculum right from the very beginning. The environmental education programmes are being conducted in various senior secondary schools and colleges. Environmental Education is a key to the success of any overall environmental strategy, determined to help in the setting up of a Centre of Excellence in Environmental Education, to play the vital role of setting the pace and agenda for Environmental Education in the country (Kartikeya, 2000). Students could be made aware of environmental problems and their effect on the biodiversity and how they can contribute in the conservation of biodiversity through proper guidance and counseling. Teachers with the right attitude and a will to equip the future generations to enable them understand the importance of conservation of biodiversity can play lead role.

**Objectives:**

To evaluate the content of environmental education in schools and colleges.

To aware the students about biodiversity conservation.

To give suggestions for more activities for students and teachers for conservation of biodiversity among higher secondary and college students.

**Materials & Methods:**

Primary information was collected through various sources. Pub med research was preferred on many related topics like Environment education in higher education, Role of EE in schools and colleges, Biodiversity conservation, Biodiversity awareness etc.

**Discussion**

**Environmental Education and Biodiversity awareness ;**

With the importance of biodiversity, environment education plays important role in educating the students about biodiversity. Without the mass-involvement of young people in caring for the environment there is no hope of sustainability. In India, learning from nature is a tradition in most cultures in which people base their lives directly on natural resources. The environmental education in India has a traditional base and it starts from early childhood at home and in immediate neighborhood . A child's perception of the environment develops with inputs from formal school and other institution and partly from informal education at home. However, the understanding of biodiversity varies with the context provided to the young learner through their surrounding environment. In most cases, it remains

limited to mere theoretical chapters in their science and social science textbooks. The real-life connections, in the teaching and learning of biodiversity and its conservation, are rather weak in the formal education system today. Modern school and college education in India tends to in fact negate learning from the students own surroundings. Further our modern educational processes have created a major 'gap' in knowledge of the value, threats and conservation needs of biological diversity. Infusing Environmental Education 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. National Policy on Education (1986) emphasizing the role of Environmental Education says that, "There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of the society, beginning with the child. Environmental consciousness should be inculcated into teaching in schools and colleges". In India, the Supreme Court in their judgments of writ petitions (M.C. Mehta Vs Union of India, 1991; M.C. Mehta Vs Union of India, 2003). At the college level the courses have been to bring about a concern for biodiversity conservation. Environmental Education plays an important role. However, it plays a crucial role in the process of sustainable development also (Tbilisi

Declaration, 1977, Rio, 1992, Montreal, 1997). Environmental Education is an important tool through which the goals for awareness can be achieved easily. Environmental Education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, to aware of how to help solve these problems, and to motivate to work towards their solution (Stapp *et al*, 1969).

#### **Activities of Environmental Education in Schools**

Thote (2007) found that knowledge, attitude-behavior model describe that increase in knowledge will change in attitude which will in turn influence behavior. A child's perception of the environment develops with inputs from formal school and other institution and partly from informal education at home. However, at primary level the students should be molded to understand the importance of environmental protection and should be exposed to the nature and environment. At secondary level students are usually receptive and are capable of assimilating the concept of environmental conservation and sustainable development. In the secondary level, NCERT has introduced topics like Disaster Management, Wildlife Conservation which will be very helpful in developing the positive attitude towards nature and environment among

students. Schools organizes different activities to promote awareness as plantation, making trees as friend, environmental club, visit to zoo, museum etc. Improvising different audio-visual aids like chart, models, posters, slogans writing on environment. Making projects on the hazardous effects of environmental pollution and measures to protect them from their fatal effects. Schools organizes debates, dramas and skit. In one of the school, the theme of annual function was based on environmental conservation. While current textbooks suggest various activities, there is very little stress on the need for field trips—the most powerful learning tool in Environment Education. Teacher training, both pre- and in-service, has been a major source of concern.

#### At College level

At the college level, the UGC has now developed a common curriculum for all undergraduate courses and has assigned the task of developing a textbook for the common paper on Environment. Biodiversity and its conservation is a substantial input in the core module course curriculum of the UGC. Several initiatives need to be taken at the National Council of Educational Research and Training (NCERT), State Council of Educational Research and Training (SCERT) and teacher education levels to implement the findings of the

above studies.

#### Concepts covered in Environmental science in undergraduate courses in Himachal Pradesh

- Need for the public awareness
- Natural resources
- Ecosystem
- Biodiversity and conservation:-

Value of biodiversity, hotspots of biodiversity, threats to biodiversity, Conservation of biodiversity

- Environmental pollution
- Fieldwork: related to local environmental assets and pollution problems

#### Biodiversity: Three levels

- Genetic Biodiversity
- Species Biodiversity
- Ecosystem Biodiversity- Alpha, Beta, Gamma

A study of undergraduate and even in subjects connected to biodiversity such as biology and zoology shows that the value of biodiversity and the need for its conservation have been inadequately dealt with. Education awareness and training for biodiversity will need not only a whole new approach but also a substantial increase in funding. Outdoor activity such as visit to local area to study the components of ecosystem, Environmental problems, pollution in local area, land sliding need to be included in the projects for students.

**Students can work for conservation of Biodiversity at local level...**

John Dewey (1859-1952) wanted to develop a school in which the students could explore, create and experiment. A school which formally divided educational content into study areas, lessons, subjects and tasks was not congruent with students' needs for comprehensive learning.

The first step needs to work with the college students to help them develop a conceptual understanding of biodiversity, interrelate the students themselves, with guidance from the faculty (Jain, 2011). This laid the foundation for improved understanding of natural systems and their importance for the existence of life. Environmental education helps the students to develop the society by giving guidance to remove the social issues in environmental education. Students can work for conservation of Biodiversity at local level...

**Compositional aspects:** Informs genetic makeup and habitats of different plants and animals.

**Structural aspects:** Informs about physical characteristics of habitat and vegetation of the area.

**Functional aspects:** Informs about climate, geographical, ecological and evolutionary processes causing diversity in an area. More importantly, the visits to neighboring areas, as well as around

their own college campus, provided a new insight to the students about the local plant species and associated biodiversity. College students can set up a Biodiversity Park in their college campus. The students should visit to ponds, lakes, rivers, farms, zoos, factories, quarries and geological sites, ancient monuments, national parks and nature trails. The students should study the community of vegetation and the plant formations.

Debates and orientation programmes should be assigned to students to enrich and strengthen the environmental education. The environmental based project or out-of-class activities should also be given to students for real experiences to increase performance of students to strengthen the environmental education.

Students can maintain inventory and records of all living beings in their locality. A biodiversity register is a compilation of day-to-day observations of the immediate environment. It is a documentation of knowledge of diversity of life known to local people. The record may include traditional knowledge regarding use of the various species. Exhibition on biodiversity by the student's own collection could be an inspiration to others for conservation.

The environmental day should be celebrated all over the India for strengthening awareness programme.

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. While NGOs such as the Bombay Natural History Society (BNHS), over the last 125 years and WWF-I from 1969, and a host of other organisations and Government agencies in India have tried to generate an awareness of the value of biodiversity. If a large proportion of human society have to be addressed through a common conservation education and awareness initiative, the most effective tool is undoubtedly school and college education.

Knowledge and awareness about biodiversity has to be provided to students through environmental education at school and college level. Environmental attitude also has significant impact on behavior of the students towards preservation and conservation of environment and

biodiversity. The process of environmental education must be encouraged in schools where the students become aware of environmental issues. This could be done by the involvement of both teachers and students. They could be encouraged to be more participative in field activities to actually conserve biodiversity. They should recognize the relationship between human and nature. Develop conscious among students to conserve and preserve ecological balance. Parents and teachers should try to inculcate knowledge about environment among students and develop positive and healthy attitude towards environment from the very beginning of their childhood. There is need to organize and conduct educational programme, group discussions in school/college focused on environmental issues and biodiversity conservation. Moreover education for biodiversity conservation will succeed only when it is taught and learned in the real-life context, exploring multidisciplinary connections and the understanding of life support systems.

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