

# **Environmental Education in school Curriculum an overall perspective**

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## **ABSTRACT**

NCF 2005 and its overall perspective of environmental education a resume – and its treatment in different levels of school textbooks of different states and CBSE boards were analyzed an overall view and strategies of implementation are presented in this paper.

### **INTRODUCTION: -**

The National Curriculum frame work is an educational policy document within which teachers and schools and plan experiences in order to realize the stated educational objectives, as envisaged in the document. The curriculum has to be conceptualized as a structure that articulates required experiences and should address some basic questions like

- (a) What educational purposes should the schools seek to achieve?
- (b) What educational experiences in EE can be provided that help to achieve these goals?
- (c) How these educational experiences can be meaningfully organized to achieve the objectives.
- (d) How do we ensure that these educational purposes are indeed being accomplished?

### **Status of environmental education in school education**

The education system in India had incorporated certain aspects of environment in school curricula as far back as 1930. The Kothari commission (1964-66) also suggested that basic education had to offer EE and relate it to the life needs and aspirations of the people and the nation. At the primary stage, the report recommended that " the aims of teaching science in the Primary schools should be to develop proper understanding of the main facts, concepts, principles and processes in physical biological environment" Environmental education at primary, secondary, Higher secondary levels was treated in different way. Environmental education is an essential part of every pupil's learning. It helps to encourage awareness of the environment, leading to informed concern for and active participation in resolving environmental problems. It was introduced without any delay from class -1Evs, as a subject so that right from their childhood, the right attitudes towards environment will be nurtured in the young minds.

It is important that we capture this enthusiasm and that no opportunity is lost to develop knowledge, understanding and concern for the environment through school education. The curricular, cross-curricular attempt of environmental education also should be a joy for the learner. In this direction, NCERT has published in collaboration with the Center for Environmental Education, Ahemadabad a book entitled "Joy of learning" with lot of environmental activities, a handbook for Teachers. Similarly several work shop were conducted to orient school teachers and educational functionaries of the state boards on various aspects of environmental education. Strategies for successful implementation of EE in Schools were discussed in detail in these interactions.

### **A curricular frame work of environmental education:-**

- It envisages the place of EE in the school curriculum.
- Place of EE vis-à-vis other subjects of study.
- Mode and strategy of inclusion of chapters at different levels.
- EE in terms of time and allocation of marks.
- Development of syllabi and instructional material for dissemination at different levels of school education.

In order to supplement the analysis of individual and institutional consultations it was decided to organise two face to face National Consultations on Environmental Education in Schools. The First Consultation on the academic aspects of Environmental Education (EE) in Schools was organised by NCERT on 13-14 February, 2004 in New Delhi. Seventy participants comprising eminent scientists, environmentalists, officials of central and state govt. departments dealing with environment, senior academicians attached to Departments/Centres of environmental studies, environmental science, environmental ecology, botany, regional development, geography, marine biology etc. of different universities, teacher educators, principals of teacher training colleges, prominent Non-Governmental Organisations (NGOs) and NCERT faculty took part in deliberations. The Second Consultation on the Implementation of EE in Schools was held on 13th March, 2004. Seventy-two officials comprising Presidents/Chairpersons of Boards/Councils of School Education, Directors of State Councils of Educational Research and Training (SCERTs), Directors of Education in the states, eminent scientists, environmentalists and NCERT faculty participated. The initial draft prepared by NCERT faculty presented in the First Consultation was revised as per the suggestions received. This revised version was presented in the Second Consultation and suggestions for further improvement were received. Various issues were deliberated upon in these Consultations through plenary presentation, open house discussion, interaction in groups and consolidation of recommendations.

### Aims & Objectives of the environmental education:-

The objectives of environmental education is to increase public awareness about environmental issues, as explore possible solutions, and to lay the foundations for a fully informed and active participation of individual in the protection of environment and the prudent and rational use of natural resources. The resolutions provide the following guiding principles for environmental education:

- The environment as a common heritage of mankind.
- The common duty of maintaining, protecting & improving the quality of environment, as a contribution to the protection of human health and safeguarding the ecological balance;
- The need for a prudent and rational utilization of resources;
- The way in which each individual can, by his own behavior and action, contribute to the protection of environment;
- The long-term aims of environmental education are to improve management of environment and provide satisfactory solutions to environmental issues.
- Provide opportunities to acquire the knowledge, values, attitudes, commitment and skills needed to protect and improve the environment.
- Encourage pupils to examine and interpret the environment from variety of perspectives-physical, geographical, biological, sociological, economic, political, technological, historical, an esthetic and ethical.
- Arouse pupil's awareness and curiosity about the environment and encourage active participation in resolving environmental problems.
- Environmental education is closely linked to the other cross circular themes of other subject areas.

For effective transaction of environmental education following objectives related to Knowledge, skill, and attitudes are essential:

### KNOWLEDGE:-

As a basis for making informed judgments about the environment people should develop knowledge and understanding of

- The natural processes which take place in the environment.
- The impact of human activities on the environment.
- The comparison between different environments both in the past and present.
- Environmental issues such as: (i) The greenhouse effect. (ii) Acid rain and (iii) Air pollution.
- Local, national and international legislative controls to protect and manage the environment;
- How policies and decisions are made about the environment.
- How human life and livelihood are dependent on the environment.

- The conflicts, which can arise about environmental issues like river water sharing.
- How the environment has been effected owing to past decisions and actions.
- The importance of planning and design and an esthetic consideration.
- The importance of effective action to protect and manage the environment.

#### SKILLS:-

Six crosses curricular skills have been identified which are necessary for to environmental education.

They are:-

- Communication skills.
- Numeric skills.
- Study skills.
- Problem solving skills.
- Personal skills.
- Social skills & Information technology skills.

#### ATTITUDES:-

Promoting positive attitudes towards the environment is essential if pupils/students are to value it and understand their role in safeguarding it for the future.

Encouraging the development of attitudes in personal qualities listed below will contribute to the process.

- Appreciations of care and concern for environment.
- Concern for other living things on earth.
- Independent thought on environmental issues.
- Respect for others opinion.
- Respect for rational argument and evidence.
- Tolerance to face others views.

Environmental education can be thought of as comprising three linked components:

- Education about the environments (Knowledge).
- Education for the environment (Values, Attitudes & Positive actions).
- Education through the environment (A Resource).

Environmental education is a process that aims at the development of environmentally literate citizens who can compete in global economy, who have the skills and knowledge and inclinations to make well informed choices concerning the Environment, and who exercise the rights and responsibilities of the members of a community, Environmental knowledge contributes to an understanding and appreciation of the society, technology and productivity and conservation of natural and cultural resources of their own environment.

Environmental education has an ability to solve the societal needs the needs of a community problem and their solutions and workforce for tackling cooperative mind. We need the school children to share and develop the motivation from school about various environmental issues, which are the challenges of today and prepare them for the future.

Environmental education must become a vehicle for engaging young minds in the excitement of first hand observation of the nature and understanding the patterns and processes in the natural and social worlds in order to take care of the habitat and its surroundings which becomes a major part of EE in both primary and upper primary stages of school education. In the secondary and senior secondary stages also some of the major issues such as environmental protection, management & conservation are to be dealt in more detail.

#### PRIMARY STAGE:-

EE is imparted as EVS, which forms a common component of syllabus, prescribed by the States and CBSE. In Karnataka textbooks and workbooks from classes I to IV on environmental studies are in use. The text books for environmental studies which are prepared by N.C.E.R.T has taken cross curricular approach to teaching environmental concepts through language, mathematics about the environment. In classes I and II where there is no separate EVS book. For classes III and IV, EVS textbooks are available. EE has been further reinforced under the art of healthy and productive living (AHPL) for which a single teacher's handbook has been developed for classes I to V.

The contents and concepts covered in these books are as follows:

- Familiarization with one's own body;
- Awareness about immediate surroundings;
- Need for food, water, air, shelter, clothing and recreation;
- Importance of trees and plants;
- Familiarization with local birds, animals and other objects;
- Interdependence of living and non-living things;
- Importance of cleanliness and sanitation;
- Importance of celebration of festivals and national days;
- Awareness of sunlight, rain and wind;
- Caring for pet animals;
- Awareness about air, water, soil and noise pollution;
- Need for the protection of environment;
- Knowledge about the source of energy;
- Importance of the conservation of water resources and forests and
- Indigenous and traditional knowledge about the protection of environment.

The textbooks lay emphasis on raising awareness levels and sensitizing children about environmental concerns. Emphasis has also been laid on the need to organize learning in local specific contexts, which will provide more meaningful experiences to children. Aspects of indigenous knowledge have also been introduced. There are references and suggestions for conducting activities in and outside the classroom. The NCERT textbooks for environmental studies generally take a comprehensive view of the natural, physical, social and cultural environment.

It is evident that the textbooks represent relevant ideas commensurate with the age and developmental level of children so as to provide them the necessary understanding about their immediate environment. However, there is a scope for inclusion of more activities to enable children to translate awareness into effective behavioral action.

#### UPPER PRIMARY STAGE:-

The contents of textbooks present an extension and elaboration of the concepts introduced at the primary stage. The textbooks in Rajasthan and Madhya Pradesh (Classes VI-VIII) and in Karnataka (Classes V-VII) contain environmental concepts by and large in the textbooks of science and social science. The textbooks of Karnataka for class V in the subjects of science, social science and language have environmental ideas infused with these subjects. The state of Orissa, deals with the environmental concepts and concerns in its textbooks for science and geography. These are also included in a single textbook of history and civics. The NCERT textbooks of 'Science' and 'Social Science' have incorporated such concepts in the textbooks.

The major concepts dealt with in these textbooks are:

- Adaptation of living beings in environment;
- Natural resources;
- Water cycle;
- Food chain;
- Importance of plants and trees in keeping the environment clean;
- Classification of plants;

- Role of plants and animals in environmental balance and soil conservation;
- Ecosystems;
- Necessity of clean air for healthy living;
- Animals and their characteristics;
- Effects of environmental pollution and the consequences of air pollution-(i) Greenhouse effect, (ii) O-Zone layer depletion and, (iii) increase in carbon dioxide;
- Role of microorganisms in the environment;
- Dependence of the community on the environment;
- Basic knowledge about the earth and its atmosphere;
- Physical features of the country;
- Population and environment;
- Care and protection of livestock;
- Necessity of wildlife protection;
- Impact of deforestation;
- Impact of industrialization on environment; and

Role of civic society in protection of the environment, personal and public property including monuments.

While most of the areas of EE have generally been covered, there is need for inclusion of more individual and group activities and project work in order to promote both the affective and cognitive domains of learning. Co-scholastic activities including organization of plays, cultural programs, debates, mock parliament, discussions and community activities may help further in achieving the objective.

#### SECONDARY STAGE:

The concepts of EE have been provided in the textbooks of science and social sciences in the states of Rajasthan and Madhya Pradesh. In Orissa, there are text books, namely science part-I (physical science), Science part-II (biological sciences) and geography. The environmental concepts both are at concrete and abstract levels. The concepts covered are:

- Bio-sphere;
- Greenhouse effect;
- ozone layer depletion;
- Use of fertilizers and pesticides;
- Wildlife protection;
- Soil chemistry;
- Management of domestic and industrial waste;
- pollution of noise, air, water and soil and control measures;
- Ecosystem;
- Management of non-degradable substances;
- Edible and ornamental plants;
- Sewage disposal and cleaning of rivers;
- Nuclear energy;
- Radiation hazards;
- Gas leak;
- Wind power;
- Bio-energy; and
- Environmental laws and acts.
- Environmental concepts also extend to subject areas like languages and social sciences which reinforce learning and internalization of all such concepts.

#### HIGHER SECONDARY STAGE:-

This is the stage of diversification. Students opt for either the academic stream or the vocational stream. The treatment of concepts becomes deeper and more discipline oriented since the content caters to the demands of the concerned subject, as an independent discipline a comprehensive view about EE is not available in the textbooks.

Majority of the concepts are found in the textbooks of biology, chemistry and geography, which are optional subjects. Students opting for any one of these subjects would accordingly benefit in different aspects of EE. The coverage of EE concepts in the textbooks of various subjects includes:

- Environment and sustainable development;
- Atmospheric pollution- global warming,
- Greenhouse effect,
- Acid rain,
- Ozone layer depletion;
- Water pollution- international standards of drinking water,
- Importance of dissolved oxygen in water,
- Bio-chemical oxygen demand,
- Chemical oxygen demand,
- Land pollution,
- Pesticides,
- Ecology.

Some of the activities pertaining to EE from Primary, Upper Primary, and Secondary & Higher Secondary classes on a sample basis a few have been give here.

### **Methods:**

### **Upper Primary & Secondary Education concepts & Activities discussed:**

**ACTIVITY 1:** - All Organisms need an Environment to live

**Materials** : A note book and pencil.

**Target Group** : Class IV – VI

**The Task:** Critically observe over a week the various activities of a bird or a domestic animal such as a cow/sheep/goat/buffalo or a pet animal such as a dog/ cat. Specific answers for the following questions must be obtained:

- Where does it live?
- What does it eat?
- What does it drink?
- What does it wear?
- When and how does it sleep?
- Can it live only on natural things?
- Does it use man-made things?
- What are its activities during daytime?
- What are its activities during nights?
- Does it make any noise? Does it disturb us?

**The Teacher:** The teacher opens a discussion about the observations made by children and summarizes that all organisms need a ‘home’ and environment is the home for most of the organisms. We must care not only for the organism but also for the environment because a good environment means a good home for all the organisms.

**ACTIVITY 2:** Human beings obtain several materials from the environment.

**Materials** : Note book, Pencil

**Target groups** : IV to VIII

**The Task:** Ask children to make a list of all the people living in their house. Let them also list all the things (atleast fifteen) which they use/need daily. Help them to categorize them into naturally available things and man-made things and arrange them in a table as shown below:

**Man made things**

**Naturally occurring things**

Tooth paste

Water

.....

.....

.....

.....

**The Teacher:** Analyze the items in the table and emphasize that all the naturally occurring things come from the environment. Unless we care for the environment and use these materials carefully, some materials will get depleted gradually and get exhausted one fine day!

**ACTIVITY 3:** Environment consists of both living and non-living things.

**Materials** : Notebook, pencil

**Target Groups** : VI to IX

**The Task :** Take children to a garden/park or to an open area within the school premises. Divide them into groups of 4-5 children. Critically observe the surrounding environment air, water, and soil. Dig the soil a little and observe the soil below the surface; list as many things. Care must be taken to classify only things that are naturally available and not man made things.

The Teacher: Teacher examines the list and leads the discussion to conclude that environment consists of both living and non-living things. Non-living things should not be construed, as things are not necessary or less important. Emphasize that everything in nature has some use or the other.

**Living things**

**Non-living things**

Bird

Water

.....

.....

.....

.....

**ACTIVITY 4:** Biodegradable and Non-Biodegradable materials.

**Materials** : Dry leaves, flowers, fruits, a few plastic covers, used refills, buttons, mumty, water.

**Target Group** : VIII to X & XI to XII

**The task** : Dig 2 Shallow pits at a distance of a foot from each other. The pits should be approximately 6" X 6" X 6". Into pit 1, put the dry leaves, flower, and fruits and into pit 2 put the plastic covers and refills. Cover both pits with mud such that the materials are completely buried.

Water the pits every day. After 15 days, dig up the pits and carefully observe the materials.

- Have the materials undergone any change?
- What changes do you observe?
- Is there a change in colour?
- Is there a change in Shape?
- Are the materials Intact?
- Is the plastic torn?
- Has the plastic changed colour?
- Has it crumpled into small bits?
- Does the plastic smell?
- Do the materials in pit 1 smell foul?
- What causes the smell?
- What happens to materials in pit A ultimately?
- What happen to material B ultimately?

Activities related to Primary classes III & IV are given below:

## LEAVES AND ITS USES (Classes III/IV)

*and its various structure modification*

**WHAT NEXT?**

- Compost pit
- Leaf structure
- Functions of Leaf
- Modifications of leaf

**HOW TO GO ABOUT?**

**Materials required:** leaves, glue, colors, scissors, work sheets, blank papers, pot, soil, water

**Time required:** 4 to 5 periods

**Procedure to Follow**

1. **Individual activity:** students are asked to collect various types of leaves and bring to the class
2. **Group work:** The students work in groups (4/5) to classify the leaves in to various categories (students decide up on the criteria)
3. **Whole class activity:** groups share their work with the whole class followed by this students along with the teacher name the leaves
4. **Brainstorming:** students brainstorm on the uses of leaves (sub group/whole class)
5. **Structured group activity:** students regroup the leaves (uses) in to the following categories ( they may draw, paste, write, pictures)

Food	Decoration	Medicine
Making things	Shelter	Traditional

6. **Craft:** Students work in groups to make various objects using leaf for example: Coconut leaf – bracelet, spectacles, parrot, bow and arrow, ball, monkey, kite, whistle etc.
7. **Compost Pit:** Using the leaves that they have brought they may be encouraged to make a compost pit in the class ( provide an earthen pot)

**LET ME LINK IT**

- Mathematics - Size, shape, numbers
- Languages - Vocabulary
- Craft/Art - Drawing, Colouring

**OBJECTIVES**

- To identify, list and classify leaves
- To describe various uses of leaves
- To develop sense of appreciation
- To develop the skill in making compost pit
- To develop the skill in making various objects using leaf

**SOFT SKILLS**

- Learn to Communication
- Develop interpersonal skills
- Learn to cooperate
- Take decisions

**LET ME REFLECT ON**

- Learner behavior
- The materials I used
- The activities I conducted
- Realization of objectives
- How I managed the time, resources, and the class
- My own behavior

**LET ME ASSESS**

- Observation
  - Attention
  - Punctuality
  - Involvement
  - Cooperation
- Portfolio
  - Leaves collected
  - Classification sheet
  - Objects created
  - Write up of compost pit
  - List of uses generated etc.

(Rubrics, checklist, schedules)

**WHAT IS THE BASE?**

- Pattern of leaf
- Size of leaf
- Shape of leaf
- Colour of leaf

**VALUES**

- Appreciation of tradition
- Concern and care of plants
- Concern for fellow beings

## Conclusion:

Tough there has been a long history of EE component in our school curriculum; it has always been treated as secondary to other scholastic areas like sciences, social-sciences, mathematics etc. The first aggressive thrust for EE at school level came in NCF 1986 and the document, Plan of Action, 1992. Environmental issues, environmental concerns and conservation were identified as core areas in the curriculum. Although, many state boards and CBSE emphasized the need to educate children about our environment, there was very little perceptible change in our approach to EE transaction. NCF-2000 & NCF 2005 has laid enormous emphasis on EE to the extent that it is projected as of grave concern in school curriculum that is as important as other school subjects.

There has been an eternal debate on the mode of EE treatment in schools. While a few curriculum planners advocate an infusion model others insist on transaction EE as a separate subject in the schools. There are arguments and counter arguments with regard to both schools of thought. What is of greater importance is how EE is taught? What are the transactional strategies that have to be followed to make it effective so that it sensitizes and motivates desirable action by the students. In this direction, orienting teachers, designing suitable, pragmatic activities that are regional and local specific are the urgent need. In this exercise, NCERT has initiated several levels of interaction with various educational functionaries such as administrators, curriculum planners, teacher educators and teachers. A national level core team and regional level teams are conducting orientation programs, preparation of training manuals in EE collaborating with state boards to promote in the respective states. These efforts have to be vastly enhanced in order to bring about a level of awareness and action that will help conserving & improving the quality of our environment.

The attainment targets and programs and Activities of study for science present opportunities for learning about environment through Science, Geography, Civics, and Social Environmental aspects can be understood to a great extent. For example, energy sources, the process of life and the effect of human activity on the environment. The following attainment targets are particularly relevant in class III to XII Science & Social Science curriculum of NCF-2005.

They can be listed as:

- ❖ Exploration of Science
- ❖ The variety of life.
- ❖ Process of life
- ❖ Human influence on earth
- ❖ Types and uses of materials
- ❖ Explaining how materials behave
- ❖ Earth & atmosphere
- ❖ Energy
- ❖ The natural resources & conservation. Education for the EE is concerned with children persecutes like: Children should study aspects of their local environment which have been affected by human activity. These may include for example Farming, Industry, and Sewage disposal, Mining or Quarrying. Where even possible this should be by first-hand observation, but secondary school, curriculum has some of the significant activities related to it, where highlighted. The range and origin of any raw materials, waste disposal procedures are some of the practical solutions to keep the environment clean, the theoretical inputs and solutions should have an appreciation so that when they become citizens they can use specific design and technology Collins 1980, required to keep the “ Environments” i.e., related to the outside world. These are home, school, parks, community places, business places and so on. History as a core curricular theme also can explain about details of contributions to environmental education. History helps pupils to appreciate how the environment has been shaped by human activity as well as natural change. Pupils can also apply historical skills to interpret written sources and physical remains which gave dues to long term changes in the environment.

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Environmental education programs that contribute to educational reform and sustainability have many different variables depending on location, cultural contexts, or community concerns. Environmental education curricula can assist in a guiding responsibility for successful program development by concentrating on explicit concepts. Education and curricula materials that address local concerns can foster responsible action and advocacy by students based on their previous experiences and knowledge. The government hoped to use environmental education programs in schools and communities as a conduit to increase awareness about the environment, and give citizens the knowledge and skills to respond to environmental issues (Pande, L., 2002). Environmental education in preschool institutions; environmental education at school (in academic and extracurricular activities); environmental education in day care centers; environmental education in summer camps; environmental self-education [2]. In a secondary school, environmental education is interdisciplinary and is examined from the perspective of the specifics of many subjects: natural history, geography, biology, chemistry, etc. However, school geography, in comparison with other academic disciplines, is more ecologized. According to Federal State Educational Standards, in the system of work of the class teacher, the following Universal Educational Actions can be distinguished and developed Status of environmental education in school education The education system in India had incorporated certain aspects of environment in school curricula as far back as The Kothari commission ( ) also suggested that basic education had to offer EE and relate it to the life needs and aspirations of the people and the nation. At the primary stage, the report recommended that " the aims of teaching science in the Primary schools should be to develop proper understanding of the main facts, concepts, principles and processes in physical biological environment Environmental education at primary,