4. Environmental Education in School Textbooks
   A Review of Content

With a view to identify the contents of Environmental Education (EE) in schools, textbooks being used in the states of Rajasthan, Madhya Pradesh, Orissa and Karnataka were reviewed by the faculty of the four Regional Institutes of Education (RIEs) situated at Ajmer, Bhopal, Bhubaneswar and Mysore. These institutes are well familiar with the development and changes in the curricula and text materials not only in these states but also in their respective regions. In addition, textbooks developed by the NCERT were also examined.

A common approach was evolved through internal discussions among the faculty at the NCERT in Delhi, in the four RIEs and at Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) at Bhopal. The review was conducted in relation to four stages of school education, namely, primary, upper primary, secondary and higher secondary. Content and suggested activities for EE were identified and examined. The main focus was on the coverage of EE concepts and the depth of their treatment. The continuity of the content across the four stages was also studied. This was ascertained by examining the concepts included in textbooks in different subjects along with the activities for their potential in providing knowledge and skills necessary for dealing with environmental issues. It was noticed that the concepts most commonly dealt with were associated with man-nature relationship in terms of basic components like water, air, soil, space and energy. It includes eco-system, conservation of natural resources, bio-diversity, biotic community, wildlife, deforestation, pollution, soil degradation, acid rain, greenhouse effect, ozone layer depletion, bio-energy, population, food and health, disaster management, management of domestic and industrial wastes and detection of leakage of Liquefied Petroleum Gas (LPG).

The stage-wise review is presented below.

**Primary Stage**

EE is imparted as environmental studies which forms a common component of syllabus prescribed by each state.

- Rajasthan has integrated textbooks in Environmental Studies for Classes I to V which focus on knowledge and awareness of environmental concepts besides developing sensitivity among children;
- In Madhya Pradesh, environmental concepts have been integrated with language textbooks for Classes I and II. Separate textbooks of environmental studies are available for Classes III-V.
In Orissa, the environmental concepts have been integrated with language and mathematics in Classes I and II and there is an integrated textbook-cum-workbook for environmental studies incorporating both science and social studies for Class III. In Classes IV and V, environmental studies has been bifurcated into two different areas, i.e., 'science' and 'society' for which separate textbooks-cum-workbooks have been provided.

In Karnataka, textbook-cum-workbooks for Classes I to IV on environmental studies are prescribed.

In NCERT's textbooks, teaching of language and mathematics has been woven around children's immediate environment in Classes I and II and no separate textbook for environmental studies has been prescribed for these classes. In Classes III-V, separate textbooks for environmental studies have been provided. EE has been further reinforced under the Art of Healthy and Productive Living (AHPL) for which a single teachers' handbook has been developed for Classes I to V.

The contents and concepts covered in these books include the following:

- Familiarisation with one's own body;
- Awareness about immediate surroundings;
- Need for food, water, air, shelter, clothing and recreation;
- Importance of trees and plants;
- Familiarisation 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 sources 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 sensitising children about environmental concerns. Emphasis has also been laid on the need to organise 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 scope for inclusion of more activities to enable children to translate awareness into effective behavioural 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 technology' 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 - greenhouse effect, ozone layer depletion and increase in carbon dioxide;
- Role of micro-organisms 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 industrialisation 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 conative domains of learning. Co-scholastic activities including organisation of plays, cultural programmes, 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 three textbooks, namely, Science Part-I (Physical Science), Science Part-II (Biological Science) and Geography, while in Karnataka, one textbook deals with science (physics and chemistry), the second with science (biology) and the third with social sciences. The textbooks deal with environmental concepts both at concrete and abstract levels. The major concepts covered are:

- Bio-sphere;
- Greenhouse effect;
- Ozone layer depletion;
- Use of fertilisers 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 internalisation of all such concepts. The NCERT textbooks of `science and technology' and integrated `social science', however, provide a wide view of EE, highlighting various environmental problems and suggesting a variety of projects and community related activities to resolve environmental issues.

**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. Certain concepts of EE occur in different subjects and the books provide only restricted views of these.

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, while others would remain deprived of this advantage. There is need for identifying a core content to be evolved on the basis of the concepts included within EE at the secondary level.

Considerable variation in the presentation of content has been noticed in the different textbooks. The topics constitute isolated entities and the focus has thus got diffused.

The coverage of EE concepts in the textbooks of various subjects includes:

- Environment and sustainable development;
- Atmospheric pollution - global warming, greenhouse effect, acid rain, and ozone layer depletion;
- Water pollution - international standards of drinking water, importance of dissolved oxygen in water, bio-chemical oxygen demand and chemical oxygen demand;
- Land pollution - pesticides;
- Ecology;
- Strategy for control of environmental pollution - the management of waste and green chemistry;
- Economic growth and development, current challenges of economy, poverty and environmental degradation;
- Importance of protecting the environment;
- Environment and behaviour - reducing environmental stresses;
- Understanding life on earth - world climates, natural vegetation, soil, water, drainage system, transport and communication;
- Natural hazards and disasters (earthquakes, cyclones, floods, droughts and landslides) and their management;
- Population and biotic community;
- Eco system and species;
- Conservation of natural resources including wildlife conservation;
- Growth of human population and its effect on environment;
- Economic importance of trees;
- Damage to environment by overexploitation of natural resources;
- Impact of ill planned industrialisation;
- Scientific management of sewage;
- Alternative automobile fuel;
- Conservation of energy and alternative sources of energy - solar, geothermal, wind and biomass; and
• Role of government and community in conservation of environment and the environmental laws.

The review of the environmental themes in the textbooks at different stages of school education reaffirms that textbooks, by and large, have environmental concepts included in them.