Greening the Textbooks

STRUCTURE

3.1 Introduction
3.2 Objectives
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3.4 What will Greening Help to Achieve?
3.5 Greening: Where and How?
3.6 Greening Language Textbooks
3.7 Greening Social Science Textbooks
3.8 Greening Beyond the Obvious
A tree is a tree is a tree of course! But to whom? From whose viewpoint? Think of it. The same tree means different things when viewed from varied perspectives. A teacher of languages could describe it poetically. For the mathematician, estimating the height, mass, weight, surface area of all the leaves, the shadows cast at different times etc., would work. The art teacher will see geometry, shape, size, proportion, light and shade, texture, colours, etc. The chemistry teacher will find different species have different chemicals predominating. The geography teacher can find out the soil types and tree relationships as also habitat preferences. And an environmental educator would see all these aspects and more!

3.1

As we have seen, EE requires that environmental dimensions or perspectives are integrated into the entire curricular system. This implies that the perspective is integrated or infused in all subjects – from science and social studies, to language, maths, arts and crafts. Also given the multidisciplinary nature of EE, teachers of all disciplines need to be involved.

The challenge is to work out ways for such infusion to be done. In other words, how can textbooks be “greened”?

This unit discusses what “greening” implies – what does it mean to achieve, and how can it be done? It also provides some ideas on how to identify and use opportunities so as to infuse an environmental perspective into whatever subject you may teach.

3.2

On completion of this unit you should be able to:
- Recognize that every subject has the potential for being taught environmentally.
- Locate the opportunities to green your textbook.
- Include ‘green’ components in your textbook lessons.
3.3 WHAT IS ‘GREENING’?

‘Greening’ textbooks is the process of bringing in environmental perspectives, concepts, information, data, questions, exercises, activities, visuals, action links, etc. into the textbook. This process would help the teacher meet the goals of environmental education, which are to develop Awareness, Knowledge, Skills, Attitudes and Action, which would help the individual to take appropriate actions to solve environmental problems, and to create a sustainable environment.

The textbook has to be greened both in terms of:

- The content of what is written/suggested/depicted in the textbook, and
- The way it lends itself to be taught—i.e., in a participatory, hands-on, experiential way, which encourages learners to explore and learn about their environment, develops critical thinking, decision-making and problem solving skills, and encourages real-life action.

Greening tries to bring in an environmental perspective into whatever subject or topic the teacher is dealing with.

‘Greening’ is, thus both the process and the outcome of infusing environmental concepts into the school curriculum and teaching them through a variety of approaches and methodologies that would help to enhance and strengthen the established chalk-talk and textbook model.

The great challenge for educators—from those developing curricula and textbooks to the teachers who actually implement and use these—is to work out models for effective infusion into different subjects. The key is not so much what the contents are, but rather the perspective and approach in which the contents are taught.

An approach that takes a holistic perspective, brings out the linkages and relationships that involve the students and which challenges them to explore their environment, their attitudes, and their values is what is required. The challenge therefore is to incorporate all this into daily teaching.

Greening also implies that all interventions should keep in view the fundamental premise that the teaching-learning process takes place in an atmosphere which is participatory, exploratory, active, empowering, and above all, enjoyable.
3.4 WHAT WILL GREENING HELP TO ACHIEVE?

Bringing in an environmental perspective to textbooks would help students in the following ways:

- Create and increase awareness about the numerous elements that make up the environment.
- Learn a little more about the subject/topic in the lesson with specific reference to some environmental aspect.
- See situations, as depicted in the lesson, in their broader environmental context.
- Make linkages between seemingly unconnected components in the lesson, and the overall context.
- Make linkages, draw upon and integrate understandings from other disciplines.
- Become aware of and appreciate the value of diversity, as adding richness to every aspect of life and learning.
- Help students to view environment as an integral part of what they are learning and doing.
- Raise issues and encourage students to consider various ways of looking at these.
- Develop sensitivity to, and appreciation of, the tremendous diversity in the natural and human world.
- Instill values and attitudes, which reflect sensitivity, respect and responsibility in all aspect of life.

3.5 GREENING: WHERE AND HOW?

Some ways of infusing environmental perspectives in the existing books include:

- Using the text of the lesson
- Using the exercises following the lesson and adding new exercises
- Giving additional readings
- Link with locale-specific examples
- Providing activities to link concepts with life, and provide real-life examples
- Adding text to supplement or explain concepts already in the lesson.
- Adding examples to illustrate or highlight concepts.
- Adding an environmental context and relevant perspective.
- Showing interconnections, linkages, and relationships.
- Linking with ongoing concerns and contemporary issues.
- Providing some action link through which students get some ‘hands-on’ experience.
Some opportunities for Greening a lesson

Using the text of the lesson

Adding or discussing more about the identified element e.g. animal, place, person, phenomenon etc. These would be in the form of additional facts or interesting information.

Using the exercises following the lesson

1. Questions: Adding a question or two, which would draw attention to the point that needs to be highlighted.
2. Fill in the blanks: Using sentences that include some concepts/aspects that are important.
3. Matching sentences with explanations and matching words with their meanings. Trying to include some words which have environment related meanings and uses.

Adding new exercises

1. Word-based exercises: Several types of word games can be introduced which help not only to clarify environmental concepts and words, but to introduce new words and encourage students to find out for themselves meanings as well as their use. Exercises could be designed so as to use environmental themes and topics to build both the language/grammar skills, as well as explore creative use of language. Ideas for such word-based exercises include word jumbles, crosswords, puzzles, riddles, and several others.
2. Creative exercises: Creative writing skills can be enhanced by guided poetry writing, essays, passages etc. Discussions, debates, elocution—all of which are popular school activities, can also be effectively used to get children to think and talk about environmental themes and issues.
3. Encouraging students to express their own thoughts on chosen subjects through letters, essays, short passages, poems, skits etc. These could be added as exercises to highlight environmental themes and issues.

While greening, there are several other factors to be kept in mind. Greened information should be accurate; it should be relevant to the immediate surroundings of the students so that they understand it; it should be appropriate to their level of understanding and most importantly the greened process should be consistent and comprehensive. However, this whole exercise should not overload students with information and also there should be not be any force connections between the textbook chapters and current environmental concerns. Greening should also remove biases relating to gender, anthropocentricty, Urban/rural, Rich/poor, Development/conservation. The following pages give some examples of one or more of the above ways to green different subject textbooks.
3.6 GREENING LANGUAGE TEXTBOOKS

In the case of language textbooks, ‘greening’ does not necessarily imply, nor require, rewritting or disturbing the existing lessons. Nor does it mean that lessons be replaced. It rather sees it as a process of recognizing the opportunities in the entire textbook and potential points of intervention through which the environmental perspective could be infused. There are several ways to do this. Some examples:

1. **Provide additional and relevant information with reference to a broader environmental context:** Even within a chapter, there could be many options to choose from about the identified element (i.e. animal, place, person, and phenomenon) on which additional & relevant information can be given.
   
   Example: A story about camels could be an opportunity to discuss a camel’s special features that help it to adapt to the environment in which it lives.

2. **Link the content of the lesson to more locale specific context:** A lesson about a fictitious island could also add information about islands around India, and their special features.

3. **Provide real life examples and activities to give a practical orientation to theoretical lessons:** A lesson about paper or water or electricity could be used to initiate a discussion on need for conserving these resources, and ideas on auditing their use in our own daily life, as well as types for conservation at personal level. A poem about rain could end by giving more information about rain in India, and ideas about things to do on a rainy day.

4. **Correct/question stereotypes and provide information to offset these:** Association of animals with human traits (sly fox, foolish crow, greedy goat etc.) is a popular reference in texts. But this is an opportunity to discuss that in reality is it not so.

   Example: Drawing attention to the fact that it is humans who attribute these characteristics/traits to the animal world, and that if an animal behaves in a particular manner; it is as an essential part of its very existence e.g. a tiger hunts only when it is hungry.

5. **Dispel the notion that all that is industrial/technological/contemporary/modern is good and everything else is not worth much:** Example of groundwater depletion and Nuclear reactor accidents can be given.

6. **Bring out the fact that often there are several sides to a picture. Every new development has several dimensions, and effects:** The Green revolution heralded in self sufficiency in food grains, but has left some adverse impacts on the environment.
7. Dispel the impression of human beings as being the ‘masters’ of the environment and as ‘controllers’ or ‘dictators’ of natural processes and phenomena and primary beneficiaries and users of natural resources: Even the wording of sentences which use this approach e.g. ‘Man Conquers Air’. The slight change in wording to shift the focus away from the dominance of humans could alter the impression of the situation e.g. the conquest of air. Lessons which talk about uses of natural resources mainly in the context of their usefulness to human beings, rather than their role as an integral part of the total environment and thereby as being linked to other components also (in addition to humans) life and survival. e.g. Role of trees as ecosystems in themselves, providing essential conditions for life for innumerable living things can be added (link it to science or social lesson that explains the importance of trees).

8. Discover the tremendous variety and diversity in the living world: Learn to recognize and importance of every individual component in making up the whole. Realize how important and effective language (words in their many uses) is in describing and portraying this, so as to create word pictures for the reader.
3.6.1 Example of Greening a Language Lesson

I am a Tree

I am a tree, so straight and free
All branches and twigs and trunk am I
But I stand alone, bare to the bone
I am a tree, so tall and free
Who will come and stay with me?

We are the roots
From us will sprout the shoots
We dig deep and wide, spread out on every side
Under the earth we hide
Food and water we gather it all
To help the Tree stand strong and tall.

We are the leaves, we dance in the breeze
So many are we, different ones for every tree
Some yellow, some red, some grow, some fall
We cover the branches and twigs like a screen,
Making a beautiful dress of green
To help the tree to breathe and dine
There’s lots to be done, but for that we need the sun.

We are the insects, we live on the tree
We crawl, we creep, we hop, we fly
In cracks and hollows, some damp, some dry
We take our fill of fruit and flower, leaf and bark
We lay our eggs and spin our webs
If you look hard you’ll see our mark.
We are the birds of different feathers
We flock to the tree in all kinds of weather
We stitch, or weave, or build our homes
From twigs, on branches, in trunks with holes
We coo, we caw, we chirp, we chatter
We rest, we roost, we flutter, we patter.

We are the children, we love the tree
In village, in city, town and country
It gives us shade and fruits for free
It plays with us when we make believe
that we are a squirrel, a hawk, Tarzan or a bee
Up we go on it, one, two... three
Look at the world like a monkey!

A tree I am, so happy and free
So many friends, are part of me
They make me a world, of colour and sound
We help each other, from sky to the ground.

I was a tree, once proud and free
I lived, I grew, I got, I gave
Some rain I brought, some soil I saved
I was a world for living things.
I am now a stump, just left to dry
Cut up for wood, oh, how I cry
A table, a chair, a window, a door
A pencil, a paper, something more
A bonfire has been lit of me.

I that was a tree
Once tall and free.
Exercises

I. Answer the following questions in your own words.
   1. How do the roots help the tree?
   2. What do the insects do on the tree?
   3. Why do the children love the tree?
   4. Which are the friends that are part of the tree? Do they make the tree happy?
   5. What happened to the tree in the poem?

II. Green Your Vocabulary

   Shoots: a new growth, the tip of a growing plant
   To flock: to gather or go in a large group
   Stump: the bottom of the trunk left in the ground when a tree is cut down.
   Dine: to have dinner (in this poem it means to get food)
   Twig: a small piece of a branch of a tree
   Roost: a bird’s resting place

III. Word Power

   Tick the meaning that is nearest to the explanation of the word as used in this poem. Make sentences using these words.

   Hollow: (a) a hole (b) a small valley
   Bark: (a) to make the sound of a dog
       (b) the outer covering of the trunk of a tree
   Bare: (a) uncovered, unprotected (b) empty
   Make believe: (a) to pretend (b) to make someone believe you.
   Weave: (a) to make by passing threads or strips over and under one another
       (a) weaver bird weaves its nest)
       (b) to spin (a spider spins its web)

IV. What’s in the News?

   Look through one page of a newspaper and underline all the action words or verbs that you find.
V. Word Play

In this poem, there is a lot of activity going on by birds, insects, children etc. Different verbs are used to describe these actions.

Given here is a list of some of these action words. Match each with the creature that you imagine would be most likely to be doing that action.

<table>
<thead>
<tr>
<th>Action</th>
<th>The Doer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stitch</td>
<td>Crow</td>
</tr>
<tr>
<td>Crawl</td>
<td>Weaverbird</td>
</tr>
<tr>
<td>Hop</td>
<td>Spider</td>
</tr>
<tr>
<td>Fly</td>
<td>Koel</td>
</tr>
<tr>
<td>Creep</td>
<td>Squirrel</td>
</tr>
<tr>
<td>Weave</td>
<td>Snake</td>
</tr>
<tr>
<td>Coo</td>
<td>Sparrow</td>
</tr>
<tr>
<td>Caw</td>
<td>Pigeon</td>
</tr>
<tr>
<td>Spin</td>
<td>Snail</td>
</tr>
<tr>
<td>Flutter</td>
<td>Children</td>
</tr>
<tr>
<td>Rest</td>
<td>Butterfly</td>
</tr>
</tbody>
</table>

3.7 GREENING SOCIAL SCIENCE TEXT BOOKS

In Social Science textbooks, ‘greening’ involves the identification of potential points of intervention through which the environment perspective could be infused. Social Science deals with social and cultural realities created by humans and therefore it is open to multiple interpretations and opinions. Social Science is divided into History, Geography and Civics.

**History helps to explain:**

1. What the environment was like at different points in time.
2. How it shaped human beings and how it was shaped by human life.
3. How historical events influence current development?

**Geography helps to understand:**

1. The interactions between human beings and their natural and cultural environment.
2. How humans have influenced natural and cultural environment and how these have shaped each other?
3. How and why these interactions and patterns differ from place to place?
Civics helps to understand:

1. Rights and duties of citizenship and systems and structures put in place by societies to ensure them.

2. Many environmental problems are the result of irresponsible citizen attitudes and behaviours.

3. Resolution of the problems requires that people understand their responsibilities, and social and political systems support them in their endeavours to prevent or solve environmental problems.

The study of Social Science provides an important opportunity to achieve the objectives of environmental education. This can be done by a conscious highlighting of the environmental connections, which includes both contextualizing the given information and localizing it so that students can relate the information to their local environment, their field of experience, and their own lives.

3.7.1 Some Examples of Greening Social Science

Greening History

A certain amount of environmental content is implicit, especially in the history textbooks. Greening of the history textbooks can help to highlight environmental content without tampering with the text. This has been achieved through:

- **Boxes** to elaborate or illustrate points already made in the text, or to add additional but related information. (E.g., box on “Environmental awareness in Maratha warfare”).

- **Separate chapters** at the end of the book to highlight what the environment was like during the period covered by the book, and how it shaped human life and was shaped by it.

- **Action links** to provide students with the opportunity to undertake some activity such as interviewing, observing, researching, mapping, to better understand certain historical context, and process of development concepts.

- **Illustrations** of and from the period (E.g. “Environment in Miniature Paintings”).

Two examples are given:
Environmental awareness in Maratha warfare

Much of the military success of the Marathas was due to their guerrilla warfare strategy. Effectiveness in this kind of warfare depended on environmental knowledge. If they had a choice, the Marathas usually began their campaigns on Vijayadashami. This was not only because it was believed to be an auspicious day but also because by then the Kharif crops would be either ripe or harvested, offering enough local food wherever they went. Also, by this time the monsoon would have receded, making cross-country travel easy.

Impact of railways on forests

The British introduced railways to India. This was on the one hand a boon in knitting the country together, but on the other hand it also had serious environmental effects.

Rail tracks are laid across closely spaced beams called sleepers. A kilometre of track need about 500 sleepers. A sleeper of good quality timber (teak, sal or deodar) has a life of about 12-14 years. If inferior quality timber is used replacement is more frequent. A mature tree can be cut into six to eight sleepers.

For producing sleepers, not only were good trees in forests cut in vast numbers, an even larger number of other trees and shrubs were cleared which obstructed the removal of the timber from the forest. Thus major deforestation resulted from the construction of India’s railway network.

Greening Geography

Although the content of geography is basically environmental, the geography textbooks need greening in order to include some of the points given below:

Provide the human context

For example, the chapter on North America “Resources and Utilization” could begin with the people: Arrival of ancestors of native Americans, “discovery” of continent by Europeans, where they came from and what they found, i.e. also add the historical context.

Introduce contemporary environmental problems and issues

For example, in the chapter on North America, a box on acid rain could be added in the section dealing with industry.

Improving Links

• By stress on and highlighting linkages between different parts of books and chapter. For example, the box on acid rain not only introduces an environmental problem but also highlights the role of the prevailing winds, an element of physical geography.
• Improve links between subjects, e.g.
  - Geography and Civics: high consumption lifestyles of Americans discussed in both
  -Geography and History: the reasons for the introduction of railways by the British which are given in the textbook help explain the pattern of the distribution of the railway network in India given in the Geography textbook for the same class.

• Improve links with students’ lives. For example, the chapter on transport is a compendium of facts and figures about roads, railways and air transport in India. Getting students to find out information about their railway zone, the name and distance of the nearest railway station, the nearest airport, the gauge of the railway track, the names of the important trains, etc. would help add some relevance to the information.

Introduce Action Links

This can be done through questions, activities and projects to link content to students’ lives. E.g., in a chapter on “Local Weather and the Sky” an activity could be added:

Identify, with help from books or biology teacher, trees and shrubs growing in or near the school campus. Monitor these plants regularly. Record: when do the different plants sprout new shoots or leaves? When do they bud? When do they flower? When do they shed their leaves? What are the weather conditions when each of these phenomena occurs? Do different plants follow different timetables?

This activity would help students recognize trees that they see around them every day, and understand the relationship between weather conditions, seasons and plant activity. It would also help them become more observant.

Explain Why

Statements such as “This region is known as the Tundra. Polar bear, caribou, musk-ox and reindeer are the important animals of this region” need explanation. The explanation here would introduce the concept of adaptation. Adding illustrations of these unfamiliar animals would help students understand what is being referred to.

Greening Civics

Greening the civics textbooks needs to include both interventions to green the content and also to improve the content to enable students to relate it with their own experience.

Add relevant environmental concepts

For example, the concept of carrying capacity and consumption level could be added to the chapter on population.
Add relevant and interesting information to improve understanding of concepts

The chapter on “Our Major Economic Problems” in the Class 8 textbook refers to the Poverty Line without giving any information on it. The following addition makes it more understandable.

**Poverty Line Diet**

Poverty line is defined as a monthly expenditure per person which is able to buy food that provides a person daily intake of 2,400 calories in rural areas and 2,100 calories in urban areas.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food grains</td>
<td>400 grams *</td>
</tr>
<tr>
<td>Daal</td>
<td>1 cup cooked</td>
</tr>
<tr>
<td>Milk</td>
<td>1/3rd cup</td>
</tr>
<tr>
<td>Edible oil</td>
<td>2 teaspoonfuls</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1 potato, 1 small brinjal, 1 onion, 1/2 tomato</td>
</tr>
<tr>
<td>Dried chilies</td>
<td>1 teaspoon</td>
</tr>
<tr>
<td>Tea leaves</td>
<td>1 tsp. = two cups of tea</td>
</tr>
<tr>
<td>Eggs</td>
<td>1 every 5 days</td>
</tr>
<tr>
<td>Fresh fruit</td>
<td>1 piece per week</td>
</tr>
</tbody>
</table>

After buying these food items, the person would have only about Rs.2 per day left over for all other expenses. One in every three Indians cannot afford even this frugal diet.

Students can be asked to do a small exercise at home based on this:

- Find out how much food grain (wheat, rice or both) is used in your home every day?
- Divide it by the number of members in your household to find out how much, on an average, each person eats?
- How many rotis or how much rice would 400 grams be?

*Explain why* for general statements and sweeping conclusions. E.g., “The countries which have successfully reduced their population growth are generally those which have also reduced their infant mortality rate. [Add] People tend to have more children when they are not sure how many will survive.”

*Highlight achievements and best practices* from different part of India. Example is again from the Class 8. The text in italics when added in a chapter on population can help illustrate the abstract statement.
“It has been found that literate women have fewer children than illiterate women, and are able to give them better nutrition and health care. This is what has happened in Kerala. By 1991 a major literacy campaign in the state had raised the female literacy rate to 86 per cent, the highest in the country. The average for India at that time was only 39 per cent. In 1991 the state also recorded the lowest birth rate at 17 per thousand population compared to 28.5 as the average for India, and also the lowest infant mortality rate at 13 per thousand live births as against 74 for India.”

To guard against the possibility of students being expected to memorize the figures, this information could be presented in the form of a graph and students could be asked to interpret the graph.

**Encourage exploration** of facts and conditions for **different parts of India**.

“In most communities, traditionally sons inherit and transmit the family’s name, land and other property. **Do you know of any communities or states in India where traditionally women, and not men, inherit their parents’ property?**

**Improve explanations and definitions**

Definition of infant mortality rate given in the textbook is “The rate at which the number of infants per thousand die.” This definition neither explains what “infant” means nor does it a time frame for the rate. Therefore, **Change to** “The number of deaths of babies up to one year old per thousand babies born in a year.”

**Remove Biases**

- **Remove gender bias.** For example
- Wherever the term “man” refers to humankind, change to “humans”.
- In the activity in chapter on population: “Prepare a family tree starting from your great- (grandfather) grandparents.”

**Bias against rural/ignorant/poor**

“[Villagers] do not know the use of potassium permanganate and chlorine which make water drinkable. The result is that the drinking water remains unclean and polluted.”

Such a statement would have to be removed. But this could be a good opportunity to introduce the concept of traditional knowledge and how people traditionally ensured the potability of their drinking water. Care would, however, have to be taken to not romanticize traditional knowledge or underplay the fact that water-borne diseases, especially those caused by drinking unsafe water, are very widespread in India.

A major challenge of greening Social Science textbook lies in its fundamental difference from Science. Whereas Science deals with physical reality governed by natural, invariant laws, Social Science deals with social and cultural realities
created by humans. The implication of this difference is that social science is therefore open to multiple interpretations and opinions. This leads to the dilemma of what to include and how much to include. Others may not agree with what one chooses to include or the perspective that one offers. The other dilemma is in terms of the need to balance between the subjective and the objective, perceptions and facts, negative and positive, general and specific. The need to inculcate among the students a sense of pride as well as an ability to be critical.

3.8 GREENING BEYOND THE OBVIOUS

Greened teaching gives a holistic understanding of the dynamics of life on earth. The objective of greened teaching is to develop an informed citizen that is better geared to responding to current issues and concerns. This can be in the form of taking concrete actions, orienting and educating others. Therefore, teachers need to go beyond the obvious opportunities for greening so that students become responsible citizens.

3.9

Take any lesson from the subject you teach. Bring in an environmental perspective into the lesson through one or more techniques listed in this chapter.

(credit points: 5)