APPENDIX – I

ENVIRONMENTAL KNOWLEDGE TEST

Dear Pre service teachers,

Please read the questions carefully and answer the all the questions by selecting the most appropriate alternative. You can put a cross mark (X) in the cell corresponding to each question in the answer sheet. The data will only be used for research purpose.

1. The unfavorable alteration of environment due to human activities is termed as …
   a. ecological disturbance
   b. catastrophe
   c. ecological degradation
   d. pollution

2. Which of the following is the major cause of pollution?
   a. plants
   b. man
   c. fungi
   d. hydrocarbon gases

3. The objective of Environmental Education is …
   a. raise the consciousness about environmental education
   b. to teach environmentally appropriate behaviour
   c. create environmental ethics that fosters awareness about ecological interdependence of economics, social and political
   d. all of the above

4. The study of the interaction between living and non-living organisms and environment is called …
   a. Ecosystem
   b. Ecology
   c. Phytogeography
   d. Phytosociology

5. The environment which has been modified by human activities is called …
   a. Natural environment
   b. Anthropogenic environment
   c. Modern environment
   d. Urban environment

6. Physical and chemical components of an ecosystem constitute …
   a. Biotic structure
   b. Abiotic structure
   c. Both of the above
   d. None of the above
7. Which of the following waste cannot be decomposed by bacteria to from compost?
   a. Kitchen wastes
   b. Plastic and polythene bags
   c. Dead plants
   d. Bodies of insects living in the soil

8. Which one of the following is a wrong statement?
   a. Greenhouse effect is a natural phenomenon
   b. Eutrophication is a natural phenomenon in freshwater bodies
   c. Most of the forests have been lost in tropical areas
   d. Ozone in upper part of atmosphere is harmful to animals

9. Two gases making highest relative contribution to the green house gases are …
   a. CO₂ and N₂O
   b. CO₂ and CH₄
   c. CH₄ and N₂O
   d. CFC₅ and N₂O

10. Common indicator organism of water pollution is …
    a. Entamoeba histolytica
    b. Escherichia coli
    c. Eichhornia crassipes
    d. Lemna paucicostata

11. Shell of egg in bird becomes thin (not properly formed) due to the pollution of pesticides. This is due to interference in the activity of …
    a. Cadmium
    b. Mg ATPase
    c. Ca ATPase
    d. None of these

12. Which one of the following is not used for ex situ plant conservation?
    1. Field gene banks
    2. Seed banks
    3. Shifting cultivation
    4. Botanical Gardens

13. Prolonged liberal irrigation of agricultural fields is likely to create problem of …
    a. Aridity
    b. Metal Toxicity
    c. Salinity
    d. Acidity

14. Which one of the following expanded forms of followings acronyms is correct?
    a. IUCN = International Union for Conservation of Nature and Natural Resources
    b. IPCC = International Panel for Climate Change
    c. UNEP= United Nations Environmental Policy
    d. EPA = Environmental Pollution Agency
    d. a and d
15. Sacred grooves are especially useful in …
   a. generating environmental awareness
   b. preventing soil erosion
   c. year round flow of water in rivers
   d. conserving rare and threatened species

16. Energy flow in ecosystem is …
   a. Bidirectional
   b. Multidirectional
   c. Unidirectional
   d. All around

17. Non-ionizing radiations with specific biological effects are …
   a. Gamma rays
   b. Beta rays
   c. UV Radiation
   d. X-rays

18. Ozone day is observed on
   a. September 16
   b. April 25
   c. January 15
   d. December 16

19. Which one of the following is not normally a pollutant?
   a. Carbon monoxide
   b. Carbon dioxide
   c. Hydrocarbons
   d. Sulphur dioxide

20. DDT is a …..
   a. Greenhouse gas
   b. No-degradable pollutant
   c. Degradable pollutant
   d. None of these

21. Decomposition of domestic wastes under natural process is called …
   a. Industrial pollution
   b. Thermal pollution
   c. Biodegradable pollution
   d. Non- biodegradable pollution

22. Global agreements in specific control strategies to reduce the release of ozone depleting substance was adopted by
   a. The Vienna Convention
   b. Rio de Janeiro Conference
   c. The Montreal Protocol
   d. The Kyoto Protocol
23. A disease affecting industrial workers is …
   a. Silicosis
   b. Fluorosis
   c. Asthma
   d. None of these

24. According to Central pollution Control Board (CPCB), which particulate size in diameter (in micrometers) of the air pollutants is responsible for greatest harm to human health?
   a. 5.2- 2.5
   b. 2.5 or less
   c. 1.5 or less
   d. 1.0 or less

25. Which one of the following statement is wrong in case of Bhopal, (India) tragedy?
   1. It took place in the night of December 2/3/1984
   2. Methyl Isocyanate gas leakage took place
   3. Thousands of human beings killed
   4. Radioactive fallout engulfed Bhopal

26. Which factors of ecosystem include plants, animals and microorganism?
   1. Biotic factors
   2. Direct factors
   3. Indirect factors
   4. Abiotic factors

27. Soap and detergents are the source of organic pollutants like …
   a. Glycerol
   b. Polyphosphates
   c. Sulphonated hydrocarbons
   d. All of these

28. The pollution which does not persistent harm to life supporting system is …
   a. Noise pollution
   b. Radiation pollution
   c. Organochemical pollution
   d. All of these

29. Algal boom results in …
   a. Global warming
   b. Salination
   c. Eutrophication
   d. Bio magnification

30. A major environmental problem affecting Latin America, Sub-Saharan Africa and Southeast Asia has been …
   a. Air pollution
   b. Deforestation
   c. Disposal of nuclear waste
   d. Acid rain
31. A major contributing to the destruction of the Amazon rain forests is the … 
   a. Movement of people from rural to urban areas  
   b. Attempt of native people to end illegal drug traffic  
   c. Need for more farm land  
   d. Spread of industrialization  

32. The amount of carbon dioxide in the atmosphere has increased in recent years.  
   Environmentalists suggest this change is a direct result of …
   a. Improper storage of solid and nuclear waste  
   b. Overcutting of forests and the increased use of fossil fuels  
   c. Dumping of inorganic material into lakes and rivers  
   d. Use of herbicides and toxic substance as asbestos and DDT  

33. In developing countries, the use of wood, charcoal and dung as major sources of energy has created an increase in …
   a. Economic dependence on industrialized nations  
   b. Sales as profit for international oil corporations  
   c. Deforestation and other environmental problems  
   d. Nuclear waste products  

34. Which of the following is not a concern of the Environmental Protection Act? 
   a. Reduction in remnant vegetation  
   b. Recycling of waste to avoid land fill  
   c. Buffle grass productivity decline  
   d. Water use  

35. World environment day is celebrated every year on …
   a. 5th March  
   b. 15th April  
   c. 15th May  
   d. 5th June  

36. Which method is used to control pollutants of particulate nature? 
   a. Combustion  
   b. Absorption  
   c. Electrostatic precipitators  
   d. Oxidation pond  

37. India generates about 4.3 million tons of hazardous wastes every year. Direct exposure to two chemicals in hazardous waste can cause death. Name them 
   a. Mercury and arsenic  
   b. Cyanide and sulphur  
   c. Sulphur and arsenic  
   d. Mercury and cyanide
38. Garbage can be put under four categories: organic, toxic, soiled and recyclable. Of the organic waste, this forms an important part.
   a. Plastic bags
   b. Vegetable peels
   c. Glass
   d. Metal

39. Landfills are the sites for the disposal of solid waste. While building it is very essential to take one of the following factors into consideration.
   a. Below the ground water level
   b. Above the ground water level
   c. In a ground water source
   d. None of the above

40. One of the following burning fuel, which is considered as the cleanest?
   a. Coal
   b. Natural Gas
   c. Oil
   d. None of the above

41. Example of primary pollutant is …
   a. SO₂
   b. NO₂
   c. CO
   d. All of the above

42. The effect of the gaseous pollutants depends mainly on their …
   a. Solubility in water
   b. Hydrophobic in nature
   c. Ability to settle down
   d. Longevity in air

43. Bio magnification is caused mainly by
   a. Organochlorine
   b. Neem oil
   c. Organophosphates
   d. All of these

44. The polluting strength of sewage is usually characterized by its
   a. BOD
   b. Nitrogen content
   c. Ozone content
   d. Eutrophication

45. A method of converting sewage water onto fairly clean drinking water is by
   a. Addition of biocides
   b. Diffusion
   c. Osmosis
   d. Reverse osmosis
46. Which method is used for removal of sulphur dioxide and ammonia from the polluted air?
   a. Wet scrubbers
   b. Absorption
   c. Gravitational method
   d. Electrostatic precipitator

47. The main purpose of studying environment education is
   a. to maintain essential ecosystem
   b. to preserve genetic diversity
   c. to maintain life support system
   d. all of above

48. Overgrazing results in …
   a. Soil erosion
   b. Retention of useful species
   c. Productive soils
   d. All of the above

49. An ecosystem may not undergo changes because
   a. It is in a state of homeostasis
   b. It has plants and animals both
   c. It gets solar energy continuously
   d. The decomposers are present in it

50. Rain percolates onto the ground and is called …
   a. Substratum water
   b. Level water
   c. Ground water
   d. All of the above
## ENVIRONMENTAL KNOWLEDGE TEST

**Answer Sheet**

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APPENDIX – III

ENVIRONMENTAL KNOWLEDGE TEST

Answer Key

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Dear Pre-service teacher,

Some statements related to environmental issues are given below. Please read all the statements carefully and give your sincere response to each statement. There is no right or wrong answer. Your response could be marked by putting a cross (X) mark in the appropriate cell under SA (Strongly Agree), A (Agree), U (Undecided), D (Disagree) and SD (Strongly Disagree). Please try to avoid selecting U, unless it is very necessary. The data will only be used for research purpose.

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<td>I try to talk people before making complaint about their polluting acts</td>
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<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>8</td>
<td>I had never took part in any environmental activities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Education for raising awareness of the public is the most viable solution exercised against environmental problems</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td>10</td>
<td>Activities of nongovernmental organizations attract the people to raise their awareness on environmental issues</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>11</td>
<td>I collect garbage and keep environment clean</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>12</td>
<td>I educate people about environmental issues</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Government is sole responsible to solve environmental issues</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tr>
<tr>
<td>14</td>
<td>I usually read labels on products to see if the content were environmental safe</td>
<td>5</td>
<td>4</td>
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<tr>
<td>15</td>
<td>I usually purchase products that can be recycled</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td>16</td>
<td>I usually try to learn what can be done to reduce environmental issues</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>17</td>
<td>I usually segregate degradable and non-degradable wastes</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>18</td>
<td>Rivers could be exploited for the purpose of thermo electric power stations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>Continuous removal of sand from river basin causes breaking down of the river banks</td>
<td>5</td>
<td>4</td>
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<tr>
<td>20</td>
<td>Rivers should be diverted to dams to make use of water</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>Enough number of sewage treatment plants are needed to reduce the water pollution</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Rain water harvesting is the best method to face the challenge of water scarcity</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>23</td>
<td>Bore wells are the necessity to have enough drinking water</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>Air pollution results in water pollution also</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>Nothing could be done to reduce air pollution</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>Compulsory laws and regulations need to be taken to reduce air pollution</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>27</td>
<td>Wastes produced in houses should be treated in their itself</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>28</td>
<td>Garbage and waste need to be separated at the origin itself</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>29</td>
<td>Paper wastes could be used for recycling purposes</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>Paperless administrative works are most suitable to reduce paper waste</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>Each hospitals should have their own waste treatment systems</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td>The habitats in the sea costs should be protected while doing construction in that areas</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>33</td>
<td>Tidal power projects are harmless to the sea ecosystem</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34</td>
<td>Pollution owing to pesticides badly affect the sea ecosystem</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>I support to use hills for the sand mining purposes for construction uses</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>36</td>
<td>Mining should be done in all possible areas in order to support our economic system</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>37</td>
<td>Fossil fuels produce CO₂ in the atmosphere when burnt</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>38</td>
<td>All living beings are interdependent one another</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39</td>
<td>Poisonous materials are introduced in the food chain for instance via ground water</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>Ozone near the ground may cause respiration problems</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>41</td>
<td>A reduced number of species may interrupt the food chain, affecting some subsequent species in the chain</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>42</td>
<td>All living things whether human beings, animals, plants or stones have the right to exist</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>43</td>
<td>All organisms are precious and worth preserving</td>
<td>5</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>44</td>
<td>For everything that I do, including deeds affecting the environment I am responsible for the same</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>45</td>
<td>The earth’s value does not depend on people, it is valuable in itself</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>46</td>
<td>If things continue on the present course, will soon experience a major ecological catastrophe</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>47</td>
<td>Human beings are severely abusing the environment</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>48</td>
<td>The balance of nature is very delicate and easily upset</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>49</td>
<td>We are approaching the limit of the number of people that earth can support</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>When human interfere with nature, it often produces consequences</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>51</td>
<td>The earth has plenty natural resources if we just learn how to develop them</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>52</td>
<td>Human will eventually learn enough about how nature works to be able to control it</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>53</td>
<td>Human beings have the right to modify the natural environment to suit their needs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>54</td>
<td>Despite our special abilities human beings are still subject to the laws of nature</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>55</td>
<td>Human beings were meant to rule over the rest of the nature</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>56</td>
<td>I can help people who are working on solving environmental problems</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>57</td>
<td>I am willing to encourage other people to do things that help to protect the environment</td>
<td>5</td>
<td>4</td>
<td>3</td>
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<td>1</td>
</tr>
<tr>
<td>58</td>
<td>I would be willing to talk with governmental officials about environmental protection</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>59</td>
<td>Natural resources should be carefully handled</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>For preventing erosion and landslide, more trees should be planted</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>61</td>
<td>I am willing to take steps to prevent environmental problems such as recycling not, littering etc.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>62</td>
<td>I consider myself to be very sensitive towards the environment</td>
<td>5</td>
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APPENDIX – V

ENVIRONMENTAL EDUCATION MODULES
Part A
MODULE 1

Objectives:
This module facilitates learners in:
• Discussing the meaning of environment
• Analyzing the importance of environment
• Justifying the importance of environment
• Reflecting the various environmental concerns
• Discussing action plant to meet the challenges of environmental concerns.

Introduction to Environment

Environment is the sum total of the entire physical, chemical, biological, economic and social factors that influencing and interacting with organisms. Environment may be analyzed into a number of factors such as soil, moisture, wind, temperature, etc. In fact, any external force, substance or condition that affects organisms in any way becomes a factor of their environment and the sum of all such factors constitute environment. The environment may be divided into abiotic and biotic components.

Importance of environment and its components: all living organisms including human beings depend on the environment for their existence and perpetuation. Human cannot survive without plants, animals and the physical environment.

The biotic components include all living things ranges from microorganisms to the largest forms of plants and animals. These constitute the organic or biological environment. The abiotic components include soil, water, air, and sunlight. These constitute the physical environment. In other words, the physical or abiotic environment includes all non living components of the biosphere. The biosphere is that part of earth where life exists naturally. It is the thin layer of soil, rock, water and air that surrounds the planet.
earth along the living organisms for which it provides support, and which modify it in directions that either enhance or lessen its life supporting capacity.

While the physical environment is essential for the existence of life in various forms, the biological environment provides the food and other material for the sustenance of life. The biotic and abiotic components continuously interact with each other. Human made environment includes all the social cultural and religious components of human activities such as language, buildings, tools, machines, consumerism, politics, aggression leading to war and displacement, neo-colonialism, rituals customs etc.

Environment includes a complex of natural, built and social components in the life of humanity and that the social components constitute a set of cultural, moral, personal values ad interrelations (Tbilisi Conference).

Environment is the sum total of all external conditions and influences affecting organisms. The environment may be divided into abiotic (non-living) and biotic (living) components. THE environmental components act as a whole (Essential Learnings in EE).

**Environmental Problems and Concerns**

In the last few decades the world has witnessed innumerable environmental problems; problems resulting out of human greed and quest for progress and development. Perhaps, never before in human history has so much been talked and written about the problems of the environment and it has been today. If the present rate of environmental destruction and degradation continues, scientists predict, the results would be disastrous, sufficient to threaten life on earth.

India, like most other developing countries, is also challenged by a multiple environmental problems and concerns. These include pollution of all life support systems (air, water and soil), depletion of forests and natural resources, loss of top soil and biodiversity, widespread decreases, shrinking energy resources, etc. Perhaps, India’s most pressing environmental challenges are its growing population and poverty which have created substantial pressure on the country’s natural ecosystems and resources. In short, these problems have impacted the overall environment of the country and living standards of the people.

**Population**

Being the second most populous country in the world, with more than one billion people, population impacts on the environment primarily through the use of natural resource and production of wastes. While population is considered as an important resource for development, it becomes a major source of environmental degradation when it crosses the threshold limits of the life support systems. Increasing population is associated with several environmental issues like loss of biodiversity, pollution of water, air and soil, and increasing pressure on the agricultural land. Thus
India’s increasing population has put a heavy pressure on the country’s natural resources and life support systems, besides bringing down the per capita availability of land.

**Land Use**

Land degradation is one of the priority concerns of India. India’s total land area is approximately 329 million hectares. Of this, according to MOEF report, 1992, almost 175 million hectares of land requires special treatment to make it productive, a situation caused due to inappropriate land use. Degradation of the land is caused by water and wind erosion, salinity and alkalinity. Intensive crop, productions farming with high chemical inputs and careless and unplanned construction activities have resulted in the large scale destruction of forests and agricultural land. Increased soil erosion has led to sedimentation or rivers and reservoirs, thereby adversely affecting the water holding capacity of these water bodies. Land degradation, particularly caused due to wind and water erosion and water logging, has resulted in irreplensishable loss of soil nutrients and soil productivity.

**Forest**

Forests are considered as the backbone of any country. As an important natural resource, forests play a critical role in contributing to the gene pool and biodiversity, moderation of floods, checking soil erosion and maintaining soil fertility, conserving water, absorption of carbon dioxide and releasing oxygen, regulating water cycle etc.

The forest cover in the country has estimated at 678,333 sq.km (2003). India loses large areas of forests due to mining and non-forestry activities. Forests are also cleared for cultivation, timber and pasture lands. All these have resulted in the loss of habitats and bio diversity, and extinction of some of the faunal and floral and microbial species. The Himalayan and the Western Ghats, two of the country’s most important bio-geographic regions, is threatened toady due to excessive deforestation.

**Biodiversity**

India is one of the world’s 12 mega diversity nations. It exhibits an extraordinary bio diversity- flowering plants, mammals, fishes, crustaceans, birds, reptiles etc. India’s biological regime is astounding. It is or some 47k species of flowering and non-flowering plants and 60k species of insects, 1.6k fish species and 372 mammals.

Although India has some of the world’s unique habitats and ecosystems and a colorful bio-geographical mosaic, in the last few decades, due to excessive loss of habitats and degradation of the ecosystems, a number of plants and animals species, at least 10% of India’s recorded wild flora and 20% of its mammals are on the threatened list. Habitat destruction, over exploitation, use of rich biodiversity areas for agriculture, cultivation, human settlement and development activities, poaching, pollution, natural calamities such as flood, draughts, cyclones etc. are some of the factors responsible for the loss of country’s rich biodiversity (Ref: www.infochangeindia.org)

**Pollution**

Environmental pollution may be defines as the addition of unwanted substances (pollutants) which adversely alters the natural or manmade environment. It refers to the way by which people pollute their surroundings. Pollution of air, water and soil and noise and radioactive pollution are some of the major environmental problems in India.
Solid and Liquid Waste

Even after 60 years since independence, India cities are still not equipped with facilities to handle the solid waste and liquid waste they generate. According to one report, only 10% of the waste water generated in the cities is treated, and the rest is let out into water bodies such as streams, lakes and rivers. Run off from agricultural fields is yet another source of water pollution as it contains dissolved fertilizers and pesticides.

Solid waste is yet another major environmental problem in India. Today, many cities and towns of India have become huge garbage bins. Increasing population, rapid economic development and changing life styles are identified as some of the important causes of this problem. It is estimated by 2047, the total quantity of solid waste generated in the country would be around 260 million tones, five times more than the present level.

India is faced with two clear priorities; on the one side, it has to have developmental and other economic activities to alleviate poverty and elevate the living conditions of people; and, on other hand, it has to see that these developmental activities do not jeopardize the environment, and negate the very benefits of development. The country, thus, needs to take the path of development without destruction or sustainable development.

Environmental problems in India can be classified into two broad categories, (a) those arising as negative effects of the very process of development; and (b) those rising from condition as of poverty and lack of development. The first category has to do with the impact of efforts to achieve rapid growth and development and continuing pressure of demand generated by those sections of the society which are economically more advanced and impose great strains on the supply of natural resources. Poorly planned development projects are also often environmentally destructive. The second category has to do with the impact on the health and integrity of our natural resources (land, soil, water, forests, wild life etc.) as a result of poverty and their inadequate availability for a large section of our population, to fulfill basic human needs (food, fuel, shelter, employment etc.), that is the two problem are interwoven.
MODULE 2

Objectives:
This module facilitates learners in:
- Discussing the concept, scope and importance of Environmental Education
- Reflecting on the goals of Environmental Education
- Analyzing the importance of Environmental Education in Teacher Education
- Devising action plans to integrate Environmental Education in teaching learning processes
- Discussing the teacher competencies related to Environmental Education

Environmental Education

Environment problems are not the problems of developing countries like India but it is concerned with the whole globe. It is the need of hour to make the whole society conscious about the ecosystem and ecological balance. Education is a powerful medium for changing our behavior. Recommendations of the Stockholm conference in 1972 declared that there was close link between the society and the environment and that the relationship between them was at a critical stage, saying that “a point has been reached in history when we must shape our action throughout the world with a more prudent care for their environmental consequences” (Basu-1991).

Thus, this is a crucial time to realize that environmental sensitivity and environmental friendly behavior should be cultivated among masses particularly among youths. For the awareness of the society, it is essential to work at grass root level. So that the whole society can work to save the environment if we want the environmental value in our children, in due course, we will get the seedlings in the form of adolescents which will nurture as tree i.e., citizen having responsibility towards environment. For this purpose it is essential to educate and train the children regarding the significance of healthy environment. When students learn about the functioning of eco-system and about environmental action strategies that contribute to their maintenance they develop more environmentally responsible behavior. We move into the 21st century the impact of human behavior on the natural environment is becoming readily apparent. Resources are becoming less abundant, space is becoming more limited and pollution of air, water and land are beginning to have a direct impact on the inhabitants of the planet we hear about global issues from the social and economic to the political and environmental, on a daily basis. Now more though it is essential that teacher should have knowledge of environmental issues, sensitivity towards the environment, proper attitudes towards the environment and appropriate action strategies for solving various problems related to the environment.

What is Environmental Education?

Environmental education is not just about learning. It about understands the environmental issues confronting our planet and changing our behaviors so we can build a sustainable world for the future.

Environmental Education (EE) has always been viewed as integral to life processes. It is the need of the hour to plan and manage environment and EE and focus on the strategies needed for enhanced collaboration with a view to ensure
sustainable living with a new pattern emerging at all levels of individual, community, national and the world. The strategies should also focus of a significant change in the mindset and practices of many people leading to emergence of educational programmes and interventions with genuinely reflect the importance and relevance of an ‘ethic for living sustainable’.

EE requires a paradigm shift in the process of teaching learning at various levels. One of the guiding principles of EE is to consider the environment in its totality- natural and built, technological and social (economic, political, cultural, historical, moral, and aesthetic). Thus EE concerns itself not only with environmental well-being but also with the human well-being.

Environmental Education includes education about, education in and education for the environment. EE aims at helping the individuals to plan and undertake actions which are in harmony with the environment. If helps them to realize their unique responsibility to save the environment for the future. Environmental educationists opined that EE should be introduced at a very early stage in schooling, as children are still in their formative years and are a propitious stage for developing independent thinking, opinions, attitudes and values. Also, at this stage, children being at the concrete operational stage are able to learn and retain information for a longer duration of time. Hence a good foundation in EE at this stage should enable children to take appropriate decisions in favor of environment when they occupy responsible positions during their career.

Definitions of EE: EE is neither a new subject nor a euphemism for biology or nature study. EE is a process of developing awareness, positive attitude and a will to act in an appropriate manner towards the environment. EE is a lifelong process and futuristic in perspective. It draws its content from several disciplines and relates to them. Hence it is a multi-disciplinary and interdisciplinary subject.

EE teaches that everyone has a responsibility to develop and maintain high quality natural and social systems in which individuals know how and are willing to act only in ways that will advance human well being and maintain ecological sustainability (UNESCO, 1996).

EE is an across the curriculum approach to learning which helps individuals and groups to understand the environment with the ultimate aim of developing caring and committed attitudes that will foster the desire and ability to act responsibly in the environment. EE is also concerned not only with the knowledge, but also with the feelings, attitudes skills and social action (Australian Association of EE).

The goal of EE is “to develop citizenry which is aware of and concerned about the total environment and its associated problems and that has the knowledge, attitude, motivation, commitment and the skills to work individually and collectively towards solutions of current problems and prevention of new ones” (Belgrade Charter, 1975).

Environment Education and Teacher Education

The ultimate aim of EE is action-action to improve the environment, prevent its degradation and sustain its well being. For children, action itself can become a powerful way of learning about the environment, because it helps them to realize that their actions can make a difference, and it fosters a sense of responsibility for their immediate environment. This could be nurtured through their teachers, parents and the peer. Since the school education is so important in our days, the environment action should be nourished and harnessed in the school itself. For the same the teachers have to be prepared. Sensitizing the importance of environmental education in school education itself has taken major focus through the contemporary educational
reforms. Teacher education is an area where the action competency of the teachers needs to be strengthened in order to filter down to our children.

Realizing the importance of Education as a potential instrument for social change, NPE (1986) had stressed on the inclusion of EE as part of general education at all levels, in particular at the school level. The significance and urgency of creating environmental awareness in school children also been upheld by the Honorable Supreme Court of India through its directive to the Central and State educational authorities to make EE compulsory at the school and college levels.

The key to successful implementation of EE is the classroom teacher, as it is teacher, who would ultimately be analyzing, interpreting and implementing EE in the class room. If teachers (pre-service and in-service) do not possess necessary knowledge, understanding, skills or commitment to environmentalism and transact the curriculum, it is unlikely that they will be able to produce environmentally literate students. Given this central role of teachers, Teacher Education both at the pre-service and in-service levels, becomes vital. Hence UNESCO describes teacher preparation in EE as the “Priority of Priorities”.

Approving the significance of intensive teacher preparation for effective implementation of EE, the Curriculum Framework for EE for Teachers and Teacher Educators, a National Document brought out by the National Council of Teacher Education 2005, states, “The educational programmes of teacher education for environment protection and improvement must include knowledge, skills, positive attitude and commitment towards environment and develop responsible behavior”.

Mostly teacher education curriculum is content ridden focusing on the theories. The opportunities to practice the theories in to the reality are very rare in the present system of teacher education, since it is time bounded and content rich. When the environment education becomes a part of teacher education curriculum, it needs to cater the broad objectives of environmental education. If the curriculum is well knit to make the teacher trainees to experience the environmental issues and realize the action strategies, they may well equip themselves to transact to their students. The curriculum need to address the environmental issues, such that there can be activities on direct action, which will show tangible results that will begin to manifest themselves in a short span of time. The sense of action and achievement will result in undertaking self directed activities will excite and motivate teacher trainees and lay a foundation for lasting commitment to the environment. The stress should be on the teacher trainees to act and on reinforcing the message that each one of them can affect the environment through his or her actions. It is important that each teacher trainee realizes the impact of what they are doing, not only in their immediate environment, but also linkages with, and implications for the micro-environment.

The initial steps of any training programme at either pre-service or in service level must include a definition of the desired teacher product. The most functional way to define the product of the desired product is in the form of expected behavioral competencies- associated knowledge, skills and attitudes which are necessary in order to effectively teach environmental education. The descriptions of EE competencies could be selected on the basis of two criteria: (i) they represent unique applications of knowledge, attitudes, behavior and or skills to EE; or (ii) they are general education competencies pertinent to EE as well other disciplines, but are not adequately developed by most existing teacher education programmes. (UNESCO,1987)

The following are the selected Foundational Competencies in Professional Education as put forward by UNESCO.
The effective EE teacher should be able to

1. Apply knowledge of educational philosophy to the selection (and or development) of curricular programmes and strategies to achieve both general education and EE goals.

   It is important that all educators be aware of the philosophical basis for education in their own society. Environmental Education goals and methods should be evaluated in light of such philosophies as Experimentalism (Dewey) or Reconstructionalism (Brammel). Many accepted goals of general education supported by such philosophies are entirely consistent with EE goals. General education materials and methods may sometimes need to be merely environmentalized to achieve the goals of each.

2. Utilize current theories of moral reasoning in selecting, developing and or implementing EE curricula which will effectively achieve accepted goals of EE with selected receiver groups.

   EE teacher should competent to assess the developmental readiness of receivers when dealing with the attitudes, and process in the affective domain, and to utilize appropriate strategies to allow receivers to recognize the role of values in environmental decision making, clarify value positions, and understand the valuing process.

3. Utilize current theories of knowledge/attitude/ behavior relationships in selecting, developing and or implementing a balanced curriculum which maximizes the probability of desired behavior changes in the receivers.

   EE teachers must balance their curriculum in view of the roles of various categories of knowledge, experiences, and locus of control in leading to desired behaviors.

4. Utilize current theories of learning in selecting, developing and or implementing curricular materials and teaching strategies to effectively achieve EE goals with selected receiver groups.

   The nature of many EE goals is problem solving. Learning theory has much to offer in guiding the selection of materials and strategies to develop problem solving abilities. Selection of appropriate EE materials and strategies for specific receiver age levels may be effective when theories of learning development are considered. A pragmatic approach to this body of knowledge would do much to increase the effectiveness of EE teachers.

5. Apply the theory of transfer of learning in selecting, developing or implementing curricular materials and strategies to ensure that learned knowledge, attitudes and cognitive skills will be transferred to life style decision making by receivers.

6. Select effective instructional methodologies which are appropriate for desired cognitive and affective outcomes, receiver characteristics, and available facilities (time, personnel, money …)

7. Develop and use effective means of planning for instruction.

8. Effectively implement the following methodologies to achieve EE goals:
   a. Outdoor education methods.
   b. affective education methods (e.g, values clarification, moral dilemma …)
   c. simulation games (including role plays)
   d. case study methods
   e. community resources use (ecological, issue related, human resources)
f. methods of autonomous student and or group investigation, evaluation and action planning for resolving environmental issues.
g. appropriate teacher behavior while handling controversial environmental issues.
(9). Effectively infuses appropriate EE curricula and methods into all disciplines to which the teacher assigned.
(10). Effectively evaluate EE curricula and methods achievement with receivers in both cognitive and affective domains.
MODULE 3

Objectives

This module facilitates the learners in:

- Discussing the concepts of Experiential Education
- Analyzing the characteristics/components of Experiential Education
- Reflecting on the experiential learning practices
- Discussing the benefits of Experiential Education in teaching at school level
- Devising action plans for implementing Experiential Education

What is Experiential Education?

"Tell me and I will forget.
Show me and I may remember.
Involve me and I will understand."

- Chinese Proverb

Experiential Education is the process which takes place between the teacher and student when the direct experience, the learning content, and the learning environment all combine. The theory provides that the learner is the one constructing the knowledge. The student is then able to develop their skills and understanding through an active involvement in their learning.

Constructed by John Dewey, experiential education came to be after grotesque dissatisfaction with authoritarian teaching methods which supplied little knowledge with even littler understanding from the teacher about the students’ experiences. The major concept behind experiential education is that the experience of learning is key to free thinking and a solid educational experience.

To obtain said education experience, the experience must have continuity as well as interaction. Continuity covers the idea that students continue to learn and expound upon what they have already learned. Interaction encompasses the moment when the educational experience fulfills the needs or goals of an individual student. Dewey’s definition of experiential education is careful to disregard mis-educative and non-educative experiences. The former is when the educational experience actually hinders the student from further growth. The latter is when the student does not personally reflect and therefore does not grow.

Lesson plans would include students’ experiences, with worksheets in the form of journals. Classroom activities would typically include personal journals. The theory behind text-related journals and personal journals both in the classroom and for homework states that through this method of learning students would become more self-aware, taking active interests in their learning, while also relating things they learned in the classroom to personal experiences.

Students are generally asked to reflect upon something they watched, read, heard. They complete this for homework if it is not completed before class ends. Then for the beginning of class, students do a free write to clear their minds and recall
Concepts they learned recently. They can write or draw pictures of how they feel or what they are thinking. Teachers are then able to view the reflections, forming a rubric based on the class’ average understanding of the material. These teacher resources provide insight into how their students have learned to solve problems, to rectify any older personal issues, personally grow and develop, form personal goals and maintain said goals, as well as reviewing their own relationships not only to people but to the world and concepts within the world.

Experiential education is not simply a classroom curriculum, but often integrated into after-school programs where the aforementioned methods are used. Using the surrounding environment is another activity wherein the students learn outside as a group, aiding in their educational experience as reflection upon their relationship to nature.

The major alterations between traditional roles of teachers and students within experiential education fall into the students’ participation within the activities and their personal voice being the main discourse for learning, as opposed to merely the teacher lecturing or telling the students how to think and understand and what specifically to understand. It is often referred to as a democratic method where the usurpation of authority is rare, since authority is shared equally between students and teachers.

Experiential education is a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values.

The principles of experiential education practice are:

- Experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis and synthesis.
- Experiences are structured to require the learner to take initiative, make decisions and be accountable for results.
- Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.
- Learners are engaged intellectually, emotionally, socially, soulfully and/or physically. This involvement produces a perception that the learning task is authentic.
- The results of the learning are personal and form the basis for future experience and learning.
- Relationships are developed and nurtured: learner to self, learner to others and learner to the world at large.
- The educator and learner may experience success, failure, adventure, risk-taking and uncertainty, because the outcomes of experience cannot totally be predicted.
- Opportunities are nurtured for learners and educators to explore and examine their own values.
- The educator’s primary roles include setting suitable experiences, posing problems, setting boundaries, supporting learners, insuring physical and emotional safety, and facilitating the learning process.
• The educator recognizes and encourages spontaneous opportunities for learning.
• Educators strive to be aware of their biases, judgments and pre-conceptions, and how these influence the learner.
• The design of the learning experience includes the possibility to learn from natural consequences, mistakes and successes.

(Source Association for Experiential Education, USA)

Essential Elements of Successful Experiential Learning:

• Purposes reflect the learners needs
• Setting considered realistic by the learners
• A physical or psychological challenge is provided by the setting
• An appropriate degree of risk exists
• Diverse settings are integrated
• Emphasis on a balance of action, reflection, and application
• Provide learning experiences that are individualized, sequential, developmental
• Provide opportunities for unplanned learning from new experiences
• Instructor acts only as a facilitator of the experience
• Learner has active role in the planning and carrying out of activities
• Learner experiences numerous roles (leader, team member, employee, tutor etc.)
• Learner must claim responsibility for actions
• Interaction with social and physical environment
• Progress is monitored, assessed, and feedback is given to the learner
• Outcomes considered real and important

Benefits of Experiential Education
Student teachers will be able to:
• Identify and investigate environmental issues using both primary and secondary sources of information.
• Analyze environmental issues with regard to the various perspectives associated with those issues.
• Further, the learner is able to identify the ecological and cultural implications of these positions.
• Identify alternative solutions for discrete issues and the value perspectives associated with those solutions.
• Evaluate alternative solutions for discrete issues with regard to their ecological and cultural implications.
• Identify and clarify his/her own value positions related to discrete issues and to the solutions proposed for those issues.
• Take either individual or group action (i.e., persuasion, consumer action, political action, legal action, eco-management) where appropriate for the purpose of solving or assisting to solve particular issues.
• Evaluate environmental actions with respect to their impact on the quality of life and the quality of the environment.
Benefits to Learners

Understanding key environmental issues and the many perspectives involved contributes to a greater appreciation of the complexity of those issues. As students explore the varying perspectives related to environmental issues they will form their own beliefs and values, and perhaps establish themselves as a player or stakeholder for an issue. Investigating actual issues that are timely and relevant to students enhances their interest and improves the likelihood that they will pursue action strategies or engage in decision making related to the issue under study. As these students become successful in the skills in decision-making and action-taking, they will begin to understand that they can be agents of change in a positive and optimistic manner. Finally, students involved in issue education will be engaged in their community, working on collaborations, developing partnerships, and making a difference.

Benefits to Educators

Benefits to educators can also be claimed for those that pursue issue education in a manner beyond the textbook. They may find that timely and relevant issues interest even the toughest of students and attract and hold the attention of other learners. Teachers may better understand that it’s not only about teaching styles, but it involves learning styles as well. Teachers will discover new activities and teaching methods that improve the overall educational experience for both students and teachers alike. Educators may also discover an entirely different style of teaching when they engage in issue instruction. Many times the instructor moves from being the “sage on the stage” and becomes the “guide on the side” and directs the students to higher levels of learning through their investigations. And finally, we may discover that some of the biggest benefits from issue education include:

- The development of an appreciation for the environment.
- A sense of responsibility to protect and preserve the natural world
- Thus, improvement in environmental quality.
**MODULE 4**

**Objectives**
This module facilitates the learners in:

- Discussing the environmental issues
- Analyzing the environmental issues
- Reflecting on environmental issue analysis
- Analyzing the different strategies of environmental issue analysis
- Describing the different content competencies of an environmental education teacher
- Devising action plans for environmental issue analysis

**Goal for Identifying and Analyzing Environmental Issues**

This process involves the “dissection” of problems and issues to several key components that are critical to understanding the “anatomy” of an issue. These components include the identification of the players/stakeholders, their positions and the associated beliefs and values. This process is necessary to help learners understand the multiple perspectives found in all issues and the importance of human beliefs and values related to key environmental topics. Environmental issues are often complicated and difficult to understand. That is because there is more to understanding these issues than just understanding the science behind them. We also need to understand the social aspects of an issue, which involves a fair or unbiased look at the different sides of the issue.

The topics and associated issues will be examined or analyzed to better understand the problems, players, beliefs, and values that are associated with each of these issues. Activities in this section will identify critical components of issue analysis and help students develop the skills needed for further issue investigation. Having learned the skills of issue analysis, students will then be able to apply these new skills to additional issues using sources such as the internet, news, media and magazines.

The following descriptions should help to understand the context of the terms event, problem, and issue:

- An event is an occurrence or happening that could bring about a change in the environment. The change could be positive, negative, or neutral. The event may be natural or man-made.
- Environmental problems are usually caused by an event either man-made or natural. Defined, an environmental problem is a situation or condition involving an interaction between humans and the environment in which something or someone is threatened or at risk.
- Environmental issues exist when solutions to problems are not agreed upon by groups or individuals. Sometimes the issue is over whether or not the problem is, in fact, a problem.

An environmental problem occurs when the condition of something or someone in the environment is at risk or threatened.

“Environmental Issues” education is an important tool in the development of critical thinking and problem solving skills. These skills are necessary to conserve the economic and environment health/developments.
“Understanding that you can approach contentions and potentially conflictual public issues in a systematic way to work through conflict and increase collaboration” (Smutko, 2002).

Today in an ever-changing technological, scientific and information based world with an ever increasing human population, we are faced with multiple issues on any given day. These issues can be social in nature related to technology or science based and environmentally driven. As an individual living in a democratic society, it is a responsibility to consider issues and act appropriately on these issues if and when possible.

“The environmental issue is a socially or ecologically significant problem, somehow related to the environment, about which there are different human beliefs and values” (Ramsey, Hungerford and Volk, 2001).

Environmental issues arise from environmental problems. An environmental problem(s) typically occurs after some event, either natural or manmade, causes a change in the environment. An environmental problem results when something or someone is threatened or put at risk by that change. The disagreement or controversy about solutions is what makes an issue. Environmental issues incorporate learning to real world situations. Although they can be complicated and, at times confusing and frustrating for anyone involved, the benefits of understanding issues are great.

The following is a list of characteristics of environmental issues that should be considered while teaching about them:

- Environmental issues are complex: - there are usually more than two sides to an issue and rarely one way to solve them.
- Environmental issues are multidisciplinary: - the often must be examined from cultural, economic, environmental, political, scientific and social point of view.
- Environmental issues involve uncertainty: - sometimes the information needed to investigate an issue is incomplete, unavailable, or nonexistent. Sometimes information sources contradict each other.
- Environmental issues are ongoing: - implementing a “solution” or course of action towards an issue often leads to more issues and challenges. (Bardwell and Turder, 1994; Pennock, 1994)

With these characteristics stated, perhaps some uncertainty in teaching about issues occurs, but this is what makes issue education interesting and challenging to teach. These characteristics can present opportunities for lively student discussion and significant skill development for learners. Students investigating issues do feel empowered to make a difference as citizens, a characteristic associated with internal locus of control.

Studies conducted by Cluen and Volk, 2000; Ramsay, 1993, 1989; Simpson, 1989; Hok, 1998, looked at variables associated with issue analysis and have examined their look to citizenship behavior. These variables included, but not limited to (a) change in belief system (with respect to issue solution), (b) change in students overt environmental behavior, (c) students knowledge of environmental action strategies, (d) students perception of their ability to use action strategies, (e) students environmental sensitivity, (f) changes in students locus of control, and (g) teacher ability to learn the rudiments of issue instruction. Researchers have demonstrated that introducing relevant and timely issue via structured issue analysis and investigation process can empower and engage students in responsible citizenship behavior.

“If students are to eventually become skilled an issue investigation, evaluation and resolution, they must thoroughly understand the anatomy of issues. It is therefore
important for them to analyze selected issues in some depth” (Ramsay et.al 2001, p.173)

Environmental education materials and text books continue to provide a large amount of information on environmental awareness, however, many are lacking in areas of understanding environmental issues and their consequences (Marshall Institute, 1997). It is important that students, teachers, and the general public be informed of environmental issues on a deeper level to effectively participate in sound decision regarding these issues.
Let’s look at some events that have taken place and see what types of problems may have been created as a result of the event. Keep in mind that events can be man-made or natural events. Describe additional problems you believe resulted from these events.

<table>
<thead>
<tr>
<th>Event 1:</th>
<th>Type of event (natural/manmade)</th>
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</thead>
<tbody>
<tr>
<td>Tsunami in 2004</td>
<td>Natural</td>
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Problems associated with this event:
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<th>Event 2:</th>
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Problems associated with this event:
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Continue to describe events and problems, keeping the following relation in mind in order to identify the issues:

An Event → Environmental Problem → Environmental Issue
Sample: Activity

Brainstorming Environmental Problems

Now that you understand what environmental problems are, try your hand at identifying some. Generate a list of environmental problems of which you are aware. Then decide which of these problems are limited to your community and which are broader in scope, impacting the state, nation, or global environment. List and describe your problems in the spaces below.

<table>
<thead>
<tr>
<th>Environmental Problem</th>
<th>Scope for the problem Local, State, Nation and Global</th>
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<tbody>
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</table>
Sample: Activity
Events and Problems
Let’s look at some events that have taken place and see what types of problems may have been created as a result of the event. Keep in mind that events can be man-made or natural events. Describe additional problems you believe resulted from these events.

<table>
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<tr>
<th>Event 1:</th>
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<tbody>
<tr>
<td>Tsunami in 2004</td>
<td>Natural</td>
</tr>
</tbody>
</table>

Problems associated with this event:

________________________________________________________________
________________________________________________________________
________________________________________________________________
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Event 2: Type of event (natural/manmade)
Natural

Problems associated with this event:

________________________________________________________________
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Continue to describe events and problems, keeping the following relation in mind in order to identify the issues:

An Event → Environmental Problem → Environmental Issue
The issue of “How should land use be regulated?” is an enormous topic that is interrelated to many other issues. As a result, it should be understood by the learner that the issues surrounding land use cannot be resolved without the engagement of players at many levels from State to regional to local. Review the Issue Web below and see how many of the related issues may have been a topic of discussion in your community or county recently.
The Basics of Issue Analysis

You have come a long way in the process of issue analysis. You should be able to apply these skills to any number of public issues that you encounter. Just keep in mind that you need information about the issue. Sometimes this is in the form of scientific or what we might call foundation knowledge related to the issue. Then you must take a look at the other sides of the issues (if possible).

To summarize:

- You first identified problems and the events that may have led to or caused the problems.
- Then you looked at the issues that evolved from the problems. Do you remember how we defined an environmental issue? (To simplify you could consider an issue as a problem when people cannot agree about its solutions.)

This is the main part of the “anatomy” of issue analysis. From this point forward you should have enough information to begin making your own decisions about these issues. You probably have taken a position about the issue you studied. Consider if your position changed from the beginning of the issue analysis to the end. This frequently does happen when we learn new information about problems and issues. Now, depending on the issue and your position you may or may not want to do something about the issue. That is your choice to make. But once people get to this point of understanding an issue, many will want to go further and help resolve or remediate the issue under study. Sometimes we say that individuals are “empowered” by the information and skills they have learned and they want to do more.

A Model for Issue Investigation

Following the steps of Hungerford Model, provides the learner with additional information and skills that are then used in the decision-making process leading to solutions and actions. Remember, the emphasis is for the student to take a more active role in the learning process.

Step 1: Select an overall topic in which you are interested.
Step 2: Conduct library research and/or a search of other secondary sources on the topic of interest.
Step 3: Identify important environmental problems and associated issues related to the topic, then select an issue of interest.
Step 4: Critically analyze the issue by completing an issue analysis, identifying important players and their positions, beliefs and values.
Step 5: Write a research question(s) about the issue.
Step 6: Summarize the secondary information you have collected.
Step 7: Write letters for information and interview resource people, (as needed).
Step 8: Plan a data collection strategy designed to collect data which could answer the research question.
Step 9: Develop, pilot and revise a survey instrument (for investigations using primary sources of data).
Step 10: Collect survey data.
Step 11: Organize the data into tables, charts and graphs.
Step 12: Interpret the findings making conclusions, inferences and recommendations.
Step 13: Produce a final written issue investigation report.
Step 14: Present your investigation to the class.
Competencies

Competencies in Environmental Education content includes: ecological foundations, conceptual awareness, investigations and evaluations, environmental action skills.

Practical initial steps in designing EE training programmes for teachers include definition of the desired result. This in turn involves the most functional way of defining the desired result, namely, in terms of desired teacher competencies, which may be divided into two linked categories: (1) foundational competencies in professional education and (2) competencies in EE content.

Foundational competencies in professional education

The effective environmentally educated teacher should be able to:

- Apply knowledge of educational philosophy to the selection or development of curricular programmes and strategies to achieve both general education and EE goals. (General education materials and methods may sometimes need merely to be "environmentalized" to achieve both objectives);
- Utilize current theories of moral reasoning in selecting, developing and implementing EE curricula which will effectively achieve EE goals. (Teachers should be competent to use appropriate strategies to allow learners to recognize the role of values in environmental decision making, clarify value positions and understand the valuing process);
- Utilize current theories of knowledge/attitude/behavior relationships in selecting, developing and implementing a balanced curriculum which maximizes the probability of desired environmentally aware behavior changes in learners. (A balanced curriculum takes into account such aspects as ecological factors vs. trade-off cost etc.)
- Utilize current theories of learning in selecting, developing and implementing curricular strategies to effectively achieve EE goals. (The methodology of EE as well as the nature of many EE goals is problem solving. A pragmatic approach on the part of teachers to theories of learning development, such as Piaget’s, can do much to increase EE effectiveness in such methodologies and goals as environmental problem solving); apply the theory of transfer of learning in selecting, developing and implementing curricular materials and strategies to insure that learned knowledge, attitudes and cognitive skills will be transferred to the learner's choices and decision making concerning lifestyle and behavior. (The ultimate goal of EE is to produce environmentally literate citizens who are willing and capable of taking positive environmental actions in their lifetime);
- Effectively implement the following methodologies to achieve EE goals: interdisciplinary, outdoor education, values clarification, games and simulation, case-study approaches, community resource use, autonomous student and/or group investigation, evaluation and action in environmental problem solving, and appropriate teacher behaviors when handling controversial environmental issues;
- Develop and use effective means of planning for instruction;
- Effectively infuse appropriate EE curricula and methods into all disciplines to which the teacher is assigned;
- Effectively evaluate the results of EE curricula and methods in both cognitive and affective domains.
Competencies in environmental education content

Level I: Ecological foundations
Effective environmentally educated teacher should be able to:

- apply a knowledge of ecological foundations to the analysis of environmental issues and identify key ecological principles involved;
- apply a knowledge of ecological foundations to predict the ecological consequences of alternative solutions to environmental problems;
- be sufficiently literate in ecology to identify, select and interpret appropriate sources of scientific information in a continuing effort to investigate, evaluate and find solutions for environmental problems;
- Communicate and apply in an educational context the major concepts in ecology.

Level II: Conceptual awareness
Effective environmentally educated teacher should be able to select, develop and implement curricular materials which will make learners aware of:

- how people’s cultural or vocational activities (economic, religious, industrial, etc.) affect the environment from an ecological perspective;
- how individual behaviors impact on the environment from the same perspective;
- a wide variety of local, regional, national and international environmental issues and the ecological and cultural implications of these issues;
- The viable alternative solutions available for remediating discrete environmental issues and the ecological and cultural implications of these alternative solutions;
- The need for environmental issue investigation and evaluation as a prerequisite to sound decision making;
- The roles played by differing human values clarification as an integral part of environmental decision making;
- The need for responsible citizenship action (persuasion, consumerism, legal action, political action, eco-management, etc.) in the remediation of environmental concerns.

Level III: Investigation and evaluation
The effective environmentally educated teacher should be competent to investigate environmental issues and evaluate alternative solutions and to develop, select and implement curricular materials and strategies which will develop similar competencies in learners, including:

- the knowledge and skills needed to identify and investigate issues (using both primary and secondary sources of information and to synthesize the data gathered);
- the ability to analyze environmental issues and the associated value perspectives with respect to their ecological and cultural implications;
- the ability to identify alternative solutions for discrete issues and the value perspectives associated with these solutions;
- the ability to autonomously evaluate alternative solutions and associated value perspectives for discrete environmental issues with respect to their cultural and ecological implications;
• The ability to identify and clarify their own value positions related to discrete environmental issues and their associated solutions.
• The ability to evaluate, clarify and change their own value positions in the light of new information.

**Level IV: Environmental action skills**

The effective environmentally educated teacher should be competent to take positive environmental action for the purpose of achieving and maintaining a dynamic equilibrium between the quality of life and the quality of the environment (if indeed one can be separated from the other) and develop similar competencies in learners to take individual or group action when appropriate, such as persuasion, consumerism, political action, legal action, eco-management or combinations of these categories of action.

**Objectives:**

This module facilitates the learners in:

- Discussing the environmental impacts of pesticide uses
- Analyzing the health hazards related to uses of pesticides
- Probing local issues related to the use of pesticides
- Proposing action strategies to control the uses of pesticides
Scenario
“I don’t make my omelet from local eggs as they smell of pesticide,” says carpenter TV Gireesh as he stands outside India’s only DDT-manufacturing factory. DDT is a deadly insecticide banned in most countries. Located 18 km from central Kerala’s Kochi city, the government-owned factory has long been accused of severely polluting the environment in the industrial belt where it is located, affecting human and animal life as well as harming crops and vegetation. Gireesh is among the increasing number of activists who want the factory shut down without delay. The nauseating smell of DDT assaults the senses as one nears this industrial belt built around the once small villages of Eloor and Edayar. There are about 200-odd factories in the region but it is the DDT factory of the Hindustan Insecticides Limited (HIL), manufacturing DDT and Endosulfan since 1956, which has many of the area’s 40,000 residents up in arms. There is by now sufficient evidence to show that water in the village’s wells has become unfit for drinking and that large tracts of land are turning uncultivable by the season.

REFLECTIONS
- Use of pesticides
- Pesticide ban
- Environmental Impacts
- Health hazards
- What can we do?
- Action points

Dichlorophenyl trichloroethane or DDT in short, is a nerve poison. It mainly affects the central and peripheral nerve systems and the liver. It is moderately to slightly toxic to mammals. Acute effects in humans exposed to low to moderate levels may include nausea, diarrhoea, and increased liver enzyme activity, irritation of the eyes, nose and throat. At higher doses, tremors and convulsions are possible.

Studies conducted on the effect of DDT have revealed that it could even cause chronic effects on the nervous system. It had also been detected that adverse effect could cause danger to the reproductive process.

The dietary intake of DDT is considerably higher in developing countries.

As regards India, the real ban on the use of the chemicals like the DDT will have to come into force and no authority could enforce it other than the producers of food products. Any chance of use of these chemicals will not only diminish the marketability of our producers but will also damage the health of the existing and future generations.
MODULE 6

Objectives:

This module facilitates the learners in:

- Discussing the role of different stakeholders in environmental protection
- Analyzing the different national and local environmental legislations
- Reflecting on the day to day practices that hamper the environmental protection
- Devising action strategies to protect environment at school level.
Scenario
TNN Jun 6, 2011,
12.38pm IST;
ALLAHABAD:
The artists from a city-based social, cultural and literary organization staged a street play ‘Tree is Life’ here on the occasion of World Environment Day on Sunday. The play appealed to the citizens to protect trees and save environment. The artists also told people how greenhouse gases are leading to global warming. They said the problem of global warming is not limited to any particular but affects entire humanity and joint efforts are needed to protect the environment. The situation is getting from bad to worse and if we fail to act, then human life would be in danger, artists said.

REFLECTIONS
• Role of different stakeholders
• Environmental Legislations
• What can we do?
• Action points

The UN Environment Programme defines the Green Economy as one that results in **improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities**. In its simplest expression, a green economy can be thought of as one which is **low carbon, resource efficient and socially inclusive**.

“We want a future where we can live in a healthy setting, with strong bonds to nature and a rich diversity of social relations. For this, we need a flourishing environment. We need to create green economies.”

Irina Bokova,
UNESCO Director-General, in her message on the occasion of World Environment Day 2012
MODULE 7

Objectives:

This module facilitates the learners in:

• Discussing the issues of waste management
• Analyzing the importance of waste segregation
• Devising action strategies to improve the waste management
• Reflecting on the various waste management strategies at home and school level
Scenario

KOLKATA: It’s an expansive, stinking pile of rubbish that you are unlikely to come across in any other Indian city, except in the metro that Mamata Banerjee has promised to turn into London. Rotten vegetables, waste paper, discarded plastic and sundry other trashes are left to rot along a 300-metre stretch at Kaikhali, barely 2km from the airport. Often, the garbage remains uncollected for days, spilling over to the northern flank of VIP Road and emits a terrible stench. Area residents and shop-owners have been complaining but to no avail. And this is not the only one along the path that leads you to the city. There are half-a-dozen more eyesores on either flank.

The state of solid waste management in Kanpur was no different from most other Indian cities until only a few years ago. Kanpur Nagar Nigam (KNN) had the responsibility for collecting, transporting and disposing of the solid waste generated in the city, estimated at about 1500 tonnes per day. There were numerous collection
centres in the city, more than 400 of which were open dumps. A fleet of 132 vehicles and 3000 safai karmacharis were supposed to collect and transport the city garbage and dump it at an “authorised” site a few kilometres away from the city. This they did at an annual cost of Rs 42 crore, which has now come down to about half. Scientific disposal of the garbage was not even contemplated. The collection and transportation activity was financed out of grants from the state finance commission. A community of ragpickers was involved in removing recyclable waste from the waste chain.

REFLECTIONS

- Waste generation
- Waste Segregation
- Waste Disposal
- Waste Management
- What can do?
- Action Point

70% of all water used is for food production, water shortages mean food shortages!

Generation of Solid Waste is a natural attribute of all human activities, including agriculture, domestic and industrial. However if not properly managed, wastes can adversely affect environment, health and safety. The problems of collection, transport, proper use and disposal have become a gigantic task, straining both financial resources of the civic bodies and their physical capabilities, not to mention the problem of availability of disposal sites. Some of these areas have a population of about 10 million or more and still growing, and the daily production of more than 6,000 tonnes of municipal solid waste is a major management problem. The problems of industrial solid waste are different and the nature and quantity depends on the product, raw materials and the process involved this requires careful consideration of management. Now the time has come when the experts and those interested in solid waste management in the country should come together, examine the practices currently in vogue, assess their suitability in the light of the existing regulations, developed cost effective and environmentally sound techniques and strategies and share such experiences. It is equally important to create awareness among the public on the need for environment sound management of all wastes.

With this in mind, an association called “National Solid Waste Association of India (NSWAI)” has been formed on 25th January 1996. The association is also a member of the International Solid Waste Association (ISWA), and provides forum for exchange of information and expertise in the field of Solid Waste Management at the international level.
MODULE 8

Objective:

This module facilitates the learners in:

- Discussing the importance of water resource
- Analyzing the problems of water contamination and water scarcity
- Reflecting on the best practices for judicial uses of water
- Devising action strategies to conserve water resource
- Proposing measures to conserve water sources
- Preparing posters on water resource management
Scenario

VARANASI: Varanasi, the millennia-old city situated on the banks of the Ganga, is witnessing alarming depletion in its groundwater table. If the facts pointed out by Allahabad unit of Central Ground Water Board (CGWB) are to be believed, the annual depletion rate of groundwater in the city is 75cm to 90cm. "In the past five years, the groundwater table has gone down to 19-20 metres from 15-16 metres in urban areas of Varanasi," CGWB scientist HK Pandey told TOI. According to him, the city witnessed 40-50% depletion in groundwater level in the past five years. "However, the situation in rural areas of the district is better than the urban localities," he said. The main reasons for fast depleting groundwater being reduction in rainfall, reduced discharge of surface water and over exploitation of groundwater without adopting any measures for its recharge. "About 50% reduction in rainfall was noticed in the past five years," he said.

The following table shows a list of the potential groundwater contamination sources:

<table>
<thead>
<tr>
<th>Place of origin</th>
<th>Municipal</th>
<th>Industrial</th>
<th>Agricultural</th>
<th>Individual</th>
</tr>
</thead>
</table>
REFLECTIONS

- Importance of Water
- Water Scarcity
- Ground water issues
- What can we do?
- How do we do?
- Action points

Low Water Use Fixtures

- install low flow shower heads
- reduce showering time (10 min = 100L), tub bath = 60L!
- operate dishwasher (40L per use) and washing machine (225L per use) on full loads
- install an aerator on kitchen faucet to reduce water usage
- replace regular toilets (15 - 26L per flush) with low flush toilet (3 - 6L flush) or place an insert in toilet tank to reduce water use per flush
- locate your hot water tank close to household taps to avoid wasting water while taps run until you get hot water
- insulate hot water pipes
MODULE 9

Objectives:

This module facilitates the learners in:

- Generating ideas on issues related to energy crisis
- Analyzing the issues related to energy crisis
- Devising action strategies to mitigate energy wastage
- Listing individual as well as social responsibilities in conserving energy

Scenario

Growing Food Demand Strains Energy, Water Supplies

(Excessive water pumping has strained both water and energy supplies in India, China and other hot spots around the world. Here, people gather to get water from a huge well in a village in the western Indian state of Gujarat. Ref:http://news.nationalgeographic.com/news/energy/2012/04/120406-food-water-energy-nexus/)

- How will you reflect on the above picture?
- Brainstorm the reasons behind the situation and come out with the possible solutions.
- List out the individual as well as social responsibilities that need to be observed and acted to avoid the situation in future?)
MODULE 10

Objectives:

This module facilitates the learners in:

• Generating ideas on different issues of pollution
• Analyzing the different legislations to mitigate pollution
• Devising action strategies to control pollution
• Proposing strategies to control pollution at home and school level
Scenario

Combined water pollution in India
30 Aug, 2010

- How will you reflect on the above picture?
- Brainstorm the reasons behind the situation and come out with the possible solutions.
- List out the individual as well as social responsibilities that need to be observed and acted to avoid the situation in future?
MODULE 11

Objectives:

This module facilitates the learners in:

• Generating ideas on issues related to radiation
• Analyzing the issues related to radiation
• Discussing the health hazards related to radiation
• Proposing measures to mitigate radiation issues
• Reflecting on the day to day influence of radiations
Scenario

At the Fukushima Dai-ichi plant, a core team of 180 emergency workers has been rotating out of the complex to minimize radiation exposure. The storage pools need a constant source of cooling water. Even when removed from reactors, uranium rods are still extremely hot and must be cooled for months, possibly longer, to prevent them from heating up again and emitting radioactivity.
Efforts were made on one day to douse a number of units with water, and authorities were preparing to continue those efforts. The other day’s smoke came from the complex’s Unit 2, and its cause was not known, the nuclear safety agency said. An explosion had hit the building on Tuesday, possibly damaging a crucial cooling chamber that sits below the reactor core. Last week’s 9.0 quake and tsunami in Japan’s northeast set off the nuclear problems by knocking out power to cooling systems at the reactors. The unfolding crises have led to power shortages in Japan, forced auto and other factories to close, sending shockwaves through global manufacturing and trade, and triggered a plunge in Japanese stock prices.

REFLECTIONS

• Issues of Radiation
• Radiation monitoring
• What can we do?
• How do we do?
• Action points
MODULE 12

Objectives:

This module facilitates the learners in:

- Analyzing the issues of land mining
- Reflecting on the local issues related to land mining
- Devising action strategies to create public awareness on issues of land mining
REFLECTIONS

- Reflect on the above news item
- Brainstorm the mitigation measures
- What can we do?
- How do we do?
- Action points
MODULE 13

Objective:

This module facilitates the learners in:

• Discussing various issues related to environmental degradation
• Analyzing the issues related to environmental degradation
• Sensitizing the impacts of environmental degradation
• Devising action strategies to face the challenges of environmental degradation
Scenario

Lead author of the report Jeni Klugman says nations in sub-Saharan Africa are at particular risk. "The main problems that we see in sub-Saharan Africa are around land degradation and desertification, which are affecting livelihoods of many millions of people, obviously in rural areas," said Klugman. "We also see some significant problems around access to water and safe sanitation in both rural and urban areas."

The report says half of all malnutrition in sub-Saharan Africa is caused by environmental factors. It says environmental degradation is expected to cut agricultural productivity and cause food prices to soar by up to 50 percent in the coming decades. It says environmental deterioration could undermine decades of efforts to expand water, sanitation and access to electricity to the world’s poorest communities. While drought in sub-Saharan Africa is of concern, the authors
say sea level rises in low-lying nations in South Asia and the Pacific will put more than 100 million people at risk in the decades ahead.

▲ Environmental Degradation

✧ Understand the various cause and effect of the factors related to environmental degradation.
✧ Focus and discuss the problems with emphasis to the management strategies:
  • Decline in biological productivity.
  • Threats to bio-diversity
  • Deforestation.
  • Waste management
  • Soil erosion- compaction of soil, water logging of soils.
  • Growing inequalities (socio-economic dimensions of EE) between and within the communities.
✧ Lack of awareness/readiness from the community side towards SD.
✧ Lack of knowledge about the roles/ responsibilities of the individuals and possible action strategies.
MODULE 14

Objectives:

This module facilitates the learners in:

- Discussing the various issues related to pollution
- Analyzing the health impacts of pollution
- Generating ideas about the control measures of pollution at various level
- Devising action strategies to mitigate pollution
Scenario

COAL POLLUTION: India’s environmental problems are exacerbated by its heavy reliance on coal for power generation. "More than 80 per cent of energy is produced from coal, a fuel that emits a high amount of carbon and greenhouse gases." said Bikash. According to him, coal pollution kills more than 300,000 people every year. Andhra Pradesh, the coastal state of eastern India is experiencing a coal-plant construction boom, including the 4,000-MW Krishnapatnam Ultra Mega Power Project, one of nine such massive projects in planning or under construction across the country.

VEHICLE POLLUTION: According to the Society of Indian Automobile Manufacturers, India’s auto production has doubled from 7 million units in fiscal year 2004 to over 14 million units in year 2010 largely on the back of a buoyant domestic market.

Bangalore holds the title of being the asthma capital of the country. Studies estimate that 10 per cent of Bangalore’s 60 lakh population and over 50 per cent of its children below 18 years suffer from air pollution-related ailments.

Delhi’s air is choking with pollutant PM 2.5: The CSE report claimed that 2010 winter pollution levels are not only high but also different — along with high levels of tiny particles, more pollutants have added to the toxic cocktail. The
official air quality index shows several locations in Delhi are reeling under concoction of pollutants like nitrogen and carbon monoxide (CO). Patients complaining of chest and throat infections have shot up in the past two weeks. Experts have blamed high pollution levels in the Capital for this. Delhi’s air is choking with pollutant PM 2.5 that is only 2.5 microns in diameter and is very small particle. Being so small, it escapes emission apparatus prescribed by Euro II and III. Any kind of combustion, especially of vehicular origin, contains this particle. If PM 2.5 is not regulated it will ensure major health hazards. The number of Asthma patients will rise and in future there may huge rise of lung cancer cases also. The toxic value of PM 2.5 is such that metals like lead present in the PM 2.5 get inhaled deeper into lungs which deposits there. The children are most affected by depositing lead due to inhaling the poisonous air. The increasing amount of PM 2.5 is like a poison in the air we breathe.

What are the different types of pollution?
- List out the different types of pollutants with examples?
- Analyze the influences of the pollutants in the environment?
- Discuss about the control measures of environmental pollution.
- Suggest a frame work for action strategies for environmental pollution mitigation in your region.
MODULE 15

Objectives:

This module facilitates the learners in:

- Generating ideas on importance of Environmental Education
- Identifying the nature of Environmental Education
- Analysing the concept of Sustainable development
- Analyzing the importance of integration of Environmental Education in the school curriculum
Scenario

1972-1977: As EE was still an emerging concept at this time, these definitions were not seen as definitive. Rather they were used as working definitions that would evolve with educational research findings and as more stakeholders were brought to the table. At an international level, EE gained prominence during the 1972 Stockholm Conference on the Environment. Recommendation 96 of this conference recommended environmental education as a critical means to address the world's environmental crises. This recommendation was addressed at the 1975 International Environmental Workshop in Belgrade, Yugoslavia, which resulted in the Belgrade Charter (Barry, J. (ed.).(1976). The Belgrade Charter: A Global Framework for Environmental Education. Connect: UNESCO-UNEP Environmental Education Newsletter, 1 (1), p.1-3) a document which begins to define the goals and objectives of environmental education. The Belgrade Charter was further refined at the Intergovernmental Conference on EE in Tbilisi, Republic of Georgia in 1977: Environmental education, properly understood, should constitute a comprehensive lifelong education, one responsive to changes in a rapidly changing world. It should prepare the individual for life through an
understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values. (UNESCO, 1977, p.24). The Tbilisi declaration also explicitly stated the objectives of environmental education as: awareness, knowledge, attitudes, skills and participation. (UNESCO. (1977, 14-26 October). Final Report - Tbilisi. Paper presented at the Intergovernmental Conference on Environmental Education, Tbilisi, Republic of Georgia, p.26-7)

- List the historical background of EE.
- Analyze the development and nature of EE.
- Enumerate the landmarks in the development of EE.
MODULE 16

Objectives:

This module facilitates the learners in:

- Analyzing the importance of Environmental Education at schools
- Discussing the teacher competencies related to Environmental Education
- Proposing different strategies to transact Environmental Education concepts
- Describing the importance of planning Environmental Education lessons
- Generating ideas on issues related to teaching Environmental Education at school level
- Reflecting on the evaluation process that could be used for Environmental Education at school level.
Scenario

GUWAHATI, Feb 24 – Environment activist group ‘Environ’ has reiterated its appeal to the people of Guwahati not to dump their waste plastic and glass in public places or in the drains. The people can sell such non-biodegradable wastes at the rates of Rs 10 per kg of waste plastic and Rs 1 against each kg of waste glass or exchange such wastes against ginger and garlic of the same value, said the environment activist group. The group has been collecting such solid wastes against garlic and ginger in the city for the past about one year. The project is restricted in the GMC wards 55 and 59 with two numbers of specially designed cycle-vans “Seuj Bahan.” Plans are afoot to spread the campaign to other areas of the country too in the near future, said the group. In the first phase of its activities Environ is collecting all types of carry bags, pouch packs of vegetable oil and milk, broken plastic bucket and mug, all types of plastic bottles and containers, plastic cups, etc., and glass bottles. The idea of offering ginger and garlic is to attract the housewife, who is usually handling the household solid wastes.

➢ List out the local/regional/national/international agencies promoting EE.
➢ Enumerate the common characteristics of these agencies.
➢ Discuss the plan of action/ frame work of these agencies.

Scenario

1980: Unfortunately many of the environmental education programs and activities that were developed in the wake of Tbilisi lacked a clear direction and were inconsistent or failed to achieve the goals set forth by the Tbilisi and Belgrade documents. In response to this lack of coordination, Hungerford, et al. published, "Goals for Curriculum Development in Environmental Education" in the Journal of Environmental Education (11:3, pp. 42-7) in 1980. Using the following as the super ordinate goal of EE: ...to aid citizens in becoming environmentally knowledgeable and, above all, skilled and dedicated citizens who are willing to work, individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment (Hungerford, et al., 1980, p.44). Hungerford et al. developed a framework to guide the development of EE curricula in a manner that would be consistent with guiding principles established at Tbilisi.

➢ Why does EE important in our schools?
➢ How does EE help/ equip our teachers and students?
Scenario

- Scenario Analyze the various teaching strategies/techniques for EE.
- The planning of the strategies.
- The selection and facilitation of learning strategies.
- The evaluation of the teaching learning processes.
APPENDIX – VI

SAMPLE WORKS COLLECTED FROM STUDENTS

Issue Web
Reflective Journal

What happened?

The waste management problem around us was an eye opener for me. How much waste everyday is generated from different sources, how it affects our day to day life was being highlighted.

How did I feel about it?

I felt very bad myself knowingly or unknowingly involved in waste generation. Usually we throw all materials, often care for our surroundings. How exactly we impact on my life, little by little, now I got convinced.

What is my honest objective assessment of what happened?

My honest objective assessment is that each individual is responsible for generating waste. Throwing or dumping waste in open space creates lots of problems. It is not the lack of awareness, but careless create the problem. Space, increased population, increased hotels, industries, fish markets etc are also the reason for this.

What can I take from this?

I could learn from this in that I should reduce the waste generation. I have to reuse whatever material possible.

What important do I want to make?

I want to make use of paper bags, cloth bags instead of plastic bags. At home, help parents to segregate dry waste into degradable & non-degradable. I started to think of setting a small biogas plant at my home.

How do I need to do to learn to achieve this?

I need to get material related to waste management. I would like to discuss it with "Kudumbashree" members on what best can be done in waste management in our locality.

What aspect of my life does this relate to?

As a human being, I need to take responsibility of my deeds. I should take care not to disturb others. Through my unintentional act.
Reflective Journal

What happened / what did I do?

The video on water pollution had shown me and I could relate the same with the pollution to the river 'Thootha' near to my home. I was not giving that much care towards the same.

How did I feel about it?

The discussion on the basis of the video on gauges pollution, I was able to recognize how pathetic is the condition of our rivers due to human impact. Our each small carelessness contribute heavily towards pollution. The sanctity of water, which we don't value much of time because we have not suffered the same.

What is my honest objective assessment?

My honest assessment regarding water pollution is that our own deeds make the river polluted. The overuse of pesticides, non-biodegradable material uses etc. add to the pollution.

What important do I want to make or assist?

- I have to rethink myself to reduce the wastage of water. Make my friends aware about the intensity of the problem.
- Involve in any activities related reducing water pollution in my neighbourhood.

What do I need to do / learn to achieve this?

I would like to know the different pollutants, the ways in which water get polluted, water refinement process that could done at the domestic level.

What aspect of my life / you does this relates?

As a human being, I have the responsibility to save/ conserve the natural resources bestowed to us. I have to act myself in all possible level to manage it meaningfully.
Issue Web

global warming — how to reduce (some examples)

- Home
- Office
  - Energy Audit
  - Industries
- Planning
  - Travel
  - Fuel efficient vehicles
  - Public transport
  - Car pooling
  - Travel
- Home
  - Reduce flying (reduce CO2)
  - Use local food
  - Reduce plants
  - Recycling
  - Reduce
  - Reduce

- Identity
  - Personal
  - Social

- Learn more
  - Discuss

- Change to energy efficient light bulbs
- Harvest solar energy
- Energy saving appliances
- Reduce home energy use

- Switch to green power

Group 2
10/11/2013