

## **Education for biodiversity conservation**

**\*Renju Krishna V, Sindhu KK**

Department of Botany, Mercy College, Palakkad, Kerala, India

### **Abstract**

Every Nation has its own nature wealth and biodiversity for the better life of living beings. The animals and other living beings, except human beings are utilizing this wealth by knowing its importance. This knowledge has received by them through their life experience and acquiring by birth. Human beings should understand this knowledge through the educational systems, but unfortunately they focused mainly on special level scientific thoughts. This will not help for conservation of our bio diversity in large extend. This paper explains the importance of our curriculum for the conservation of our nature.

**Keywords:** biodiversity conservation, education, nature, knowledge

### **Introduction**

Education for biodiversity conservation is very important in the present scenario especially in Kerala which have extremely rich biodiversity recorded. But our curriculum mainly focused on species level identification and its importance which means species diversity is mainly focused, other than biodiversity. Education for biodiversity conservation is more than the teaching of species names. Naming of organisms might be seen as a starting point, but must be followed by knowledge of complex interrelations and connections of organisms of nature and by student activities. This way, all relevant dimensions of conservation – ecological and social – can be embraced when teaching biodiversity. Biodiversity education can then be seen as a model for education for nature conservation and sustainable development. It becomes much more than “showing them animals and plants” and illustrates how concepts of conservation can be applied in teaching.

In a learning process the learner’s understandings and misunderstandings are key factors for the success of teaching processes. The model of Laurillard (1993) focused on three analytical components related to teaching lessons: scientific understanding, learners’ understanding and the resulting approach for teaching <sup>[1]</sup>. For example if we conducted a survey among students on learners’ understanding of the term “biological diversity”, will be showed that the term is widely known to all. But sometimes, the term is reduced to a single meaning: the variety of species. The meanings of genetic diversity and diversity of ecosystems are rarely offered as explanations. The term is thus not completely understood. The concept biodiversity includes species diversity, genetic diversity and ecosystem diversity. In some cases the concept will be misinterpreted with different subject areas in biology science (like zoology, botany). The misunderstandings probably were due to students’ direct and literal interpretation of the “biological” and “diversity”. This problem has to rectify through our curriculum and method of teaching.

The aim of education for biodiversity conservation is to enable

all people to act according to the overall concept of conservation. Education for biodiversity conservation is thus one instrument for achieving a good nature in future. Other ways to achieve biodiversity conservation could be through scientific innovations, restrictions by law, etc.

Environmental education happens in school/college level have keep some sort of relationship with education for biodiversity conservation as follows,

1. Education for biodiversity conservation is a part of good environmental education.
2. Environmental education as a part of education for biodiversity conservation – because education for biodiversity conservation is more comprehensive than environmental education and includes issues of development, species relationships, cultural diversity, social and environmental equity.
3. Education for biodiversity conservation and environmental education as partly overlapping, but different concepts.
4. Education for biodiversity conservation as a stage in the evolution of environmental education. Here, Education for biodiversity conservation will be considered the next generation of environmental education, which includes issues of ethics, equity and new ways of thinking and learning.

Education for biodiversity conservation is a new viewpoint from which to see things in a different and more complex and often more contentious way. Education for biodiversity conservation is viewed as an evolutionary stage of environmental education. In this understanding of education for biodiversity conservation, sustainable development is not a fixed goal or steady state, but a concept, a goal, a strategy that needs definition, redefinition, negotiation of sub-goals, etc. The ecological, economic and social (-cultural) dimensions of sustainable development are analytical tools. Depending on the analysis, the dimensions that need to be included are selected, e.g. social-cultural, political-institutional, technological, etc.

Important components of education for biodiversity conservation are:

1. Orientation towards a sustainable future.
2. Interrelatedness and interdisciplinary thinking.
3. Preservation of nature and management of natural resources.
4. Also include topics such as mobility, justice, culture and cultural diversity, fair trade and participation.

### **The Convention on Biological Diversity and Nature Education**

The Convention on Biological Diversity (CBD) was also signed during the Rio Earth Summit 1992, the Statement of Forest Principles and the Convention on Climate Change. The CBD includes three main objectives ([www.cbd.int](http://www.cbd.int)):

1. Conservation of biological diversity.
2. Use of biodiversity in a sustainable fashion.
3. Sharing the benefits of biological diversity fairly and equitably.

The role of education is specified in Article 13 of CBD. The contracting parties are to include the topic in educational programmes and develop educational and public awareness programmes with respect to conservation and sustainable use of biological diversity. CEPA, a global initiative on “Communication, Education and Public Awareness” was also started related to this. As all relevant dimensions of sustainability were incorporated, conservation of biodiversity becomes a central issue in the context of sustainable development. Recalling the objectives of the CBD acknowledging the emphasis given to the need for public awareness and education in all sectoral and thematic items under the programme of work of the CBD (Article 13) is need of the hour.

### **Themes and topics on biodiversity**

The following three key themes focus on various aspects of biodiversity. The first focuses on an object (ecosystems), the second theme is climate change and especially relevant to future and the last one deals with consumption and individual behaviour. These key themes provide a framework within which specific tangible topics for teaching can be designed (UNESCO 2009) <sup>[2]</sup>.

### **Diversity of Ecosystems**

70 % of our Earth is covered by water and the remaining 30 % by land. Diverse landforms have fostered an even greater diversity of ecosystems. Humankind has altered and impacted the ecosystems, creating a spectrum ranging from natural, nearly undisturbed ecosystems to ecosystems highly affected by humans. People live in unnatural and constructed megacities, but they subconsciously seek with the rest of life and this deep affiliation with nature might be rooted in our biology (biophilia hypothesis) <sup>[3]</sup>. It has been shown that people recover faster from illness in nature or behind a window with a view outside to nature<sup>4</sup>. Attractive landscapes also play an important role in recreation and holidays, as tourism in national parks and nature areas shows.

In India, large expanses of ecosystems have been formed by agriculture, agro forestry, hunting and fisheries. Species richness peaked in the 19th century and has declining

afterwards due to introduction of techniques for intensified land use. The strong local connections between production, culture and consumption, which were the rule in former times, have now been globalized. This had serious impacts on biodiversity as modern agricultural landscapes became less diverse.

One third of the world population lives in urban areas today, and they will become more and more important in the future. Some animals (so-called synanthropes) follow humans and use cities as substitute habitats. This example shows, that biodiversity is also found in areas influenced by human beings, but this cannot justify altering or destroying untouched areas. It must be taken into account that only some species will profit and are capable of living in areas influenced by humans. Many specialized species cannot. Thus it is not sufficient to equate biodiversity with species richness, as richness alone does not account for the specific character of the biodiversity (i.e. kinds of species).

Ecosystems provide many essentials for humankind such as water, soil, air, food and building materials. Additional benefits are cleaning processes, especially the self-cleaning of water and air. At the Heiligendamm Summit in 2007, the G8 leaders endorsed a global study to analyse the global economic benefit of biological diversity, the cost of its loss and the cost of failure to take protective measures compared to the cost of effective conservation. In the field of bionics, natural innovations are used to develop new products and natural achievements are used as inspiration or blueprints. The negative side is biopiracy, in which industry uses genetic resources, traditional knowledge or technologies in production, but withholds the benefits from local people.

### **Climate change and the future**

Climate change will have worldwide impacts on ecosystems<sup>5</sup>. An increase in the average temperature will not only result in the melting of poles and glaciers and in an increase of the sea surface level, but also will alter species composition in ecosystems. On land, desertification and droughts will threaten humans in Africa. In Middle Europe extreme weather situations will increase in number, a change of seasonal rhythms will affect biocoenoses, and tropical diseases could spread wherever it happens to get warmer.

Within the theme “climate change” topics for discussing personal impacts and possible activities can be developed. Calculation of the individual carbon footprint could provide direct links between activities and climate change ([www.carbonfootprint.com](http://www.carbonfootprint.com)) and students could be encouraged to develop own ideas, communicate them and work locally in projects to reduce CO<sub>2</sub> emissions ([www.co2nnect.org](http://www.co2nnect.org)).

### **Consumption and behavior**

Consumption is the final step in a sequence: production, processing, transport and finally trading. All steps are relevant to the preservation of biodiversity and involve all three dimensions of sustainability – ecology, economy and social/culture. As it doesn't stop with consumption, many people therefore talk about a circle for the resources.

Key areas of consumption are food, clothes, health and energy (including mobility, tourism and housing). Daily consumption for some means more than satisfying one's basic needs; it is

an important part of lifestyle, esteem and status in society. Competencies for a more sustainable life style must be promoted without ignoring the psychological functions of consumption. One possible tool for initiating discussions about consumption and the concept of a sustainable lifestyle is calculation of an “ecological footprint” ([www.footprintnetwork.org](http://www.footprintnetwork.org)).

### Methods for Teaching

All the topics of biodiversity are highly complex in contents and they cannot be reduced without oversimplifying the issues and introducing inaccuracy. Therefore, they pose a challenge for teaching. Complexity is an attribute of key themes of sustainable development, and it must not be reduced but rather adequately explored and illustrated. In this way complexity is made understandable. This can be done by working with case studies and presenting the most important connections in a stakeholder analysis (e.g. posters, mind maps, concept maps, and role playing). These kinds of methods can help prevent students from getting demotivated and help them think through complex issues.

Another challenge is to develop realistic perspectives for behavior for single persons and groups. People often feel that they cannot influence anything; they believe that an individual’s effect is too small to have an impact. Showing positive examples of how customers have influenced production can be motivating in this respect. Lack of time and money is often also commonly viewed as an obstacle to sustainable behaviour. But sustainable activities need not be necessarily be linked to financial or temporal resources. Low cost activities can be a first and easy step into a more sustainable life style. As a motivating factor, reward systems could be used.

In conclusion, proper management of biodiversity is more than an aesthetic desire; it is a life supporting need. It may or not be seen as a moral obligation to our environment, but it is most certainly a moral obligation to us and to future generation. Effective, optimal management of biodiversity will require appropriate individual and collective behavior of world citizens. The means to achieve that behavior is Education for Sustainable Development. Also, through education and life long learning, we can achieve lifestyles based on economic and social justice, food security, ecological integrity sustainable livelihoods, respect for all life forms and strong values that foster social cession, democracy and collective action. Education for sustainable development is immediately necessary for securing sustainable life chances, aspirations and futures for young people. There are many ways to teach biodiversity while contributing actively to a sustainable future. Thus, environmental education is advancing toward education for sustainable development and biodiversity conservation.

### Reference

1. Laurillard D. Rethinking university teaching: A framework for the effective use of educational technology. London: Routledge, 1993.
2. UNESCO World Biodiversity into education and learning: [<http://www.esd-worldconference-2009.org>].
3. Wilson EO. Biophilia and the conservation ethic. In

Kellert SR (ed) The Biophilia hypothesis. Washington: Island Press, 1993, 31-41.

4. Kaplan R, Kaplan S. The experience of nature: a psychological perspective. Cambridge: Cambridge Univ. Press, 1989.
5. IPCC-Intergovernmental Panel on Climate Change. IPCC fourth assessment report: climate change 2007 – impacts, adaptation and vulnerability, 2007.