

A Review Study of Existing Curriculum for Sustainable Education to Solve Complex Environmental Challenges

Sunil Kumar^{*1}, Puja Singh¹, Kavita Verma², Anoop Yadav³ and Pradeep Kumar⁴

¹*Amity School of Earth and Environmental Science (ASEES), Amity University Gurugram, Haryana, India*

²*Centre of Advanced Study in Botany, Institute of Science, Banaras Hindu University, Varanasi, India*

³*Department of Environmental Studies, Central University of Haryana, Jant-pali, Mahendragarh, Haryana-123031*

⁴*Department of Vocational Studies & Skill Development, Central University of Haryana, Mahendragarh, Haryana, India*

(Received 28 July, 2023; Accepted 18 September, 2023)

ABSTRACT

Several sustainable development themes are integrated in India's educational policies. It is maybe the only country in which the Supreme Court has legislated environmental education at all levels of formal education, including a required university course. It is critical to identify the characteristics of sustainability curriculum in higher education so that it may be used as a guide to help in the process of designing a sustainability-oriented curriculum. As a result, the purpose of this study is to present an understanding of the characteristics of existing curriculum. The findings are centred on the features of curricular structure. As a result, environmental education and awareness, as well as public engagement in environmental preservation, have become critical to achieving environmental sustainability. As a result, the ultimate aim of green education is to redirect and influence human behaviour toward problem-solving attitudes, as well as responsible behaviours and pledges to address environmental concerns. As a result, good environmentally friendly tools and encourages responsible citizenship towards the environmental challenges and its conservation. It is critical to train students to deal with environmental challenges such as global warming, air-water and soil pollution, climate change, desertification, agricultural residue burning, and others. Many higher education institutions, which are responsible for providing knowledge and essential skills to the next generation of leaders, are proactively attempting to implement the Sustainable Development Goals in Higher education for sustainable development policy, curriculum, and practice through scattered and isolated initiatives. This is an evaluative analysis of differing attempts in Indian higher education to provide environmental and sustainability education in various institutions, taking into practices. The main aim of the sustainable education is to train the young generations as well as develop the innovative skills and techniques to better use of natural resources. So that they may contribute to aware the society and solve the environmental challenges.

Key words: Existing curriculum, Sustainable development goals, Environmental challenges, Higher education

Introduction

Environmental education gained traction on a global basis with the 1972 Stockholm Earth Summit, the first conference on the environment sponsored by the United Nations. As a result, the International Programme in Environmental Education (IEEP) and the United Nations Environmental Programme (UNEP) were founded in 1975. In 1977, Tbilisi hosted the inaugural Inter-Governmental Conference on Environmental Education, which served as a watershed moment for environmental education in the worldwide community. The conference suggested that EE should have the ability to: disseminate information, foster the development of skills and attitudes, and encourage greater public participation in the urgent environmental concerns facing the world today. Together with UNESCO and the FAO, IUCN, UNEP, and WWF developed a global conservation strategy in 1980.

EE was included as an issue for the international community in another report by the International Development Issues Independent Commission (Brundtland, 1987). Rio de Janeiro's 1992 United Nations Conference, Brazil placed a strong emphasis on increasing environmental and development-related education and training in order to raise public awareness. In 1976, India's 42nd amendment to the constitution added provisions addressing environmental issues. The environment is now a top focus in numerous policies, programmes, and tactics at the local, state, and federal levels with the establishment of an established Ministry of Forests and the Environment. The government of India created a plan for the adoption of environmental education in schools in response to growing environmental concerns in the country. Since development is the primary cause of environmental issues, a new paradigm for environmental change and development is necessary. Even though EE was already part of the school curriculum in some way or another, Despite the fact that environmental education was previously in some form or another a mandatory topic, the Honourable Supreme Court of India issued a directive on that day to make it a requirement (Sonowal, 2009). There was misunderstanding on how environmental education was taught in schools across the country. The "Green Teacher" programme was launched in 2005 by the India's Centre for Environment Education and Canada's Commonwealth of Learning for working educators

and teachers. The Green educator programme was developed in response to the Indian the Supreme Court's National Policy of Education (1986) ruling that environmental education should be obligatory subject at all educational levels. Recently, The Swachh Bharat Mission (2014-2019) was established by the Ministries of Water supply and sanitation for both urban and rural areas, as well as urban development. Manual scavenging, public knowledge of sanitation and health, waste dumping, technical solid waste management behavioural changes toward good sanitation practises, and are all goals of the mission. A national effort called Swachh Bharat Abhiyan seeks to encourage clean India.

The goal is to inform citizens of the value of a clean, safe environment. Higher educational institutions (HEIs) are crucial to the educational and social transformation of societies (Barth and Rieckmann, 2012). Therefore, the growth of the idea of sustainable development justifiable necessity for society and business seems to be a topic for debate for both academic staff and students. The constitution of India's guarantees of inclusive growth and equitable development serve as a crucial underlying reason for impactful education that promotes sustainable development to look into the connections between environmental education and sustainable development is the aim of the current study. Second, the actions done to carry out the objectives of environmental education are carefully examined for the intended results. It also outlines a behavioural flow-chart for environmental citizenship that researchers created to encourage environmentally conscious behaviour in order to achieve sustainability (Fig. 1).

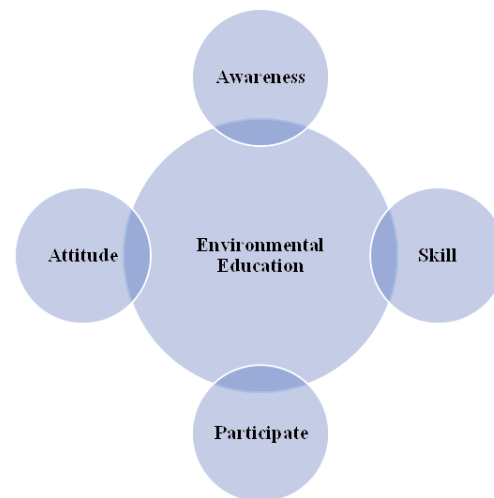


Fig. 1. Objectives of Environmental Educations

Initiatives for Environmental Education

The first environmental education programmes were implemented in 1969 and the support of international agencies like UNICEF, UNEP, and UNESCO have helped to amplify these programmes. The National Environment Policy Act was passed in the USA in 1970. To recognise environmental conservation, Earth Day is celebrated on April 22. For the first time, the UN commemorated World Environment Day on June 5th, 1974, to increase public awareness of environmental challenges. 96 demands for providing environmental education to address environmental problems challenges around the world have been made as a result of this conference. The Belgrade Charter was drafted at a meeting sponsored by UNESCO in Belgrade, Yugoslavia, and it outlined the fundamental. The core concepts of environmental education were stated in the Belgrade Charter, which was created at a conference organised by UNESCO in Belgrade, Yugoslavia. The Georgia's Republic of Tbilisi hosted the Intergovernmental Conference on Environmental Education in 1977, by the United Nations Environment Program and UNESCO. Many environmental educators still adhere to the conference's aims, objectives, and guiding principles. The proclamation made clear what should be taught in environmental education: awareness, knowledge, attitudes, skills, and involvement. These standards have improved communication and collaboration between environmental and educational entities. In several nations, it is now a legal necessity for environmental authorities to participate in EE and awareness campaigns. Under the Environmental Quality Act, the Malaysian Department of Environment formed a department that aggressively promotes EE.

Environmental issues are taught in many Asian and Pacific Islander nations' curricula. An effective system of lifelong education that is adaptable to changes in a world that is changing quickly should include environmental education. It should equip the student with the knowledge of the world's most pressing issues as well as the abilities and qualities necessary to contribute positively to the improvement of human existence and the preservation of the environment while taking ethical principles into consideration. Understanding how nature and constructed environments respond as a result of ongoing interactions between biological, physical, social, economic, and cultural elements is the core objective

of environmental education. It also aims to give people and communities the expertise, principles, dispositions, and abilities they need to take an active role in identifying and resolving environmental issues as well as managing the South Africa, by the United Nations Commission on Sustainable Development. To focus on resource conservation in a world where the population is constantly growing and there are increased needs for electricity, water, sanitation, housing, food, health care, and economic stability, this summit has together thousands of delegates from around the globe. The Decade of Education for Sustainable Development will run from 2005 to 2014 thanks to a resolution voted by the UN General Assembly. The principal organisation for promoting the Decade is the UNESCO. In reaction to this summit, NGOs, the government, the media, and educational institutions have made significant efforts to promote EE in their various nations. It has also led to initiatives like eco-banking, eco-press, eco-lobbying, environmental policies, agricultural, and harvesting practises in the localities. Environmental education courses are offered at schools that receive special financial incentives (subsidies, tax exemptions, and other rewards). The Foundation for National Environmental Education and Training celebrated the inaugural National Environmental Education Week from April 10 to 16 of that year. The Conference was then held in the Centre for Environment Education in Ahmadabad, India on Education for a Sustainable Future. Over 800 students, academics, and professionals from more than 40 nations attended the conference. Participants at the conference created the Ahmadabad Declaration of 2005 on sustainable development in education. According to the examination of these programmes, neglecting human factors, integrating the progress of EE in educational institutions has been hindered by a number of negative reasons, including the integration of environmental education into physical sciences and the prioritisation of sustainability (Bhandari and Abe, 2000). Some writers suggested that while beginning advancements in EE, it is important to consider the thorough assessment and re-focusing of these educational reforms as well as the commitment from implementation authorities (Fien *et al.*, 2000). The fundamental axis for these reforms can be found in environmental education and sustainable development education when they are linked to human rights, gender equality, democratic rights, peace, and sustainable development. There-

fore, a political revolution that views the future as a problem that needs to be solved rather than something that is decided by the unknowable forces of the market is urgently needed. In order to increase the number of alternative energy sources, an economic revolution is also necessary (solar, wind, biomass, hydropower, geothermal, and tidal energy). After the 42nd amendment was passed in 1976, environmental education in India gained momentum. Following the foundation of the 1980s saw the establishment of a full-fledged Ministry of Environment and Forests, which was thereafter adopted by Indian institutions and schools, it has become a key area. Because of global population growth, industrialisation, and resource mismanagement, the public now generally believes that the environmental situation is getting worse. It has been suggested that environmental education is a tool and process that encourages widespread participation among people of all ages. All societal tiers—formal, non-formal, and informal—are involved in orienting environmental education toward sustainability. Environmental engineering, environmental science, and environmental studies are broadly referred to as the three dimensions of EE. Different processes in water, air, soil, and creatures that harm the environment are the focus of environmental science. Environmental studies focus on environmental disturbances and how to reduce them by adjustments to the social sciences. A world summit was convened in New Delhi in March 1985. There were several papers on non-formal education programmes and environmental education for elementary and secondary schools that were discussed. For a deeper understanding of the connectivity between people and the ecosystem, the conference has emphasised the relevance of field research and demonstration programmes (Bandhu, 1987). When India's highest court (Honorable Supreme Court of India, 1991) ruled that environmental education should be incorporated into all levels of school, the field of environmental education made significant strides. The Court ordered that environment courses be made required for undergrads, which presents a chance to introduce problems of sustainable development to higher education. In order the court granted additional instructions to the University Grants Commission in order to facilitate and ensure the delivery of this programme (UGC), which is responsible for establishing policy frameworks for universities and other higher education institutions and for awarding

grants for higher education.

Environmental education is being embraced by national educational guidelines, curricular materials, curriculum development projects, and environmental protection efforts more and more (Rickinson, 2006). Environmental experts and educators from throughout the world have emphasised time and time again that addressing the environmental catastrophe will need environmental awareness and comprehension, both of which need to be ingrained at all levels of education throughout the educational system (Shobeiri *et al.*, 2007). Since Fourx in 1971 and the Stockholm Conference of the United Nations on the Environment in 1972, the subject of environmental education (EE) has been the subject of intense debate. These conversations took place in a number of seminars, workshops, and conferences that were both national and international.

Environmental education in India

India's environmental situation is highly diverse. Our nation has a wide range of climatic, geological, geographic, educational, floristic, faunistic, ethnic, linguistic, social, and economic diversity. March 1985 saw the holding of a New Delhi hosts an international conference on environmental education. Several publications have looked at environmental educational programmes at basic and secondary schools, colleges, and other semi education programmes. Higher-level environmental education is provided in India through universities, research institutions and several other organisations. Some of them have established programmes for environmental education, while others have incorporated some environmental topics into their curricula. Teachers, students, administrators, etc. must be involved in and participate in the launch of an environmental education programme (Swain, 1997). Gujarat is one of the first states in India to implement environmental education, having launched a comprehensive environmental programme on solid foundation. Programmes for formal and informal environmental education were launched. Children and the general public's awareness of the environment is being raised by the Centre for Environment Education (CEE), Ahmedabad. According to Souza (1987), environmental education needs to be prioritised beginning at the elementary school level. Although there is some bias against environmental education in the current school system, this needs to be expanded.

Khoshoo (1984) makes a call to educators to mobilise, inspire, and catalyse the student body to conduct ecological research on the area close to the school's colleges and universities.

Environmental studies are now one of the disciplines taught in undergraduate colleges, which enrol 85% of Indian participants in higher education, as a result of these Honourable Supreme Court rulings and subsequent UGC intervention (Government of India, 2009). Programs for environmental education should be designed to foster awareness of the challenges related to the biosphere, hydrosphere, lithosphere, and anthroposphere, according to Das et al. (1987). Awareness of the environment, the issues it is related with, and the responsible role that humanity plays in it. Attitudes, strongly held convictions, societal ideals, and the desire to contribute to the preservation and protection of the environment. Action that addresses developing environmental concerns quickly and appropriately. Encourage citizens to have the knowledge and skills necessary to assess environmental challenges and programmes. According to Kopardekar (1985), EE will aid in restoring the bond between people and their surroundings. The deterioration of the natural environment in daily life can be halted by educating people about it. EE must coordinate biology, economy, and ecology with one another, with us, and with nature. It must be able to instill a culture of sustainability and a culture of peace. In addition to educating people about the ecological laws of nature, EE introduces a new idea of reality that is closely related to people. Environmental education becoming a required subject in schools is a positive development for sustainable development. By encouraging environmental education among the populace, the environment and natural resources can be restored. In order to further environmental education, the Ministry of Environment and Forest established the Centre for Environmental Education (CEE) in 1984. CEE has developed environmental studies as a required subject, offered it, and arranged orientation programmes for college professors (Chhokar *et al.*, 2004). Prior to the Honorable Supreme Court of India's order on December 18, 2003, mandating the teaching of environmental education as a required subject in schools, environmental education was already a component of the curriculum. However, it was mishandled, and no real steps were done to incorporate it into the national curriculum for schools.

To forge a consensus, several comments and recommendations had been put out. There have not been many tangible accomplishments two years after the start of the decade for environmental sustainability. Up until the eighth grade, EE is a required subject in schools in Uttarakhand, which is unusual. Still, there are some problems that need to be addressed, such as which educational programmes incorporated the idea of sustainability and environmental education. What number of networks exists today? Apart from conferences and meetings, which additional projects, programmes, and activities are in place? The implementation of meetings' or conferences' decisions what metrics of educational excellence are being developed for sustainable development? What methods are employed? Whether or not to include engineering to the list of subjects offered at schools alternatively, just a few pertinent chapters from EE in other connected topics.

Active learning techniques involve students in debates, writing, posing and responding to inquiries, and participating in their own learning. Students are then required to apply critical thinking abilities including analysis and evaluation through these exercises (TIEE, 2006). In student-active classrooms, instructors employ a range of techniques, including debate and discussion, cooperative group projects, and free-form problem solving. A crucial component of student-active teaching is formative evaluation of continuing course evaluation since it enables instructors to become more thoughtful and effective instructors (TIEE, 2006). According to constructivist theory, learning is an active, ongoing process in which students construct their own interpretations and meanings of information they gather from their surroundings using their existing information and experiences (Driver and Bell, 1986; Roth, 1992). Additionally, learners build knowledge through physically and intellectually interacting with environmental objects or phenomena as well as through social interactions with other community members (Piaget, 1970). Thus, the personal thoughts and understandings that kids form about the world have an impact on their learning about the environment. Service-learning education, field studies, student education, team projects, problem-based activities, and active classroom sessions were the main tenets of active teaching/learning techniques. The processing of knowledge in active learning also necessitates a problem-solving attitude, a critical perspective, and a knowledge evaluation. The aim of knowledge pro-

cessing is for the learner to elaborate on how knowledge is applied and possibly even create new knowledge through cognitive processes, as opposed to just being a passive listener. Science professors and all educators generally aim to teach pupils how to encourage their sense of interest and how to learn. For example, biology, which is concerned with the miracles of life, offers a wide range of exciting natural events that pique interest and prompt thought. If students engage naturally with direct occurrences, use using their senses to take in, and use equipment to increase their capacity for perception, they are more likely to comprehend the natural world (National Science Board, 1991). According to Novak's (1964) theory, human beings engage in inquiry when they seek out plausible explanations for occurrences that pique their interest. While focusing on the active pursuit of information and understanding of unexpected components in the environment, inquiry should involve activities and abilities to satiate curiosity (Maw and Maw, 1965; Haury, 1993). The experiential learning theory (Kolb, 1984) states that students learn more effectively by "doing" than by "listening" (active learning as opposed to passive memorization). This is a major benefit of learning in the field, where students are involved in environmental projects, data collection, and analysis. Fieldwork has been shown to boost motivation and self-assurance in addition to the immediate educational advantages (Smith *et al.*, 2004; Boyle *et al.*, 2007). The natural world will be protected if people are exposed to it and therefore understand it, according to the environmental philosopher John Muir (1901). It is now widely accepted that having knowledge of the natural world affects one's views about it, which in turn influences one's behaviour in support of the environment (Goralnik and Nelson, 2011). The present body of research focuses on how well the active teaching and learning approach can handle environmental challenges. This will add to the body of knowledge already available and provide crucial insights into how to create programmes that encourage environmental advocacy, and educate the student population about the many intricate local ecological challenges. Due to the increased industrialization and urbanisation of these towns, as well as the subsequent rise in car traffic, Puducherry and Cuddalore are currently dealing with severe environmental issues. Due to their future as responsible citizens, students play a significant role in raising environmental awareness. Therefore, middle school

kids from the Puducherry and Cuddalore districts of South India (age group: 7th to 9th standards; range: 13 to 15 years) were the subjects of this study.

Purpose of the Study

Examining the environmental science curriculum at the high school, college, and university levels reveals the significance of having a strong, optimistic attitude toward environmental issues. Understanding and environmental knowledge seem to be of relevance. The goal of this study is to draw attention to the inadequacies in the environmental science curricula at the high levels.

The following research inquiries will be addressed in this study:

1. Are syllabi adequately designed to develop better understanding regarding environmental problems?
2. Are there any practical approach used by teachers to develop solving nature among students' attitudes and behaviours?
3. Are there is balance between practical and theory content?

The significance of this study lies in its examination of the variables that influence students' adoption of responsible environmental attitudes and behaviours. This study may also aid in creating activities and course materials, as well as offer advice on how to preserve the environment and look into environmental issues' remedies.

Suggestions

After analysing the syllabus of school, college, and university level we proposed many suggestions:

1. Class sizes for environmental sciences should not exceed 30–40 students. This offers pupils the possibility to participate more actively in class activities.
2. The course material for environmental sciences should be revised, with an emphasis on certain recent, serious environmental issues that affect humanity, such as nuclear power and global warming issues, and should include some doable actions that pupils can take to contribute to the preservation of the environment.
3. Because there was a lot of information in the environmental course materials, they should be split into sections.
4. Environmental course topics should be delivered in an engaging manner with more hands-on activities.

5. To get students more concerned in environmental issues, environmental sciences courses need to include hands-on activities.
7. Visits to businesses involved in environmental work.
8. Invite environmental industry companies to offer events at schools, colleges, and universities including workshops, seminars, training, lectures, and contests to increase environmental awareness and care among students.
9. Through curriculum-based activities, teachers can play a crucial part in imparting knowledge and raising environmental consciousness.
10. Teachers should take the lead in developing the environmental education curriculum. There may be opportunities for teacher and community collaboration.
11. Knowledge distribution can be greatly aided by technology-mediated learning. For the purpose of enhancing the ability of environment educators, non-formal educational channels can be used effectively.
12. Throughout the year, a variety of extracurricular activities focused on environmental awareness should be planned, including essay contests, debates, plays, songs, and more.
13. All universities should adopt the Swachh Bharat Abhiyan.
14. Universities should develop proper waste disposal procedures.
15. It should be illegal to smoke, chew tobacco, gutka, and consume alcohol on school.
16. Polythene bags should be completely prohibited on campus (in dormitories, staff housing, and offices).
17. A two- and four-wheeler parking area that prevents noise and air pollution.

Conclusion

Since we all are very aware of the fact that there is no living without home and life without environment, it is very important to take immediate action to make our environment which is on verge of extreme degradation in order to make our living in this planet possible. This so called eco-unfriendly human deeds needs to be immediately controlled leading to various kinds of pollution, global warming, soil erosion etc. Education in this context surely plays a vital role in sensitizing humans to be careful with their eco-unfriendly deeds, but for that also

several above-mentioned challenges need to be catered with the help of every individual and stakeholders of the society. Immediate steps need to be taken especially in the field of Environmental Education by improvising educational content, allotting more of time to environmental concerns, emphasizing Environmental Education as a discipline and career and by incorporating environmental awareness and training in teacher education curriculum. Further, organizational support is also needed to fulfil the aims of Environmental Education along with becoming demanding in terms of required eligibility for various teaching professionals dealing with environment and its education.

Acknowledgements

Author Sunil Kumar would like to acknowledge Amity University Gurugram for providing research facility for this work.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The authors declares that they do not have any conflicts of interest.

References

- Barth, M. and Rieckmann, M. 2012. Academic staff development as a catalyst for curriculum change towards education for sustainable development: an output perspective. *Journal of Cleaner Production*. 26: 28-36.
- Bandhu, D. and Berberet, G. 1987. Environmental education for conservation and development. In International Conference on Environmental Education 1985: New Delhi, India. *Indian Environmental Society*.
- Bhandari, B. B. and Abe, O. 2000. Environmental education in the Asia-Pacific Region: Some problems and prospects. *International Review for Environmental Strategies*. 1(1): 57-77.
- Boyle, A., S. Maguire, A. Martin, C. Milsom, R. Nash, S. Rawlinson, A. Turner. 2007. Fieldwork is Good: The Student Perception and the Affective Domain. *Journal of Geography in Higher Education*. 31 (2): 299-317.
- Chhokar, K. B. 2004. Higher education and curriculum innovation for sustainable development in India. *International Journal of Sustainability in Higher Education*. 11. 141-152. 10.1108/14676371011031865.
- Das, S. and Jain, A. 1987. Crisis of the forest community in

- postcolonial Indian forest policies and laws. *Environmental Sociology*. 5(1): 23–32.
- Driver, R. and Bell, B. 1986. Students' thinking and the learning of science: A constructivist view. *School Science Review*. 67(240): 443-56.
- D'Souza, C., Brahme, M. and Babu, M. S. 1987. Environment Education in Indian Schools: The Search for a New Language. *Journal of Education for Sustainable Development*. 14(2): 174-189.
- Fien, J. and Maclean, R. 2000. Teacher education for sustainability. In *Education for a sustainable future*. (pp. 91-111). Springer, Boston, MA.
- Goralnik, L. and Nelson, M. P. 2011. Framing a philosophy of environmental action: Aldo Leopold, John Muir, and the importance of community. *The Journal of Environmental Education*. 42(3): 181-192.
- Haury, D. L. 1993. Teaching Science through Inquiry. *Digest*. ERIC/CSMEE
- Kolb, D.A. 1984. Experiential learning: Experience as the source of learning and development. *Englewood Cliffs*. NJ: Prentice-Hall.
- Kopardekar, H.D. 1985. Environmental Education in Desh Bandhu and G. Berberet (Eds) Environmental Education for Conservation and Development. *Indian Environmental Society*. New Delhi
- Maw, E. W. and Maw, W. H. 1965. Personal and social variables differentiating children with high and low curiosity. *Child Development*. ED003274
- Novak, A. 1964. Scientific inquiry. *Bioscience*. 14(10): 25-28.
- Piaget, J. 1970. Science of education and the psychology of the child. *Trans. D. Coltman*. Orion.
- Ravi, S. 1987. Modernizing Nature: Forestry and Imperial Eco-Development. *Oxford University Press*, 1800-1950.
- Rickinson, M. 2006. Researching and understanding environmental learning: Hopes for the next 10 years. *Environmental Education Research*. 12(3-4): 445-457.
- Roth, C. E. 1992. Environmental literacy: its roots, evolution and directions in the 1990s. *ERIC/CSMEE Publications*, The Ohio State University, 1200 Chambers Road, Room 310, Columbus, OH 43212.
- Saxena, P. and Srivastava, P. 1999. Environmental Awareness of Senior Secondary Students in Relation to Their Eco-Friendly Behaviour. 1(2), 8.
- Shobeiri, S. M., Omidvar, B. and Prahallada, N. N. 2007. A comparative study of environmental awareness among secondary school students in Iran and India.
- Smith-Sebasto, N. J. and Semrau, H. J. 2004. Evaluation of the environmental education program at the New Jersey School of Conservation. *The Journal of Environmental Education*. 36(1), 3-18.
- Sonowal, C. J. 2009. Environmental education in schools: The Indian scenario. *Journal of Human Ecology*. 28(1), 15-36.
- Swain, B. C. 1997. Environmental Education: An evaluation. *UNESCO*. 1977. Source book in environmental education for Secondary School teachers, UNESCO Principal Regional Office for Asia and the Pacific, Bangkok, Thailand.
- Khoshoo, T.N. 1984. Caldwell LK. Environmental Concerns and Strategies, *Indian Environmental Society*, New Delhi, India: 296 pp., Environmental Conservation. 11(4): 376-376.
- Yogamoorthi, A. 1992. Need for Environmentally trained teachers for Environmental Education. *Journal of Educational Research and Extension*. 8(2): 22-28.
-