

## **A review and suggestions on the need for upgrading the syllabus of compulsory course on Environmental Studies in India**

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### **Abstract**

Education is the mirror of any society. What we teach today to our youth becomes the practice tomorrow. Education is one of the keys for environmental protection and sustainability. But education in general and technical education in particular, are themselves a big source of pollution via wastewater discharge laden with chemicals from laboratories, generation of e-waste like discarded computers, mobiles, projectors etc. Youth form a significant part of the green fight back. They intuitively understand the value of the environment and its protection. But if the current crop of youth is to emerge as a generation that cherishes the environment, they need to understand it, connect with it and love it. That goal must form part of the educational experience. They can be molded to become green guards. What is needed to give them, are the methods of science, the culture of technology and manners of sustainable development. Even though the Supreme Court of India has made Environmental Education compulsory at all levels of education, but the harsh reality is that making this course non-credit by most Universities and School Boards has made the basic philosophy behind its inclusion obsolete; and to add to its woes non specialist teachers are entrusted with teaching of this important subject. Even the central body for school technical education National Council of Educational Research and Training (NCERT) has stressed that in order to have compliance; a separate subject is not necessary. It can be done through infusion, in science, social studies, mathematics, language and other subjects, and/or through a separate subject. Again, this beats the very objective of the subject. This paper is intended to offer a new scientific, systematic and sound model approach for integrating concurrent topics and cases related to environmental studies, e-waste and green design, energy conservation, sustainable resource utilization, pollution control, environmental policies, etc. in curriculum along with fun interactive activities, theme events related to important environmental days and field visits for gaining ground level knowledge. The syllabus should also provide the students with the knowledge and tools for opening startups to tackle environmental issues and make a career in this field. Provision for timely up-gradation of the syllabus and interaction with the student and teaching community in designing the curriculum has to be given priority by using social networks. It is expected that this research will help the policy makers in evolving a more relevant and contemporary syllabus of compulsory course on environmental studies for the students at all levels of education.

**Keywords:** curriculum development; education for sustainable development (ESD); environmental studies (EVS); Indian education policy; university grants commission (UGC)

## 1. Introduction

The Indian traditional philosophy of environmental protection is based on the knowledge provided by the most ancient scriptures of the world, sacred texts called the Vēdas (derived from the Sanskrit root “vid” which means to know). They contain descriptions of environmental processes like rainfall, seasonal changes and based upon it the categorization of months, environmental protection, ecological balance, and related topics implying an extraordinary level of scientific knowledge at that time. The holy Hymns written in the four Vedas, Ṛigvēda, Yajurveda, Sāmavēda, and Atharvavēda, divulges the absolute acquaintance of the negative effects of deforestation, climate change, distorts in the weather and ecological balance, environmental degradation and related pollution, etc. and aptly warn against them. This ancient literature presents in great details the theory that *all forms of life are so closely linked that disturbance in one gives rise to an imbalance in the other and hence, one must look at every entity of Nature with the eyes of a friend and sympathizer: Mitrasyaaham chakshushaa sarvaani bhootaan* (Sharma 2014, 1-8).

This knowledge about environment and its conservation was at the centre of Indian Civilization, which is the oldest surviving civilization on the planet today. But in the past few decades, the state of India’s environment has degraded considerably, with 6 of the 10 topmost polluted cities of the world in 2022 being in India (smartfilters 2022, par. 3).

The Indian Constitution had laid down the responsibility of the Government to protect and improve the environment and made it a “*fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife*”. On this background the Department of Environment was established by the Government of India in 1980 and a Ministry was formed in 1985. The Constitution and the Government’s commitment to the environment along with environmentally sound practices is an important backdrop under which the Environment Education (EE) strategy has been evolved. Comprehensive scheme of 'Environmental Education, Awareness and Training' was launched in 1983-84. The National Policy on Education, 1986 (NPE) states that the “*protection of the environment is a value which must form an integral part of the curriculum at all stages of education*”. The NPE states that “*There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should be a part of teaching in schools and colleges. This aspect should be integrated in the entire educational process*”. The programme obliges the Ministry of Human Resource Development (MHRD) and the Ministry of Environment & Forests to ensure that environmental education is imparted adequately at all levels of education. It mandates that environmental components are covered in the school curriculum at various levels. (Bhardawaj et al. 2013, 222-227; Rajagopalan 2015 par. 5; Lahiri 2019, 49; Rabindranath 2016, 89-109). The historical, present and future perspectives of environmental education have been discussed in many researches elsewhere (Sylvia, A. and Cutter-Mackenzie 2011, 122-133; Bhattacharjee et al. 2015, 12-17) and its importance is very well appreciated.

National Council of Educational Research and Training (NCERT) recently dropped EVS (environmental studies) as a separate subject at school level. In an affidavit filed with the

Supreme Court, NCERT said it plans to offer environmental studies in an "infused model" rather than as a distinct subject. The role of compulsory environmental education in higher learning cannot be undermined (Choudhary et al. 2020, 389-401) as it makes students display environmentally appropriate behavior and awareness (Smith-Sebasto 1995, 30-34; Dave 2011, par. 6).

When environmental studies was introduced in India as a mandatory subject to sensitize children about their immediate environment, all state boards followed a similar drill: they drew up a quick curriculum, published texts and asked schools to assign the subject to the science or geography teacher. Within a year, the subject was rolled out. Through the early years of schooling, right through to class XII. Following the NCERT affidavit, boards across the country are doing away with the new subject and clipping components of environmental studies to the existing palette of languages, mathematics, science and social sciences while keeping the core idea of "connecting knowledge to life outside the school" intact. Even the UGC has failed to achieve the vision it had for the EVS course. In today's scenario the course has become obsolete and requires urgent up-gradation and external evaluation (Rajendrakumar et al. 2020, 89-109).

This research paper is intended to review the existing syllabus of compulsory course on Environmental Studies in India and offer suggestions on the need for upgrading the curriculum.

## **2. Methodology**

The methods used in the preparation of this research article included relevant literature review including published government gazette reports, UGC model syllabus and comparison with similar syllabuses elsewhere. Based upon the extensive reviews, research gaps were identified. Then a digital questionnaire was designed and distributed to different stakeholders like environmental educators, undergraduate students who had or will in future study EVS subject, policy experts in this field, etc. between June 2020 to April 2022. From the total 1763 responses received, recommendations on upgrading the EVS syllabus has been proposed.

## **3. Results and Discussions**

### ***3.1 Environmental education in undergraduate curriculum in India***

Since independence, India has had only three National Education Policies (NEPs), in 1968, 1986 (revised in 1992) and 2020. Environmental education was never given due importance or serious thoughts to be included in the syllabus. Hence, environmental lawyers took upon themselves to approach the judiciary to incorporate environmental studies as a compulsory subject for all undergraduate students in India. A landmark judgment of the Supreme Court of India-M.C. Mehta vs. Union of India, (W.P Civil No.860 of 1991) ordered that environmental awareness be raised through media and academics. As these orders were not brought forth by the government, a review petition was filed in 2003 (2003(10) SCALE 100b) against several State Governments for not complying with the Supreme Court orders of 1991. This ruling was much more comprehensive containing detailed directives on Environmental Education (EE) that was to be taught in schools and colleges all over India. Environmental Education then became a compulsory subject for most courses with the University Grants Commission (UGC) and National Council for

Education Research and Training (NCERT) framed a 'detailed' syllabus on 'Environment Studies' (EVS) (Kurukulasuriya 2003, par. 4).

### **3.2 Importance of environmental education**

There should have been special emphasis on the need to give importance to environmental education (EE) while designing curricula, framing the syllabi and developing text books. But unfortunately. No such emphasis was given. Currently, there is a national debate going on about how to make environmental education not only widespread but also effective at all levels of education. The effective implementation of environmental education and conservation programs depend on the level of training AND expertise of the teachers. But here again, specialist teachers with qualifications in environmental studies are not recruited, which defeats the very objective of the plan. Although, the government of India has launched several schemes and projects to spread awareness about environmental issues, by and large the implementation at ground level remains short. The main elements of the strategy for environmental education must be:

1. Strengthening Infusion of EE.
2. Teacher Training for effective EE.
3. Introduction of Environment as a separate subject with specialist teachers and credit to the course with projects, internships and exams.
4. Use of formal and non-formal methods of EE through the involvement of schools, colleges, NGOs, etc.
5. Close industry-academia linkage in teaching, Research and Development.

The success of the above strategy will depend upon the close synergy and partnership between the MHRD and the MOEF, their key institutions, State Governments, NGOs as well as educational institutions throughout the country. In addition, all these components are closely linked and one cannot be viewed in isolation from the other. The operationalization would need to keep this in view.

### **3.3 Critical analysis of current syllabus**

The current compulsory course on EVS comprises of eight units: Multidisciplinary nature of Environmental studies, Natural Resources, Ecosystems, Biodiversity and its Conservation, Environmental Pollution, Social issues and the Environment, Human populations and the Environment and field trip (Sinha and Bhardwaj 2011). All set-in theory with little to no practical exposure. The UGC's vision melancholy reads that "*It is now even more critical than ever before for mankind as a whole to have a clear understanding of environmental concerns and to follow sustainable development practices*". Keeping that in mind, it can be argued that Environment Education in our country is diseased with two basic flaws:

- *at the perceptual level, and*
- *at the implementation level.*

Even the new education policy (NEP-2020) has been largely non receptive to upgradation of EVS syllabus and its delivery mechanisms (Kumari 2021, par. 3). Hence, more pressure must be put on the governments to imbibe environmental education by upgrading it with latest syllabi and case studies. This paper is an attempt in the same direction and hopefully it may influence the educational policy makers.

### **3.4 Loopholes in the current syllabus and course delivery mechanism.**

Some of the ambiguity in Environment Education in India can be listed as:

- Environment Education for its name's sake and formality only.
- Interaction and survey with several college students and teachers makes it amply clear that many of them do not know that they are supposed to study or teach environment as part of their curriculum.
- Not all undergraduate courses have EVS as a compulsory subject. Unlike Engineering, students of other professional courses like Medicine do not read the environment. But in essence they should, as future medical practitioners will deal with a lot of Bio-Medical wastes may be engaging in environmental epidemiology cases.
- Amongst the students who read it, how it is taught and how they study it, is also laughable if not incorrect at least. With most teachers supplying all course material at the start of the semester itself and a majority of EVS lectures being taken up by core subject teachers to teach their subjects.
- Even the field trip which should ideally be a study tour is more of a local picnic for the sake of compulsory attendance.
- A lot of universities have EVS as a non-credit/internal assessment course, which makes students not take it seriously.
- EVS Syllabus has not been updated/revised since its inception in 2002.
- Too much stress is given on ecology which most students have already studied at school level. Hence, they become bored in the lectures and not show any enthusiasm or active participation. Engineering/ technological solutions to environmental problems are never covered which may be very interesting.
- Non-specialist teachers usually take up the course in most colleges with chemistry, physics, economics, history or even sometime physical education teachers teaching this all-important course. In the dearth of specialist teachers, the interest levels recede among the students.

## **4. Recommendations**

### **4.1 Proposed changes to the existing syllabus**

The following changes in the existing syllabus of compulsory course on EVS may be done:

**4.1.1 Unit 1. Multidisciplinary nature of environmental studies:** This unit needs a total revamp its topics are not very relevant. The topics here should discuss the contribution of different fields into environmental studies with practical examples and case studies, history of environment (here documentaries like Cosmos: A Space-Time Odyssey could be shown), examples from ancient texts like Vēdas could be utilized to make students aware about our rich history and tradition of environmental protection, etc.

**4.1.2 Unit 2. Natural Resources:** This unit also has been already studied by students since their school. Hence its repetition here at undergraduate level is not required. It may either be modified and replaced by some suggested units. In the renewable energy section, practical videos and technical inputs about working of renewable energy plants must be done.

**4.1.3 Unit 3. Ecosystems:** The ecology part in EVS syllabus needs to be curtailed and its practical applications included. For example, rather than just learning about food chains

and webs, the application of pollutant contamination (bioaccumulation and biomagnification) into such processes should be taught with mathematical examples.

**4.1.4 Unit 4: Biodiversity and its conservation:** This is an important unit and students must be made aware about best sustainable modern living practices for biodiversity conservation measures. They must be taught importance of in-and ex-situ conservation measures, hot spots of biodiversity (with mathematical calculations and classifications), conservation measures of diversity, etc.

**4.1.5 Unit 5: Environmental Pollution:** The chapters on Environmental pollution should imbibe the latest environmental laws and punishments for violators as well as latest technical solutions for remediation. All the concepts in units on pollution are too theoretical. The students must be encouraged to explore the latest techniques and policies in pollution control and visit to various industries arranged to study pollution control mechanisms. They must be made aware about various sources of pollution around them at home and colleges and control measures for them.

**4.1.6 Unit 6: Social Issues and the Environment:** In this unit, relevant social issues like effect of migration on environment, ill effects of war and conflicts on environment, anti-social behavior, poverty, drug-abuse, racial discrimination etc. must be discussed with respect to environment. Good habits like recycling, carpooling, using public transport, tools for tracking energy use, more focus on vegetarianism to counter ill effects of animal farming, etc. should be taught. More latest case studies including video documentaries must be included.

**4.1.7 Unit 7: Human Population and the Environment:** The chapter on Human Population must try and include safe sex education, equality and gender sensitization with focus on strict laws against such crimes. Also, separate section on diseases should be included which may cover cancers, common infections, life saving resuscitation, basic first aids, basic genetics, factors to check before marriages like blood group compatibility, etc. All such inclusion will help the students make better informed decisions in future.

#### **4.1.8 Unit 8: Field work**

- Field work should be replaced by Field and Practical work.
- Students must be encouraged to present their ideas through innovative means like memes, social media posts, dance-drama, street plays, debates, lectures, etc.

### **4.2 Proposed new additions to the syllabus**

#### **4.2.1 Climate change: causes, effects and remediations**

##### **Theory**

- Introduction to climate change, causes and effects.
- Historical background, Present scenario & Future Projections in Climate change.
- Characteristics and Classification of Climate change.
- Social, environmental and Health impacts of climate change.
- Legal Aspects, Rules, Regulations and their implementation.
- Case Studies, digital video reviews (DVR) of documentaries on climate change.

##### **Practical and field activities**

- Compiling a database of climate change history of region of the institution.
- Interaction with elder generation people to gain knowledge about earlier climates.
- Basic data download and analysis related to climate change to understand the trends and projections.
- Making working models, apps, social media campaigns of techniques to counter climate change etc.

#### **4.2.2 E-waste and single use plastics: Management & safe handling**

##### **Theory**

- Introduction to e-waste and single use plastics.
- Laws and legislation related to e-waste and single use plastics.
- Life cycle assessment of e-waste and single use plastics.
- Environmentally compatible e-waste and single use plastics management.

##### **Practical and field activities**

- Compiling a database of e-waste and single use plastics management handlers in the surrounding areas and submitting to a common authority.
- Organizing camps for collection of e-waste and single use plastics from buildings, societies, colleges, etc. and supplying to authorized handlers.
- Visit to e-waste and single use plastics handling and recycling units.

#### **4.2.3 Environmental Risk Assessment (ERA) and Environmental Impact Assessment (EIA)**

##### **Theory**

- ERA and EIA: Principles, Practices and characteristics.
- Principles, concepts and methodologies of biophysical/environmental and socioeconomic impact assessment of natural resource systems, development projects and programs.
- Environmental Impact Statements (EIS) to EIA process.
- Risk assessments (chemical, radioactive, biological, physical, etc.)
- Skill development in the preparation of an environmental and social impact assessment.
- Case studies and DVR on ERA and EIA.
- Review of EIA of major projects in the vicinity of the institution.

##### **Practical and field activities**

- EIA and ERA projects to be distributed at 3<sup>rd</sup> week of course and final submission before one month of end of the course with teacher's guidance at every stage.
- Visit to an under-construction project to understand EIA and ERA.

#### **4.2.4 Green and Sustainable Designs and Energy Audits**

##### **Theory**

- Introduction to Green Design and energy audits.
- Diverse applications of Green Design.
- Green Design, Energy Efficiency and Sustainable development.

##### **Practical and field activities**

- Hands on Training in software like Design Builders (2.3v).
- Seminar Presentation/workshop/conference presentation.
- Visit to Green structures like Green Buildings in the vicinity to study energy conservation techniques.
- Conduct of preliminary energy audit at homes/colleges/ surrounding buildings.

#### **4.2.5 Disaster Management and rescues**

##### **Theory**

- Introduction and types of Disasters.
- Hazards and risks around us.
- Risk and Vulnerability Analysis
- Disaster Preparedness and Response.
- Rescue, Rehabilitation, Reconstruction and Recovery

##### **Practical and field activities**

- Hands on Training in disaster drills like fire escapes, earthquake drills, etc.
- Use of IT tools in disaster management.
- Invited lectures from civil defense and national disaster management authority experts. Presentation/workshop/conference presentation.

#### **5. Conclusions**

Integrating new topics of concurrent importance into environmental studies is the need of the hour. The student and teaching community and other stakeholders should be involved in the design of any course curriculum before it is implemented. The purpose of environmental education should be envisaged and put into practice so that the development should be *sustainable growth with equity* and *studies with purpose*. If the suggested proposals of this research paper with respect to changes/modifications in the syllabus is implemented with timely updating and revision, then it is expected that the students would not only study the subject with zeal and enthusiasm but also in the long run would help in environmental protection, resource conservation and energy efficiency by becoming green and clean citizens.

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