Education Community

Environment
Water Community

Solution Exchange for the Education Community
Solution Exchange the Water Community
Consolidated Reply

Query: New Trends in Environment Education - Experiences; Examples

Compiled by Nitya Jacob, Resource Person and Sudakshina Mallick, and Sunetra Lala, Research Associates

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From Shankar Musafir, Centre for Science and Environment, New Delhi
Posted 25 September 2008

The Centre for Science and Environment (www.cseindia.org) is a public interest research and advocacy organization based in New Delhi. The Centre researches into, lobbies for and communicates the urgency of development that is both sustainable and equitable. The Environment Education Unit of CSE has been creating innovative environment education tools for schools, colleges and institutions and also produces the magazine Gobar Times. We do capacity building of teachers/educators on environment.

CSE is developing a refresher course for environment educators, in which we plan to introduce a module on 'best practices in environment education-national and international'. We wish to include some examples of participatory, experiential, and contextual environment education initiatives in the said module. Although, we already have a sizable knowledge base on endeavours in India, we would benefit from knowing more. We invite inputs from community members on:

- Examples of innovative environment education initiatives in India and outside India
- The pedagogical approach of such initiatives
- Contact information about such initiatives

Moreover, we would appreciate if members can suggest international experiences, which can be customised for India, or give inputs for us to develop something altogether new.

We would acknowledge the contributions from members, and share the content so developed with the Communities.

Responses were received, with thanks, from

1. **Anshuman Das, Development Research Communication and Services Centre, Kolkata**
2. **Naaz Khair, Independent Consultant, New Delhi**
3. **Sanjay Singh, Public Health Engineering Department (PHED), Bhopal**
4. **Neelima Garg, Uttarakhand Jal Sansthan, Dehradoon**
5. **Subbalakshmi Kumar, Centre for Development Education (CDE), Pune**
6. **Sunetra Lala, United Nations Children's Fund (UNICEF), New Delhi**
7. **Jitendra, Indictrans, Mumbai**
8. **Anuradha Gupta, Prithvi Innovations, Lucknow**
9. **Latha Bhaskar, The Ashoka Trust for Research in Ecology and the Environment (ATREE), Kerala**
10. **Megha Phansalkar, Development Consultant, Mumbai**
11. **Vijay Ghugey, Nisarg Vidnyan Sanstha, Maharashtra**
12. **A. K. Pandeya, Bihar Education Project, Patna**
13. **Uday Bhawalkar, Bhawalkar Ecological Research Institute, Pune**
14. **Ramesh Savalia, Centre for Environment Education (CEE), Ahmedabad**
15. **Dipan Shah, Society for Environment Protection (SEP), Chennai**
16. **Ajay Rastogi, The Viveka Centre, Ranikhet (Response 1; Response 2)**
17. **Vishwas Saxena, Former Consultant, Mussourie**
18. **Lima Rosalind, Independent Consultant, New Delhi**

Further contributions are welcome!

Summary of Responses

Environment awareness used to be something a person learnt outside school depending on one's interest in 'green' issues such as forests, wildlife, marine life or pollution. All this has changed, and the 'greening' of India's education system, started about a decade ago, is now nearly complete. It was partly the result of a campaign by non-profit organizations, and partly the outcome of an order by the Supreme Court in 2003, mandating compulsory environment education (EE) throughout India at all level.

The query sought examples of innovative environment education (EE) initiatives, their pedagogical approach and contact information for organizations engaged in these initiatives, to use as inputs for a module on best EE practices – nationally and internationally – for environment educators. Members responded by suggesting a wide range of initiatives that demonstrated what NGOs, the government and schools have achieved.

Broadly, members said EE has to be practical and incorporate a large component of field activities. Theorizing will only help introduce topics, but students truly appreciate the value of environment education and internalize the concepts, if accompanied by a conducive physical learning environment in school where basic necessities such as sanitation and clean drinking are available. In addition, members suggested linking EE with livelihood opportunities, such as

earning an income from a environment-related activities (a tour operator in a national park), to make it more effective. Out-of-school children must be included in EE.

Sharing **experiences with EE programmes in schools,** respondents mentioned the Green Governance Programme that provides environmental education to students in 20 army schools across the country. These include garbage management and tree plantation in schools. A similar programme in **Andhra Pradesh** implemented by a coal-mining company resulted in the development of a teacher's manual entitled "Environmental Education in Singareni Schools" through the combined efforts of school teachers and students, eco-clubs, college teachers and students, and staff from NGOs. The company worked to build environmental awareness by offering EE, which also help improve the environmental situation in the area.

In **Kerala**, where an NGO developed a module called Jalpaadom, Lessons of Water which is being taught in 50 schools around the Vembanad Lake. The module covers a range of topics, each with a practical and theoretical component, and includes practical activities such as water quality testing of the lake using field test kits, studying the traditional livelihood practices in the area, doing fish and water bird counts and biodiversity studies, and developing aquariums in water bodies. The module is also linked to the classroom syllabus giving value addition to the normal classroom sessions.

The Centre for Development Education, Pune, **Maharashtra** is working on a project called Gardens of Life to provide EE. The project's field activities are linked to the school curriculum and local issues, and the 20 schools involved exchange their experiences. The programme also gives students a say in development of the EE curriculum. Similarly, in **Gujarat**, the Manav Ghadtar project successfully introduced environment and value education in low-income schools in Ahmedabad. In **Madhya Pradesh** three agencies collaborated to develop a module called "wise-water management." The module covers a range of topics including environmental sanitation and water harvesting, and is being used in several schools in tribal areas.

Along with school EE programmes implemented by NGOs, members also mentioned several government initiatives. Under the India Environment Management Capacity Building Project of the Ministry of the Environment and Forests (MoEF), the Environmental Education in School System project introduced environmental concepts into schools in 18 states. Subsequently, the Supreme Court passed an order making EE compulsory at all stages of school education. The National Council for Educational Research and Training (NCERT) has included an EE component in the National Curriculum Framework called "Habitat and Learning".

Another MoEF programme, the National Green Corps, successfully set up eco-clubs, which help educate children on the environment. And in **Delhi** the Green Canopy School Education Programme being run by the Chief Minister's residence offers schoolchildren a weekly three-hour outdoor EE session.

In addition, members discussed a simple ICT-based tool for EE being used effectively in schools to map and monitor village-level activities in **Maharashtra**. The application has helped local youth earn a livelihood by working as data collectors and analysers.

Members said schools are using the information and educational material generated under the Total Sanitation Campaign (TSC) to educate children on environmental sanitation and using children as change agents. Several **community-level EE initiatives** that have changed the way people acted. For example, the Abhivyakti project in **Uttar Pradesh** worked with local community members to educate them on recycle and re-use of solid waste, resulting in improved waste management and employment opportunities. In **Uttarakhand** a Foundation developed a

tool that effectively motivated communities to appreciate nature and the environment through a multi-step process.

Overall, the discussion highlighted several practical initiatives by NGOs and the government programmes across India. It revealed NGOs have played a lead role in spreading EE through the formal education system as well as in schools they run. Members stressed the importance of linking classroom sessions with practical experiences to help students internalize environmental concepts. Most environmentalists in India over the past three decades have been spurred to action after a first-hand experience rather than reading about concepts in a book. Thus, effective EE, must be a mix of outdoor teaching and learning: an outing, a lecture-cum-slide show, a nature camp or stories their grandparents narrated a'la Corbett, James Harriet, Gerard Durrell or Salim Ali has been more effective in creating an environmentalist than plain textbooks.

Comparative Experiences

Madhya Pradesh

Water Management System for Tribal Students *(from Sanjay Singh, Independent Consultant Bhopal)*
UNICEF, National Environmental Engineering Research Institute and Public Health Engineering Dept. developed an integrated water and sanitation model. The model includes a grey water reuse system, rainwater harvesting, flouride dilution techniques, and water safety plans. The system currently is being implemented in many schools in tribal areas. Now it is proposed to use it in all the state tribal hostels. The system has helped students see how concepts taught in class extend beyond classroom. Read more

Maharashtra

Community GIS Application Helps Rural Communities*(from Megha Phansalkar, Development Consultant, Mumbai)*
Micro Associates developed a GIS tool called "Community MAP Application for Rural Communities," that can be used for natural resource management, with an interface for gathering village-level information. It is currently being used in a few villages. A multilingual self-learning kit has been developed with mapping tools and case studies related to the environment. They are also training senior school students to collect data, map it and conduct analysis of the data, that will help find jobs with local NGOs. Read more

EE Project Involves Children in Planning their Education, Pune and Mumbai *(from Subbalakshmi Kumar, Centre for Development Education, Pune)*
The Gardens for Life project works with 20 English medium private schools. The project involves establishing school gardens. It uses the "Development Education" approach where students actively take part in the learning process and have a say in their learning programme. A set of materials, a handbook on cultivating school gardens and a CD documenting the success stories have been developed as a part of the project. Read more

Kerala

"Lessons of Water" Module Educates Schoolchildren on EE, Vembanad Lake *(from Latha Bhaskar, Ashoka Trust for Research in Ecology and the Environment (ATREE), Kerala)*
ATREE developed a wetland conservation module called "Jalapaadom," which is being implemented through 50 schools (a few colleges and TTIs are also involved). Every school has a Wetland Study Center (WSC) with about 100 students each (classes 6-9). The module, based on

the "Wetland Module," has 58 topics and suggests practical activities for students. A compendium of the hypothesis testing methods and reports done by WSC members is being developed and will be available in 2009. Read more

Uttar Pradesh

Using EE to Change Behavior at the Community Level, Lucknow (*from Anuradha Gupta Prithvi Innovations, Lucknow)*
Prithvi Innovations' Abhivyakti project used EE to promote scientific waste management, local crafts and women's empowerment. To address inappropriate waste management, it initiated a scientific waste management project based "your waste is not waste unless you waste it". They sensitized the community about valuing waste & exploring ways to make the best use of it (i.e. using waste to create crafts). The response has been very positive & now women are producing crafts from waste. Read more

Uttarakhand

Appreciation of Nature Approach to Improve Environmental Awareness *(from Ajay Rastogi, Viveka Foundation, Ranikhet; response 1)*
The Viveka Foundation developed a tool called "Aesthetic Appreciation of Nature" to "motivate" communities by creating an emotional connection to take an interest in their environment. The approach involves several steps such as "Contemplation" and "Naturalness Orientation." This approach is now being used in various national parks and nature reserves in the state to complement ongoing environmental education efforts. Read more

Andhra Pradesh

Environmental Education in Singareni Schools, Singareni *(from Naaz Khair, Independent Consultant, New Delhi)*
Based on the experiential learnings gained from teaching EE in Singareni schools, Singareni Collieries Company Ltd produced a teacher's manual. The initative came out of the company's environmental awareness and education project. It was implemented in 17 schools run by the company. The project activites were linked to the company's overall environmental efforts, and focused on community participation. Read more

Gujarat

Project Introduces EE into Regular Curriculum, Ahmedabad *(from Dipan Shah, Society for Environment Education, Chennai)*
In 2004, the Manav Ghadtar project was initiated in 9 schools. It used environment & value education to develop multiple life skills. The EE components included exposure to the environment to sensitize students & education on importance of air/water/earth/energy, emphasizing how day-today life affects the environment. It reached about 800 8^{th} & 9^{th} class students. The project convinced the schools to make EE part of their curriculum, & now runs two classes per week per class in each school. Read more

From Lima Rosalind, WWF India, New Delhi

Delhi

Green Education Programme for Urban Schoolchildren, New Delhi
The Chief Minister of Delhi's residence is implementing the Green Canopy School Education Programme. Under the programme a nature trail was set up along with an interpretation centre.

Every week on Tuesday and Friday schoolchildren from the NGC schools and non-NGC school are able to attend a three-hour outdoor education programme with an interpreter provided by WWF-India. The programme's goal is to sensitize children on the environment. Read more

Rajasthan

Eco-Clubs Helping to Educate Rural Schoolchildren, Sawai Madhopur District
The Ministry of Environment and Forests under its National Green Corps programme created eco-clubs. In remote rural schools in the district, schoolchildren have been learning about the importance of planting trees, keeping school premises free of litter and how to handle waste water. This also helped villagers set up animal husbandry ventures, reducing their dependency on the forest for their livelihoods. Read more

Assam, Tripura and Sikkim

Environment Education Integrated into School Sugjects *(from Sunetra Lala, UNICEF, New Delhi)*
As part of the Environment Education in School System (EESS) project, environment was introduced into all the social science, science and language (available in English, Assamese and Bengali) textbooks in consultation with stakeholders. Handbooks for teachers and an eco-chart of Assam have been developed under the project. NGOs were trained for district-level implementation of the project in the schools. As a result, the textbooks in three states have been 'greened'. Read more

All India

Green Governance Programme Publishing Ecological Resources *(from Lima Rosalind, WWF India, New Delhi)*
WWF-India currently runs an EE programme in 20 schools under its "Green Governance Programme," which includes army public schools and Sainik schools. They teach classes once a week to schoolchildren and also provide a set of resource material, including a guide to ecological resources called "TIGERS". WWF has published and distributed the guide, which covers biodiversity in a broad format. It has now compiled lessons learned from the programme and is in the process of bringing out a report. Read more

Sanitation Campaign Educates Communities *(from Neelima Garg, Uttarakhand Jal Sansthan, Dehradoon)*
The Total Sanitation Campaign (TSC) is a demand-led programme for generating the demand for sanitation facilities in rural areas. Its information campaign target school children and youth to raise awareness about hygiene, water-borne diseases and the link with open defecation. In Uttarakhand, it has successfully developed human resources and capacity to increase awareness and demand generation for sanitary facilities. Read more

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Related Resources

Recommended Documentation

Ecology and Natural Resource Education (*from Anshuman Das, Development Research Communication & Services Centre, Kolkata)*
Article; by Anshuman Das; Development Research Communication & Services Centre; Kolkata
Available at http://www.solutionexchange-un.net.in/environment/cr/res25090801.doc (Doc Size: 96 KB)

Describes the experimentation process adopted to impart environment education to schoolchildren, which included promoting garden-based learning

From Naaz Khair, Independent Consultant, New Delhi

Teacher's Manual - Environment Education in Singareni Schools
Manual; Singareni Collieries Company Limited (SCCL); Andhra Pradesh
Available at http://www.scclmines.com/forestry/forestrypublications.asp#

Compiles experiential learning on EE gained by Singareni schoolteachers, students, college teachers and NGOs, approach emphasizes community participation in EE initiatives

Acrobatics of Change
Book; by Moin Siddiqui; Sage Publications; New Delhi; 2008; Permission Required: Yes, paid publication
Available at http://www.a1books.co.in/searchdetail.do?itemCode=8178298473

Discusses the dynamics of change in an organization that lead to significant profits while implementing environmentally sensitive practises and educating students

From Sunetra Lala, UNICEF, New Delhi

Environmental Education in School System
Project Report; World Bank and Ministry of Environment and Forests
Available at http://www.ceeindia.org/cee/download/eess.pdf (PDF Size: 107 KB)

Report describes the way in which environmental education was introduced into the school system of three Indian states by training teachers, curriculum modification, co-curricular activities

Activities on Greening Textbooks in Phase II
Report; Center for Environmental Education (CEE); Ahmedabad; 2002
Available at http://www.greenteacher.org/?page_id=65

Describes the major activities undertaken by different states for strengthening environmental education in schools involving teacher training and curriculum changes

Environment Education in School System (EESS) - Major Activities of Phase III
Report; Center for Environmental Education (CEE); Ahmedabad; 2003
Available at http://www.greenteacher.org/?page_id=66

Describes the major activities undertaken under Phase III of the EESS project, including introducing environmental education in the curriculum for classes 6 to 8

Nature Scope -Incredible Insects
Book; by Isaac Kehimkar; Center for Environmental Education (CEE); Ahmedabad; 2000
http://ceeisc.org:8080/lsopac/html/Browse?brwbuttonid=B&link=TIncredible%20Insects

Dedicated to inspiring children towards an understanding of the natural world while developing the skills they will need to make responsible decisions about the environment

Act Now
Book; Center for Environmental Education (CEE); Ahmedabad; 2000
Available at http://ceeisc.org:8080/lsopac/html/detailbrw?offset=2

Gives many useful tips on how to save energy and water, by switching off fans and taps at the right time. Aimed at a young audience

Panda, January - June 2008

Book; WWF-India; New Delhi; 2008
Available at http://wwfindia.org/wwf_publications/index.cfm

This volume of the Panda brings into focus how life is interconnected -from conservation of animals and their habitat to connectivity shared by creatures and people

A Handbook of Environmental Education
Book; by Philip Neal; Routledge; 1994; Permission Required: Yes, paid publication
Available for purchase at http://www.amazon.com

Describes what environmental education is, how it can be best used, taught, and disseminated to students at all levels

Ecological Literacy: Educating Our Children for a Sustainable World (The Bioneers Series)
Book; by David W. Orr, Michael K. Stone, Zenobia Barlow and Fritjof Capra; Sierra Club Books; 2005; Permission Required: Yes, paid publication
Available for purchase at http://www.amazon.com

Offers authoritative definitions of what sustainable living means and progressive theories for achieving it, beginning with educating the young on environmental issues

Environmental Education in the 21st Century: Theory, Practice, Progress and Promise
Book; by Joy Palmer; Routledge; 1998; Permission Required: Yes, paid publication
Available for purchase at http://www.amazon.com

Addresses the impediments to developing programmes in environmental education, includes the history of environmental activism and its role in shaping the current political climate

Abhivyakti Project – 1 Degree Change-From Insight to Action (*from Anuradha Gupta Prithvi Innovations, Lucknow)*
Article; Abhivyakti; Lucknow
Available at http://www.solutionexchange-un.net.in/environment/cr/res25090802.doc (Doc, Size: 66 KB)

Presents initiatives undertaken towards recycling and re-use through community involvement and generating awareness on ecological sustainability under the Abhivyakti project in Lucknow

From Latha Bhaskar, ATREE, Kerala

Wetland Module
Module; Ashoka Trust for Research in Ecology and the Environment (ATREE); Kerala
Available at http://www.solutionexchange-un.net.in/environment/cr/res25090803.doc (Doc Size: 35 KB)

Lists all the topics of the environmental education module developed by ATREE, which focuses on wetlands and is based on practical learning through exercises and activities

Vembanad Water Conservation Programme - Jalapaadam (Lessons of Water)
Module; Ashoka Trust for Research in Ecology and the Environment (ATREE); Kerala
Available at http://www.vembanad.org/#3

Environmental education module implemented in 50 schools to create awareness among students about the ecological functions of the Vembanad wetland ecosystem

Vembanad
Newsletter; Ashoka Trust for Research in Ecology and the Environment (ATREE); Community Environmental Resource Centre; Bangalore; January-March 2008

Available at http://www.atree.org/newsletters/vembanad/vembanad_1_1.pdf (PDF Size: 1.59 MB)

Contains articles on conservation of wetland ecosystem at Vembanad Lake, including information on environmental educational programmes to create awareness among students

Manav Ghadtar: An Educational Programme for Schools (*from Dipan Shah, Society for Environment Protection, Chennai)*
Document; Society for Environment Protection; Chennai
Available at http://www.solutionexchange-un.net.in/environment/cr/res25090804.pdf (PDF, Size: 233 KB)

Concept note for the Manav Ghadtar project, which describes how the project focuses on values and real life experiences to teach environment education in Ahmedabad

From Lima Rosalind, Independent Consultant, New Delhi

Communicating Green – Environmental Education and Media Strategies
Book; by Silanjan Bhhattacharya and Sukanya Sanyal; Khetro and Goethe Institute, Max Mueller Bhavan; Kolkata; 2006
Available at Goethe Institute, 8, Ballygunge Circular Road Kolkata 700019; Tel: 91-33-24866398, 2486-6424; Fax: 91-33-24865188; khetro3i@yahoo.co.in or info@khetro.net

Presents details of best practices of environment education, including details of Germany's experience with environment education in schools

CM's Residence Offers 'Nature Trail' for Children
Article; The Hindu; New Delhi; 7 October 2006
Available at
http://www.hinduonnet.com/thehindu/thscrip/print.pl?file=2006100713100200.htm&date=2006/10/07/&prd=th&

Delhi Chief Minister Sheila Dikshit runs an "Interpretative Nature Trail" at her residence to provide an opportunity to school children to see the varied flora and fauna

From Subbalakshmi Kumar, Centre for Development Education, Pune

Garden for Life Resource Material
Handbook and CD; D 2/3 Ratan Park - Phase II, Pashan Sus Road Pune 411021 Maharashtra;
To avail of copy contact Subbalakshmi Kumar, Project Officer, Gardens for Life, Centre for Development Education (CDE)

Information on school gardens and a CD documenting the success stories and lessons from the environmental education project Garden of Life

Gardens for Life (GfL) – India
Report; Syngenta Foundation for Sustainable Agriculture
Available at http://www.syngentafoundation.org/pdf/2006english/GfL_India_E.pdf (PDF, Size: 203 KB)

GfL has captured the imagination of some 19,000 students on three continents, who use their hands-on experience in school gardens to learn biology, art and mathematics in a global context.

From Sanjay Singh, Public Health Engineering Department, Bhopal

Greywater Reuse and Water Safety Plans: A Case Study from Madhya Pradesh, India
Note; Chartered Institution of Water and Environmental Management (CIWEM)

Available at http://www.ciwem.org/resources/water/domestic/india.asp

An informative note on the initiatives of UNICEF in Madhya Pradesh on recycling grey water for domestic purposes such as toilet flushing, watering gardens and cleaning

Greywater Reuse in Rural Indian Schools
Presentation; by Sam Godfrey; IWA World Water Congress; China; September 2006
Available at
http://www.iwahq.org/uploads/conference_graphics/beijing2006/workshops/who%20safe%20water/Sam%20Godfrey.pdf (PDF, Size: 870.33 KB)

Presentation on the need for water reuse, available technologies on water reuse in schools and grey water generation, including identification of hazardous contaminants

Recommended Organizations and Programmes

National Green Corps, Ministry of Environment and Forests, New Delhi *(from Lima Rosalind, WWF India, New Delhi)*
Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11-24363956; Fax: 91-11- 24363956; envisect@mef.nic.in; http://envfor.nic.in/divisions/ee/ngc/ngc_brochure.html#0

Government programme aimed at involving schoolchildren in environmental programmes and inculcating awareness about the environment

Centre for Science and Environment (CSE), New Delhi *(from Shankar Musafir)*
41, Tughlakabad Institutional Area, New Delhi 110062; Tel: 91-11-29955124; Fax: 91-11-29955879 cse@cseindia.org; http://www.cseindia.org/programme/eeu/eeu-index.htm

Aims to provide quality resource material/programmes for school, college students and environment educators to create awareness about environmental issues

Development Research Communication and Services Centre, Kolkata *(from Anshuman Das)*
58A, Dharmotola Road, Bosepukur, Kasba, Kolkata 700042 West Bengal; Tel: 91-33-24427311; Fax: 91-033-24427563; drcsc@alliancekolkata.com; http://www.drcsc.org/projects.html

Trains educators, teachers and social workers on environment protection issues and works with schools create awareness on protecting and nurturing nature

Singareni Collieries Company Ltd., Andhra Pradesh *(from Naaz Khair, Independent Consultant, New Delhi)*
Kothagudem Collieries, Khammam District, Andhra Pradesh 507101; Tel: 91-8744-242301; Fax: 91-8744-242305; http://www.scclmines.com/forestry/forestry9.aspx; Contact S. Narsing Rao; Managing Director; Tel: 91-40-23393746; cmd@scclmines.com

Organization implementing environmental awareness and education projects in its 17 schools and has increased tree cover near the coal mines

WWF-India, New Delhi *(from Naaz Khair, Independent Consultant, New Delhi and Lima Rosalind)*
72 B, Lodhi Estate, New Delhi 110003; Tel: 91-11-41504815; Fax: 91-11-24691226; http://www.wwfindia.org/about_wwf/what_we_do/education/index.cfm

Implementing environment sensitisation programmes for students and teachers and advocates research on environmental education within the formal education system

From Sanjay Singh, Independent Consultant, Bhopal

United Nations Children's Fund (UNICEF), New Delhi

73 Lodi Estate, New Delhi 110003; Tel: 91-11-24690401; Fax: 91-11-24627521; newdelhi@unicef.org; http://www.unicef.org/india/wes_2831.htm

Implementing an environmentally sound integrated water and sanitation model that engages children in bringing about positive environmental changes within communities

National Environmental Engineering Research Institute (NEERI), Nagpur
Nehru Marg, Nagpur 440020 Maharashtra; Tel: 91-712-2249885; Fax: 91-712-2249900; ra_sohony@neeri.res.in; http://neeri.res.in/mission.php

Organization conducts research in environmental science and has developed an integrated water and sanitation model, called "wise water management"

From Neelima Garg, Uttarakhand Jal Sansthan, Dehradoon

Total Sanitation Campaign, New Delhi
Department of Drinking Water Supply, Ministry of Rural Development, 247, A Wing, Nirman Bhawan, New Delhi 110011; Tel: 91-11-23010207;
http://india.gov.in/sectors/rural/central_rural.php

Central Government programme, launched in 1986, has a strong school sanitation component to teach children about environmental sanitation and hygiene

Centre for Environment Education (CEE), Ahmedabad *(from Ramesh Savalia and Sunetra Lala, UNICEF, New Delhi)*
Nehru Foundation for Development, Thaltej Tekra, Ahmedabad 380054, Gujarat; Tel: 91-79-26858002; Fax: 91-79-26858010; cee@ceeindia.org; http://www.ceeindia.org/cee/Children.html

Organization conducts educational programmes for schoolchildren reaching out to over 3000 schools across the country, in collaboration with government agencies

From Sunetra Lala, UNICEF, New Delhi

Ministry of Environment and Forests, New Delhi
Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi 110003; Tel: 91-11-24361669; envisect@nic.in; http://envfor.nic.in/

Ministry implements schemes to sensitize students on educational issues, imparts knowledge about eco-systems, their inter-dependence and their need for survival

National Council for Educational Research and Training (NCERT), New Delhi
Sri Aurobindo Marg, New Delhi 110016; Tel: 91-11-26560620; Fax: 91-11-26868419; proncert@yahoo.co.in; http://www.ncert.nic.in/html/pdf/environment/eose_guidelines_final.pdf (PDF, 34 KB)

Provides guidelines for EE courses to be run at all classes in schools to create environmental consciousness among students

C.P.R. Environmental Education Centre, Ministry of Environment and Forest, Tamil Nadu
The C. P. Ramaswami Aiyar Foundation, No.1, Eldams Road, Alwarpet, Chennai, Tamilnadu, India - 600 018; Tel: 91-44 -24337023 / 24346526 / 24359366;
cpreec@vsnl.com; http://cpreec.org/environmentaleducation.htm

Pioneer in environmental education efforts in South India and has conducted a variety of programmes to spread awareness and interest among the masses on the environment

Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore *(from Latha Bhaskar)*

659 5th A Main, Hebbal, Bangalore 560024, Karnataka; Tel: 91-80-23533942; Fax: 91-80-23530070 info@atree.org ; http://www.atree.org/ce-overview.html

Organization conducts field-oriented educational programmes and workshops for students and teachers to create awareness on environmental issues

Nisarg Vidnyan Mandal, Nagpur *(from Vijay Ghugey)*
Nisarg Vidhnyan Sanstha, 138, Mahalaxmi Nagar #2, Manewada Road, Nagpur 440024; Tel: 91-712-3260950; nisargvg@yahoo.co.in; http://nisargvidnyan.org/id7.html

Works with 65 schools in Nagpur conducting educational activities in natural settings to stimulate environmental awareness

Viveka Centre, Ranikhet *(from Ajay Rastogi)*
Village and PO Majkhali Ranikhet, 263652 Uttarakhand; Tel: 91-11-24628877; http://viveka-international.de/en_en/

Provides consultancy in the fields of leadership and team development and practises emotional motivation through aesthetic appreciation of nature.

Gardens for Life, Centre for Development Education, Pune *(from Subbalakshmi Kumar for Development Education, Pune)*
D 2/3 Ratan Park - Phase II, Pashan Sus Road, Pune 411021, Maharashtra; Tel: 91-0-9371069730, 91-20 25862982; gfl1@vsnl.net;
http://www.handsontv.info/series6/03_Green_Beginnings_reports/report1.htm

Gardens for Life brings together students from across three continents in an exciting project to enable them to share their experiences of gardening

Recommended Portals and Information Bases

Gobar Times (*from Shankar Musafir, Centre for Science and Environment, New Delhi)*
Centre for Science and Environment; New Delhi;
http://www.gobartimes.org/20080915/20080915.asp

Monthly magazine covering environmental issues for students and teachers, which attempts to sensitize them about the concept of sustainable development

From Sunetra Lala, UNICEF, New Delhi

Joy of Learning- I
Handbook; Center for Environmental Education (CEE); Ahmedabad
Available at http://www.edutechindia.org/

Handbook of 75 activities to help children understand different facets of the environment, developed for the National Council for Educational Research and Training

EEKS! Environmental Education for Kids, Wisconsin Department of Natural Resources, USA
http://www.dnr.state.wi.us/eek/

Electronic magazine is for kids in classes 4-8, viewers can explore the site to learn more about the great outdoors and the environment

EnviroEducation.com - The Environmental School Directory, A Monster Company, USA
http://www.enviroeducation.com

Provides information on environmental schools for campus and online degree programmes including: Environmental Engineering, Wildlife Sciences, etc

From Ramesh Savalia Centre for Environment Education, Ahmedabad

Green Teacher, Centre for Environment Education, Gujarat
http://www.greenteacher.org/

Contains information to sensitize adults and children on environment conservation and advocates for an environmental perspective to textbooks

Focus on Climate Change, Centre for Environment Education
http://www.kidsrgreen.org/krg.html

Educational website for children providing information about natural habitats and ecosystems through virtual images and multimedia interaction

TIGERS
Paper; WWF-India; New Delhi
Available at http://wwfindia.org

Information guide to ecological resources, which deals with outdoor learning of biodiversity in a broader format

Recommended Training Courses

From Sunetra Lala, UNICEF, New Delhi

Masters of Science in Environment Science and Diploma in Environmental Education, Bharati Vidyapeeth University-Institute of Environment Education and Research, Pune
http://environment.bharatividyapeeth.edu/html/admission_msc_environment.shtml; For details contact: Katraj - Dhankawadi Campus, Campus, Pune 411043, Maharashtra; Tel: 91-20-24375684; Fax: 91-20-24362155; bvieer@vsnl.com

M.Sc. programme equips students with skills needed as environmental professionals and diploma programme is designed to develop the capacity of students to incorporate EE into any field

Asbestos, Environmental, Hazardous Waste, and Safety & Health Courses; Institute for Environmental Education, USA
On going courses (available on-line);
Information available at http://www.ieetrains.com/Course%20Description%20Page.htm; For details contact 16 Upton Drive, Wilmington, MA 01887, USA; Tel: 978-658-5272; Fax: 800-823-6239; courseinfo@ieetrains.com

Offers job-specific classes in asbestos, lead, OSHA Hazardous Materials/Waste and related environmental classes and seminars. Can be adapted for use in India

Recommended Tools and Technologies

Pune Municipal Corporation-GIS, Maharashtra *(from Jitendra, Indictrans, Mumbai)*
GIS mapping tool; Owned by Pube Municipal Corporation
http://demo.binyasit.com/mGIS/pmc/

GIS tool with local language interface for representing and investigating environmental information and also for collaboration across schools and is free to use

GIS Tool for Jidnyasa-Quest of Learning *(from Megha Phansalkar, Development Consultant, Mumbai)*
Web based application; Owned by Micro Technologies, Mumbai
Available at http://www.micromict.net/jidnyasa/micromapper.html

Provides interface for village information and planning with primary and secondary information at the village level. Users can view facilities and conduct water budgets

Recommended Upcoming Events

From Sunetra Lala, Research Associate

EDU-COM 2008 - Sustainability in Higher Education: Directions for Change, Thailand, 19-21 November 2008
Sponsored by Edith Cowan University in collaboration with Khon Kaen University and Bansomdejchaopraya Rajabhat University; Sofitel Raja Orchid Hotel, Thailand; Information available at http://educom2008.scis.edu.au/

Fourth international conference in a sequence focusing on engagement, empowerment and most importantly, sustainability and quality education

International Conference on Environmental Ethics Education, India, 16-17 November 2008
Sponsored by Banaras Hindu University, Varanasi; Information available at http://www.aaebhu.com/

Will focus on themes such as environmental crisis and challenges, environmental ethics education and the history and current trends in environment education

Outdoor Education, Research and Theory: Critical Reflections, New Directions, Australia, 15-18 April 2009
Sponsored by La Trobe University, Victoria, Australia;
Information available at http://www.latrobe.edu.au/oent/research_conf_2009.htm; Contact Kathleen Pleasants; Tel: 61-3- 5444 7801; k.peasants@latrobe.edu.au

Will discuss the promotion of an international community of researchers working on critically examining outdoor education theory and practice

5th World Environment Education Congress, Canada, 10-14 May 2009
Sponsored by Lakehead University, Montreal, Canada; Information available at http://www.5weec.uqam.ca/EN/; Tel: 1-514-287-1070; 5weec@jpdl.com

Will celebrate the courage, creativity, and successes of environmental educators from different countries

Related Consolidated Replies

Status of Environment Education in the School Curriculum, from Livleen Kahlon, TERI, New Delhi. Experiences . Education and Water Communities,
Issued 28 February 2007. Available at http://www.solutionexchange-un.net.in/education/cr/cr-se-ed-wes-01020701.htm

Provides experiences, difficulties encountered when integrating EE as a subject, and offers suggestions to make it more joyful, inclusive and meaningful learning experience

Developing Learning Material on WaSH for School Children, from Sarita Thakore, Centre for Environment Education (CEE), Ahmedabad. Experiences, Examples. Water and Education Communities,
Issued 19 June 2008. Available at http://www.solutionexchange-un.net.in/environment/cr/cr-se-w es-ed-27050801.pdf (Size: 130 KB)

Presents suggestions on contents as well as teaching methodologies to engage students, sharing insights and guidance based on their experiences in developing learning material

Responses in Full

Anshuman Das, Development Research Communication and Services Centre, Kolkata

I am attaching a file with our experience. I hope CSE already has all the books we published so far. CSE is free to use the content with reference to DRCSC. To access the file, click on, http://www.solutionexchange-un.net.in/environment/cr/res25090801.doc.

Those who are new to our work, please comment/share ideas/suggest.

Naaz Khair, Independent Consultant, New Delhi

Please look at "Teacher's Manual- Environmental Education in Singareni Schools", which is a product of experiential learning of Singareni school teachers, students, eco-clubs, college teachers and students, NGOs in environment around Singareni, concerned Singareni coal-mines officers and World Wide Fund (WWF), Andhra Pradesh. It arises out of an environmental awareness and education project implemented in 17 schools run by Singareni Collieries Company Ltd. The school project links to the overall environmental efforts of the Company and to that extent is participatory and led by a vision of community participation as one family.

SCCL not only registered significant environmental gains (drop in overall temperatures in and around Singareni) but the Company's profits rose remarkably during the period. Thus an age-old Company (of the late nineteenth century) declared unfit, revived and turned into a profit making body.

The just inaugurated book "Acrobatics of Change" jointly authored by Mr. Moin Siddiqui and Mr. RH Khwaja recounts the experiences of Mr. RH Khwaja, who was the CEO of SCCL during the period the Company registered the changes mentioned above. Mr. Moin Siddiqui provides the concepts to analyze the experiences.

“I reviewed the Singareni Schools Environmental Awareness and Education Programme around 2003-04 and was witness to the developments mentioned above. It was a short term project that I looked at. Following the review, SCCL and WWF went in for long term support of project. The teacher manual was produced to form an important input under the long term project.”

SAGE has published "Acrobatics of Change". The teacher manual could be obtained by contacting the Company at http://www.scclmines.com or by contacting WWF, Delhi or Andhra Pradesh.

Sanjay Singh, Independent Consultant, Bhopal

In an attempt to take environmental learning beyond classrooms, UNICEF Bhopal in collaboration with National Environmental Engineering Research Institute and Public Health Engineering Department has developed an interesting and well- accepted integrated water and sanitation model, which is termed as wise water management. This environmentally sound system is already being implemented in many tribal hostels and is proposed to cover all the tribal hostels of the state. The model is internationally acknowledged and constitutes the following:

- Grey water reuse system (grey water is being used for toilet flushing and kitchen garden after treatment)
- Rainwater harvesting system with ferrocement tank for storage
- Fluoride dilution technology (could be used for diluting other chemicals also)
- Water safety plans

Apart from the above, training of schoolgirls on menstrual hygiene, production of sanitary napkins and their safe disposal through incinerators is the integral part of the system. Efforts such as these are helping to ensure that the environmental lessons extend beyond classrooms and that student can actually see some of the textbook concepts being implemented. It has also enabled recycling of water in the water-scarce residential schools of the province.

UNICEF has also developed Water Safety Plans through school Water Safety Clubs. Each school paints a Water Safety Plan matrix on the outside wall of their school building. The Water Safety Plan is then managed and monitored daily by the Water Safety Club (comprising of both teachers and students). For more details please visit:
http://www.ciwem.org/resources/water/domestic/india.asp and
www.iwahq.org/uploads/conference_graphics/beijing2006/workshops/who%20safe%20water/**Sa m**%20**Godfrey**.pdf

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Neelima Garg, Uttarakhand Jal Sansthan, Dehradoon

The Government of India is implementing the Total Sanitation Campaign to motivate people to adopt good hygienic practices and develop an open defecation free environment. There are several lessons for environment educators regarding water quality, sanitation and health.

In Uttarakhand, as per the 2001 census, rural sanitation coverage was only 22% in the state. Individual health and hygiene is largely dependent on availability of potable drinking water and proper sanitation. There is a direct relationship between water quality, sanitation and health. Consumption of unsafe drinking water, improper disposal of human excreta and poor sanitation are attributed to high, high infant mortality rate and incidence of diseases in rural area.

It was in this context that the Central Rural Sanitation Programme (CRSP) was launched by Government of India in 1986 with the objective of improving the quality of life of the rural people and to provide privacy and dignity to women. CRSP was restructured in 1999, following which, a demand responsive community led "Total Sanitation Campaign (TSC)" was introduced which emphasizes more on Information, Education and Communication (IEC), Human Resource Development, Capacity Development activities to increase awareness and demand generation for sanitary facilities. This program is being implemented under direction of Government of India (Department of Drinking Water Supply, Ministry of Rural Development).

The main focus of the campaign is on motivating people to adopt good hygienic practices and develop an open defecation free (OFD) environment forever. This program is being implemented under direction of Government of India (Department of Drinking Water Supply, Ministry of Rural Development).

Objectives:

1. Bring about an improvement in the general quality of life in rural areas by accelerating sanitation coverage in rural areas.

2. Generate felt demand for sanitation facilities through awareness creation and health education and encourage cost effective and appropriate technologies in sanitation.

3. Cover schools/Anganwadis in rural areas with sanitation facilities and promote hygiene education and sanitary habits among students.

4. Encourage Eliminate open defecation to minimize risk of contamination of drinking water sources and food.

5. Convert dry latrines to pour flush latrines, and eliminate manual scavenging practice wherever in existence in rural areas.

Subbalakshmi Kumar, Centre for Development Education (CDE), Pune

The Centre for Development Education, Pune (CDE) has been working with 20 schools in India linked with 75 schools in UK and Kenya on a very interesting and exciting project called 'Gardens for Life'. This is a part of the Development Education initiative and coordinated by the Eden Project, Cornwall, UK. The Gardens for Life project worked with 20 English Medium, urban, private schools in Mumbai and Pune. Most of them catered to the middle class homes in suburbs of Mumbai and Pune.

The various aspects of the project were:

1. Establishing School Gardens – Here gardens mean food production and not decorative gardens. Children were encouraged to grow tomatoes, brinjals, pumpkins, herbs like coriander, fenugreek, etc; gardens range from 2 acres plots in Kenya to roof top terrace gardens in Mumbai to a few pot gardens in Pune....
2. Connecting the garden activities to the curriculum: Not only the science curriculum but other subjects like art, languages etc benefited from the connections made to the school garden! Activities like weeding and preparing beds were used to teach about different kinds of roots while weeding...
3. Relating gardens to local issues: Whether it is discussing the use of chemical fertilizers or the flip side of GM foods, debates are carried out in the class room and in the garden of-course!! Even the sensitivity on how much care is required to grow plants and the farmers plight when his crop is ruined, were discussed.
4. Exchanging their experiences on gardens activities with other students in Kenya and the UK; sharing their success stories, their failures with the gardens, sharing the medicinal value of plants grown, recipes are just some of the examples of the exciting exchange programme of these 75 participant schools. Now the project extends to ten schools in rural Purandar taluka.
5. Teachers also tried out activities developed by the experts in the Eden Project, UK in partnership with DFES and Science across the World. Teachers met to discuss the tried out activities and gave their views on how feasible it is in the Indian curriculum...There were schools that had a Garden laboratory where several experiments were carried out with plants to enhance outdoor learning.
6. The Sustainability Approach was followed where schools developed their own system of generating enough revenue from the produce of the gardens for the next years soil and seeds!

The project followed a Development Education approach, which meant that the students were a part of the learning process and had a say in their own learning programme. Whether it is selecting garden space or what to grow, students were involved. Emphasis was given to trials, experimentations and failures - rather than successful green gardens. That is failures were celebrated along with the success!

A set of materials, a handbook for school gardens and a CD documenting the success stories and various other stories that happened during the project were developed as a part of the project. These are available on request from me.

Sunetra Lala, United Nations Children's Fund (UNICEF), New Delhi

I was involved in the Environmental Education in School System (EESS) http://www.ceeindia.org/cee/download/eess.pdf project for the states of Assam, Sikkim and Tripura. The EESS project was a sub-component of the India Environment Management Capacity Building Project of the Ministry of Environment and Forests (MoEF) supported by the World Bank, aimed at infusing environmental education (EE) in the school system. Centre for Environment Education (CEE) was a Consultant to the MoEF for implementing this project. The project aimed at strengthening environmental education in the school system through:

- Strengthening infusion of EE in textbooks
- Teacher training for effective EE/Class room transaction
- Use of non-formal and hands-on teaching learning methods
- Creating a separate space and time for consolidating environmental learning

The project implementation was in four phases:

Phase I involved detailed analysis of the textbooks of all the 32 states of the country. This was to assess the level of infusion of environmental concepts in school curricula in the textbooks of Science, Social Studies and Languages. Along with this a sample study in 10 states of the country was done to assess teaching methods used for delivering environmental concepts in schools to provide insights into the methods and materials being used to teach these concepts in an effective way and to investigate the major barriers towards effective environmental education. The recommendations of this phase were implemented in six states in the country. The study was carried out by the Bharati Vidyapeeth Deemed University.

Phase II involved pilot implementation of the programme in eight states at the middle school level (Std VI, VII, and VIII) mainly through impacting the teaching of Science, Social Studies and Languages and through extra and co-curricular activities. For strengthening EE in schools, as a first step, greening of existing state level textbooks was undertaken by infusing environmental concepts into the textbooks of Science, Social Studies and Languages for standards VI, VII and VIII. The process of greening textbooks involved adding, deleting, modifying and adapting text, visuals, activities, exercise etc., to give an environmental perspective. The project involved pilot implementation of the programme in eight States i.e. Andhra Pradesh, Assam, Jammu & Kashmir, Goa, Maharashtra, Orissa, Punjab and Uttaranchal (100 schools per State). More on Phase II http://www.greenteacher.org/?page_id=65

Phase III involved 10 more states for a similar exercise of greening textbooks, training teachers, and enriching EE by co-curricular hands-on activities. As part of Phase III, the greening framework was developed for 10 states, which agreed to participate in this process. These states were Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Sikkim, Tripura, Tamil Nadu and West Bengal. The process involved training of Master Trainers and teachers, and co-curricular hands-on activites, among others in the selected states.
More on Phase III http://www.greenteacher.org/?page_id=66.

As part of my involvement with Phase III, we not only 'greened' the Social Science, Science and Language (English/Assamese/Bengali) textbooks for the states of Assam, Sikkim and Tripura, but also developed Handbooks for Teachers, which assisted them in teaching the infused 'green' components more effectively, through concept building, game approaches, etc. An eco-chart comprising the historically and environmentally significant aspects of Assam was also developed under the project. The textbooks and handbooks were developed with extensive consultations and inputs from the textbook boards, SCERT, and the teachers themselves. We also connected with 4 NGOs for the state of Assam who assisted in rolling out the training programmes for the schools at the district levels. These NGOs were first trained by CEE before they began with the district level implementation and their roles were monitored on a quarterly basis.

Phase IV Strengthening Environment Education in School System (StrEESS)

In 2003 the Supreme Court (SC) of India mandated compulsory environmental education at all stages of education throughout the country. It directed the National Council of Education Research and Training (NCERT) to prepare a model syllabus for this purpose. In 2004 NCERT published the first edition of the syllabus, which the SC approved and directed all the boards and councils for school education in the country to adopt, to suitably modify their existing syllabi and textbooks, or to develop them anew.

Most education boards responded to the SC directive and initiated the process. Further to this, NCERT published the National Curriculum Framework (NCF) 2005, in which EE appeared as *Habitat and Learning* and was recommended for an infusion approach. The Government of India, MOEF extended technical help to further the initiative. CEE was invited as a consultant to streamline and support the execution of the directive. In 2005, MoEF initiated the project *Strengthening Environment Education in School System* (StrEESS). This is a national project in collaboration with State Departments of Education (SDEs) across India.

CEE, with its regional and state offices, worked closely with the SDEs to evaluate the existing EE syllabi and textbooks vis-à-vis the SC-approved syllabus. This was done to commence the process of developing material appropriate to the implementation of the SC directive. CEE initiated discussions with the SDEs to facilitate and help them in the compliance of the SC directive, and facilitated the development of proposals by them focusing on the action plan to facilitate implementation of the curriculum, orienting text book writers, developing text books and teaching-learning materials, and teacher training.

During 2006-07, CEE continued these activities in the states and developed a web-enabled EE database for use as a resource base. For more information, please visit, http://www.ceeindia.org/cee/Children.html.

Jitendra, Indictrans, Mumbai

Using GIS for representing and investigating environmental information as also for collaborating across the schools and geographical regions is well accepted as an idea. The main issues are affordability and ease of use at the grassroots. Luckily many FOSS GIS tools have now matured and many teams have developed capabilities to support the idea. I have been mentoring some groups using local language interfaces and webGIS. The following links demonstrate the technology: http://demo.binyasit.com/mGIS/pmc and http://mumbai2.freemap.in/mumbaifreemap.

Hopefully the interface can be used for environmental issues quite effectively. A number of scenarios how students can use these tools effectively for real life problems are available for those interested. The platform can also be used for location-based services.

Anuradha Gupta, Prithvi Innovations, Lucknow

We wish to share a small real life example of how environmental education created ripples and change in the way we view things and the way we act. This little effort of ours was very well received locally, nationally and internationally.

We are attaching a word file of the ABHIVYAKTI Project – 1 Degree Change-From Insight to Action. It can be accessed at http://www.solutionexchange-un.net.in/environment/cr/res25090802.doc (Size: 66 KB)

Another case of Acrobatics of Change:
From Waste to Beauty,
From Dependence to Independence,
From expression to empowerment,
From sleep to awakening.

Latha Bhaskar, The Ashoka Trust for Research in Ecology and the Environment (ATREE), Kerala

In this context, I wish to highlight the environmental education module, implemented by Ashoka Trust for Research in Ecology and the Environment (ATREE) as part of our wetland conservation programme in Vembanad wetlands of Kerala. This module is named as "JALAPAADOM' (Lessons of water) and is implemented through 50 schools around the Lake. Wetland study centers (WSC) are set up in these 50 schools and in each center there are around 100 students from 6^{th} to 9^{th} standards. A few colleges and TTI are also involved.

Our Environmental Education module mainly focus around wetlands, based on a "WETLAND MODULE" with 58 topics (expanding each letters of the word wetland) developed for the purpose, as listed out in the table accessible at http://www.solutionexchange-un.net.in/environment/cr/res2509 0803.doc (Size: 35 KB).

This module introduces each topic and suggests various exercises/activities for the students to learn things outside the class, through practical ways. Hypothesis testing by students - a minimum of 5 hypothesis testing in each school/year- is another significant step, which helps to waken up the 'young scientists' in them. Water quality testing of the lake using field test kits, study of the traditional livelihood practices of the lake, Fish counts, Water bird count, bio diversity studies, developing aquariums in water bodies etc are some of the examples which were tried under hypothesis testing. The module is also linked to the syllabus, of their study giving value additions to normal classroom sessions.

WSC have weekly sessions with lot of activities- guest classes , film shows, nature walks, field trips, puppet shows , butterfly gardening, competitions, cross visits , special workshops etc. and the teacher in charge who volunteer to guide the club takes keen interest to guide the students through many innovative methods . They in turn are trained at ATREE. A notice board is displayed in each school, maintained by WSC members with environmental news, which also attracts other students.

ATREE also organizes classes for selected students on special topics like - common fishes of Vembanad, odonates and butterflies, Lake Water quality monitoring, theater methods using puppet show, etc. Seminars/workshops, competitions, summer camps, study tours etc are also directly organized based on our annual calendar and budget.

Recently students from Wetland study centers brought out a **Jalapaadom Student magazine**, which is edited by student editors, including the creations, experiences and feed backs of WSC members/teachers. A compendium of the hypothesis testing methods and reports done by WSC members will be developed, next year. The best WSCs who do genuine projects will be awarded too and that is already announced, helping to have healthy competitions among schools.

With our experience, we have learned that, "catch them young ", and develop them as 'strong advocates of nature conservation", is the best and most effective form of environmental education for sustainable development.

Megha Phansalkar, Development Consultant, Mumbai

Micro Associates have developed innovative application that can be used at school and community level for natural resource management and environment through GIS. The details can be see on,
http://www.micromict.net/jidnyasa/micromapper.html.

Community MAP Application for Rural Communities provides interface for village information and planning. Primary and secondary information can be entered. Village level activities, facilities can be viewed and monitored. Local language interface is available. Village resource/PRA application can be drawn with GIS interface.

The application is being used in a few villages in Maharashtra for community mapping. A self-learning kit (multilingual) has been developed with mapping tools with case studies related to environment, natural resource management for rural youth.

The idea is to deliver the course through community service centre and IT centers for employment generation amongst 10th and 12th pass youth. The youth will be empowered with the skills on collection of local resource data, map the same, conduct analysis etc. This will develop a cadre of Para professionals for the NGO s working in development sector.

Vijay Ghugey, Nisarg Vidnyan Sanstha, Maharashtra

Thanks for sharing of a very important information and knowledge trove with us. We are also working with 65 schools of the Nagpur division through Nisarg Vidnyan Mandal (NiViM) on local support and fund raising. The resources are not sufficient to cover a larger number of schools.

Please advice on how to raise funds to inculcate environmental education and popularizing science among students.

A. K. Pandeya, Bihar Education Project, Patna

I am not well versed with the “New Trends in Environment Education,” but elementary schools are huge in number especially in rural areas, in comparison to other institutions. If these schools and students are taken seriously for environment education, they will play a great role.

Besides, the students of elementary schools are beginners and they will inculcate a better understanding regarding environment as they are from rural background; it is easier for them to do the ‘practical’ in their own fields and homes.

If we are successful in developing better understanding among the vast number of beginners, Environment Education will be successful. Why are we not thinking about returning to the basic education Philosophy of Gandhi ji?

Uday Bhawalkar, Bhawalkar Ecological Research Institute, Pune

EE can be formal or informal, but it should always be backed up by actual practice/demonstrations. EE has gone into schools, colleges and many social organizations; NGOs and Government Organizations are actively involved in it too.

We still find many schools and colleges that do not have full-scale waste recycling systems and hence have not achieved a 'zero discharge' status. May be it is perceived as being the job of only

the industries as they would not be able to afford and operate the waste management systems that need industrial skills.

We are in the field of ecological research and education and guide individual families, farmers, institutions and industries, to 'convert pollution into resources' using only the ecological techniques and without using much machinery/electricity to operate it.

We believe that such hands-on education will create eco-literacy and that will help us solve the environmental degradation challenges before us. For details, please see www.ecoguru.org.

Ramesh Savalia, Centre for Environment Education (CEE), Ahmedabad

When the discourse on Environment Education (EE) started in India, it was nature education in most of cases since people were perceiving environment as equivalent to wildlife. The Centre for Environment Education (CEE) started working on EE and it evolved a conceptual framework through various target groups since 1984. The first and most intensive EE experiences with CEE are on EE in school education. CEE has various models for EE in schools starting with teacher training to a more holistic EE approach.

We need to understand that EE in India is different to other developed countries.

First, we need to emphasize on upgrading quality of teaching-learning school environment i.e. software and hardware. You cannot do EE without proper and conducive physical and psychological environment. When we talk about conserving water and if there is no safe drinking water storage system or rain water harvesting model in school, will children learn the water conservation concept?

Secondly, you need to link EE with its immediate livelihood opportunities. Without linking the role of national park in sustaining their family livelihood, EE among children will be futile. This means that we need to turn the EE course from entertainment or romantic education to life education or survival education.

Thirdly, most children-related efforts in the area of EE have been for school children; however, we also need to target non-school going children. Many children in India constitute non-school going children (School dropouts and never been to school). To provide opportunities in EE to non-school going children, the best way is child-to-child interaction. The non-school going rural children are future communities of the rural area and also future conservators of their natural resources.

Non-school going children usually work alongside their families and closely observe direct impact of nature conservation surrounding them, especially where they are involved in activities such as shepherding animals, collecting firewood, agricultural work and foraging for food. Such children should be perceived as prospects who can effectively serve as catalysts for responsible environmental awareness and action within their own families. Therefore through such children, several ventures need to be attempted to establish a long-term strategy towards EE.

There are various strategies and approaches tried across India by CEE for EE in schools. For more information you can visit main website of CEE is www.ceeindia.org and also EE website for teacher www.greenteacher.org and EE website for kids www.kidsrgreen.org.

Dipan Shah, Society for Environment Protection (SEP), Chennai

SEP i.e. Society for Environment Protection (SEP) has Environment and Value education (VE) as one of its main focus area. We believe that to bring about a real change in the society and develop environmentally responsible citizens it is must that EE and VE (value education) go hand in hand.

EE is not just a set of information or statistics but is something, which a person has to ingrain in him/her as an attitude as a value. To reach out this goal we have our project titled "*Manav Ghadtar*" which is actually a synthesis of value and life education with Environment education. What we do is we teach value/life education and all the activities are designed in the realm of EE. You may access the brief concept note for your reference at http://www.solutionexchange-un.net.in/environment/cr/res2509 0804.pdf (PDF, Size: 233 KB)

For the project, we had taken 2 periods a week from the school on a regular basis and facilitators from SEP had taken sessions during these periods.

During our implementation we have found that due to this integrated approach, information actually crosses the domain of statistics or data and becomes something, which "I" am directly linked with. It processes itself to knowledge and then the regular activity helps build that into an attitude of a child, which is naturally sensitive to the surroundings.

Ajay Rastogi, The Viveka Centre, Ranikhet *(response 1)*

EE is a classical case where information and knowledge does not often lead to practice and action. There is a considerable amount of research being conducted to understand why people know about something and still fail to act. This problem is often referred to as "Behaviour Attitude Gap."

Present day psychologists suggest that one is motivated to act primarily with the force of emotions. The emotional connection with nature is therefore considered essential for self-motivation of people. It is also important because without high motivation, people would not make the desired shift in their lifestyle of high consumption. High level of consumerism affects environment adversely and is one of the biggest challenges for sustainable and equitable development.

One of the tools that could be effectively used for emotional motivation is 'Aesthetic Appreciation of Nature', which involves several steps such as 'Contemplation' and 'Naturalness Orientation' etc. The Viveka Centre has made attempts to refine this approach and use it practically. I would be happy to work with other interested organizations.

Vishwas Saxena, Consultant, Mussourie

Pedagogical initiatives for environment education now require a paradigm shift. It must become participatory for students and adopt a system ecological model. It means that the three domains of learning viz., cognitive, affective and connotative, must be incorporated in a simulated ecosystem structured in such a way that it provides direct interaction between ecological dynamics with the learning dynamics.

I shall specify this by a working example. If we are teaching a child about a lake, then we shall prepare a simulation model of a lake citing all the units constituting it. Thus, water, plankton, sun, zooplanktons, etc., shall be linked in an interrelated fashion to prepare an energy transfer model often referred as Calsim model (Californian Simulation Model).

At the same time, a learning model is to be prepared incorporating signals of cognitive, connotative & affective aspects of learning. This means that a series of activities have to be developed by the pedagogist or teacher to present a well-designed picture, followed by a verbal activity, question & answers, group work etc.

A learner must be made to think, answer, explore answers and work out solutions to the ongoing problems. I have presented this model in the form of a paper to NCERT-NEW DELHI, DTEE in 1997 at a seminar for innovative teaching practices. I can provide the same on demand to the interested members of the community.

Lima Rosalind, Independent Consultant, New Delhi

Best practices in EE – There are very many practices, both indoor and outdoor based. Some details of such practices in India and Germany are available in the publication:
Ref: Communicating Green – Environmental Education and Media Strategies, edited by Silanjan Bhhattacharya and Sukanya Sanyal. Published by Khetro and Goethe Institute /Max Mueller Bhavan Kolkata, 2006.

Please email: khetro3i@yahoo.co.in or info@khetro.net for a copy of this publication.

You will find details of Germany's Experience of EE in schools. Also, the German Educational Initiative for the UN decade of ESD 2005-2014. Silanjan's non-formal and innovative EE experiment in Kolkata.

WWF-India's own experience in the area of non-formal EE, which is still popular and doable is also found in this publication. CEE's initiative in the formal and non-formal sectors is described in detail.

WWF-India currently runs an EE programme in 20 schools supported by the Ecology cell of the army under the Green Governance Programme, which includes army public schools, sainik schools. EE programmes were delivered once a week to the school children, a set of resource material - The information guide to ecological resources "TIGERS" was published and distributed which deals with outdoor learning of biodiversity in a broader format. (*Resource is available on request)*.

School projects that can be taken up by the respective schools like greening their school campus, setting up medicinal gardens, fruit and flowering trees plantation, garbage management in residential schools and several other such activities were taken up by these schools during this academic year. A compilation of these learnings will be brought out in the next few months.

In 2000, WWF-India published “People's Biodiversity Register – The Indian Experience.” This has been a transitional book, which took the knowledge base of biodiversity from the grassroots to the halls of knowledge, besides also juxtaposing the socio-cultural settings of our traditions. As a result, the biodiversity legislation (Biodiversity Act 1998) tabled in the parliament in February 1999 has specifically entrusted to the village councils the responsibility of documenting biodiversity resources, knowledge and conservation efforts. The Urban Biodiversity Register is an offshoot of this exercise and has been successfully carried out by Mr. Utkarsh Ghate and his group in Pune and Madurai and elsewhere.

One of the best outputs of EE is the formation of eco–clubs the National Green Corps of the MoEF. The scope and reach of this programme is immense. But its operational system needs much oiling. Nevertheless, in remote rural schools in Sawai Madhopur district, the schoolchildren are at least able to understand the importance of tree planting and keeping the school premises

clean of litter and waste water and able to celebrate the wildlife week with much gusto through paintings and songs and rallies!

One other programme, which needs a mention is the green canopy school education programme run from the CM of Delhi's residence. A nature trail was set up along with an interpretation centre and every week on two days Tuesday and Friday school children from the NGC schools and non-NGC school experience a three-hour outdoor education programme along with an interpreter, run by the WWF-India. The programme is essentially a sensitization, and one of the primary attractions on this trail is the Indian fruit bats of which there are more than 3,000 on a cloudy day! Children come in with their phobias and at the end of this trail bat for bats!

Outdoor teaching and learning is the best form of teaching and it is sadly missing when we try and infuse EE in the curriculum. One just needs to look around and count the number of conservationists that India has produced in the last three decades and talk to them what their "environmental identity" is. It will always transpire that it was an outing, a lecture-cum-slide show, a nature camp or stories their grandparents narrated a'la Corbett or a James Harriet or a Gerard Durrel even a Salim Ali! How many school children of this generation have heard of these noblemen among naturalist story tellers!

In closing I would like to add that there are enough number of innovative teaching and learning methods adapted by various groups, organizations, individuals and universities. But the best I have come across which is experiential is "**Whole School Approaches To Education For Sustainable Development Through School- Focused Professional Development (The SEEPS Project) - Tony Shallcross *,** *Manchester Metropolitan University, England and Arjen Wals, Wageningen University, The Netherlands.

Because

- EE is meaningful if it takes place in real life and is geared towards understanding and solving real-life problems. Practical activities and first hand experiences are essential for creating this understanding, but most schools and the EE curriculum itself are not geared towards this.

I quote "Whole-school approaches imply that the concern shown for environmental problems in the formal curriculum are, whenever possible, reflected in day-to-day practice in a school's non-formal curriculum. In this way values and attitudes advocated in the classroom become habituated in the daily actions of teachers, pupils, and support staff. Thus, schools practice what they teach, values are reinforced in actions and consequently caught, rather than taught" (Posch 1999) this paper is available on request.

I am currently working among the rural schools around the Ranthambhore National Park and the township schools of Sawai Madhopur district. My experiences of EE in this set up are a matter of another discussion.

Mr. Musafir, please feel free to ask of any help or clarification and access to resources.

Ajay Rastogi, The Viveka Centre, Ranikhet *(response 2)*

In addition to my earlier posting regarding new approaches in Environment Education, I wanted to detail out some of the approaches adopted by Viveka Foundation mentioned in my previous email.

Experience of being in nature goes beyond the direct sensory recognition of various objects or patterns, as we feel a certain connectedness with the natural environment. For human beings,

the sensations are not only sensory and physiological, but inseparably linked to cultural influences leading to a complex experiential continuum.

The arousal of emotions and experience of pleasant sensations have a certain distinct quality in response to nature. Sometimes, we are so deeply entrenched in the natural environment that we experience it from within without being particularly aware of any specific object. It uplifts our mood, we feel tranquil and deep calmness descends on us. One of the reasons for such a liberating experience is that nature helps meet our unconscious needs. The affect, combination of emotions and mood, strongly influences our beliefs, thinking, learning, and actions. "Emotions are prime candidates for turning a thinking being into an actor. No matter how rational your thoughts about helping the needy may be, you need an emotional impulse before you actually volunteer to help."

Aesthetic experience helps us realise our deep emotional connection with nature and consider nature as a part of our community structure. This relationship serves as a moral motivation to enhance our commitment for conservation of nature. Aesthetic experience not only helps us relate to nature respectfully but also enhances our capacities of perceptual sensitivity and feelings which aid our sense of overall ethical decision making and develop an attitude of caring.

How to connect aesthetically with nature is offered by the technique of Contemplation. Three basic elements of contemplation are: disinterestedness, sympathetic attention and philosophical reflection. These techniques are increasingly being used in various national parks and nature reserves to complement the ongoing efforts of environmental education in Europe. In Indian contemplative traditions, nature also has a prominent place and we need to complement our EE efforts by including elements of aesthetic experience.

In India, nature has a special place in contemplative traditions. It is considered that the connection with nature helps establish connection with ones own inner self. That is the stage where the step of naturalness orientation is introduced. "Naturalness can be explained by the contrast between what a man wants simply in virtue of being the kind of organism he is – and what this or that man learns to want by being luxurious, fanciful or fashionable. The latter describes people whose wants have been conditioned to a greater extent by the influence of the society. The former, who is considered more natural, retains a greater degree of autonomy from the influence of the society can take place." The naturalness orientation is therefore an important step in environmental education because increasing consumerism is one of the key problems.

To sum up, aesthetic experience comprises a three-step process: Contemplation of Nature, Guided Philosophical Reflection and Naturalness Orientation. I understand that it is difficult to describe the whole process in short because of a different approach that this methodology takes. It requires substantive explanations about why and how. The methodology has been worked out and has been successfully tried at a programme in Viveka Centre recently.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for the Education Community in India at se-ed@solutionexchange-un.net.in and/or Solution Exchange for the Water Community in India at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-ed] [se-watr] Query: New Trends in Environment Education - Experiences; Examples. Additional Reply."

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