

# Punjab ENVIS Centre

## NEWSLETTER

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### *Education for Sustainable Development*



Status of Environment & Related Issues  
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# EDITORIAL

The United Nations General Assembly in its 57th Session in December 2002, proclaimed the Decade of Education for Sustainable Development (DESD) for the period 2005 - 2014. It offers an opportunity to rethink the manner in which we approach global challenges and aims to reorient education, policy, practice and other activities to address sustainability. The DESD has made considerable progress in terms of concrete activities and actions on the ground. Apart from the regional and national launches, progress has been achieved in both institutional and programmatic areas at international, regional and national levels. However, given the scale and severity of the global challenges we face, much still remains to be done. It is a long-term goal, which both individuals and institutions and countries need to pursue. This important theme is characterized by an intrinsic complexity, since it encompasses ecological or environmental considerations on the one hand, and economic matters, social influences and political frameworks on the other.

This issue of Newsletter has an article on Education for Sustainable Development which discusses the general concept of Education for Sustainable Development and its global perspective. The article also attempts to explore the national and state ESD perspectives and provides an insight into the special initiatives taken up within the state w.r.t. formal, non-formal and informal education. The activities in state related to ESD, focus on ecological handprint vs footprint, climate change, natural resource conservation, environmental auditing involving school children and general public for taking initiatives in the direction of environment protection and conservation. The Punjab State Council for Science & Technology has joined the Global Regional Centre for Expertise (RCE) Network of United Nation University- Institute of Advanced Studies within the region by establishing RCE Chandigarh. It is hoped that this Newsletter would help to understand the importance of ESD and relate to various ESD related initiatives that would further foster sustainable living practices in the state.

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## INTRODUCTION

Sustainable development refers to a mode of human development in which resource use aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come. Though, the concept sustainable development is the subject of ongoing debate but it is important because it influences and shapes the world in which we live. Thus, sustainable development has been defined in many ways, but the most frequently quoted definition is from 'Our Common Future', also known as the Brundtland Report. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". It contains within it, mainly two key concepts:

- the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

All definitions of sustainable development require that we see the world as a system, a system that

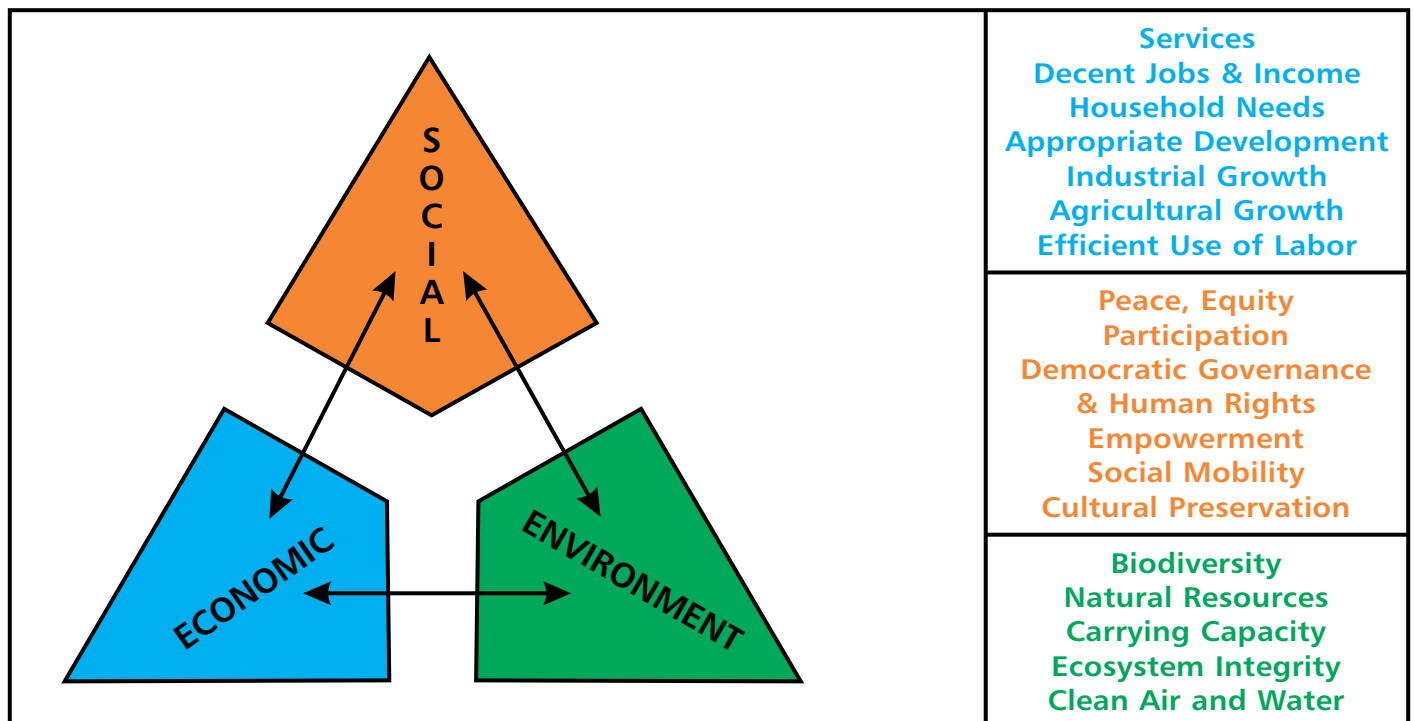
connects space and a system that connects time. However, as per the above definition, meeting the needs of the future depends on how well we balance social, economic, and environmental objectives (Fig. 1) or needs when making decisions today.

- Social: to look at the issues that impact people directly and that either helps or hinders the process of improving the quality of life.
- Economic: to look at the system that determines how the limited resources needed to improve peoples' lives are distributed.
- Environmental: to look at the natural resources, both renewable and non-renewable, that make up our surroundings and help us to sustain and better our lives.

Thus, the above stated needs are tightly interconnected and have certain common characteristics that determine sustainable development often termed as sustainable development indicators as shown in Box 1.

Education is considered the only key component of human development, which is, greatest beneficial force and is essentially intertwined with the

**Fig.1. Sustainable Development : Objectives**



## Box 1. Sustainable Development Indicators

- Gross National Happiness (GNH) : GNH is an attempt to define quality of life in a more holistic and psychological terms than Gross National Product. The four pillars of GNH are the promotion of equitable and sustainable socio-economic development, preservation and promotion of cultural values, conservation of the natural environment and establishment of good governance.
- Human Development Index (HDI): HDI is the measure of life expectancy, literacy, education, and standard of living for countries worldwide. It is a standard means of measuring well-being, especially child welfare. It is used to determine and indicate whether a country is a developed, developing, or underdeveloped country and also to measure the impact of economic policies on quality of life.
- Ecological Footprint (EF): EF compares human consumption of natural resources with Earth's ecological capacity to regenerate them. EF is an estimate of the amount of biologically productive land and sea area needed to regenerate the resources human population consumes and to absorb the corresponding waste, given prevailing technology and current understanding.
- The Happy Planet Index (HPI): HPI is an index of human well-being and environmental impact. The HPI is an innovative measure that shows the ecological efficiency with which human well-being is delivered. It is the first ever index to combine environmental impact with human well-being.

Source : CEE, 2007 as cited on [www.sayen.org](http://www.sayen.org)

development process. The sustainability can be used as an integrating force in education to improve and facilitate academic and community relationships. If sustainability and its foundation in scientific, environmental, technological, socio-economic and ethical learning is to become a paradigm for analysis, decision-making, planning, and action, it is essential that it be incorporated into the curriculum and instructional practices at all levels of schooling, which in turn can strongly influence programs for community education and can be referred to Education for Sustainable Development (<http://www.cnie.org/NCSEconference/2003conference>).

## EDUCATION FOR SUSTAINABLE DEVELOPMENT

People around the world recognize that current developmental trends are not sustainable and that public awareness, education and training are key to moving society towards sustainability. Although sustainable development and hence ESD are difficult to envision, we must create frameworks for initial ESD efforts that so that others can understand and teach it (IUCN, 2002). Education for Sustainable Development (ESD) aims to make

the world more fit for human habitation presently and for future generations.

As ESD uses education as a tool to achieve sustainability and it differs from education about sustainable development as the later is an awareness lesson or theoretical discussion on sustainable development. It is an important pedagogical tool which is based on the fundamental principle of making an individual see and recognize the interdependence between human beings and each and every unit of ecology. The role of ESD, based on the three pillars of economy, society and environment (the sustainable development needs), is critical in changing prevalent perceptions and attitudes of people towards self, society and environment. It is a comprehensive package for quality education and learning. The holistic nature of ESD allows it to be a possible tool for the achievement of the Millennium Development Goals (MDGs) and the Education for All (EFA) goals (Box 2).

ESD requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. ESD allows every human

being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. Thus, ESD, promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way (<http://www.unesco.org/>).

## Box 2. Millennium Development Goals (MDGs)

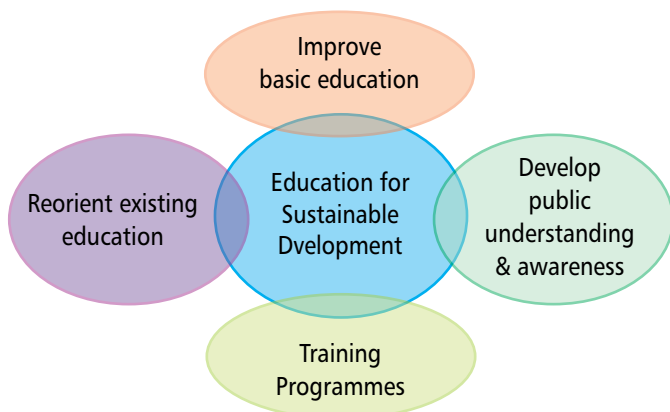
In 2000, 189 nations made a promise to free people from extreme poverty & multiple deprivation. This pledge became the 8 MDG's to be achieved by 2015. In 2010, the world recommitted itself to accelerate progress towards the goals stated as under :

- Eradicating extreme poverty and hunger,
- Achieving universal primary education,
- Promoting gender equality and empowering women,
- Reducing child mortality rates,
- Improving maternal health,
- Combating HIV/AIDS, malaria, and other diseases,
- Ensuring environmental sustainability, and
- Developing a global partnership for development.

Source : [www.undp.org](http://www.undp.org)

ESD, has four major thrusts (as described by Chapter 36 of Agenda 21) stated as under & shown in Fig. 2 (<http://www.ceeindia.org/>):

Fig. 2. Major Thrusts of ESD



- Improving access and retention in quality basic education : Enrolling and retaining both girls and boys in a quality basic education is important to the well-being of individuals over their lifetime and to the society in which they live. Basic education should focus on learners gaining knowledge, skills, values and perspectives that encourage sustainable livelihoods and support citizens to live sustainable lives.
- Reorient existing education to address sustainable development: Education must be able to develop creativity and problem-solving skills to create a more sustainable future.
- Increasing public understanding and awareness of sustainability: Citizens should be knowledgeable about sustainability and the actions needed to reach sustainability goals.
- Training programmes to address specific social, environmental and economic sustainability issues: All sectors of people should be provided vocational and professional training infused with the principles of sustainability.

The relationship between Environmental Education (EE) and ESD has been the subject of significant discussion. EE is closely associated with sustainable development. This relationship however can be perceived in different ways. For some, sustainable development is the ultimate goal of environmental education: the term Environmental Education "for" Sustainable Development (EEFSD) is proposed. For others, sustainable development refers to specific objectives, which should be added to those of environmental education: therefore, they use the expression education for environment "and" sustainable development. According to the document proposed by UNESCO in 1992 at the Education & Communication on Environment & Development Conference (ECOED), EE is one of many thematic educations that contribute to the overall education for sustainable development. The relationship between Education For All (EFA) and ESD has further been explored through a study on EFA -ESD dialogue as in Table 1.

EE has a significant role to play in addressing sustainable livelihood in context of poverty and risk

**Table 1. Education for All and Education for Sustainable Development**

Education for All (EFA)	EFA/ESD Overlap	Education for Sustainable Development (ESD)
<p>Basic education and literacy available to all learners, particularly addresses those who are excluded from quality basic education.</p>	<ul style="list-style-type: none"> <li>• Commitment to quality education.</li> <li>• Education as a human right.</li> <li>• Promotion of human rights, especially gender equality and rights for marginalized people.</li> <li>• Concern to improve the quality of life, reduce poverty, improve health.</li> <li>• Importance of primary education.</li> <li>• Participation of all in education and development: governments, civil society organizations (CSOs), the private sector, communities and individuals.</li> <li>• Includes non-formal learning.</li> </ul>	<ul style="list-style-type: none"> <li>• Broader purposes beyond education <i>per se</i>.</li> <li>• Relevance and importance of ESD for all planned learning activities (formal, non-formal and informal)</li> <li>• Includes those in privileged positions in societies where consumerism dominates.</li> <li>• Emphasis on basic values, processes and behaviour as part of learning.</li> </ul>

Source: UNESCO, 2009

and needs to receive continued emphasis and attention. However, ESD has introduced a range of concepts that add value and extend the rich array of Environmental Education processes that have developed over the years.

## ESD : GLOBAL PERSPECTIVE

ESD has its roots in the United Nations and international history of the environmental movement. In fact, one major push for ESD came from international political and economic forums (e.g., United Nations, Organization for Economic Co-operation and Development, Organization of American States). The initial thoughts concerning Education for Sustainable Development (ESD were captured in Chapter 36 of Agenda 21, "Promoting Education, Public Awareness, and Training" (<http://www.esdtoolkit.org/>). Unlike most education movements, ESD was initiated by people outside the education community.

The concept of ESD crystallised when world leaders agreed that the concept of sustainable development should be actively pursued as a global goal. In 1983, a Brundtland Commission (with 22 member nations), formerly also known as the World Commission on Environment and Development was formed to have an organization independent of the UN to formulate "a global

agenda for change" and subsequently, published a report titled "Our Common Future" in 1987. This Report was the first historic document supporting sustainable development.

From 1987 to 1992, the concept of sustainable development matured as committees discussed, negotiated, and wrote the 40 chapters of Agenda 21. A series of major UN conferences helped to further develop the concept of sustainable development. The conferences, which dealt with core aspects of sustainability, included the Earth Summit' (Rio de Janeiro in 1992), World Conference on Human Rights (Vienna, 1993), the International Conference on Population and Development (Cairo, 1994), the World Summit for Social Development (Copenhagen, 1995), the Fourth World Conference on Women (Beijing, 1995), and the Second World Conference on Human Settlements (Istanbul, 1996). Each major UN Conference also added to the conceptual framework of ESD. In 2000, the Millennium Summit was held, where all world leaders in attendance adopted the United Nations Millennium Declaration and eight Millennium Development Goals (MDGs) originated from it (Box 2).

Further, in 2002, the 'World Summit' on Sustainable Development was held in Johannesburg which recommended that the United Nations General

Assembly consider adopting a Decade of ESD. As a result, the 57th Session of the UN General Assembly in December 2002, adopted Resolution 57/254 declaring 2005 to 2014 as the 'Decade of Education for Sustainable Development (UNDESD)' and designated UNESCO as the lead agency to promote it. UNESCO has developed an International Implementation Scheme for the Decade. The goals of the decade are to provide an opportunity for refining and promoting the vision of and transition to, sustainable development - through all forms of education, public awareness and training; and to give an enhanced profile to the important role of education and learning in sustainable development. The major objectives of DESD are enumerated in Box 3. However, in all the above mentioned conferences following issues have been stressed upon:

- the need for social and human development along with economic development and environmental concern;
- call for the advancement and empowerment of women;
- demand for basic social services for all;
- recognition of the critical importance of sustainable livelihoods;
- necessity of broad enabling environments for social and economic development;
- sustain the environment and natural resources on which all people depend;

#### Box 4. RCE Network

An RCE is a network of existing formal, non-formal and informal educational organisations, mobilized to deliver ESD to local and regional communities. A worldwide network of RCEs constitutes the Global Learning Space for Sustainable Development. RCEs aspire to achieve the goals of the UN Decade of Education for Sustainable Development (DESD, 2005-14), by translating its global objectives into the context of the local communities in which they operate. This group meets regularly to discuss issues, and looks for common grounds and issues to focus and work upon.

Each RCE empowers people within its community to lead better, more sustainable lives by providing them with the information, education and tools they need to create positive social and environmental change.

The core elements of RCE are : Governance, Collaboration, Research & Development and Transformative education.

#### Box 3 : Objectives of the DESD

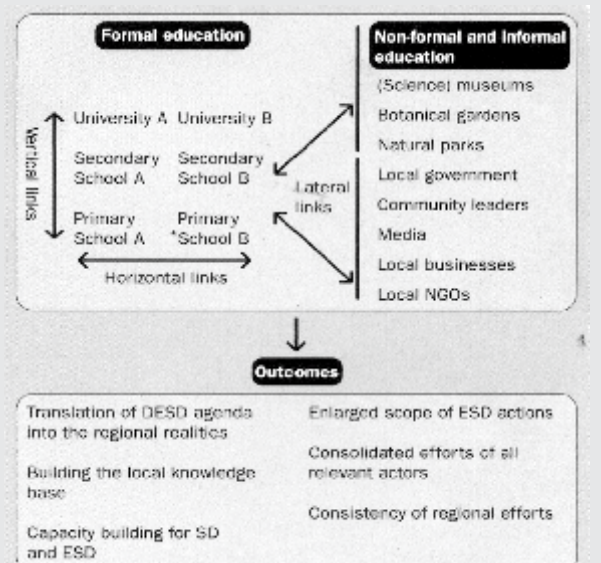
The objectives of the DESD are to:

- facilitate networking linkages, exchange and interaction among stakeholders in ESD;
- foster increased quality of teaching and learning in ESD;
- help countries make progress towards and attain the Millennium Development Goals through ESD efforts;
- provide countries with new opportunities to incorporate ESD into education reform efforts.

Source : www.desd.org

- the importance of human rights;
- identification of the role of education as critical to achieving sustainability goals.

Further, on 29 June 2005, at the UNU-UNESCO Conference on Globalisation and Education for Sustainable Development, UNU presented the concept of a Regional Centre of Expertise (RCE) on ESD as a vehicle that may promote local involvement and contribute to the articulation of a global vision of ESD at the regional/local level. An RCE is expected to bring existing institutions together at the regional/ local level to jointly promote ESD (Box 4). An initial group of seven RCEs were launched as pioneers of a larger



Source : www.ias.unu.edu

number to be developed throughout the UN Decade of Education for Sustainable Development (DESD), 2005-2014. The seven RCEs launched were from Barcelona (Spain), Greater Sendai Area (Japan), Okayama (Japan), Pacific Island Countries (University of South Pacific, Fiji), Penang (Malaysia), Rhine-Meuse+region (Netherlands, Belgium, and Germany) and Toronto (Canada). Thus a global vision of ESD was articulated in local terms through an RCE network (Mochizuki Yoko, 2005). Presently there are 116 RCEs all over world.

## ESD : AN EVOLVING CONCEPT IN INDIA

Traditionally, India has been a sustainable society. A large part of the Indian population still has a lifestyle that is based on the principle of reuse, reduce and recycle. In some cases it is a matter of personal choice but for a large majority, it is necessitated by economic compulsions. The country is experiencing both an accelerating growth rates alongside unequal socio-economic development with new concerns of environmental conservation and protection emerging as an imperative issue. These issues are of immediate concerns as it has inevitable consequences in terms of environmental degradation felt particularly on socio-economically marginalized communities.

India has integrated sustainable development into its planning process and has several programmes directed towards this goal. It's initiatives address development and sustainability issues covering social, economic and environmental proportions. The Government of India has integrated the principle of 'sustainability' in its various policies and developmental programmes. India's developmental strategic framework is based on a five year planning system, first five year plan was rolled out in 1951. These plans focus in a big way on education and also include specific initiatives and programmes so as to achieve sustainability & MDG's. This can be in the form of outreach, capacity building, formal education, training, informal education, non formal experiential learning, etc for

the policy makers and community /society as a whole.

In order to achieve the goals of sustainable development and to promote the value of sustainable development in education, the Indian government directed its various education departments to actively work on an EE component as part of the curriculum. This strategy was adopted post Stockholm Conference in 1972 by setting up Centres of Excellence for Environment Education (CEE) under Ministry of Environment and Forests (MoEF) in the early 1980s. For a very long time, most of these activities were restricted to the MoEF. However, gradually with the realization of the role that Education can play for ensuing sustainable development, the government broadened its purview and created Ministry of Human Resource Development (MHRD) to integrate environmental concerns into all aspects and levels of education.

Since, WSSD (World Summit on Sustainable Development) in 2002, the idea of sustainable development has been at the front position of policy formation in India. Earlier the effectiveness of policy directives and actions of various sectors was weighed against its environmental friendly outcomes as the only indicator of Sustainable Development. However, lately outcomes of policy reforms started being viewed /reviewed from its socio-economic outcomes towards sustainability. For instance, reviewing the feasibility of employment generation programmes for the BPL in relation to socio-economic and environmental considerations for livelihood. However, there are still some gaps between introducing idea of sustainable development and its implementation.

The ESD goal became finer when India became part of UN General Assembly resolution for establishing UN DESD (2005-2014) in the year 2005, in recognition of the need to enhance efforts in education and learning to address issues of sustainable development. The Indian vision for the DESD /ESD is hence, based on a commitment towards sustainability rooted in a centuries old



tradition of living in equilibrium with nature and all its elements. In India, MHRD is responsible for framing and building guidelines of national programmes for DESD. It aims at going beyond teaching about the knowledge and skills associated with understanding environment, society and economics. It also promotes respect and understanding for the values and perspectives necessary for nurturing sustainable livelihoods and build human capacity for actions towards sustainable development.

As we move forward to redefine the notion of 'development' to be more sustainable from all quarters it also becomes important to develop the paradigm of 'education' i.e. the way it is practiced and conceptualized. In India, ESD has brought about a shift in emphasis from teaching to learning in innumerable forms. The new National Curriculum Framework 2005 has as one of its key guiding principles: Connecting knowledge to life outside the school. In this regard, Supreme Court of India has directed all Education Boards to include EE as part of the formal education system at all levels. EE in India has always been seen in the development. The perspective of ESD needs to be built on the foundations of sector specific development already laid out and then integrating it as part with to achieve wider development agenda. Various programmes like National Environment Awareness Campaign, National Green Corps, Paryavaran Mitra, etc. have been launched in the country by Ministry of Environment & Forests (MoEF), GOI so as to strengthen and enrich the on going curricular and co curricular school activities, in the context of the national initiatives and imperatives of the Government of India including the Supreme Court Directive with reference to Environmental Education, National Curriculum Framework 2005, and the Continuous and Comprehensive Evaluation. They aim to strengthen Environmental Education (EE) as mandated by the Honourable Supreme Court's Order of 22 November 1991 in response to the PIL (Writ Petition (Civil) No. 860 of 1991) filed by Shri M

C Mehta in 1991 for compulsory EE. The Order stated, "We accept on principle that through the medium of education, awareness of the environment and its problem related to pollution should be taught as a compulsory subject." Further, the Honorable Supreme Court in its judgment of 18 December 2003 directed that the NCERT shall prepare a Model syllabus of Environment Education. The NCERT developed the Model syllabus and submitted it to the Honourable Supreme Court. The PIL of 1991 was deemed fully disposed off based on the Affidavit (October 2007) submitted by the NCERT and accepted by the Honourable Supreme Court in December 2010. The Affidavit, a key document, outlined the sequence of relevant events subsequent to the PIL up to proposal for how EE may be transacted from classes 1 to 12.

In India, ESD is also being promoted by RCE network. It consists of eleven RCE's namely, RCE Bangalore, RCE Chandigarh, RCE Delhi, RCE East Arunachal Pradesh, RCE Goa, RCE Guwahati, RCE Kodagau, RCE Lucknow, RCE Mumbai, RCE Pune and RCE Srinagar.

## TRANSITION FROM EE TO ESD IN PUNJAB

Within the state ESD is an evolving concept. With a view that ESD should not remain confined to schools alone but it should reach wider public domain, the State is adopting both formal and nonformal/ informal education to foster understanding, develop skills and inculcate values in the society. Accordingly, school curricula has been revised in order to integrate environmental issues in formal education as discussed under :

- I. Formal Environmental Education:** Previously initiatives had been taken within the state in formal EE. A study was conducted by PSCST in 1992 & by Bharti Vidyapeeth Institute for Environmental Education and Research under Environment Management Capacity Building Programme of MoEF. During 2002, Environment Education in School System Project in Punjab

was undertaken to infuse EE concepts in 100 schools as Pilot Project by Greening of Textbooks from VI to X classes.

Further, in the formal education, Punjab has introduced EE as a compulsory subject for all classes from I to XII in 2003. While environment education is separate subject from Classes III-V and XI-XII, it was included in other related subjects from Classes VI-X. However, as per Jerath *et al.* 2012, the sustainability related issues within the books developed by Punjab School Education Board & National Council of Educational Research & Training are given in Table 2 & 3. Punjab School Education Board (PSEB) has introduced ESD at school level in Class XII in 2007. They have adopted a top to bottom approach for promotion of ESD in the schools. Further, PSEB got its official trained in ESD from Ramboll Swedan during 2006. This training has provided a greater significance to

ESD within the school system. Since then, PSEB has also made ESD an important part in all its activities and has developed guide book for teachers 'Eco-Guru' for strengthening the same.

In college education, at Graduate level, environment is a compulsory subject. However, at Master's level the EE status has been summarized in Table 4. The Guru Nanak Dev University, Amritsar have courses in Environmental Science at Post Graduation level including M. Phil, M.Sc. and PG Diploma in Environment Science/ Protection Course. Punjab University and Punjab Technical University have also introduced courses in environmental science at Post Graduation level. Thapar University Patiala has introduced Environmental Chemistry Course. Besides, the Central University, Bathinda has started Masters degrees in Environmental Science and Environmental Law.

**Table 2. Sustainable Development Related Issues in PSEB Books (6<sup>th</sup> - 12<sup>th</sup> Class)**

Class	Topic
6	Waste Generation, Waste Management, Health & Hygiene, Water Pollution, Air Pollution, Our Environment, Biodiversity based livelihoods, Rain Water harvesting and Over utilization of land & soil.
7	Generation of Waste, Waste Management, Water, Conservation of Renewable Resource- the forests, Health, Hygiene & Food Habits, Climate Change, Air Pollution, Water Pollution, Effect of population Growth on Environment, Consequences of Human Activities on Environment, Biodiversity based Livelihoods, Overexploitation of Forests & Wildlife, Life on Earth, Food Production & Management
8	Waste Management, Energy & Environment, Air and Green House
9	Environmental laws, Ethics & Culture, Biodiversity Conservation, Sustainable Agriculture, Health, Hygiene & Food Habits, Waste Management, Air Around us, Agriculture and Energy
10	Environmental Laws, Solid Pollutants , sources of energy & coal & petroleum under Management of Natural Resources, Global Warming, Ozone Hole, Air Pollution, Man made Habitats for Wildlife
11	International Efforts & Legislation, Conventional & Non Conventional sources of energy, energy consumption, ozone layer depletion, Green House effect, water Pollution, air pollution, Environmental Problems of Rural & Urban Areas, Natural resources & their depletion, Impact of Human Activities on Environment , Role of Society in Development and Environment
12	Sustainable Development, Water, Environmental Management( Quality Criteria, National Ambient Air Quality Standards), Air Pollution, Water Pollution, Biodiversity (Megadiversity Nation), Introduction of Exotic Species & Conservation of Biodiversity, Sustainable Agriculture, Agro Chemicals & their Impacts on Environment, Waste Management.

Source: Jerath *et al.*, 2012

**Table 3. Sustainable Development Related Issues in NCERT Books (6<sup>th</sup> - 12<sup>th</sup> Class)**

Class	Topic
6	Garbage in/ Garbage out, Health, Hygiene & Food Habits, Rain water Harvesting, Air Around us.
7	Waste Water Story, Our Lifeline, Sustainable Transport.
8	Health, Hygiene & Food Habits, Air Pollution , Be Water wise.
9	Food Nutrition & Health, Water - A wonder liquid, Green House Effect, Carbon Cycle & Global Warming, Air Pollution.
10	Managing the Garbage we produce, Forests & Wildlife, Energy, Air pollution & Global Climate, Ozone layer & its depletion, Sustainable Management, Water Harvesting.
12	Biodiversity Conservation, Waste Management, Domestic Sewage & Industrial effluent, Air Pollution & its Control, Water pollution & its control.

Source: Jerath *et al.*, 2012

**Table 4. Environment Education Courses in Punjab**

University	Name of Department	Degree/Course
Central University, Bathinda	Law	LLM degree in Environmental Law
Guru Nanak Dev University, Amritsar	Environmental Science	M. Phil in Environmental Sciences M.Sc. in Environmental Sciences PG Diploma in Environment Science / Protection Course
Punjab University, Chandigarh	Environmental Science	M. Sc. in Environmental Sciences
Punjabi University, Patiala	Zoology & Environmental Science	M.Sc.
Thapar University, Patiala	Chemistry	Environmental Chemistry Course
Punjab Engineering College University of Technology	Engineering	M. Tech in Environmental Science
Punjab Technical University	Engineering	M. Tech in Environmental Science

**II. Non Formal Environment Education :** In Punjab, ESD is actively promoted as a part of non-formal learning which takes place alongside the mainstream systems of education & training. However, Environmental Education, Awareness and Training plays a significant role in encouraging and enhancing people's participation in activities aimed at conservation, protection and management of the

environment, essential for achieving sustainable development. In the state NGOs and educational institutions are promoting non-formal environment education by creating awareness among all sections of the society through diverse activities using traditional and modern tools of communication. Some of the major activities undertaken in this direction through various programmes are as under :

- National Green Corps (NGC):** National Green Corps, is a programme conceptualized and initiated by the Ministry of Environment and Forests, Government of India to spread environmental awareness among school children and involve them in environmental related activities. The programme aims to create environment awareness among students through eco-clubs established in schools through out the country. The main focus of this programme is to sensitize children about their immediate environment and impart knowledge about the eco-systems, their inter-dependence and role of public for environmental conservation through visits and demonstrations etc. It is also to mobilize youngsters by instilling in them the spirit of scientific inquiry into environmental problems and involving them in the efforts of environmental preservation. This programme is being implemented in Punjab through State Nodal Agency PSCST. In Punjab, 5500 eco-clubs (250 eco-clubs in each of the district) have been established with 30-50 student members for creating mass awareness of students and general public for environment conservation and protection for sustainable development (MoEF, 2010).

Council is infusing ESD activities in the eco clubs. Some of the case studies in this regard have been summarized below to get an insight of the potential which can contribute to hand print/ conservation actions leading to sustainable development in the long run.

### Case Study 1

**Environmental audit in schools through eco-clubs :** In the year 2010, the Council mobilized some eco-clubs to conduct environmental audit to



**Water Audit**

assess the availability, consumption and conservation measures adopted by the some NGC schools. Eco-club incharge teachers were trained for preparing environmental audit reports of resources in school involving students using Manual of Green School Programme of Centre for Science & Environment (CSE). Participating schools prepared environmental audit reports using guidelines provided in the manual. Five teams of student members of eco-clubs were constituted for different parameters to evaluate / perform self assessment of its environmental practices with respect to water, air, energy, land, and waste in the school using Green Schools Programme Manual for evaluation of environmental quality and management in the school. Punjab State Council for Science and Technology received 36 environment audit reports from participating schools of various districts. After analysis of these reports it was noted that 93.74% of these schools are doing water recycling. 30.6% had rain water harvesting system. As far as air parameter is concerned, most of the schools have well ventilated rooms. In land parameter most of the schools had scored maximum marks as they have good tree cover, biodiversity rich area and herbal/medicinal garden etc. Some schools were found highly efficient in conservation of land and were not using pesticides. In energy audit, schools scored up to 99% and are making efforts to save energy. These schools showed proper waste management system having waste collection, recycling and disposal mechanism and were making efforts in reducing their waste.

### Case Study 2

**Action Programs for enhancing understanding about Wetland Ecosystems among students :** The NGC schools in many districts took special initiative



**Energy Audit**



**Master Trainers during demonstration session**

of creating school wetlands as live ecological models to make the students understand the unique and vital importance of these ecosystems. The wetlands established by eco-clubs are used as teaching facility by schools, to demonstrate features of aquatic ecosystem such as aquatic food chain, aquatic flora/ fauna, adaptations. These tiny water bodies have also attracted a number of faunal species like insects, frog, etc. In some schools, students have also been able to observe the life cycle of frog and making learning a fun filled experience. These wetlands have also added aesthetic value to schools.

NGC School constructed wetlands of the size / depth depending on the available area. Since these wetlands were constructed in the schools, safety of young children was of utmost importance; hence, depth of these wetlands was kept less than one metre. Well known aquatic plant species (water lilies, lotus, etc) were planted in the school wetlands. These and some other rooted floral species were initially planted in jute baskets (half filled with soils) and then immersed in wetland water. To avoid mosquito breeding in standing water of school wetlands, fingerlings of *Gambusia* fish which also feeds on mosquito larvae were released by some schools. Students are taking care of these wetlands.

The above initiative of Tarn Taran, Kapurthala and Ropar schools has motivated the other Eco-clubs of the state to take up similar activities. They have gone a step ahead by adopting village ponds/wetlands and take steps to clean these water bodies. These schools have planted samplings along the periphery of the adopted wetlands to prevent soil erosion and to improve their natural habitat.



**Wetland Model in a School of District Ropar**

PSCST has also taken the initiative of establishing wetland education centers in the schools near the three Ramsar sites of International importance and at the Nangal wetland which is of National importance. Forty wetland education centres have been established and are actively taking up awareness through capacity building programmes for wetland conservation.

PSCST has trained eco-club incharge-teachers about wetland issues and provided them with interactive multimedia CD, brochures and posters, eco-game on the wetlands of Punjab. Teachers in turn educate students about the role of wetlands in biodiversity conservation, ground water recharge and related issues. The trained teachers and students further aware the communities about the benefits of these ecosystems.

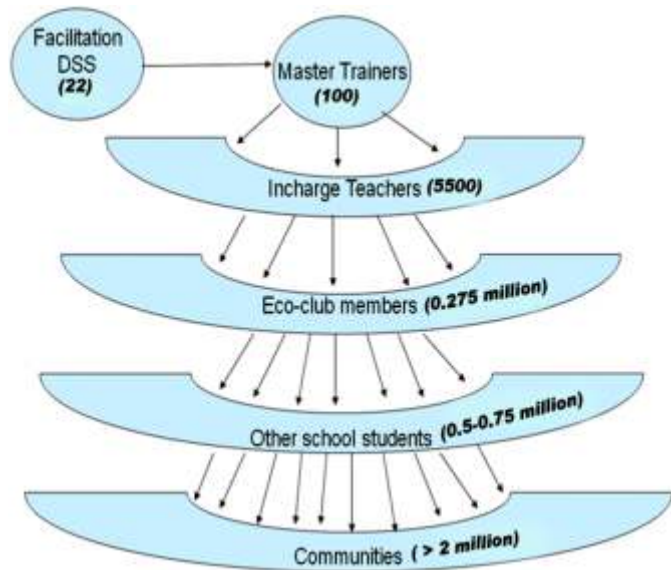
### Case Study 3

#### **Development of teaching learning material to sensitize & facilitate action for SD/ESD and capacity building across all sections of society :**

PSCST has developed teaching learning material to sensitize & facilitate action for SD to promote capacity building across all sections of society. Following resource material has been developed and NGC network is being utilized for the same as this network has a multiplier effect (Fig. 3).

- i) Activity book "My Carbon Footprint Vs Handprint" for Students : activity oriented learning module "Learning by Doing", tool to help , assess & reflect on the implications of daily actions and to suggest simple ways towards carbon neutral life styles. The key elements of the book provide opportunity to

**Fig. 3. NGC Network : Multiplier Effect**



understand & change behaviour, contributions which an individual can make through small change in routine activities. The module provide the chapters on, Education for Sustainable Development, Natural resources and Sustainability, Carbon Footprint and Handprint Principle, Exercises to calculate our carbon footprint and handprint w.r.t : Water, Electricity, Travel and Food & Waste.



ii) Guidebook "My Carbon Footprint Vs Handprint" for teachers with specific aim to build capacities of educators by citing real life examples and to provide opportunities for interactive learning about environmental issues (formative & summative) assessment. The



key element of this publication is that it provides links to existing curriculum.

iii) Pamphlet on 'A Matter of Rain Drops : Harvesting Rainwater' covering concept of Rainwater Harvesting (RWH), benefits who can harvest rainwater & where, options for RWH (Rooftop rainwater & Surface run-off), main components of RWH and RWH potentials.



These publications have been developed to: identify areas where impact of ESD activities would be discernable, provide locale specific information & link to Global issues; help understand impact of individual & collective actions; facilitate ESD discussions in classrooms w.r.t. local information; link between non-formal & formal education system by participatory action oriented approach; bring an attitudinal change; undertake need assessment, document & replicate good practices; mobilize students, teachers & communities to reorient EE to ESD.

- **National Environment Awareness Campaign (NEAC) :** The main objectives of this programme are to make the general public aware about environment issues and mobilize them to take locale specific actions for environment protection. While the Ministry chooses a national theme for NEAC every year (like 2011-12 theme was 'Forest for Sustainable livelihood' and 2012-13 theme being 'Biodiversity Conservation'), the Regional Resource Agencies appointed by the Ministry for coordinating and monitoring the campaign activities of the approved participating organisations may add local/regional themes to the national theme, if necessary and as appropriate. Ministry of Environment & Forests, Govt. of India selected Punjab State Council for Science & Technology as Regional Resource Agency (RRA) for implementation of NEAC in Punjab, Chandigarh and Uttrakhand during 2011-12. The Council has been dove-tailing NEAC programme with special sessions on ESD. Further this network

being connected to other networks within the state so as to interwine ESD initiatives and bring out more concrete results at state level.

- **Environmentally important Days and ESD:** Environmentally important days like World Environment Day, World Wetlands Day, World Earth Day, etc. provide opportunity to create mass awareness with focus on certain issues. They help in mobilizing people to take initiatives for conservation and protection of nature and natural resources. Now the activities are also reoriented to include ESD related programs as envisaged by RCE Chandigarh with its partner agencies WWF India, SISE, PSEB, Forest department, local NGO's, etc. Further, 'Save Dolphin Campaign' is being promoted which is threatened aquatic animal sighted at Harike.

### A Glimpse of Celebration of World Environment Day



- **Paryavaran Mitra programme :** Through the scholastic and co-scholastic approach, the Paryavaran Mitra programme is strengthening the implementation of the Supreme Court judgment by suggesting both, class activity-based approach and action projects. The Paryavaran Mitra programme provides opportunities to students to engage in hands-on experiences that change behaviour. The Paryavaran Mitra programme with emphasis on Explore, Discover, Think, Share, and Act takes student's experiences beyond the classroom and into the larger school and community. In the punjab state, CEE is promoting the programme and booklets in english and punjabi have been distributed to schools.



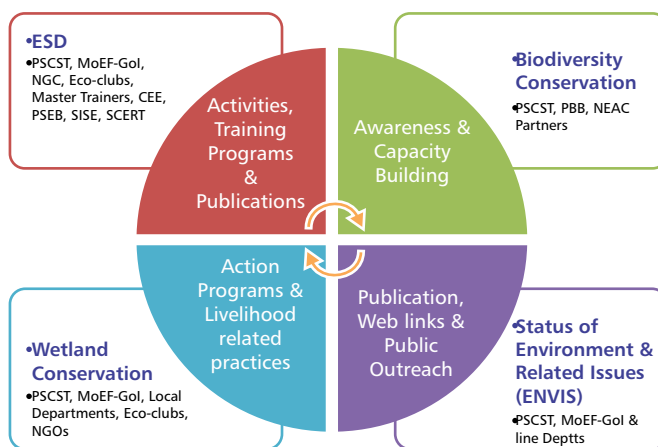
- **Other outreach activities :** Special sessions on ESD are also included in other activities of Council like orientation workshops of popularization of science particularly during NSD, NTD, etc.

### III. Informal Environment Education:

- Establishment of RCE Chandigarh Network on ESD: PSCST had taken lead in setting up the Regional Centre for Expertise (RCE) on Education for Sustainable Development (ESD) for the Chandigarh region. The RCE Chandigarh is the 100<sup>th</sup> member of the Global RCE network.

RCE Chandigarh has identified its Vision as 'Small steps at regional level to giant leaps at global level'. As a leading agency, PSCST has identified and established linkages with 32 institutions/ organizations represented by Educational Institutions (through DSS, Eco-Club teachers & NEAC Partners) Educational administration institutions (PSEB, SCERT & SISE), other state agencies (PBB,PGSC) and NGOs (Fig. 4).

Fig. 4. RCE Chandigarh Activities on ESD



- **Environment Information System Centre (ENVIS):** ENVIS Centre in the Council use different means of communication or dissemination to enhance the understanding about state related environmental issues. The Centre has provided a special weblink on 'ESD'





on its website [www.punenvis.nic.in](http://www.punenvis.nic.in). The centre also published two Newsletters on 'Sustainable Livelihoods: Traditional Practices and Recent Approaches' and Biodiversity Heritage Sites: Some New Identified Sites in Punjab

with RCE Chandigarh partners.

Further, the Centre has established **ENVIS Gallery** at Harike, Kanjali and Punjab School Education Board, Mohali to educate people about state environment & related issues. These are encouraging visitors to relate to locale specific environmental issuing and promote sustainable development activities.

### ENVIS Gallery



**Harike**



**Kanjali**



**Punjab School Education Board, Mohali**

- **Establishment of Interpretation Centres:** Council has facilitated strengthening of Interpretation Centers at Harike, Ropar and Nangal wetlands for education and general awareness on wetlands. These Centers are attracting large number of students & general public and imparting mass education for conservation of wetland and biodiversity.
- **Capacity Building Activities :** PSCST has taken the following meetings/workshops / trainings related to ESD :
  - Consultation meeting for establishment of RCE Network at Chandigarh was organized on 13th August, 2010 in the Council. 32 participants from govt. institutions/ organizations, universities, colleges,

### A Glimpse of Events on ESD



schools and NGOs participated. 27 institutions/ organizations (initially) provided their consent & signed their partnerships in setting up RCE network. The goals & directions were finalized.

- 'Need Assessment Exercise for Identification and Prioritization of ESD Issues' which need to be introduced in schools was conducted with NGC Program eco-club in-charge teachers and NEAC Partners on 26<sup>th</sup> May, 18<sup>th</sup> July and 10<sup>th</sup> August, 2011.
- "Guidance ESD Workshop for Educators": NGC Program eco-club in-charge teachers (88 Master Trainers) and NEAC Partners participated in workshops on 24<sup>th</sup> Feb., 2012 for field testing of resource books on ESD.
- To identify new biodiversity rich sites, ENVIS Centre, RCE and Punjab Biodiversity Board (PBB) organized a brain storming workshop with technical guidance of UNESCO for "Identification of Biologically Rich Areas in Punjab" on 21<sup>st</sup> March, 2012 at U.T. Guest House Chandigarh. The main objective of the workshop was to identify Biologically rich sites in the state, which have potential to get declared as Biosphere Reserves or Biodiversity Heritage Sites. During the deliberations, various biodiversity rich areas were recommended to be specifically considered for conservation which may further be proposed to be declared as Biodiversity Heritage Sites or Biosphere Reserves.
- Regional Workshop on Advanced Training Programme on "ESD in Formal Education" was undertaken on behalf of Centre for



Environment Education, Ahmedabad under Swedish International Development Corporation Agency sponsored programme on 17<sup>th</sup>-18<sup>th</sup> July, 2012 at Teacher's Training Institute, Chandigarh.

- Interactive Meeting & Workshop on ESD with RCE Network Partners was held on 18<sup>th</sup> December, 2013 at PSCST : 45 participants from Govt. institutions/ organizations, universities, colleges, schools, NGOs and Officials of PSCST participated. Stock on "Ongoing ESD activities" was taken. RCE Srinagar representative also attended and shared his views on 'Strengthening RCE Network & Collaborative Opportunities'.
- Visit to Science Express : MoEF has taken initiative to create mass awareness on the issue by using an interactive mobile exhibition, mounted on 16 coach AC train, "Science Express: Biodiversity Special". RCE Chandigarh alongwith its partner PBB motivated & mobilized the partners to welcome the Science Express - Biodiversity Special' train for information on biodiversity of India on 15<sup>th</sup> Nov., 2012 at Chandigarh railway station.
- **Involvement of local Community for promotion of ESD** : PBB in collaboration with RCE Chandigarh is undertaking biodiversity surveys and training for documenting local floral & faunal diversity with the help of schools & local community.

Further, RCE has also explored livelihood options gainful utilization of water hyacinth & other bio-resources for promotion of community livelihoods at wetlands of Punjab.



Hands on training workshops and for preparation of handicrafts from water hyacinth

with the involvement of mainly women, from villages around Harike and Kanjli have been organized at Harike with active involvement of Forests Department & WWF-India. The products were displayed in Trade fair New Delhi and COP-11 exhibition at Hyderabad.

Further, workshops and hands on training on making of ropes, leaf plates and brooms from local weeds-Bhabbar grass, *Lantana*, *Munj*, *Typha* & other bio-resources have been organized at village Nikkuwal for 60 SHG members (mainly women) of Ropar and Nangal wetlands in association with Forests Department and local NGOs. Council in association with Department of Forests & Wildlife and WWF-India is also working on value addition and promotion of marketing of products for making the project self sustainable.

A Nature Guide's Training Programme was organized at Keshopur Miani Wetland on 24<sup>th</sup> and 25<sup>th</sup> November, 2012 by Punjab Heritage and Tourism Promotion Board in association with RCE and Department of Forests & Wildlife. People from local community and forest guards were guided about the importance of wetlands as repositories of biodiversity. Another Nature Guide training program was organized at Harike on 13-14<sup>th</sup> March, 2013. The RCE has also facilitated bird census activity at Harike.

#### IV. Learning & Experience sharing at International

Besides taking up activities in the state with the partner agencies Council has also participated in many international events for learning & experience sharing on ESD related issues which are as under :

- Advanced International Programme on ESD in Formal Education.
- Participation in UN Group Training Course on "Regional Development by Sustainable use of Biodiversity" organized by UNCRD & JICA at Japan.
- Participation in 'The 7th Global RCE Conference at Korea.
- Participation in 'COP - XI Side Event' at Hyderabad.

Further, the various ESD initiatives of PSCST has provided it with opportunity to publish paper in UNU-IAS book as a part of its series of publications "Innovation in Local and Global Learning Systems for Sustainability". The book titled "Traditional Knowledge and Biodiversity has learning contributions of the RCEs on ESD" containing 18 success stories received from 16 different RCEs. A case study of RCE Chandigarh: Enhancing Understanding about Wetland Ecosystems among students is amongst the case studies.

UNU-IAS has provided the Council with 'Recognition Award of Honour' for its ESD Publications namely, Activity book "My Carbon Footprint Vs Handprint" for Students and Guide book "My Carbon Footprint Vs Handprint" for Teachers.

## WAY FORWARD

The mandate of ESD is very broad, therefore it simultaneously becomes a challenge and an

opportunity. ESD provides an excellent doorway to the social, economic and environmental spheres of Punjab, India and societies elsewhere to trigger awareness, analysis and action on sustainable development. The path to ESD is an important one and regions that tread it carefully and use it to their advantage would provide its present populace and bequeath its future generations an environment that would empower them to fulfill their needs and aspirations by striking a balance between economy and ecology. The people of the region are aware of and interested in ESD. More efforts are required to make a quantum leap in providing proper linkages amongst people, environmental degradation & poverty, further relate these success stories and synergize them. Henceforth, there is an initial need to clarify the complex notion of responsibility and to construct the theoretical framework of such a global educational project, ESD, and also to addressing more effectively the challenges that still lie ahead so that the DESD may truly fulfill its potential.

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### Rare migratory birds spotted at Harike

Harike (Ferozepur): Migratory bird watchers are in for a feast this winter as endangered Jerdon Babbler *Scindicus* has been spotted for the first time ever in the country at the world-famous Harike wetland here.

Found in certain wetlands of Pakistan and Myanmar, the International Union for Conservation of Nature has listed Jerdon Babbler as a vulnerable species. The Myanmar species of the bird has already become extinct. The population of the species has fallen by more than 30 per cent due to the shrinking of wetlands.

Other rare species of Comb Duck and Lesser Flamingo have also been spotted.

Upbeat by the presence of these rare species, the Department of Forests and Wildlife has mooted a proposal to create a "nature trail" near this wetland to attract bird lovers and wildlife enthusiasts from all over the world.

The proposal, if approved, will go a long way in giving a boost to tourism at the wetland whose potential has remained untapped so far. Harike is formed by the confluence of the Sutlej and the Beas.

Similar proposals had been sent to the state government earlier as well, but none of them could fructify due to the alleged apathy of the authorities concerned, an official said. The aim is to develop the wetland and preserve its ecosystem so that it could become a major tourism hub.

Divisional Forest Officer (wildlife) Saudaghar M said 350 species had already arrived at Harike this winter. In 2010, around 1.20 lakh winged visitors had arrived from Siberia, Central Asia and other Arctic countries. The count was likely to increase this time, he said.

Saudaghar said a nature trail had been proposed along the Left Marginal Bundh for the birdwatchers and nature lovers on a pilot basis. He said basic

amenities, including tents, portable toilets and boats besides other such facilities would be provided to research scholars and wildlife enthusiasts. He said agencies like the World Wildlife Fund (WWF), Bombay Natural Historical Society and Chandigarh Bird Club have been contacted to do a survey. A two-member WWF team has been camping at the wetland since the past two years to conduct the survey and study the ecosystem.

In 2009, dolphins were also spotted at the site.

### Endangered species

- Jerdon Babbler, found in certain wetlands of Pakistan and Myanmar, has been seen at Harike
- The species has listed as vulnerable by the International Union for Conservation of Nature
- Its overall population has fallen by more than 30 per cent due to shrinking of wetlands
- The Myanmar species of the bird has already become extinct
- Other rare species of Comb Duck and Lesser Flamingo have also been spotted
- In all, 350 species have already arrived from Siberia, Central Asia and other Arctic countries
- In 2010, around 1.20 lakh winged visitors had arrived at Harike and in 2009, even dolphins were seen

### Tourism plan hanging fire

- The Department of Forests and Wildlife has mooted a proposal to create a 'nature trail' near the wetland
- Similar proposals, however, have been sent to successive state governments earlier as well but they did not bear any fruit
- The aim of creating the trail is to attract bird lovers and wildlife enthusiasts from all over the world .

Source: The Tribune, December 17, 2012

