## Thoughts on Environmental Education at the School Level

*The expanded version of the comments made by Shri Kartikeya V. Sarabhai, Director, Centre for Environment Education (CEE), at the meeting called by National Council for Educational Research and Training (NCERT) on February 13, 2004 at New Delhi.*

I would like to welcome the initiative of NCERT in having wide consultation towards preparing the response to the directive of the Hon'ble Supreme Court on Environmental Education in Schools.

The direction No. 4 of the Hon'ble Supreme Court reads thus:

> "We accept on principle that through the medium of education awareness of the environment and its problems related to pollution should be taught as a compulsory subject. So far as education up to the college level is concerned, we would require every State Government and every Education Board connected with education up to the matriculation stage or even intermediate colleges to immediately take steps to enforce compulsory education on environment in a graded way. This should be so done that in the next academic year there would be compliance with this requirement"

The Supreme Court directive is really something which opens up an opportunity to do something and bring about a change in the School Syllabus on lines which have been thought about for a fairly long time but needed that extra push, that extra imperative to really take it forward. If one sees the Supreme Court directive in terms of that opportunity, then it can have far-reaching and fundamental impacts on school education in India.

But before we really discuss how to do this, and whether the directive is to be understood as a direction for a separate subject, and we go on to a detailed issue of the type of syllabus which we need to develop for this, the type of teacher training and the materials that need to be developed, I think it is very important that we all understand what we really mean by learning about the environment, what we mean by true environmental education (EE).

### Environmental Education - What and Why

The first good formulation of this was done at the Inter-governmental Conference on EE held at Tbilisi in 1977. I think it is important to go back to this because it does remain one of the best formulations of what constitutes good EE, and something which I think many of us would consider valid as the basis for any work in the area of EE.

The Conference and the objectives and guidelines that emerged therefrom recognized that while awareness of the environment and environmental problems was essential, understanding of the inter-relationships both within the environment and with human beings was also critical. It talks not only of knowledge, but of attitudes and values which are in harmony with environmental quality. It emphasizes

the importance of imparting skills to solve environmental problems, and developing the ability to evaluate environmental measures, and ultimately have citizens take responsibility and recognize the necessary urgency to deal with environmental issues which are facing us.

**The Indian Heritage**

In India, we have very often talked about our social values and attitudes, which historically and culturally have in fact been in harmony with the environment. If one reads our own literature, the writing of sages, our religious texts – all of these reflect the recognition of the fact that all life on earth – human life included – is intimately dependent on the quality of the environment. These also talk of the humbleness of human kind in this larger system, and the need and responsibility to protect it.

The Indian Constitution has further strengthened this and captured much of this in giving responsibility to its citizens to protect this environment. The Constitution enjoins the

> "State to take measures to protect and improve the environment and to safeguard the forests and wildlife of the Country" (Article 48-A).

It also makes it a:

> "Fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have ecological compassion for the living creatures" (Article 51-G).

**An Alternative Paradigm**

When India was preparing its submission to the United Nations Conference on Environment and Development held at Rio in 1992, we who were involved in writing and developing this report, said that the real challenge to development is not "how to get there" but really "how not to get there". How does a nation develop an alternative paradigm, not only for itself but for the world? A model that uses resources and is respectful to the environment in a way which will ensure both the survival and the sustainability of not only the human race, but life on earth as we know it?

We should go back to another quote from Gandhiji, when he talked of consumption, way back in 1932. He was referring to consumption patterns in the West, especially in England at that time and said that if Indians were to consume or live a lifestyle which was like that of an average person in England, the earth would be stripped of its resources; much like locusts landing on an agricultural field.

That reality is perhaps immensely more true today than it was when Gandhiji first made this comment. With both increased population, and a more consumptive lifestyle among the richer nations of this world, imitating and going in that direction is not really the solution and cannot be the basis of development.

But all this requires a deep understanding of what the environment is, its relationships, and the impact human beings and human activities are having on that.

The foundation of this understanding needs to be laid as early as possible. One of the critical audiences where these seeds can be sown is that of children. The school system and curricular are some of the fundamental structures and frameworks within which the segment of school going children can be reached and addressed.

The current syllabus and the way it is taught across India have largely been led by the NCERT's efforts at developing model curricula, which play a pace-setting role for curricula developed across India. In some cases, the states have improved and changed this, they have added and enriched the curricula. There are many fine examples of how topics on environment should be taught. By and large, these have been taught through the subjects of science, social studies and even languages, through which key issues of environment have been dealt with.

In 1986, when NCERT took upon itself the responsibility of conducting what was called a "massive teacher training programme", it recognized that good EE was not merely a transfer of information and knowledge, but required students to engage themselves in activities, in observations, in going out in nature, and that these needed to be integrated into the classroom environment. It asked CEE, along with its sister institutions, to develop an activity manual that would help meet these needs. Our first manual "Joy of Learning" was developed as a response to this, for the NCERT, and is today available in over 20 languages. Besides India, our neighbouring countries are using this material as well.

So the whole approach of dealing with EE not just as content transfer or information transfer, but as activity oriented, started almost two decades ago. Later it was felt that at least at the primary level (Standards I to V), an attempt must be made to use the environment as a binding, over-arching subject. And so science and social studies in these standards were integrated into "Environmental Studies".

Over the years, through the efforts of Ministry of Human Resources Development (MHRD) and NCERT, and the Ministry of Environment and Forests (MoEF) and through the institutions set up by it and with its support, including the Centres of Excellence (CEE and C.P.R. Environmental Education Centre), other centres like Bharati Vidyapith Environmental Education and Research Institute (BVEERI) and the Uttarakhand Sewa Nidhi, key experiments at bringing locale-specificity into EE have been carried out. Several fascinating and far-reaching experiments have been done in this country and I think it would not be wrong to say that in terms of sheer quality of material, in developing an expertise in EE, India would be second to none and in fact could play a leadership role across the world today.

**Bridging the Gap**

At the same time, if one looks at what is actually happening in the school and in the classroom, there is a huge gap between what is conceptualized in the writing or in the imagination of the curriculum, and what is being done there. And I would like to spend a little time in discussing this, because it should be at the cornerstone of our thinking on the separate subject, and what the separate subject, in fact, should do and how it should do it.

I would like to relate a little story of friend's child who, during the drought period in Gujarat was attending his junior class. The teacher asked him "What do birds eat?", and the child immediately jumped up and raised his hand and said "Birds eat cows". While there might have been laughter from some, the teacher was certainly not taking it positively, and told the child to shut up, thinking he was making fun of the whole system. The textbook was clear – birds eat grains and insects. But the child had just been observing a number of carcasses of cattle, and perhaps could even see one through the window, with vultures and other scavenger birds sitting and eating the flesh of these animals.

The teacher's reaction to the children's real life observations and several other such experiences, teach a child in the Indian school context that observations of and learnings from the environment on the one hand, and what is taught in schools or what is considered as valid information in textbooks on the other, are really two completely separate things. In the school, the reality is the textbook, and reproducing answers from what is given in the textbook is what is required.

Even in instances where you have an enlightened teacher, and the teacher recognizes that there might be some kind of simplification of facts in the textbooks, or that what you have in the textbook is not really applicable to that particular locale-specific environment, a teacher will have to say that if the child were to write something like that in the exam, there is no way of ensuring that the examiner would consider it a valid answer, and would in fact probably mark it wrong. And thus begins the process of what I will call alienation – the alienation of the school system from the environment and its observation.

Much though we have tried – NCERT and all of us – to introduce more activities, more laboratory experiments, more observations, more thinking in the classroom, the structure of the system itself prohibits this in many ways. Especially as you go to higher classes where examinations become critical, it almost prohibits much of what EE is about – an education that is holistic, encompassing all that is around us, giving a better understanding of the way the world functions, how it operates as a total system.

The second issue which I think we must recognize and I need to emphasize, is the way in which the textbooks are often written in our country. They are usually written through a committee mode, where individual chapters are farmed out to authorized people to write. The subject of environment requires a lot of cross-linkages. Environment really permeates all subjects. At the same time, EE requires that we pull together knowledge and experiences from a very wide variety of situations and subjects, to bear upon a single problem. The current methodology of developing textbooks and curriculum really prohibit in many ways our ability to do this.

I have often said that perhaps if you get five of the world's best architects together and ask them to design one building, it will probably be a terrible mess. While each one of them individually is quite capable of doing outstanding work, that particular work of compromise and trying to meet each other's point of view does not go well with the nature of creativity and does not result in a good quality product.

It is important to have committees when curricula and syllabi are made. When textbooks are evaluated, again we need committees. You do need to have a wider cross section of people looking at material. But in order to develop good quality of material, you need to give it to one agency. Of course, we may ask different agencies to develop their own textbooks and we could say that we will select the best textbook. And maybe we can look at the possibility of more than one textbook being approved per state. This is a structural issue which I would really like to highlight.

The third is to do with the nature of our evaluation and our examination system. The entire examination system is based really on reproducing facts from a textbook. Even our evaluation questions are based on data which is supplied in the question itself. And usually this data is in itself, as much as is required to solve a problem. No more and no less. The ability of a student to seek data, to find out what is relevant, to discard what is not relevant, and to infer and to approximate where data is not available – these qualities are usually not given a place in the way examinations are conducted in India today. We need to change this as well, if we want to do justice to EE.

**Towards Greening: Efforts So Far**

But now let us go on to what has happened in the more recent past. In 1998, CEE was asked to prepare a paper by Ministry of Environment and Forests, Government of India on greening formal education. The paper, “Greening Formal Education: Concerns, Efforts and Future Directions”, came out with the recommendation that there should be much better infusion of environmental concerns in all subjects. Infusion, as on that date, often meant that certain chapters in a science or a social studies book were “green”. But this did not go into the very greening of thinking. And therefore the paper stressed that a major effort was needed towards infusion of environmental concerns, perspectives, environmental skills and understanding into the existing textbooks. The paper also stressed that there was a need to create time and space in which there could be an integration of what was infused in different subjects, of the parts which need to be pulled out and related to current happenings and to the outside world. This would be a link subject – an integrating subject. There was need for space to do projects, where students could work in an environment which was different from the way conventionally subjects were structured, i.e., essentially content-based, and examination and textbook oriented.

We suggested that initially this should be done through extra curricular activities and slowly move into the curriculum itself. And NGOs, local government, and in fact the community, all should be part of defining what some of these issues were and what some of these problems were. At that stage, through meetings involving MHRD and the NCERT and various other stakeholders, it was felt that initially the stress should be on focusing on the infusion method, before we look at curricular interventions in creating a separate subject beyond Class V.

**Analyzing Textbooks**

A very major study was undertaken in the year 1999-2000 through MoEF, with participation from MHRD, and with the involvement of CEE as Principal Consultant.

This massive study was conducted by BVEERI. It involved looking at each and every textbook from Standard I to Standard XII in every state of this country. Perhaps it was for the first time that such a massive exercise was done in so systematic a fashion. A very interesting template was developed and based on that template, every lesson was evaluated. The study classified every opportunity that existed, every bias that might have crept in, every right and wrong fact, every diagram which either said or did not say something correctly.

A key finding from this that my colleague Dr. Erach Bharucha from BVEERI has mentioned is that many concepts were treated in fits and starts. You would have often had something coming up in say Standard III. Then it would disappear completely for the next two years and again be dealt with in Standard VI. You had situations where a subject or a topic would be presented in one way in social studies but in a completely different way in science. You also had situations where one chapter and another in the same textbook were not really coordinated. You saw that in the critical years of the Standards X and the XII which were examination years, the amount of environmental content dropped dramatically. And in the school system which is based on examinations, this really is a signal to say that this was an extra-curricular type of activity, not to be taken as seriously as other topics or subjects. The study also looked at quality and found that quality was at variance too. You would have certain standards where the quality would be really very good, and the content and the amount of environmental topics taught at that standard were low and vice-a-versa. The study is a benchmark for subsequent work.

**Greening Textbooks**

In 2001, the MoEF undertook a massive exercise in eight states of this country under the same project called “Environmental Education in School System (EESS)”. Here was an attempt at improving the quality of greening in textbooks through infusion. Of course at this stage, it was an improvement which I often say was like working with “hands tied behind your back”. “Hands tied behind your back” in the sense that the curriculum was not to be changed, the basic structure of the textbooks or the lessons was not to be changed, the basic structure of examinations could not be changed. But within that framework, the attempt was to do what could be done. This effort was carried out through the SCERTs and the state bodies, using all the systems which existed, but through better awareness, through pace setting, through examples. And what was seen in these eight states is that a remarkable amount was done – not enough, but still adequate, could be achieved, even with these constraints. In the next year (which is on currently) this experiment was taken to a further 10 states, and we hope that this momentum will carry forward in all the other states of India. Even in the states which have done one round of infusion, we hope that they will have another look at it – another look at what has happened, learn from other states, and strengthen infusion further.

**More than Infusion**

But the question which we are all asking today and for which we have come together is “Is infusion enough?” If infusion is done, do we need another subject? Do we even consider another subject? By mentioning another subject, are we saying that infusion has failed? Has the Supreme Court reprimanded the current government, saying that

you have failed in your infusion? I think that it would be a completely wrong reading of all what has happened. Infusion has succeeded, is succeeding and will succeed. But is it enough? Perhaps it is not.

And that goes back to our earlier discussion on “what is EE”. Infusion which is done in existing subjects with existing parameters of textbooks and examinations – is it still a vehicle for largely information and knowledge transfer? Is it the best instrument for looking at other skills, for learning how to analyze? Where we infuse environmental concepts may not necessarily be the best place to undertake observations or take action, perhaps not even the best place to deal with the emotional aspects of education. Maybe languages can bring in the emotional aspects – some of the poems, some of the text, some of the writings, do evoke those qualities. But in terms of doing, in terms of observing, in terms of action, in terms of bringing outside knowledge and observational knowledge and experience into school learning, infusion is perhaps not the best.

This links to our recommendation to “Greening Formal Education” of 1998, where we said that there is a need for a separate time and space. The Supreme Court has said the time to think of a separate subject is now. It has set the pace of what we need to do in future. It says that the time has come and by April 14, we need to say what is to be done. That is the challenge before all of us and that is the challenge we should all accept as a fantastic opportunity for what many of us ought to do in any case.

**Meeting the Challenge**

The methodology and the time frame are in many ways set. In order to carry out the task, I hope that we will draw on the best that India has to offer. And that is considerable. We have the best talent, the talent which matches any in the world. We have so much resource material developed by several organizations including CEE, which is a premier organization set up with the sole purpose of EE. Over the last 20 years it has worked hard, and worked with several partners, to show what type of activities work, the type of programmes which you can do in schools, the type of ways you can examine them, and you can take it forward.

Organizations like WWF through their pioneering camping programmes have shown what you can do by just taking children out on a well-structured nature education programme. There are several groups which have shown how you can take local issues and convert these into learning experiences. There are groups like Centre for Science and Environment, which have shown how you can mobilize opinion and use advocacy and issue-based discussions to get people. And most important, you have the considerable work of several SCERTs, and NCERT itself in bringing good quality education here.

I think we have an opportunity today. I think we must take that opportunity and we should move ahead, not engaging ourselves in the controversy of whether it is infusion or a separate subject. It is definitely both. We should look at the separate subject as an addition, a supplement, as an integrating subject, which draws on what we are teaching through infusion, which draws on the skills which are learnt in math, skills learnt in science and social studies. This separate subject needs to be done as a subject which is essentially not textbook based; a subject where you provide

excellent teacher material and classroom material; where there is a syllabus which is project-oriented; which draws on the learnings of that standard; which links. We need to have teacher training programmes – in-service and pre-service – which capture this and build the capacity and confidence in the teachers to make this subject a vibrant and meaningful one.

All this is possible, all this has been done in small ways. We need to scale it up, we need to put all our energies together, we need to have a better way of working together with each other in partnership, rather than just in the committee mode; a partnership where the NCERT and the MHRD work with the MoEF and with several other Ministries which are concerned with environmental issues, work with State Governments, work with NGOs and leading institutions, premier institutions, Centres of Excellence. Truly, the response to the Supreme Court throws the challenge before us.