# Promoting outreach through conservation education programmes – Case study from Indian Himalayan Region

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*The UN Conference on Environment and Development (1992) helped to mobilize international understanding on promoting the awareness component for conservation and sustainable use of biological resources. As a result, two broad initiatives received focused attention: (i) orientation of education towards improving the capacity of the people to address environment and development issues, and (ii) integrating human dimension component into biological conservation programmes. On account of vastness of the area and prevailing eco-cultural diversity of the country, it is increasingly realized that there is an urgent need to develop programmes to address location/ region-specific concerns. In this context, the Indian Himalayan Region (IHR) which represents a unique biogeographic entity, unfortunately, has not received due attention under the changing perspective of conservation science. Nevertheless, a few initiatives, including the present one, have yielded positive results. This paper analyses the results of a systematic conservation education programme (initiated by G.B. Pant Institute of Himalayan Environment and Development) and highlights its potential of becoming a model for the entire IHR.*

CONSERVATION biologists are required to be equipped with skills to communicate with the public and integrate their science into public policies and action[1–3]. In other words, they need to incorporate interdisciplinary thinking into their approach to address problems related to the society[4]. However, the traditional disciplinary borders, which control the academic world, often hinder this progress[5]. Conservation biologists, by and large, focus on scientific and technical aspects of species/ecosystems[6], applied ecology and field population genetics[7]. Therefore, a perceptible shift in the mindset is necessary to achieve success in integrating conservation science with societal needs through the present method of formal education. Ultimately, the critical issue is to spread conservation education (CE). Currently, conservation education programmes through non-formal techniques[6,8–10] are viewed as one of the important steps in this direction. These programmes hold promise for creating a positive climate[3] and promote public understanding of conservation issues[11]. Concurrently, growing concern over environmental education (EE) programmes calls for developing prescriptive guidelines for implementation in both formal and non-formal sectors. Any success in this regard would take care of CE.

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## Environmental education – A global priority

The international agreements emanated as a result of the UN Conference on Human Environment, Stockholm (1972), the first Intergovernmental Conference on Environmental Education, Tbilisi (1977), and the UN Conference on Environment and Development, Rio de Janerio (1992) have brought EE on the global agenda. The recommendations, particularly in Chapter 36 of AGENDA 21 (Rio–1992), call upon reorientation of education (formal and non-formal) towards improving the capacity of the people to address environment and development issues. The agenda strongly advocates strengthening of awareness component for sustainability of earth's biological diversity. The Global Forum on Environmental Education for Sustainable Development, convened by the Indian Environmental Society (September 1993) recommended that, (i) EE should be integrated into the curriculum from the pre-primary to the university level, and (ii) teachers' training and their participation should be ensured through periodic programmes[12].

## Indian scenario

As elsewhere in the world, EE programmes in India gained momentum during the last three decades. While reviewing overall progress made under formal education, it is encouraging to note that EE components find

satisfactory coverage[13] in the school curriculum developed by the National Council of Educational Research and Training (NCERT). Likewise, in the non-formal sector, several organizations such as Centre for Environmental Education (CEE), Ahmedabad; Environmental Education Centre, Chennai; National Museum of Natural History, New Delhi, etc. have contributed in creating environmental awareness among masses and as a component of formal education at the school level. However, the EE scenario at college/university level has not been impressive[14].

Notwithstanding these efforts, in a country like India – with vast geographic area, richness and uniqueness of ecosystems, and diversity of socio-cultural environment, most of the EE programmes do not address issues of the entire nation. In this context, the education process needs to consider diverse features of this country[15]. Therefore, development and implementation of EE perspectives to cover location/region-specific concerns would require specific strategies.

With regard to the initiatives in the Indian Himalayan Region (IHR) – a unique biogeographic and socio-cultural entity – very little has been achieved so far. However, one successful initiative by an environmental NGO – Uttrakhand Seva Nidhi (UKSN), Almora, deserves mention. Recognizing the ground realities of the region (i.e. Uttaranchal, west Himalaya), UKSN designed and tested a course on environmental education for rural schools of Uttaranchal. The course content is prepared for students of class 6–8 and involves over 500 schools with nearly 65,000 students and 1000 teachers. While drawing lessons through experience of this course during the last twelve years, the centre recommends 'that the vital relationship between biodiversity and sustainable local livelihood be a major aspect of our teaching of biodiversity in the school curriculum' (Lalit Pande, pers. commun.).

## The programme

In order to supplement the above effort and enhance relevance of CE for the IHR through non-formal means, our team at the G.B. Pant Institute of Himalayan Environment and Development, Almora, designed a programme for the IHR initially focusing on Uttaranchal in west Himalaya. It was conceptualized under the umbrella activity 'Peoples' participation in Himalayan biodiversity conservation' (for details about this activity, see ref. 16). After three years of continuous monitoring under Planning–Process–Product evaluation model[17], reorientation in approach was attempted[16,18]. Under this reorientation, efforts were taken to make the activity an integral part of the education system. With this understanding, a specially designed conservation education programme, targeting high school/college level institutions, was launched (1998 onwards). The goal is to impart education on biodiversity conservation among high school/college students and teachers in a multidisciplinary fashion (i.e. integrating the basic and technical aspects of biodiversity conservation with the applied and socio-economic aspects). The target groups consisted of teachers (as managers) and students (as work force). As discussed in earlier publications[16,18], the first phase of this programme focused on training workshops/discussion meetings and follow-up of initiated activities in the Kumaun region, west Himalaya, India (Figure 1).

## Approach

### *Training material and workshop*

We designed a training schedule consisting of the following six modules: (i) definition and dimensions of biodiversity; (ii) status assessment and monitoring (including contemporary tools such as remote sensing); (iii) value and value addition; (iv) maintenance (*in situ*-protected

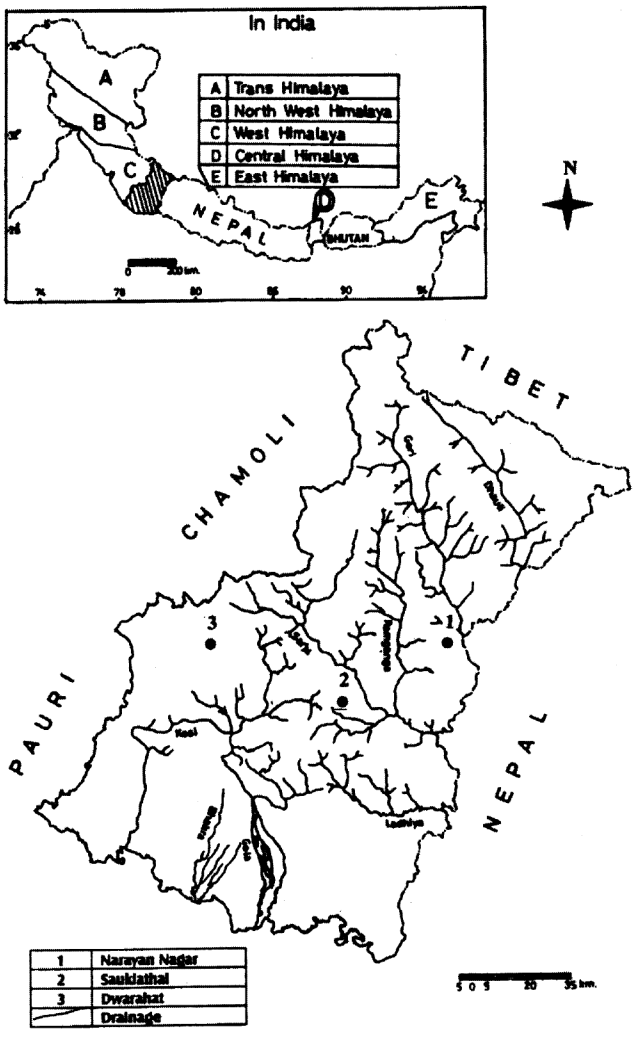


**Figure 1.** Location map of the study area (Kumaun, west Himalaya).

areas, *ex situ*-gene/seed banks, and tissue culture, etc.); (v) methods for re-vegetating degraded lands (nursery preparation, propagation packages, etc.); (vi) linking biodiversity with soil and water components. Each training module included teaching (40–45 min) by the subject experts (experts identified within the institute – researchers and scientists, and outside the institute – university professors). Training material included write-ups in Hindi – to provide background information on the relevant subjects – compiled in the form of a small booklet. Each participant received a booklet just after the pre-training survey. Teaching on each module was followed by a group discussion (15–20 min) and an on-site training/demonstration (30–35 min, mainly through relevant posters and practical demonstration). The presence of every participant in each training module was ensured through regular attendance at the beginning of module. Considering the medium of teaching in formal teaching courses in identified institutions, all deliberations and conversations during the training were conducted in Hindi.

Training was imparted through training workshops (two-day) in remotely located school campuses. On our invitation, participants were nominated by the school/college authorities (usually two students and one teacher from each institution). Three such training workshops were organized between November 1998 and March 2001 at distant localities of Kumaun (i.e. Narayan Nagar, east Kumaun; Saukiathal, central Kumaun; and Dwarahat, west Kumaun). As the participating institutions ($n = 42$) were distributed in different parts of Kumaun, this random mix of participation ensured representation of different socio-cultural conditions of the area. The structure of participation in each workshop is given in Table 1.

## *Evaluation*

Pre-workshop (before initiating workshop activities) and post- (immediately after completion of training) workshop questionnaire surveys (questions were prepared in Hindi; English translation given briefly in Table 2 and complete structure in Box 1) were conducted to reveal shifts in attitude, if any, as a result of the training[17]. Questions were mostly kept open-ended (except questions 10 and 11), so that participants could express their thoughts. The questions were designed to evaluate the participants: (i) their general understanding/concerns (question 1 through 3) about biodiversity, and (ii) factual knowledge (questions 4 through 11) on different biodiversity-related subjects (as included in training modules). Participants were not informed of the survey prior to distribution of the questionnaire. They were given 15 min to attempt these questions and were not allowed to consult each other.

Considering the nature of the questions (open-ended) and difference in time and locale of the workshops, evaluation of response sheets required extra care. It was decided to evaluate responses of all three workshops simultaneously by a single evaluator (who was present in all three workshops). The possible correct answers/options were, however, thoroughly discussed with the evaluator by the identified experts. This process, in our opinion, reduces the chances of perception-based error.

## *Statistical analysis*

The answers were initially grouped into three categories, i.e. attempted and correct; attempted and wrong; and not attempted. However for statistical analysis, attempted and wrong, and not attempted were clubbed together as negative response. Responses from all three workshops (for all questions) were pooled for target groups (teachers and students). Among students, responses for general understanding/concerns (Q1–3) were further analysed by gender and education level (< 10th standard level and > 10th standard level). We did not restrict the analysis to the frequency of correct answers provided by the target groups (students and teachers) because it would not have been possible to test the significance of variance in the correct answers both within and among groups. Therefore, significant differences in response to pre- and post-training surveys were analysed by $\chi^2$ test of indepen-

**Table 1.** Representation of participants under different categories in training workshops

| | | Male student | | Female student | | | |
|---|---|---|---|---|---|---|---|
| Place/year of training workshop | Number of institutions involved | < 10th standard level | > 10th standard level | < 10th standard level | > 10th standard level | Teacher | Total |
| Govt Inter College, Narayan Nagar (Nov. 1998) | 11 | 10 | 18 | 04 | 10 | 18 | 60 |
| Inter College, Saukiathal (Nov. 1999) | 14 | 18 | 14 | 08 | 08 | 15 | 63 |
| Govt Girls Inter College, Dwarahat (March 2001) | 17 | 10 | 15 | 10 | 11 | 16 | 62 |
| Total | 42 | 38 | 47 | 22 | 29 | 49 | 185 |

dence[19]. Besides significance of variance, this statistical tool was used to test the independence in two attributes. To compute $\chi^2$, the following formula was used:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e},$$

where $f_0$ = is the frequency observed and $f_e$, the frequency expected.

## Assessment

### *General understanding of biodiversity*

Frequency distribution of correct responses for various questions is presented in Table 2. Target groups differed significantly in their understanding and concerns about biodiversity at the beginning of the workshop. At this stage, compared to students, the frequency of teachers answering correctly the questions on general understanding/concerns about biodiversity was markedly high (realized biodiversity as resource Q1–63.3%; exhibited alertness towards biodiversity loss Q2–53.1%; showed willingness to contribute to the cause of biodiversity Q3–61.2%). The performance of teachers, however, did not improve significantly at the end of training (Q1–67.3%; Q2–59.2%; Q3–63.3%). On the contrary, the training helped in significantly improving the students' understanding and concerns about biodiversity. By the end of the training, difference in understanding of two groups narrowed considerably and surprisingly, the frequency of students with correct answers slightly exceeded those provided by the teachers (Table 2).

Amongst students, at the start of workshop, more participants in > 10 standard level realized biodiversity as a

**Table 2.** Differences in frequency of correct responses during pre- and post-training within and among target groups (values in parentheses represent percentage)

| Question in brief | Survey time | Teacher ($n$ = 49) | Student ($n$ = 136) | $\chi^2$ (df 1) |
|---|---|---|---|---|
| 1. Is biodiversity a resource for the present and the future? | Pre-training | 31(63.3) | 56(41.2) | 5.3597, $P < 0.05$ |
| | Post-training | 33(67.3) | 93(68.4) | 0.0178, ns |
| | $\chi^2$ (df 1) | 0.1801, ns | 19.3729, $P < 0.001$ | |
| 2. Give examples of biodiversity loss in your surroundings. | Pre-training | 26(53.1) | 43(31.6) | 7.0826, $P < 0.01$ |
| | Post-training | 29(59.2) | 88(64.7) | 0.4725, ns |
| | $\chi^2$ (df 1) | 0.3729, ns | 43.7156, $P < 0.001$ | |
| 3. Are you interested in participating in such programmes? | Pre-training | 30(61.2) | 54(39.7) | 6.72874, $P < 0.001$ |
| | Post-training | 31(63.3) | 105(77.2) | 3.5953, ns |
| | $\chi^2$ (df 1) | 0.0434, ns | 39.3761, $P < 0.001$ | |
| 4. What is biodiversity? | Pre-training | 14(28.6) | 22(16.2) | 3.5311, ns |
| | Post-training | 38(77.6) | 53(38.9) | 21.4522, $P < 0.001$ |
| | $\chi^2$ (df 1) | 13.8151, $P < 0.001$ | 17.6915, $P < 0.001$ | |
| 5. What is the importance of biodiversity for sustenance? | Pre-training | 17(34.7) | 29(21.3) | 3.4468, ns |
| | Post-training | 32(65.3) | 50(36.8) | 11.9217, $P < 0.001$ |
| | $\chi^2$ (df 1) | 9.1836, $P < 0.01$ | 7.8673, $P < 0.01$ | |
| 6. Define and name a few protected areas of your neighbourhood. | Pre-training | 24(48.9) | 19(13.9) | 24.7463, $P < 0.001$ |
| | Post-training | 28(57.1) | 37(27.2) | 14.1653, $P < 0.001$ |
| | $\chi^2$ (df 1) | 0.6555, ns | 7.2857, $P < 0.01$ | |
| 7. What are value and value addition with regard to biodiversity? | Pre-training | 3(6.1) | 3(2.2) | 1.7608, ns |
| | Post-training | 31(63.3) | 59(43.4) | 5.8191, $P < 0.05$ |
| | $\chi^2$ (df 1) | 33.3300, $P < 0.001$ | 65.514, $P < 0.001$ | |
| 8. What is the role of remote sensing in assessment and conservation? | Pre-training | 6(12.2) | 2(1.5) | 10.107, $P < 0.01$ |
| | Post-training | 33(67.3) | 58(42.6) | 8.7928, $P < 0.01$ |
| | $\chi^2$ (df 1) | 31.33, $P < 0.001$ | 67.0591, $P < 0.001$ | |
| 9. What is the role of tissue culture in biodiversity conservation? | Pre-training | 8(16.3) | 7(5.1) | 6.042, $P < 0.05$ |
| | Post-training | 37(69.4) | 59(43.4) | 10.5625, $P < 0.01$ |
| | $\chi^2$ (df 1) | 34.5568, $P < 0.001$ | 54.0959, $P < 0.001$ | |
| 10. Do you agree/disagree? | Pre-training | 37(75.5) | 47(34.6) | 24.3693, $P < 0.001$ |
| (i) Excessively utilize bioresources | Post-training | 42(85.7) | 77(56.6) | 13.2892, $P < 0.001$ |
| (ii) Completely protect them | $\chi^2$ (df 1) | 1.6322, ns | 13.3391, $P < 0.001$ | |
| (iii) Give equal importance for protection and utilization | | | | |
| (iv) Present form of use should continue | | | | |
| 11. 'Conservation of bioresources is important' Agree/disagree | Pre-training | 26(53.1) | 46(33.8) | 5.6079, $P < 0.05$ |
| | Post-training | 28(57.1) | 65(47.8) | 1.2593, ns |
| | $\chi^2$ (df 1) | 0.1649, ns | 12.5199, $P < 0.001$ | |

Questions 1–3, general understanding and concerns; Questions 4–11, factual knowledge of subject. (See complete structure of questions in Box 1.)

resource (50%); expressed concern towards biodiversity loss (40.8%); and showed willingness to contribute to the cause of conservation (43.8%). The difference from below 10th standard level was significant in the first two cases (Q1: $\chi^2 - 5.5371$, $P < 0.05$; Q2: $\chi^2 - 6.7025$, $P < 0.01$). Training helped in improving the level of understanding in both the groups (Figure 2). Across gender, responses did not vary considerably with regard to general understanding. At the start of training, female students in < 10th standard level showed slightly higher understanding (Q1–36.4%; Q2–27.3%; Q3–36.4%) than their male counterparts (Q1–26.3%; Q2–15.8%; Q3–34.2%). However, by the end of the training, understanding did not improve significantly in female students at < 10th standard level (except willingness to contribute towards conservation; $\chi^2 - 6.2345$, $P < 0.01$). On the contrary, training helped in developing better understanding of biodiversity with respect to female students at above the 10th standard level, and male students at both the levels (Figure 2). Above the 10th standard level, male students more often answered correctly both in the beginning and at the end of training. Nevertheless, training narrowed the differences in understanding biodiversity of both the sexes at different educational levels (Figure 2).

**Box 1.**

**Structure of questions included for analysis**

*General understanding and concerns about biodiversity*

Q. 1. How do you recognize biodiversity as a resource for the present as well as the future?
Q. 2. Give three examples to illustrate biodiversity loss in your immediate surroundings.
Q. 3. Are you interested in participating in biodiversity conservation programmes? If yes, how do you plan to be a part of this process?

*Factual knowledge of subject*

Q. 4. What is biodiversity?
Q. 5. What is the importance of biodiversity for sustaining human life?
Q. 6. What is a protected area? Name a protected area in your neighbourhood.
Q. 7. What do you understand by value and value addition with regard to biodiversity?
Q. 8. What is remote sensing? What is its role in biodiversity assessment and conservation?
Q. 9. What is tissue culture? What is its role in biodiversity conservation?
Q. 10. With which statement do you agree most?
(a) We should excessively utilize the available bioresources.
(b) Bioresources, preferably the forests, should be completely protected.
(c) Equal importance should be given to both protection/preservation and utilization of bioresources.
(d) The present form of bioresource utilization should continue.
Q. 11. Do you agree with the statement 'Conservation of bioresources is important for our sustenance'? If yes, please explain.

### *Factual knowledge of the subject*

Compared to responses for general understanding/concerns about biodiversity, the frequency of correct responses on factual knowledge was invariably low at the start of training (Table 2). At this stage, both the groups showed very poor knowledge on certain specialized subjects like biodiversity value and value addition (teachers: 6.1%, students: 2.2%); role of remote sensing (teachers: 12.2%, students: 1.5%); and role of tissue culture (teachers: 16.3%, students: 5.1%). In general, in the beginning a large number of teachers had knowledge about various biodiversity-related subjects compared to students. At this stage, the frequency of teachers answering correctly the questions related to protected areas (48.9%), biodiversity as a resource for sustenance (53.1%) and importance of conservation and utilization of bioresources (75.5%), was significantly higher than the students. Training improved the factual knowledge of subjects in both the cases (Table 2). Improvement in the case of students was significant for all the subjects (Q4–11). However, teachers could not register marked improvement with regard to their knowledge about protected areas; agreement with the fact that biodiversity is the resource for sustenance, and utilization is equally important as preservation of bioresources. Nevertheless, at the end of the training, teachers showed markedly higher frequency of correct answers in all cases (except Q11: $\chi^2$, ns). Even in case of defining biodiversity (Q4), realizing the importance of biodiversity (Q5) and knowledge on value and value addition (Q7), differences between responses of teachers and students were non-significant in the beginning; they increased considerably at the end of training.

## Implications

The results are discussed to highlight similarities and significant differences in responses among target groups (students and teachers), and to establish that the current approach can serve as a model for replicating it in other areas of IHR. One could argue that a small sample size is a major limitation of the present data set. However, ensured randomness in representation of participants deserves equal consideration to judge the strength of the interpretations.

Improvement in general understanding carries greater value in view of the potential to express the participant's concerns about bioresources and enthusiasm to ensure

protection. In the beginning, significantly higher frequency of teachers realizing biodiversity as a resource; showing sensitivity towards loss of biodiversity in immediate surroundings; and willing to contribute towards the cause of conservation, is a reflection that maturity (age and experience) and level of education play a role in determining the participants understanding/concerns about biodiversity. This is further strengthened by the fact that + 10th standard level, students expressed better understanding than those lower than 10th standard level.

The training served to plug the wide gaps in understanding of both teachers and students by increasing the frequency of students showing understanding and concerns about biodiversity. They even exceeded the teachers in responding correctly (Q1–3). These results show that the present form of training (disseminating conservation education) is well-suited to students. However, one of the discouraging results of the study was that the training could not markedly enhance the frequency of understanding among teachers. This indicates that some changes in approach are warranted to improve their responses. As advocated by Holl *et al.*[20], perhaps the improvement in style and depth of information presentation is needed. In this context, organization of orientation camps for teachers (as suggested by most of the teachers during informal discussions) can be a viable option. These camps, with improved quality and quantum of information, will not only help teachers in taking up the task of disseminating conservation education independently in their institutions, but will also inculcate a higher sense of responsibilities. The present findings, however, are not in agreement with our previous assumption[16] that both management (teacher) and work force (students) can be mobilized through one common combined approach of encouragement, coercion and trust (*sensu* Ahlback[21]). We feel (evidences of informal discussion with teachers) that the element of coercion (forced involvement) is not acceptable to this target group until it is associated with some sound career-based incentives (e.g. promotion, transfer, annual increments, etc.).

Several studies focusing on impact of environmental awareness programmes have shown a considerable pre-training difference between male and female students[10,20], thereby suggesting gender-based changes in approach. However, in the present case, students' responses with regard to general understanding did not significantly vary across sexes (both pre- and post-workshop). This fact, along with the observations of significant post-workshop improvement of students' understanding, is a reflection that the present approach of involving both male and female students together is suitable and should be continued.

In general, people largely fail to comprehend the implications of the global environmental concerns at local/individual level and therefore do not express willingness to act[20,22,23]. In this context, in the present case the increased willingness (teachers 63.3%; students 77.2%) to actively participate for the cause of biodiversity conservation is an encouraging sign. This indicates that the training inculcates interest among participants to contri-

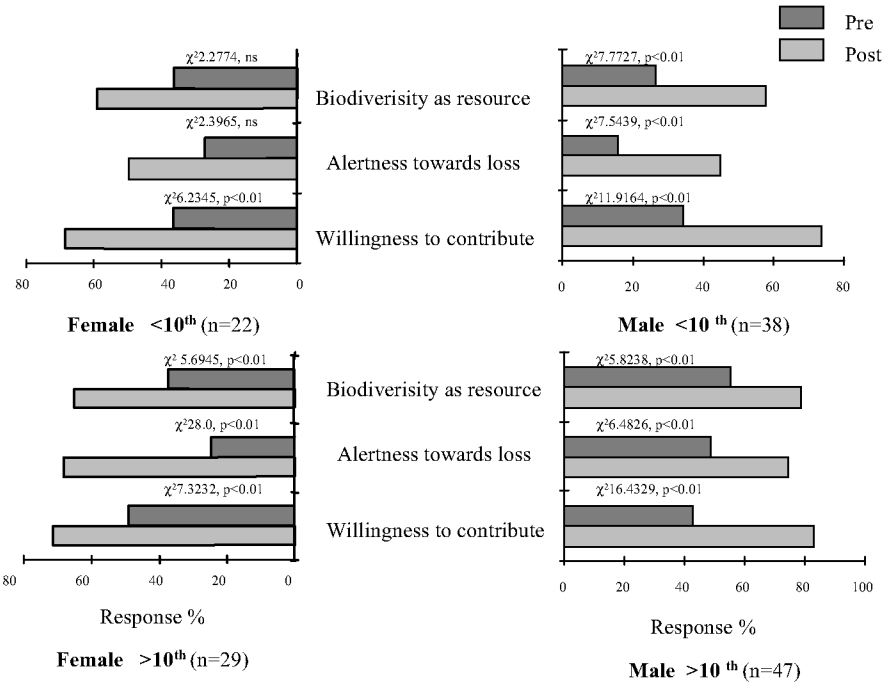


**Figure 2.** Pre- and post-training response of student participants (analysis across gender and class groups).

bute at individual/local level to promote biodiversity conservation. As such, a greater willingness for participation at local level (also observed in previous experiences of Dhar *et al.*[16]), and concern towards loss of surrounding bioresources indicates the extent of the linkage of participants with these resources. We assume that this synergy will sustain their interest towards biodiversity-related issues/programmes, despite a growing attraction of inhabitants towards the programmes having direct cash incentives[24]. This consideration needs to be harnessed in the right perspective to strengthen and extend this programme on conservation education.

With regard to factual knowledge of the subject matter, overall poor response (Q4–11) of respondents (in both the groups) was expected in pre-workshop surveys. Except for question 10: 75.5% (agreeing that use of biodiversity is equally important as preservation) and question 11: 53.1% (agreeing that conservation of biological diversity fulfils daily needs for human sustenance), where > 50% teachers could respond correctly, in no other case was above 50% frequency of correct answers achieved. This highlights the pressing need for improving overall knowledge on conservation science in the region. Similar observations of low level of factual knowledge, even among educated masses, about general environmental problems have been reported elsewhere[20]. As such, like the general understanding of biodiversity, maturity (experience) and education level helped the teachers to answer far more correctly than the students at the beginning of the training. However, at this stage (pre-workshop) both the groups did not vary significantly in defining biodiversity; realizing its importance, and assigning values and implementing concepts of value addition in biodiversity. Training, however, significantly widened the difference among the two groups. This can be explained by the fact that the teachers are expected to have better assimilation and comprehension of concepts/themes covered during the training. Also, they possess better communication skills to provide logical answers to the questions.

Markedly low pre-workshop responses regarding three important emerging aspects of conservation biology (viz. concept of value and value addition; role of remote sensing; and role of tissue culture), reflect that despite a growing scientific knowledge in these aspects across the globe in general and India in particular, even the awareness among educated masses in a representative area of IHR is not adequate. Also, the fact that very few students (13.9%) and teachers (< 50%) who had the knowledge on protected areas, was discouraging in view of the fact that India (including IHR) has a well-established protected area (PAs) network[25] and many representative PAs are part of the study area. This suggests that information dissemination on the objectives of establishing PAs has not been adequate (before and after establishment of PAs). The far-reaching implications of this neglect, as observed in school/college systems of the region, need to be addressed. This has also been reported for Brazilian Parks and Reserves[10], where the advantages of proximity to such natural areas/reserves have not been realized for strengthening conservation education. Training, however, served to significantly improve the participants' knowledge on the above subjects, and this therefore, strengthens the viewpoint that such programmes in IHR need to be promoted.

## Perspectives for IHR

The biodiversity of IHR offers richness, uniqueness and values, besides manifesting in itself rich and diverse tradition of resource use. Unfortunately, the region has also experienced rapid loss of bioresources in recent decades[26,27]. In this context, conservation education programmes, on account of their in-built potential of mobilizing public attention and support, may emerge as one of the important activities of biodiversity conservation.

The present programme, evolved after a systematic assessment of an umbrella activity initiated in 1995, has revealed that it has (i) the potential to markedly improve understanding and knowledge of target groups about biodiversity, and (ii) the ability and flexibility to further evolve itself through the learning process so as to accommodate positive changes in approach for implementation. In view of the fact that the issues of peoples' involvement in biodiversity conservation have not been adequately addressed in the IHR and that conservation education is entirely a new field in the region, we feel that the programme, with proven values, has potential to serve as a model for replication in other parts of the IHR.

Apart from inculcating awareness among the target groups, the programme can subsequently attract and motivate various stakeholders. Therefore, as one of the components of EE, the programme is expected to be followed by an action-oriented, problem-solving approach, transmitting positive message about what individuals and groups of people can do to tackle environmental problems[28]. The overall success of the initiative will depend on the following: (i) increasing outreach at different levels and locations of the IHR; (ii) ensuring effective coordination and networking among various stakeholders (target groups); (iii) promoting confidence-building measures among individuals/groups to make the programme self-sustaining; and (iii) developing innovative methods to attract voluntary contributions (funds and technical support).

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ACKNOWLEDGEMENTS. We thank the Director, G.B. Pant Institute of Himalayan Environment and Development, for necessary support and encouragement. Support received from Department of Education (State Govt.), especially from the Principals of three colleges where workshops were organized, is acknowledged. We also thank Prof. S. P. Singh, Kumaun University, Nainital, for providing technical inputs. Thanks are due to various resource persons and participants for their excellent co-operation and enthusiastic support. We thank the two anonymous referees for useful suggestions to improve the manuscript.

Received 16 August 2001; revised accepted 17 January 2002