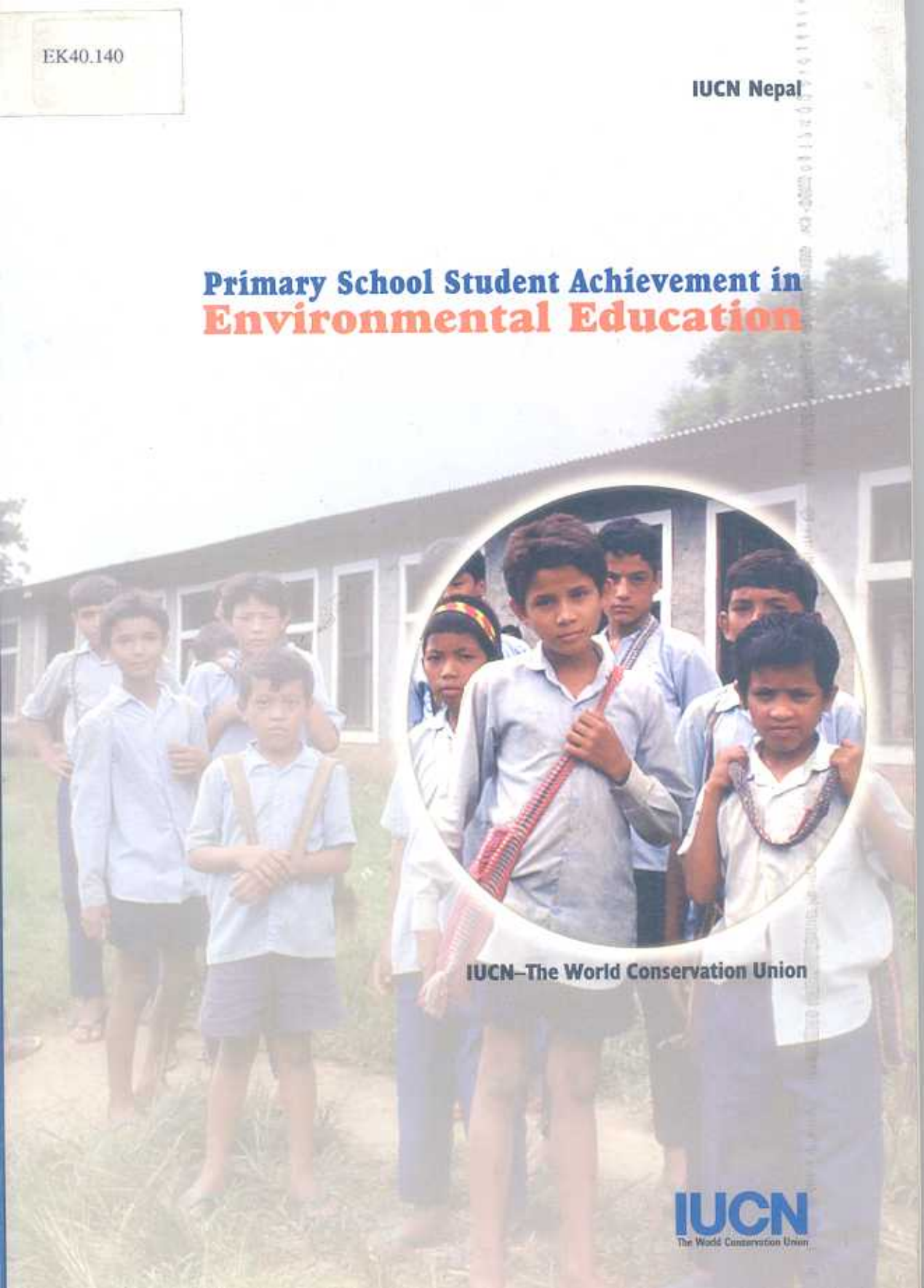
IUCN Nepal

Primary School Student Achievement in Environmental Education



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December 1998
IUCN–The World Conservation Union

Published by: IUCN Nepal

The Role of Swiss Agency for Development and Cooperation in supporting IUCN Nepal is gratefully acknowledged.

Citation: Pande, B.D and U. Karki. 1998. *Primary School Student Achievement in Environmental Education.* Kathmandu: IUCN Nepal. x+111 pp.

ISBN: 92-9144-036-1

Layout Design: Upendra Shrestha

Available from: IUCN Nepal
P.O. Box 3923
Kathmandu, Nepal

PREFACE

The National Conservation Strategy Implementation Project reviewed the status of environmental education in Nepal in 1990. The review indicated the need for the incorporation of environmental education in the school education system. On the basis of this study, the Environmental Education for Primary School Programme, a two-year pilot project was initiated in 1990 with a view to integrating environmental concerns with the main subjects of primary school curriculum. A National Environmental Education Steering Committee was constituted under the chairmanship of the member responsible for the environment sector of the National Planning Commission to provide guidance for designing the programme and to develop a implementation strategy.

A Technical Committee consisting of subject experts from the Basic and Primary Education Project and Curriculum Development Centre, Ministry of Education and environmental experts of IUCN Nepal was formed to develop environmental education curriculum and resource materials for primary schools. The Committee developed draft environmental education curriculum for primary schools following the infusion model. It then developed a series of resource books on environmental education integrating the basic components of the environment with Nepali language, Social Studies, Health Education and Science which were the main subjects of primary school curriculum. Each lesson of environmental education resource book included illustrations and practical activities relevant to the content of the lesson to make them simple and easy to understand. Some posters, charts and other relevant teaching aids were also developed as supplementary materials to the resource books.

Primary schools representing different geographical regions of Nepal were selected for carrying out the pilot test of the environmental education curriculum and resource books. A baseline survey of the sample schools was done by the technical staff of IUCN Nepal before initiating pilot test activities. The activities of pilot test included training of teachers, administration of pre- and post-tests, follow-up visits and class observation and evaluation workshops.

The teachers of these schools were oriented on the environmental resource books and trained in teaching strategies of environmental topics. The resource books with some instructional materials were distributed to the pilot schools. The trained teachers taught the lessons of the environmental education resource books to students and also maintained a record of their comments and learning difficulties of students in the evaluation booklet provided by IUCN Nepal. The environmental education resource books were pilot tested in the sample schools for one full academic year with provision of technical support to teachers from the environmental experts. The environmental resource books were revised and published on the basis of field experiences obtained from the teachers, subject experts and students.

This study is a part of the pilot test of environmental education resource books. The qualitative and quantitative approaches used in data collection and analysis were the main methods used in this study. It includes the assessment of effectiveness of teachers' training and resource materials, impact of environmental education on the communities and schools, impact of environmental education on students as perceived by teachers and parents and impact of environmental education on students' knowledge and attitude. The effectiveness of teachers' training programme assesses the usefulness of the training to teachers and its impact on teachers' knowledge and attitude. The effectiveness of resource materials contains the evaluation of the use of resource materials in classes and difficulties faced and suggestions made for their improvement. The impact of the environmental education programme on the communities and schools deals with the main effects of the programme on the communities and schools and major changes observed in school environment and teachers' perception towards the environment. The impact of environmental education on students as perceived by teachers and parents includes the determination of the expected knowledge of students, expected behaviour of students, change in the knowledge of students, change in the behaviour of students and change in the attitude of students towards the environment. The impact of environmental education on students' knowledge and attitudes deals with the pre-test scores of experimental and control schools, post-test scores of experimental and control schools, pre-and post-test scores of experimental schools and pre-and post-test scores of control schools. These data have been presented in this book with their tables and graphs. The quantitative data of knowledge and attitude of students are a benchmark for developing curriculum and instructional materials on environmental education for schools.

This study is the first ever in the field of environmental education in Nepal. It describes briefly the processes of developing environmental education resource books and their pilot test. It includes in detail students' knowledge of and attitude towards various components of the environment which would be helpful in designing curricula for school level and teacher training programs. It is hoped that this study will form a foundation for developing environment-related programmes and initiating other studies on environmental education at the school level.

I take this opportunity to thank Dr. Badri D. Pande and Mr. Uddhab Karki, both highly qualified to address this subject, for undertaking the required research and for writing this important book. I further would like to express IUCN Nepal's gratefulness to all experts, consultants, teachers, officials and students involved in making this study possible. Thanks are also due to Upendra Shrestha, Chandra Mani Bhandari and Ekaram Maharjan for their dedicated efforts to produce this book.

Dr. Ambika P. Adhikari
Country Representative
IUCN Nepal

ACKNOWLEDGEMENTS

This study report is an integral part of the NCS Implementation Project's Environmental Education for Primary School Programme. In order to implement this programme effectively, a National Level Steering Committee and a Technical Committee were formed to provide guidance for designing and implementation of the programme and to oversee its progress and impacts on periodic basis. A Technical Committee of subject experts was formed for development and implementation of the programme activities. The programme was pilot tested in sample schools with the help of School Management Committees, headmasters and school teachers during the 1991/1992 academic year. The National Level Steering Committee Members provided invaluable suggestions to the Technical Committee in the course of developing resource books, achievement and attitude tests and teacher training programme for teachers. The Steering Committee also reviewed the programme activities on periodic basis and gave valuable guidelines to the Technical Committee which greatly helped in designing and implementation of the programme effectively. IUCN Nepal expresses its sincere gratitude to the National Level Steering Committee members for its encouragement and invaluable contribution. Special thanks go to Dr. Lekh Nath Belbase, Chairman of the Steering Committee and Member of the National Planning Commission for his able leadership and valuable advice.

IUCN Nepal appreciates the technical inputs provided by the Technical Committee members to this programme.

This programme was implemented in 10 pilot schools in collaboration with the Curriculum Development Centre, Basic and Primary Education Project and District Education Offices of the Ministry of Education. They provided administrative support and resource persons while developing and implementing this programme at the schools. IUCN Nepal heartily expresses its sincere thanks to the Ministry of Education and District Education Offices of

Kathmandu, Dhankuta and Dang for their unremitting support and cooperation to programme.

The School Management Committees of the pilot schools kindly extended their support to implement the programme in their schools. The Headmasters and teachers of the schools were involved in the various activities of the programme during its implementation phase and extended their support to the Technical Committee and other experts. IUCN Nepal expresses its thanks to them for their continuous participation in the programme and support to the Technical Committee and subject experts.

Without the financial support of the Swiss Agency for Development and Cooperation the Environmental Education for Primary School Programme would not have been initiated, IUCN Nepal is grateful to Swiss Development Cooperation for its contribution to this programme.

IUCN Nepal is thankful to Dr. Bijay K. Thapa, Consultant, for his most valuable technical support in analysing the quantitative data of this report. Thanks are due also to Dr. Jaya Raj Acharya for editing the language of this report. The staff of publication Unit/IUCN Nepal namely, Mr. Upendra Shrestha and Mr. Eka Ram Maharjan and Mr. Chandra Mani Bhandari of the Environmental Education Unit deserve thanks for computer processing, design and layout of the report.

CONTENTS

EXECUTIVE SUMMARY

The Environmental Education for Primary Schools Programme under the NCS Implementation Project was initiated in 1990 and completed in 1992. The main objectives of the programme were to develop environmental curriculum and resource materials for the primary school level. Based on the infusion approach, resource materials in the Nepali language, social studies and health education for classes 1 to 5 and science for classes 4 and 5 were developed in collaboration with the Primary Education Project (Presently Basic and Primary Education Project) and the Curriculum Development Centre of the Ministry of Education. These resource materials were also supported by other materials such as supplementary readers, games, charts and posters. They were pilot-tested in ten schools in the districts of Kathmandu, Dhankuta and Dang for an academic year under the technical guidance and supervision of the central level professional staff. A total of 50 teachers were trained in teaching environmental education in primary schools. In order to compare the results of the project inputs, ten similar adjacent control schools were also included in the study. A total of 2,310 students from experimental schools and 2,195 from the control schools were involved in this study. As part of the field work, the project staff visited the houses of the students and interviewed the households regarding various aspects of the Environmental Education Programme implemented at school. The findings of the study are briefly presented below.

1. Effectiveness of Teachers' Training

1.1 It was found that the 12-day teachers' training in environmental education helped teachers to develop their knowledge and skills of teaching environmental education in primary schools. Specifically, they were taught the basic concepts of environmental education, teaching methods and evaluation techniques in the

training. They also developed skills in preparing lesson plans and teaching activities for developing students' knowledge, skills and attitude towards various aspects of environment.

1.2 Teachers observed that the students were very interested and enthusiastic in learning about the environment and teachers emphasised the need for teaching environmental education to primary school children.

2. Resource Materials

2.1 Effectiveness of Resource Materials

The study showed that the environmental education resource materials were useful for both teachers and students. These materials helped them promote their knowledge of environmental concerns. The contents were found to be simple, interesting and practical. The presentation and description of the contents and illustrations were clear and the prescribed activities were encouraging and supportive of the contents.

2.2 Difficulties Faced in Using Resource Materials in Classes

The study indicated that illustrations such as pictures showing pollutted ponds, dirty places and dust were found unclear to teachers while teaching. Words such as pollution, germs, bacteria and deterioration were difficult to understand for students, especially for lower classes (1, 2 and 3). Exercises such as observation of the environment and report preparation as directed by the textbooks and teachers' directives were perceived as essential for effective teaching though these tasks were sometimes difficult to perform because of time constraints.

2.3 Suggestions for Improvement of Resource Materials

Teachers felt the need for resource materials such as audio-visuals, posters and charts to teach environmental education effectively for primary level students. They suggested that these materials should include contents and illustrations depicting the local context and that they be printed in colour to make them clear and realistic. They also felt the need for organising field

trips for students on environmental concerns to develop their practical knowledge.

3. Impact of Environmental Education on Community

Ninety per cent of parents were aware of the school environmental education programme. The environmental education programme that was implemented, contributed to raising the awareness of the community of the importance of the environment and the need for its protection. It was also noticed that the communities realised the need for keeping their villages clean on their own initiatives.

People also felt the need for the environmental education programme in their community to raise awareness of the deteriorating environment, its importance and methods of its protection.

4. Impact of Environmental Education Programme in the School

4.1 Change in the School Environment

Teachers noticed that the environmental education programme helped to improve the school environmental condition such as cleanliness of the school compound and its surroundings. The students began to help to keep the school clean by keeping waste papers and litters in their proper places, and by using the toilets properly. They also felt the need for taking care of plants, orchards and kitchen gardens.

4.2 Changes in Teachers' Perception of the Environment

The environmental education programme contributed to developing the knowledge, skills and attitudes of teachers towards the environment, and also raised their environmental awareness. They felt the need for protecting environmental assets such as birds and animals, and the need for conserving the land, water resources and forests through controlling deforestation and proper utilisation of resources. They also felt the need for environmental

education for children and the communities in order to mobilise them in the endeavour for environmental protection.

5. Impact of Environmental Education on Students

5.1 Expected Knowledge of Students

Parents expected their children to learn about the importance of various environmental aspects such as plants, animals, land, water, air, crops, and methods for their conservation. Parents felt that children should be conscious of the importance of personal hygiene and cleanliness of their schools, houses and surroundings in order to make their environment healthy.

5.2 Change in Knowledge of Students

Parents observed that their children learnt the need for keeping their houses and surroundings clean. The children perceived the importance of plants, animals, water and temples, and felt the need for their protection. They also felt the need for preserving their social values, customs and culture. The children also realised the importance of personal hygiene and developed some skills of cleanliness.

Class 1

The gain scores of experimental school students in class 1 in the post-tests were highly significant in the districts of Dhankuta and Dang but not in Kathmandu. However, the gain scores of the control school students in the post-tests are negligible in all three districts.

Data revealed that the achievement level of the experimental school students of class 1 was better than that of the control school students in Dhankuta and Dang, whereas there was not any difference in the student achievement level between experimental and control school students in Kathmandu.

Class 2

The gain score of the experimental school students in class 2 of Dhankuta was found to be the highest and Dang the second highest. The gain scores in post-tests of experimental school students of all three districts were highly

significant. In the case of the control schools, the gain score of Dang was the highest, that of Dhankuta the second highest and Kathmandu the lowest. It was found that the gain scores of experimental school students of all districts except Kathmandu were highly significant.

The data indicate that although the students of class 2 of control schools made some progress, the level of achievement of the experimental school students was much higher.

Class 3

The gain scores of experimental school students in class 3 in post-tests over pre-tests were highest in Dhankuta, whereas Dang and Kathmandu were second and third highest respectively. The gain scores of all three districts are significant, however, in the case of control schools, the gain scores of all districts except for Dang are insignificant.

Although the performance of control school students of class 3 in Dang District was relatively better than those of the other two districts, the performance of the experimental school students of all districts was much better than that of control school students.

Class 4

The gain scores of the experimental school students in class 3 from all three districts were higher than those of the control school students. The gain scores of all districts are highly significant. The gain score of the students of Kathmandu is the highest among the three districts, with Dang second and Dhankuta third. In the case of control schools, the gain scores were considerably lower as compared to the experimental school students'. However, the gain score of only Kathmandu is significant at 05 level.

As compared to the control school students' achievement level, the achievement level of experimental school students of class 4 is highly significant. In general, the performance level of the control school students did not increase significantly over the experimental period.

Class 5

The gain score of one of the experimental schools in the post-test indicates that the performance of the students in class 5 is better than that of the control school students in all the study districts. Although the gain scores vary considerably with individual districts, they are highly significant. Students of Dhankuta District performed better than those of other districts but the gain scores of the control school students of all the districts are low and insignificant.

In conclusion, the performance level of experimental school students of class 5 was found to be higher than that of control school students. There was no noticeable change in the performance of control school students when compared to the experimental school students'.

The pre- and post-data regarding the level of knowledge of the experimental and control school students on environmental concerns indicated that the level of knowledge of the experimental school students (except for class 2) increased significantly-more than that of the control school students. It can be concluded that the school students benefited significantly from the project.

5.3 Expected Behaviour

Parents expected their children to develop the habit of throwing rubbish and waste materials into pits or their proper places. They expected them to behave properly and express their affection to animals as well as feel the need for the protection of animals, plants and other environmental elements. They felt they should cooperate with each other in protecting the environment.

5.4 Change in Behaviour of Students

The teachers observed that the students developed their environmental knowledge, attitudes and skills and felt the need for the protection of the environment. They were conscious of the importance of protecting the environment and were cooperative in environmental protection efforts.

The students realised the need for keeping their schools neat and clean, and began to help in these initiatives. Parents and teachers observed that children began to use the toilets properly. The children were conscious of waste materials and solid waste, and began placing such materials in their proper places. They also realised the need for clean water and fresh food for good health. They also helped their parents keep the house and its surroundings clean. They were conscious of personal hygiene and also began using the toilet properly.

5.5 Change in Attitude of Students

Teachers pointed out that students felt the need for being aware of environmental conservation. They were supportive of environmental protection activities and realised the importance of clean drinking water and fresh food.

Parents noticed that their children felt the need for protecting plants. The

children were interested in raising orchards and kitchen gardens. They realised the importance of public places and cultural heritage and felt the need for their preservation. They also felt the need for keeping their house and its surroundings clean and were conscious of personal hygiene.

Class 1

The gain score of experimental school students in class 2 in Kathmandu in the attitude test towards the environment was negligible. However, the gain scores of Dhankuta and Dang were highly significant. On the contrary, in the case of the control school students, the gain scores of Kathmandu were found to be significant and that of the other districts insignificant.

The attitude level of experimental school students was significantly higher than that of control school students in Dhankuta and Dang.

Class 2

The gain scores of the experimental school students in class 2 in the attitude test were significant in all study districts except for Kathmandu. In control schools, the gain scores of all the districts except Dang were insignificant. The gain scores of experimental and control school students in Dang were very close in terms of proportionate gain (about 57%).

The attitude of the experimental school students in class 2 in Kathmandu did not change as compared to the control school students'. However, the attitude of the experimental school students of Dhankuta improved significantly as compared to other districts.

Class 3

The gain scores of experimental school students in class 3 in all the districts in the attitude test were high and significant. But the gain scores of the control school students in all three districts are quite low and insignificant.

The data indicates that the attitude of the experimental school students improved compared to control school students' from all the three districts.

Class 4

The gain scores of the class 4 experimental school students in all the districts in the attitude test were highly significant. The gain scores of Kathmandu and Dhankuta are very close to each other and the gain score of Dang is the highest. In case of control schools, the gain scores were relatively low and close to each other. Only the gain scores of Dang and Kathmandu were statistically significant.

The data reveal that the attitude of the experimental school students improved significantly as compared to that of the control school students within the experimental period.

Class 5

The gain scores of the class 5 experimental school students of the three districts in the attitude test were highly significant. The gain scores of the control school students in Kathmandu and Dang were significant, whereas that of Dhankuta was insignificant. However, the gain scores of the experimental school students in all the study districts are considerably higher than those of the control school students.

In sum, although the scores of students in control schools of two districts gained significantly, the attitude level of the class 5 experimental school students is relatively higher.

A comparative analysis of the attitude test scores of the experimental and control school students clearly revealed that the experimental school students (except for classes 2 and 5) have developed a significantly positive attitude towards the environment. Overall, the data indicate that the project inputs contributed significantly to developing a positive attitude in the experimental school students towards environmental concerns.

6. Suggestions for School Environmental Programme

Teachers suggested organising training programmes, seminars, talk programmes and panel discussions on environmental education with an emphasis on raising teachers' awareness on various relevant environmental problems. They suggested increasing the participation of the students in environmental protection by involving them in sanitation, plantation, and various activities such as drama, essay writing, quiz contests, poem composition, songs, dances, cultural activities, and by conducting various types of relevant competitions.

6.1 Suggestions for Environmental Education in the Community

Both teachers and parents suggested mobilising teachers, students and the community in environmental conservation activities such as protection of and maintaining cleanliness of public places. They felt the need for promoting of the awareness of the community on various environmental concerns such as protection of animals and birds, control of deforestation, proper use of

resources, and sanitation of town or village through organising seminars, workshops and discussion programmes.

Parents suggested publicising the need for modern fuel technology such as improved *chulo* and *gobar gas* plants and that these fuel technologies should be used by the community for the protection of the environment.

CHAPTER 1

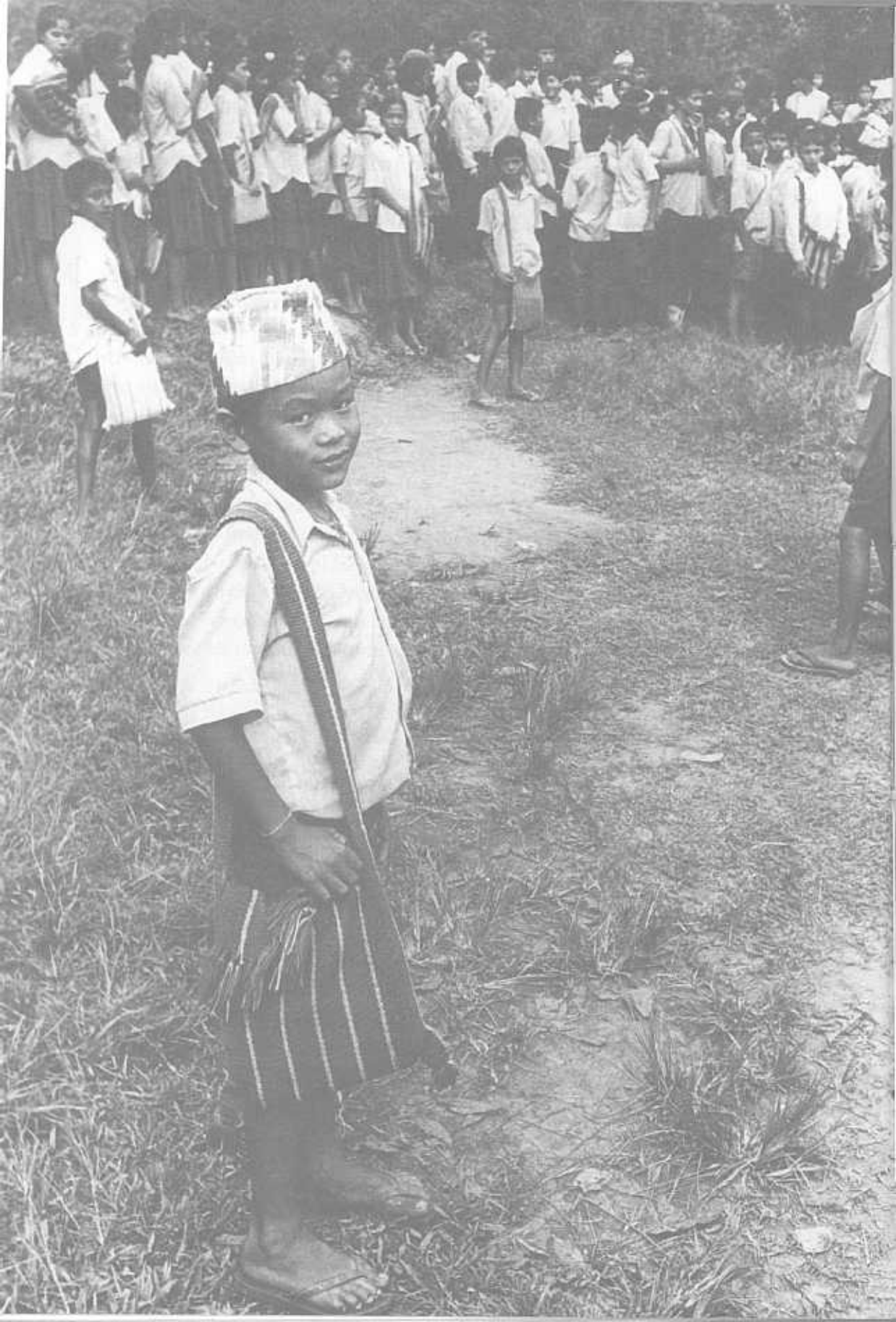
Introduction

This is the introductory part of the report. It deals with the overall background of the experimental project as well as the focus, objectives and major components of the study.

1.1 Background

The National Conservation Strategy (NCS) for Nepal was completed in 1987 and was then endorsed as a policy document by HMG in 1988. IUCN-The World Conservation Union, in coordination with the National Planning Commission implemented the programmes of the NCS Implementation Project. Environmental Impact Assessment, Environmental Planning, National Heritage Conservation, Environmental Education and Communication and NGO Environmental Management programmes have been in operation since 1990 under the NCS Implementation Project. The Environmental Education Programme is one of the more important components of the NCS Implementation Project. The ultimate goal of the Environmental Education Programme is to integrate environmental concerns in formal and non-formal education, especially in national programmes.

A series of environmental education programmes is being designed and initiated in connection with environmental education. In the non-formal sector, Environmental Education Programme initially worked with various training institutes such as the Nepal Administrative Staff College, the Women's Training Centre, and the Hotel Management and Tourism Training Centre to incorporate environmental concerns in their training curricula. It also worked with three other training centres, namely the Agriculture Development Bank,



the Training Division of the Ministry of Forest and Soil Conservation and the Central Agricultural Training Centre of the Ministry of Agriculture.

In the formal sector, Environmental Education for the Primary Schools Project was started with the Ministry of Education to integrate environmental concepts in the primary school curriculum. This project was initiated in early 1990 to prepare environmental education resource material for Nepali, Social Studies and Health Education in classes 1 to 5 and Science in classes 4 and 5. The resource material contains texts and teachers' directives for these subjects, supplementary readers, games, charts and posters. The aim of the project was to integrate environmental concepts with the formal national curriculum and texts.

Objectives

The specific objectives of the project were as follows.

- To prepare texts and teachers' directives for Nepali Language, Social Studies and Health Education for classes 1 to 5 and Science for classes 4 and 5, incorporating natural and cultural resource conservation components.
- To train the teachers of the sample schools to use the environmental education resource material prepared for primary schools.
- To experiment with the environmental education resource material in primary schools and to maintain a daily record of classroom activities for developing the basis for evaluating the effectiveness of the project activities.
- To assess the effectiveness of the resource materials, methods and activities used to teach environmental education to primary school children.

Project Site

The Steering Committee selected ten schools from the districts of Kathmandu, Dhankuta and Dang for pilot testing the resource materials. The selection of schools was made on the basis of geographical and demographical variation to ensure the heterogeneous coverage of students for the resource materials test.

Selection of Districts

Districts for pilot testing the resource materials were selected in order to have representation of the mountain and Terai regions, as well as the rural and urban areas of the country. In this regard, three districts, Kathmandu, Dhankuta and Dang, were selected to test the resource materials. Kathmandu represented the urban area in the Central Development Region. Dhankuta represented the rural mountain area in the Eastern Development Region and Dang represented the rural Terai area in the Far Western Development Region. Two of the above districts were selected from the PEP districts(at present known as BPEP).

Selection of Schools

Four schools were selected from Kathmandu for the experimentation of the resource materials. One of them was a private boarding school. Four schools, which had very similar characteristics to the experimental schools, were also selected as control schools. Accordingly, three experimental schools and three control schools were selected from both Dhankuta and Dang.

Two schools selected from each district were primary schools with classes 1 to 5. The third from each district had a secondary school with a primary section. The private boarding schools of Kathmandu were of the secondary level, but with primary classes also. A total of twenty schools were selected from three districts. Of them, ten were experimental and ten were control schools (refer to Annex 1.1 List of schools selected for pilot test).

Project Activities

Formation of Steering Committee

A Steering Committee chaired by the Environment Member of National Planning Commission was formed to oversee the overall implementation of the project. As the project aimed at integrating environmental concepts into primary education curriculum, the Director of the Primary Education Project was also included in the Steering Committee (refer to Annex 1.2 for the List of Steering Committee Members).

Formation of Working Committee

A technical committee was formed with the representation of curriculum specialists of Nepali Language, Social Studies and Health Education of the Basic and Primary Education Project, one science specialist from the Curriculum Development Centre, and technical experts from IUCN. The committee reviewed the curriculum and textbooks of the above mentioned subjects, then prepared a basic working strategy for developing environmental education curriculum for primary schools (refer to Annex 1.3 for the list of Resource Persons).

Preparation of Curriculum and Resource Materials

The subject experts of the working committee developed an environmental curriculum on the basis of the findings of the review. Following this curriculum, they prepared texts and teachers' directives for Nepali Language, Social Studies, Health Education and Science subjects. These were also supported by a supplementary reader entitled "There Was a Tree" and the game "Snakes and Ladders". The committee members completed the preparation of the resource materials in one academic year. The four types of posters "Mountain Trees and Shrubs of Nepal", "Animals Found in and Around Nepal", "Some Birds of Nepal" and "Forest Trees of Nepal's Terai" were also prepared and published. These resource materials were then distributed to project schools (refer to Annex 1.4 for List of Environmental Education Resource Materials).

Conduct of In-service Teacher's Training

A two-day teachers' training workshop on environmental education was conducted from 20 - 21 December 1990 at the International Centre for Integrated Mountain Development (ICIMOD) conference hall. The objectives of the workshop were to present the sample lessons and teachers' directives, and to discuss with the participants and other resource persons about how to make environmental education more relevant and effective. A total of twenty-two teachers representing eleven primary schools in Kathmandu, Bhaktapur and Lalitpur were present at the workshop. The trainers included curriculum specialists of BPEP and CTSDC (at present known as CDC) of MOE and technical personnel of IUCN. Also, representatives of various NGOs attended the workshop. Using suggestions and comments from the workshop, a detailed working strategy was prepared for developing environmental education resource materials.

A 12-day teachers' training package was prepared by the members of the

working committee to train the teachers of the experimental schools in the use of the resource materials in the classes. A total of 50 teachers of classes 1 to 5, including some observers, received the intensive training. The training was organised at the Primary Education Project's Resource Centre in Dhankuta and Dang. In the case of Kathmandu, the training was organised at Tyaud Secondary School, one of the schools involved in the project.

Use of Resource Materials in Class

The trained teachers of the sample schools were provided with a set of resource materials after completion of the training. All the students in classes 1 to 5 also received these materials. The teachers taught the students environmental education using the materials provided. These teachers maintained records of the activities conducted both in and outside classes. They also maintained a record of the problems faced during the use of resource materials in the classes and conducting field activities. These problems were discussed and possible solutions were explored during the supervision visits.

Field Supervision

The subject experts of the working committee and some technical personnel supervised the use of resource materials in schools. They organised several meetings of the subject teachers and held discussions on the activities carried out in classes every day during their supervision visits, the purpose of which was to provide feedback and technical support to the teachers to improve their performance in teaching. On the basis of the field supervision, some suggestions were also collected for improving resource materials, which were taken into consideration during the improvement phase of the resource materials.

Conduct of Review Meeting

A two-day review meeting was held for the teachers of each project district by the technical personnel of IUCN. At the meeting, the teachers presented a report on the resource materials that covered environmental activities in and outside of classes, effectiveness, problems and their possible solutions. The presentation was followed by a group discussion led by the project personnel.

Conduct of Evaluation Workshop

sA five-day evaluation workshop was conducted at the central level to assess the overall activities of the project. A total of 10 headmasters, 38 teachers from ten schools of three districts and 13 subject specialists and environmental

experts were present at the workshop. The group leader of each district presented the group report and intensive discussions were held on the effectiveness of the resource materials in terms of their contents, illustrations, methods, activities, teaching materials, effectiveness and impacts. A list of suggestions for each subject and class was prepared to incorporate into the resource materials during their revision.

1.2 Focus of the Study

The Environmental Education for Primary Schools Project was implemented on an experimental basis for one complete academic year in ten schools of three districts (Kathmandu, Dhankuta and Dang) with the view of pilot testing the resource materials prepared for primary schools. In this context, it was necessary to carry out an evaluation study to determine the effectiveness of the project activities. Consequently, this evaluation study was designed to be conducted along with the pilot testing of the resource materials.

1.3 Objectives of the Study

The objectives of the study were:

- to assess the effectiveness of the environmental education teachers' training;
- to appraise the use of environmental curriculum and resource materials in classes;
- to determine the impact of the environmental education resource materials on teachers, students, parents, schools and the community; and
- to test the students' knowledge of and attitudes towards the environment.

1.4 Major Components of the Study

There were a number of project activities which were carried out during the pilot testing of the resource materials. The main components of the project were assessed in terms of the impacts of the project's activities on teachers, students and the community. Some indicators of the impacts were measured in

the form of opinions, and others in the form of data. The main components of evaluation are as follows:

(a) Environmental Education Training
(b) Resource Materials
(c) Environmental Education at School Level
(d) Environmental Education at Community Level
(e) Learning Outcomes of Students:
    (i) Knowledge of Students on the Environmental Contents
    (ii) Attitude of Students Towards the Environmental Contents

CHAPTER 2

Methodology

This chapter on methodology of the study is presented under four main sub-headings : study sample, study instruments, data collection methods and data analysis procedure.

2.1 Study Sample

In describing the study sample, the report deals with the population of the study, sampling strategies and sample size. This study was conducted in all the project schools of three districts. In addition, ten other schools were also selected as control schools for the study.

2.1.1 Population

The population of the study consisted of teachers, students and parents of the selected ten experimental and ten control schools from the three districts. The focus of the study was on the students of classes 1 to 5. The distribution of aggregate students, teachers and parents of the experimental and control schools is given in the table below.

Table 2.I: Distribution of Students of Experiment and Control Schools

Type of schools	Students	Class I	Class 2	Class 3	Class 4	Class 5	Total I-5
Experiment	Boys	495	266	247	248	205	1461
	Girls	283	153	138	150	125	849
	Total	778	419	385	398	330	2310
	Per cent	34	18	17	17	14	100
Control	Boys	431	313	282	247	210	1483
	Girls	235	196	140	159	124	852
	Total	666	509	422	406	334	2337
	Per cent	30	23	19	18	15	100

2.1.2 Sampling

The procedures of the sampling are as follows:

- As some of the schools had more than one section in one class, only one section from each class was chosen on a random basis.
- A maximum of thirty students from the selected classes were chosen randomly.
- Approximately ten percent of the parents of the students who took the test were included in the study sample. However, the parents of Kathmandu were not included in the study because of the difficulty in contacting them.
- The teachers of the selected classes were involved in the study.

2.1.3 Sample Size

The teachers, students and parents were the respondents of the study, and were chosen randomly. The sample size of the study was as follows :

Table 2.2 : Distribution of Schools, Teachers and Parents

Type of schools	No. of schools	No. of Teachers	No. of Students	No. of Parents
Expt.	10	50	2310	150
Control	10	50	2195	-

2.2 Study Instruments

Four types of instruments were used in the study: achievement tests, attitude tests, interview schedules for teachers, and interview schedules for parents.

2.2.1 Achievement Tests

Achievement tests on the environment were developed for classes 1 to 5. These tests were basically designed to determine the knowledge of the students in the primary level. The distribution of questions and sub-items of the tests are shown in the table below.

Table 2.3: Distribution of Questions and Sub-Items of Achievement Test

Class	Questions	Sub-Items
1	19	59
2	23	79
3	25	75
4	22	79
5	19	74

During the test development process, efforts were made to cover the major concerns of the environment with respect to the level of primary students. Tests which were titled "Attitude and Achievement Test" were developed for each class and published. The main areas covered by each test are given below.

Class 1

Family, temples, safety, personal hygiene, cleanliness of room, clean and waste materials, nests and trees, vegetables, planting trees, domestic and wild animals, animals and their habitats, festivals, water resources, clean water, fruits, cleanliness inside and outside the house, and good habits.

Class 2

Natural resources, personal hygiene, use of toilets, need for clean classrooms, keeping villages and rivers clean, proper use and saving of fuel, use of dustpits, ways of keeping school clean, benefits from forests and their protection, environmental terms, identification of wild animals and birds, habitats of animals, birds and their food, population and environment, cattle

grazing in the forest, clean drinking water, sources of drinking water and food, classification of grains and vegetables, concept of sugar mills, personal hygiene, and musical instruments.

Class 3

Situation of a dirty classroom, care of plants, need for cleanliness of school, houses and temples, using dustpits, keeping toilets clean, how to keep temples and their surroundings clean, identifying and protecting birds, environmental terms, importance of water, how to keep surroundings of taps clean, keeping spring water sources and wells clean, benefits of animals, man and the environment, sculptures, cultural activities, sun, pollution from vehicles, and personal hygiene.

Class 4

How to keep houses clean, public places and their protection, environmental terms and their usage, importance of toilets, keeping schools clean, protection of animals, role of plants in the food chain, photosynthesis, control of soil erosion, plantations in school compounds, making compost, need of manure for plants, humans and animals, healthy and polluted food, air pollution, role of people in protecting the environment, preservation of valuable archaeological items such as doors, windows, drawings and artifacts, and the sun as a source of energy.

Class 5

Need for and means of keeping houses clean, public resources, solid waste, waste water, environmental terms and their usage, protection of birds and animals, destruction of forests and their protective measures, national parks and reserves, relationship between humans and plants, importance of water resources, river pollution, watershed management, soil erosion, industrial pollution, cultural heritage, tourism development and its impact on the environment, environmental protection, environment of villages, relationship between plants and animals, protection of living beings and natural things and their surroundings, protection of water resources, description of the environment of a village, a brief description of the mountain and Terai regions, and role of the sun in the preparation of food of plants.

2.2.2 Attitude Tests

Attitude tests on environmental education for classes 1 to 5 were developed.

The purpose of the tests was to measure the perception of the students on the environment. The distribution of questions and sub-items of the tests are shown in the table below:

Table 2.4: Distribution of Questions and Sub-Items of Attitude Tests

Class	Questions	Sub-Items
1	16	25
2	14	25
3	15	39
4	12	46
5	12	50

One of the main objectives of environmental education is to develop positive attitudes in the feelings of students towards the environment. In this regard, a number of test items based on the following items were developed to measure the attitudes of the students towards the environment before and after the project inputs.

Class 1

Clean and dirty houses, dumping of waste materials, plants and their protection, relationship between plants and animals, usefulness of plants, care of animals and birds, size of family, festivals, clean and dirty water, sources of food, environment friendly and unfriendly activities.

Class 2

Houses with and without gardens, friendly and unfriendly activities related to the environment, use of toilets, dumping of solid waste, deforestation, population and food, concept of balanced population, water pollution, industrial pollution, proper location of industry, cultural activities, water resources, environment of a village or a town.

Class 3

Health, clean houses, different activities relating to the environment, health and dirty house, contamination of river water by solid waste, animals and grazing lands, some features of the environment reflected in the map of Nepal, environmental terms and their usage, protection of water resources, pollution of well water, ways of keeping the surroundings clean, smoke,

pollution, handicrafts, temples, sculptures and their preservation.

Class 4

A house with a good garden, a house surrounded by filthy materials, a dirty school, cleanliness of schools, cleanliness of wells and taps, dirty ground, cleanliness of religious sites, environmental terms and their usage, proper dumping of wastes, destruction of forests, making terrace land and drainage system, clean drinking water, dumping of waste in wells, ponds and rivers and their effects, protection of plants, air pollution, saving fuel, keeping the surroundings clean, dirty food and their effects, destruction of plants, construction of roads, planting of trees, dumping waste in pits, cleanliness of compounds and pollution through industry and vehicles.

Class 5

A clean house with garden, environmental terms and their usage, public places such as ponds and lawns, dirty food and effects on health, water-borne diseases, the sun, clean and dirty houses, control of landslides, preservation of culture such as valuable songs, fashions, customs and heritage, tourism development and its impact on the environment, noise pollution, relationship between humans and plants, population growth and the environment, environment of village or a town, soil erosion and protection.

2.2.3 Interview Schedule for Teachers

An interview schedule for teachers was developed to determine the teachers' perceptions on the resource materials that were pilot tested in their schools and overall environmental education activities. This interview schedule consisted of eleven items. The questions were based on the following points (refer to Annex 1.5 for the Interview Schedule for teachers) described below.

Teachers' experience on the usage of resource materials in the classes, usefulness of the training, contribution of environmental education to change the teachers' behaviour, problems and constraints faced during the use of materials, suggestions for the effective use of resource materials, impact of environmental education on the school, contribution of environmental education to changes in students' behaviour, impact of environmental education on students' houses and the community or village level, possible environmental education programmes for school and community, and other suggestions relating to the environment.

2.2.4 Interview Schedule for Parents

An interview schedule for parents was designed to identify their opinions on the environmental education programme launched at school on a trial basis, and to explore any changes that occurred in their villages or communities. This interview schedule consisted of eight questions that were related to the following areas (refer to Annex 1.6 for the Interview Schedule):

Awareness of the environmental education programme initiated at the school, the environmental knowledge acquired by students, changes brought about in students by environmental education, any changes observed in the village or community as impacts of environmental education, expected knowledge and behaviour of students from environmental education, anticipated impacts of environmental education on the village or community, and other suggestions regarding the environment.

2.3 Data Collection Procedures

The procedures adopted in administering various tests and interview schedules are described in this section.

2.3.1 Administration of Tests

The technical staff of the project visited the selected schools and collected some general information such as student data and physical facilities. The team then randomly selected students from each class to test them. They conducted the pre-test in mid-February before providing the resource materials. After the pre-test, the students received the environmental education resource materials. The team again administered the post-test to the same group of students at the end of the academic session (i.e. the end of November).

2.3.2 Interview of Teachers

During the post-test administration, the field staff held informal discussions with the headmasters and teachers on environmental education. The teachers who had been involved in the implementation of the project activities were interviewed according to the interview schedule. The information obtained during the course of the discussions and interviews was recorded.

2.3.3 Interview of Parents

Members of the study team visited the houses of selected parents to study the environment of their houses and their attitudes towards the environmental education programme implemented at the project schools. In the beginning, informal discussions were held with parents and interviews conducted using the interview schedule. The information and suggestions obtained during the discussions, observations and interviews were duly recorded.

2.4 Data Analysis Procedure

The answer sheets of the attitude and achievement test scores were checked by the technical staff of the project. Necessary tabulation sheets were also prepared for data entry. Then, all the scores were entered into the computer to generate the statistical data. The perceptions of the teachers and parents were initially tabulated and, consequently, a number of tables were developed.

The quantitative data of achievement and attitude tests were separately analysed in terms of mean, standard deviation, percentage and maximum and minimum scores. These data were further analysed using the t-test to determine the significant difference of the study groups. The quantitative data of knowledge and attitude were analysed comparing the pre- and post-test scores of the experimental and control schools. The data for classes 1- 5 were analysed on the following basis:

(a) a comparison of the pre-test scores of experimental and control schools;

(b) a comparison of the post-test scores of experimental and control schools;

(c) a comparison of pre- and post test scores of experimental schools; and

(d) a comparison of pre- and post-test scores of control schools.

Qualitative information, obtained through the observation of classroom activities and perception of the teachers and parents was also incorporated in analysis while interpreting the data.

The perceptions of the teachers and parents were analysed through content analysis techniques. The main response categories were identified to group their responses. The perceptions of the teachers and parents were quantified by a number of respondents and their respective percentages. The information thus obtained was further interpreted.

CHAPTER 3

Teachers' Training and Resource Materials

This chapter deals with the effectiveness of teachers' training and resource materials, use of resource materials in classes, difficulties faced during the use of resource materials, and suggestions for their improvement. The project school teachers and resource persons at the field level received the twelve-day environmental education training and periodic feedback from the project staff. They used the resource materials in classes for one academic year. The opinions of a total of 31(62%) teachers - 11 from Kathmandu, 10 from Dhankuta and 10 from Dang, on the effectiveness of the teachers' training and resource materials of the environmental education programme were solicited through interviews.

3.1 Effectiveness of Teachers' Training

Towards the end of the environmental education programme, the teachers who received the training were asked to assess the effectiveness of the training. They expressed the opinion that the training was useful to them in a number of ways. The various useful aspects of the training as perceived by the teachers are given in Table 3.1:

Table 3.1 Usefulness of the Environmental Education Training

Useful Aspects	No. of Respondents	Percentage
Developed the knowledge and skills of teaching environmental education at primary school.	28	90
Acquired the skills of preparing lesson plans and developing teaching learning activities and planning field trips for developing students' knowledge, skills and attitudes regarding environmental concerns.	25	80
Learnt the basic concepts of environmental education, teaching methods and evaluation techniques.	22	71
Realised the need for environmental education at the school level.	19	61
Total Respondents	31	100

As shown in Table 3.1, the teachers developed a positive attitude towards the need for environmental education at the school level. They developed their capability for teaching environmental education to primary school students with proper planning of lessons and conducting practical activities.

3.2 Effectiveness of Resource Materials

Pilot schools received environmental education resource materials at the beginning of the academic year. The trained teachers used these resource materials in teaching environmental education to the children for one academic year. They gained practical experience in the use of resource materials in the classes. In this regard, they were asked to assess the effectiveness of the resource materials. Their perceptions on the effectiveness of the resource materials are given below.

School teachers involved in practical activities

Table 3.2 Teachers' Perception on Resource Materials

	No. of Respondents	Percentage
Environmental education resource materials include environmental contents, practical activities, problems and cases, pictures and guidelines related to environmental conservation. They are attractive, interesting, simple and useful for teachers and students.	28	90
Students prefer to study environmental resource materials as compared to other textbooks.	26	84
The contents of the resource materials are clearly presented and the activities given are practical.	24	77
Resource materials have helped to promote the knowledge of teachers about environmental concerns such as animals, birds, social customs, values and their significance and conservation.	23	74
Students developed knowledge on environmental concerns such as plants, animals, birds, land, culture, sanitation and protection of the environment.	23	74
Resource materials are relevant to primary level students.	20	64
Resource materials contain simple and practical activities followed by illustrations which enhanced the quality of the text and also made it easy to teach these lessons in classes.	18	58
Total Respondents	31	100

The teachers felt that the resource materials were relevant to primary teachers and students for developing their knowledge of and attitudes towards the environment. They found that the activities given in the resources materials were simple and practical. The illustrations were clear, and facilitated students' understanding of the contents.

3.2.1 Use of Resource Materials in Classes And Difficulties Faced

Teachers used the resource materials to teach students for one academic year. During that period, the technical personnel of the project provided guidance for effective teaching through organisation of environmental education activities, class observations and conducting feedback sessions for teachers. The teachers were interviewed on difficulties that they might have faced in the course of using the resource materials. Out of 31 teacher, only twelve (39%) faced some difficulties while using the resource materials in classes. These difficulties are given below.

- Some of the illustrations such as pictures showing ponds, waste materials and dust were not clear, and were difficult to explain.
- Some exercises of the lessons such as field observations and report preparation, were difficult to carry out due to time constraints.
- Resource materials included some difficult words such as pollution, deterioration, and conservation. They could not be explained to make students understand their meanings.
- Some of the activities mentioned in the teachers' directives, such as field work and preparation of the report were difficult and could not be performed.

According to the teachers, they found that some illustrations were not as clear as needed to facilitate the students' understanding of the concepts given in the texts. Some the words such as pollution, deforestation, erosion and conservation were difficult for students to understand. Some of the exercises and activities such as report preparation, picture drawing, and collection of information from the field could not be performed effectively.

3.2.2 Suggestions for Improvement of the Resource Materials

The teachers from the project schools used resource materials in classes and performed several field activities for students. Therefore, they were asked to give suggestions for the improvement of the resource materials if necessary. The suggestions are given in table 3.3.

Table 3.3 Suggestions for Improvement of Resource Materials

Suggestions	No. of Respondents	Percentage
Some resource materials containing contents and illustrations of the local context should be prepared.	21	68
Audio-visual materials supporting the contents of the resource materials should be available.	17	55
Reference materials written about the local context should be available.	11	35
Resource materials should have colour illustrations to make them clear and realistic.	8	26
Posters and charts relevant to the environment should be available.	7	22
Provision for field trips for students on the environment should be made.	6	22
Total Respondents	31	100

The teachers felt the need for some reference materials which reflected the local environmental context. They felt the necessity for supplementary materials, such as references, charts, posters and audio-visuals for the enrichment of the resource materials. About a quarter of the teachers suggested making all the materials available in colour, as such materials will reflect clearly the context of the environment.

3.3 Summary

3.3.1 Effectiveness of Teachers' Training

Teachers felt that the 12-day teachers' training on environmental education helped them to develop their knowledge and skills for teaching environmental education in primary schools. They recognized the need for environmental education for primary school children and felt that they learnt the basic concept of environmental education, teaching methods and evaluation techniques. They developed the skills for preparing lesson plans and teaching activities in regard to developing students' knowledge, skills and attitudes towards the environment.

3.3.2 Effectiveness of the Resource Materials

Teachers found the environmental education resource materials to be useful for both themselves and the students. According to them, these materials helped increase their knowledge of the environment and were found simple and interesting. The presentation of the contents of the resource materials is clear and the activities given are practical. Most of the illustrations given in the resource materials are clear, which also enhanced the quality of the materials.

3.3.3 Use of Resource Materials in Classes And Difficulties Faced

Teachers found that a few illustrations used in the resource materials were unclear and difficult to explain. The resource materials contain a few words which were found difficult for students. A few exercises in the books and activities given in the teachers' directives were also found difficult to perform.

3.3.4 Suggestions for Improvement of the Resource Materials

Teachers suggested preparing additional resource materials that include contents and illustrations relevant to the local context. They also felt that the materials should be in colour to make them clear and realistic. They suggested preparing audio-visual materials on relevant aspects of the local environment, and that different types of posters and charts be available to make teaching environmental education effective. They also felt the need for organising environmental field trips for student.

CHAPTER 4

Communities and Schools

The environmental education programme was implemented in the primary schools and was designed for teachers and students. The teachers and students performed different types of environmental education activities related to teaching and learning environmental education in school. Since teachers and students were in close contact with the community in their areas, the teachers were asked to assess the impact of environmental education on schools and the community. Efforts were also made to assess the feelings of the parents regarding environmental education.

4.1 Impact of Environmental Education Programme on the Community

Although no direct inputs were provided to the community as such, environmental education provided some impacts on the community through children and teachers involved in the programme. In this regard, it was important to assess the impact of environmental education on the community as well. Therefore, both teachers and parents were asked about the impact of environmental education on the community.

The teachers felt that environmental education contributed, to some extent, in developing a positive attitude of people in the community towards the importance and conservation of the environment. The teachers' feelings are given below.

Table 4.1 Impacts of Environmental Education on Community

Types of Impacts	No. of Respondents	Percentage
Realisation the importance of plants and animals and felt need for taking care of them.	24	77
Felt need for keeping the village clean through a cooperative approach of the community.	19	61
Perception of the need for implementing environmental protection measures to control environmental degradation.	16	52
Total Respondents	31	100

According to the teachers, an impact of the programme on the community was that people realised the importance of environmental conservation at the local level. This means that the programme helped make the community aware, to some extent, of the importance of environmental protection.

Out of the 176 parents interviewed, 90 per cent (160) of the parents were aware of the environmental education programme implemented in schools. These parents felt the need for environmental education for the whole community. In this regard, they suggested that the community be aware of the following aspects of the environment, given below.

As a result of environmental education classes school compound look much cleaner

Table 4.2 Suggested Environmental Aspects for the Community

Environmental Aspects	No. of Respondents	Percentage
Development of the concept of the need for protecting public places such as ponds, land, lawn and heritage sites.	42	24
Development of the concept of the need for preserving cultural heritage and traditional customs.	42	24
Development of the concept of the importance of the environment and the need for cooperative approach to environmental conservation.	40	23
Development of a system of tree plantation each year in the community through local initiatives, and making the necessary provisions for their protection.	38	21
Development of the feeling for the need for clean drinking water, and taking necessary local measures to keep drinking water clean.	36	21
Development of the concept of the need for protecting animals and birds in the community.	36	24
Development of a cooperative feeling among individuals in the community regarding environmental protection.	33	18
Total Respondents	176	100

The programme had a general impact on the community regarding their awareness of environment conservation. However, the parents felt that the community should be aware of the need for environmental protection. They suggested that the community feel the need for developing a proper system of tree plantation and tree protection through a cooperative approach. As water is an important part of the environment and also an important factor in sanitation, the community should be aware of the measures of keeping drinking water clean.

4.2 Impact of Environmental Education Programme on Schools

The main target group of the environmental education programme was students. The teachers implemented the programme at the schools with the support of the project personnel. It was necessary to know to what extent the programme contributed to changing the students' behaviour and perceptions of

the teachers of the environment. Therefore, in this section the impacts of environmental education on the schools' environment and teachers' perceptions were assessed through the analysis of the teachers' views. The impacts as perceived are given below under each separate heading:

4.2.1 Change in School Environment

The teachers noticed that the environmental education programme helped to improve the environment of the schools themselves. The following are some of the changes observed in the school environment.

Table 4.3 Changes in the School Environment

Aspects of School Environment	No. of Respondents	Percentage
Improvement in the cleanliness of the school compound and its surroundings.	27	87
Change in the students' behaviour in the use of toilets.	21	68
Students began to help keep the school compound and toilets clean.	18	58
Students began to throw waste paper and waste materials in pits or their proper places.	15	48
Students took the initiative to take care of plants in and around the school.	10	48
Students began to take the initiative in making flower and kitchen gardens.	8	26
Total Respondents	31	100

The teachers noticed the change in the cleanliness of the school compound and its surroundings as the students began to throw waste paper and dirty materials in pits. The students realised the need for cleanliness in schools and also began to use the toilets properly. They initiated taking care of plants, flowers and kitchen gardens. Some of them also began to make flower and kitchen gardens.

4.2.2 Change in Teachers' Perception on the Environment

The inputs such as training and resource materials helped to develop positive feelings of the teachers towards environmental education. Therefore, efforts were made to determine teachers' perception of training and resource materials. Their perceptions are as follows.

Table 4.4 Teachers' Perceptions on the Environment

Perceptions	No. of Respondents	Percentage
Developed knowledge, attitude and skills regarding the environment.	27	87
Developed concept of the need for protecting birds and animals and conserving the environment through controlling the destruction of forests and proper utilisation of resources.	26	84
Realised the need for a balanced system in the environment.	24	77
Realised the need for preserving cultural values and traditional customs.	23	61
Increased awareness of the importance of the environment and the need for its conservation.	17	55
Developed concept of the need for environmental education for children.	15	48
Realised the need of environmental education for community.	15	48
Total Respondents	31	100

The teachers developed their knowledge of and attitude towards the environment. They felt the need for the preservation of animals and birds through the conservation of natural resources. They realised the importance of cultural values and traditional customs and began to think about their preservation. They perceived the need for maintaining the ecological balance for healthy environment. They also realised the need for providing environmental education for school children and community people.

4.3 Summary

4.3.1 Impact of Environmental Education on Community

The environmental education programme helped the community to realise the importance of the environment and the need for its protection. The community felt the need for keeping their village clean by their own initiatives.

Ninety percent of the parents were aware of the school environmental education programme. They realised the need for environmental education for community people to make them aware of the importance of healthy environment and the importance and methods of its protection.

4.3.2 Impact of Environmental Education Programme on Schooi

The teachers opined that the environmental education programme contributed to the improvement of the environment of schools. The improvement has been in the cleanliness of the school compound and its surrounding. The students began to help their schools remain clean through keeping waste papers and dirty material in their proper places. They also began to use toilets properly. They felt the need for taking care of plants, orchard and kitchen garden.

4.3.3 Change in Teacher's Perception of Environment

The environmental education programme helped to develop teachers' knowledge, skills, and positive attitude towards the environment. They felt the need for protecting birds and animals. They realised the need for conserving the environment through controlling deforestation and proper utilisation of natural resources. This programme raised the teachers' awareness of the importance of the environment and its conservation. They also felt the need of environmental education for children and community people.

Some schools have recognised the value of tree planting

CHAPTER 5

Perception of Teachers and Parents

The environmental education programme was implemented in schools with the objective of testing educational materials and their teaching strategies. Along with the teaching in the classes, a number of practical activities were conducted to achieve the objectives set in the curriculum. The students were the main beneficiaries of the programme. In this regard, the impact of environmental education on the students was assessed through the observation made by the parents and teachers.

The parents were asked to express their expectations of their children from the environmental education in terms of knowledge, attitude and behaviour. They were also interviewed on their observation of the changes in their children's knowledge, attitude and behaviour as impacts of the environmental education programme. In addition, the teachers were also asked about the changes in knowledge, attitude and behaviour of students. The opinion of parents and teachers are classified in the categories of knowledge, attitude and behaviour in the following paragraphs:

5.1 Expected Knowledge of Students

The parents expected that their children should acquire the knowledge of the environment. Their expectations are given below:

Table 5.1 Expected Knowledge of Students

Types of Expectations	No. of Respondents	Percentage
Development of the concept of importance of plants and need for their proper care.	136	77
Provide the knowledge of the environment and develop the concept of the need for its conservation.	120	68
Be conscious of the personal cleanliness.	100	57
Development of the concept of throwing rubbish and waste materials into pits or other proper place.	18	10
Total Respondents	176	100

The parents felt the need for developing the knowledge of their children of the environment and skills for its conservation. Being conscious of the need of cleanliness, they wanted to develop in their children the concept of throwing rubbish in their proper places.

5.2 Expected Behaviour of Students

The parents expected their children to develop proper behaviour related to the environment. The expected environmental friendly behaviours of the students are given in the table below:

Table 5.2 Expected Behaviour from Students

Types of Behaviour	No. of Respondents	Percentage
Throwing waste materials or dirty materials in pits or proper places.	120	68
Development of the concept of the importance of animals and need for their protection.	114	65
Need for keeping their houses and its surroundings clean.	113	64
Development of proper habit of behaving properly with the domestic and wild animals and feel the need for protecting them.	64	36
Be supportive in the activities of the protection of plants and develop the habit of using their products properly.	25	14
Mutual cooperation with each other regarding environmental protection.	17	9
Total Respondents	176	100

Some of the parents' expected behaviours of children are similar to the expected knowledge. The parents wanted their children to develop the habit of taking care of personal hygiene. They should behave properly with animals and take their care too. They should throw the wastes into a fixed place and keep the house and its surroundings clean. They should be aware of the importance of the environment and its protection through mutual cooperation.

5.3 Change in the Knowledge of Students

Parents mentioned that the environmental education programme was useful for students. They noticed that their children acquired some valuable knowledge of the environment. They are as follows:

Table 5.3 Students' Knowledge of Environmental Education

Students' Knowledge	No. of Respondents	Percentage
Students felt the need for keeping their houses and its surroundings clean.	115	72
Students realised the importance of plants and their protection.	61	38
Students learnt the importance of personal cleanliness and were conscious of personal hygiene.	33	21
Students realised the need for preservation of social values, customs and culture.	15	9
Total Respondents	176	100

Students developed their knowledge of the importance of the cleanliness of their house and its surroundings. They perceived the importance of plants and their protection. They realised the importance of personal hygiene and social values and culture. These are closely related to the parents' expected knowledge of their children.

5.4 Change in the Behaviour of Students

The parents of the children in the project schools also noticed the changes in behaviour of their children. As reported by the parents, the following were the changes in behaviour :

Table 5.4 Changes in Students' Behaviour as Observed by Parents/ Guardians

Types of Students' Behaviour	No. of Respondents	Percentage
Development of the habit of throwing waste or dirty material in pits or proper places.	128	79
Help parents keep the house and its surrounding clean.	108	67
Conscious of personal cleanliness.	60	37
Use the toilet properly and help keep it clean too.	22	12
Enthusiastic to plant trees and protect them.	19	11
Interested in making flower beds and kitchen gardens.	8	4
Total Respondents	161	100

The observation made by the parents regarding the change in students' behaviour is very similar to teachers'. The changed behaviour is in tune with the parental expectations. It indicates that the observation of the teachers and parents of the change in behaviour of students is very close to each other.

Not only the parents but also teachers were asked about their perception regarding changes in students' behaviour towards the environment. The teachers observed some changes in behaviour of the students after the implementation of the environmental education programme. The main changes in behaviour of the students are as follows:

Table 5.5 Changes in Students' Behaviour as Observed by Teachers

Types of Students' Behaviour	No. of Respondents	Percentage
Students behave positively about the various aspects of environment.	28	90
Students realised the need of cleanliness in and outside their school and helped to keep the school clean.	26	84
Students began to use toilets properly and helped keep it clean too.	22	71
Students developed the curiosity to learn about the environment and plants, animals, birds and began to take care of them.	22	71
Students are conscious of dirty materials or solid waste and throw these in pits or proper places.	20	64
Students developed the cooperative concept regarding environmental protection.	20	64
Total Respondents	31	100

According to teachers, students developed their knowledge of, attitude towards and skills for environmental care. They realised the importance of cleanliness in their schools and in the toilets. They felt the need for clean water and fresh food for good health. They realised the need for taking various measures of environmental protection through a cooperative approach. As mentioned in Table 5.5 there are six broad parental expectations regarding behaviour of the students, three of them are directly related to bringing about a change in students' behaviours whereas three are indirectly linked. Overall, the programme contributed to some extent to achieve the expectations of the parents.

The teachers were also asked to assess the impact of the programme on the student's behaviour as noticed in their house. The student's behaviour noticed by teachers are as follows:

Table 5.6 Impacts of EE on Students' Behaviour as Observed by Teachers

Students' Behaviour	No. of Respondents	Percentage
Students felt the need for keeping their houses clean and began to help their parents keep the houses clean.	25	81
Students initiated to make flower beds and kitchen gardens in their houses and take care of them as well.	23	74
Students began to use toilets in their houses properly and helped their parents keep them clean.	20	64
Students in their houses began to throw waste material or rubbish in pits or their proper places.	18	58
Some of the students also told their parents about the importance of the environment.	10	32
Total Respondents	31	100

The students' behaviours were to some extent translated in practice. They realised the importance of the cleanliness of their houses and began to help their parents keep them clean. They began to throw rubbish in pits and helped their parents keep the surroundings of their houses clean. They developed interest in the plantation of flowers and making kitchen gardens in their houses.

5.5 Change in the Attitudes of Students

In the opinion of the experimental school teachers environmental education programme was helpful in changing the students' attitude as well. Their responses are summarised in the table below.

Table 5.7 Changes in the Attitude of Students as Perceived by Teachers

Types of Students' Attitude Changes	No. of Respondents	Percentage
Students felt the need to know about the environment.	17	55
Students were conscious of drinking water and felt the need of fresh and clean water for good health.	10	32
Students realised the need of fresh and clean food for good health.	7	29
Total Respondents	31	100

The parents noticed that their children developed some important concepts regarding the environment. These are given below:

Table 5.8 Changes in Attitudes of Students as Perceived by Parents/ Guardians

Types of Students' Attitude Changes	No. of Respondents	Percentage
Children felt that the plants are important and they should be protected.	60	53
Children felt the need of cleanliness in and outside their houses for healthy life.	80	45
Children were found conscious of the personal hygiene and cleanliness.	60	34
Children were interested in making flower gardens and kitchen gardens around their houses and also began to take initiatives in this regard.	18	10
Children understood the importance of public places, cultural heritage and felt the need for their preservation.	9	5
Total Respondents	176	100

The students developed a positive attitude towards the importance of the environment. They realised the importance of personal hygiene and cleanliness of their house. They perceived the importance of cultural heritage sites and felt the need for their preservation.

5.6 Summary

5.6.1 Expected Knowledge of Students

The parents expected their children to know the importance of the plants and animals and need for taking their care. They should develop knowledge of the environment and its conservation. They should be conscious of personal hygiene and feel the need for keeping their houses and surroundings clean.

5.6.2 Expected Behaviour of Students

Parents expected their children to develop the habit of throwing waste materials and rubbish in pits or their proper places. They should behave properly towards animals and feel the need for protecting plants. They should cooperate with each other to protect the environment.

5.6.3 Change in the Knowledge of Students

The parents observed that their children learnt the need for keeping their house and its surroundings clean. They realised the importance of plants and their protection. They learnt the importance of personal cleanliness and were also conscious of their personal hygiene. They also felt the need for preservation of social values, customs and culture.

5.6.4 Change in the Behaviour of Students

The teachers observed that the students developed their knowledge, attitude and skills regarding the environment and felt the need for knowing about the environment. They were conscious of the protection of the environment and became cooperative in environmental protection. The students realised the need for keeping their schools neat and clean and began to help in this effort. They began to use the toilets properly. They were conscious of dirty materials or solid waste and began throwing them in their proper places. They also realised the need for clean and fresh water and food for good health.

5.6.5 Parents' Observation/Changes in Students' Behaviour

The parents observed that their children developed the habit of throwing waste

materials into pits or their proper places. They helped the parents keep their houses and surroundings clean. They became conscious of personal hygiene and also began using toilets properly which helped in keeping them clean. They felt the need for the protection of plants and were interested in making orchards and kitchen gardens.

5.6.6 Change in Attitude of Students

The teachers pointed out that students felt the need for being aware of the importance of the conservation of the environment. They also felt the importance of fresh and clean drinking water and food for good health.

The parents noticed that their children felt the need for the protection of plants. They felt the need for cleanliness in their house and its surroundings. They were conscious of personal hygiene. They were interested in making orchards and kitchen gardens. They realised the importance of public places, cultural heritage and felt the need for their preservation.

CHAPTER 6

Change in Students' Knowledge

This chapter of the report on student's achievement includes analyses of the knowledge and attitude scores. A comparative analysis of the data of the pre- and post-tests of experimental and control schools has been made. Specifically, the data of students from classes 1 to 5 are presented in the following ways:

(a) a comparison of the pre-test scores of experimental and control schools;
(b) a comparison of the post-test scores of experimental and control schools;
(c) a comparison of pre- and post-test scores of experimental schools; and
(d) a comparison of pre-and post-test scores of control schools.

6.1 Interpretation of Students' Knowledge by Class

The first part deals with the analysis and interpretation of students' knowledge test scores. In this part, interpretation of the data of the control and experimental schools has been presented for individual classes. The interpretation within each class focuses first on the aggregate scores of all the districts and then on the scores of the individual districts.

Class 1

Aggregate Mean Score

The mean scores for class 1 students of all the three districts combined are shown in Table 6.1 and Figure 6.1 below.

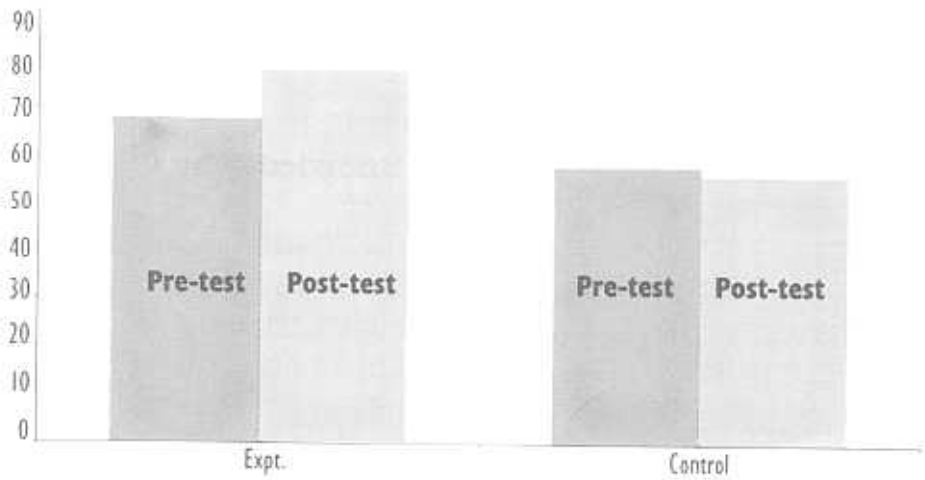
Table 6.1 Aggregate Mean Scores of Class I Students

Test	Type of School		Diff. Score(E-C)	t-score
	Expt.	Contr.		
Pre	67.89	58.06	9.83 (14.48)	6.08
Post	77.84	56.20	21.63 (27.79)	12.30
Diff.(Post-Pre)	9.95 (14.66)	-1.86 (3.20)		
t-score	6.05	1.07		

Note: Figures in the parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

As seen in Table 6.1 and Figure 6.1, the average pre-test score of the experimental schools is higher than that of control schools by 9.83 scores (14.48 %). This score is highly significant. The post test score of the experimental schools is greater than that of control schools by 21.63 (27.79%). The difference in these scores is highly significant. Though the score of the experimental schools was greater than that of the control schools in the pre-test itself, the difference in these scores is two times greater than that in the pre-test

Figure 6.1 Aggregrate Mean Scores of Class I Students



The average score of the experimental schools increased by 9.95 scores (14.66%) in the post-test and this increase is highly significant. On the other hand, the post test score of the control schools decreased by 1.86 scores (3.20%). These data show that the achievement level of the experimental

school students is considerably higher than that of control schools.

Mean Score of Individual District

The mean scores of individual districts are shown in Table 6.2 below.

Table 6.2 Districtwise Mean Scores of Class I Students

District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	69.89	60.08	9.81 (14.04)	3.33
	Post	69.61	55.78	13.83 (19.87)	3.92
	Diff.(Post-Pre)	-0.28 (40.00)	- 4.30 (7.15)		
	t-score	.08	1.41		
Dhankuta	Pre	60.76	58.98	1.78 (2.93)	0.79
	Post	79.48	60.67	18.81 (23.67)	8.42
	Diff.(Post-Pre)	18.72 (30.81)	1.69 (0.69)		
	t-score	9.85	0.69		
Dang	Pre	72.19	53.24	18.95 (26.25)	7.10
	Post	84.38	51.84	32.54 (38.56)	15.06
	Diff.(Post-Pre)	12.19 (16.88)	-1.40 (2.63)		
	t-score	5.74	0.51		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

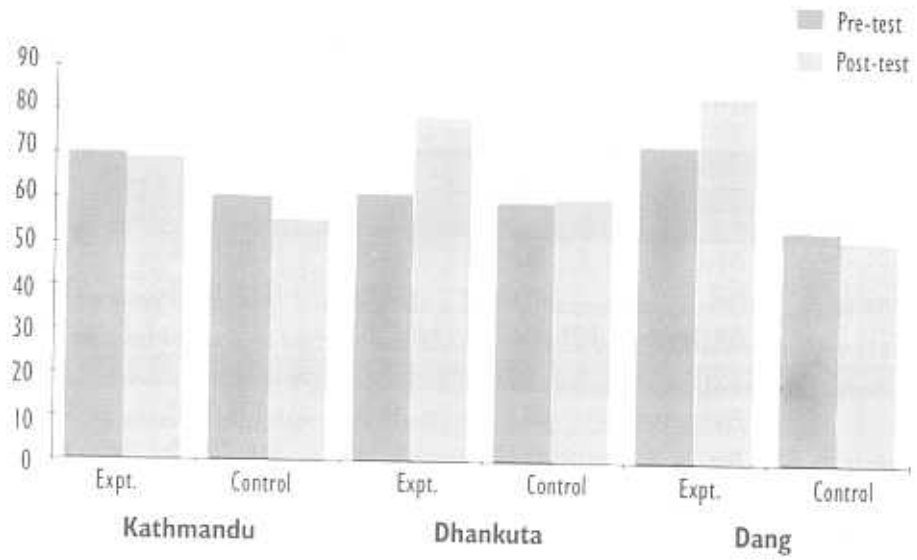
As indicated in the table above and Figure 6.2 below the average pre-test scores for the experimental schools of all the three districts are greater than that of the control schools. The difference in scores is greatest in Dang and is the least in Dhankuta. While comparing the pre-test scores of the experimental and control schools, the pre-test difference in scores of the experiment schools of Kathmandu and Dang were found significantly higher.

The average post test scores for the experimental schools are greater than that of the control schools in all three districts. The difference in scores between experimental and control schools in the post-test indicated that the scores of the experimental schools were found highly significant in all the three districts. That gain score is the highest in Dang which is 32.54 scores (38.56%).

The differences between the post- and pre-test scores of experimental schools of Dhankuta and Dang districts are highly significant. In this regard, there is no gain score for the experimental school students of Kathmandu. However, in the case of control schools of all the three districts, the differences

in scores of the post- and pre-test are negligible.

Figure 6.2 Districtwise Mean Scores of Class I Students



The data show that the performance of class 1 of the experimental school students of Dhankuta and Dang is better than that of control school students. Though the post test score of the experimental school students of Kathmandu district is higher than that of control school students, they could not gain any score in post test.

Class 2

Aggregate Mean Score

The mean scores for class 2 students of all the three districts combined are shown in Table 6.3 and Figure 6.3 below.

Table 6.3 Aggregate Mean Scores of Class 2 Students

Test	Type of Schools		Diff. Score (E-C)	t-score
	Expt.	Contr.		
Pre	36.96	31.02	5.94 (16.07)	2.88
Post	55.26	38.21	17.05 (30.85)	7.26
Diff.(Post-Pre)	18.30 (49.51)	7.19 (23.18)		
t-score	8.10	3.34		

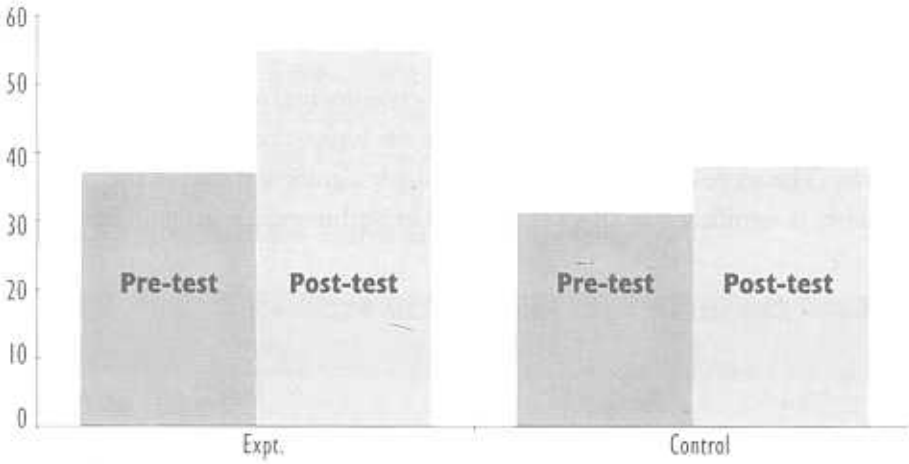
Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The average pre-test score for the experimental schools is greater than that of the control schools by 5.94 scores (16.07%). The difference in scores is significant at .05 level.

The post-test difference in scores for the experimental and control schools is 17.05 scores (30.85%). This difference in scores is highly significant. The difference in scores between experimental and control schools in the post-test is three times higher than their difference in scores in the pre-test.

The gain score for the experimental schools in the post-test over pre-test is 18.30 scores (49.51%). It is highly significant. In case of control schools, the gain score in the post-test over pre-test is 7.19 scores (23.18%) which is also highly significant. However, the gain score for the experimental schools is more than two times that of the control schools.

Figure 6.3 Aggregate Mean Scores of Class 2 Students



Mean Score of Individual District

The mean scores of individual districts are presented in Table 6.4 and Figure 6.4 below.

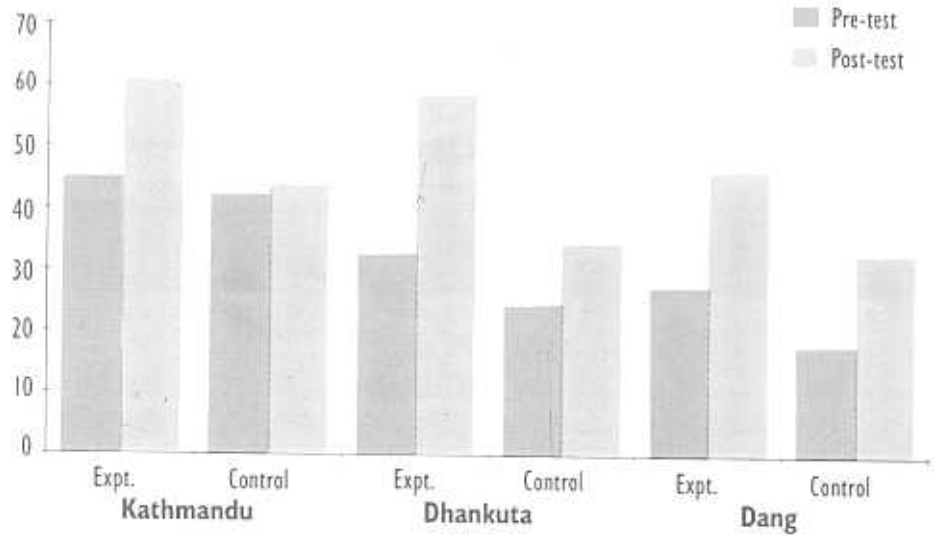
Table 6.4 Districtwise Mean Scores of Class 2 Students

District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	44.94	42.39	2.55 (5.67)	0.85
	Post	60.62	43.49	17.13 (28.26)	4.88
	Diff.(Post-Pre)	15.68 (34.89)	1.10 (0.42)		
	t-score	5.20	0.42		
Dhankuta	Pre	32.79	24.67	8.12 (24.76)	2.39
	Post	58.21	34.30	23.91 (41.07)	8.07
	Diff.(Post-Pre)	25.42 (77.52)	9.63 (39.03)		
	t-score	5.24	2.98		
Dang	Pre	27.57	17.77	9.80 (35.54)	3.44
	Post	46.23	32.72	13.51 (29.22)	3.42
	Diff.(Post-Pre)	18.66 (67.68)	14.95 (84.13)		
	t-score	3.06	5.07		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The difference in scores between the experimental and control schools in the pre-test shows that the score for Dang is the highest compared to other districts. The score difference for Dang is highly significant; that of the Dhankuta is significant at .01 level and that of Kathmandu is insignificant.

Figure 6.4 Districtwise Mean Scores of Class 2 Students



The experimental and control schools of all the districts scored more in the post-test compared to the pre-test. The average post-test scores for the experimental schools are greater than that of control schools. The post-test score difference between the experimental and control schools is highest in Dhankuta. These score differences of all three districts are highly significant.

The comparison between the average pre- and post-test scores within the experimental schools indicates that the increased score of Dhankuta is the highest and in this case, Dang is at the second highest position. The gain scores in the post-test over the pre-test are highly significant in all three districts. In case of the control schools, the gain scores for Dang are the highest; that of Dhankuta are the second highest; and that of Kathmandu are the lowest. The gain scores are, however, highly significant in all the districts except Kathmandu.

These data indicate that although the students of the class 2 of control schools made some achievements, the performance of the experimental school students is much better.

Class 3

Aggregate Mean Score

The mean scores for class 3 students of all the three districts combined are presented in Table 6.5 and Figure 6.5 below.

Table 6.5 Aggregate Mean Scores of Class 3 Students

Test	Type of Schools		Diff. Score (E-C)	t-score
	Expt.	Contr.		
Pre	30.85	29.05	1.79 (5.80)	2.19
Post	48.59	28.48	20.11 (41.39)	10.56
Diff.(Post-Pre)	17.74 (57.50)	-0.57 (1.96)		
t-score	8.77	0.34		

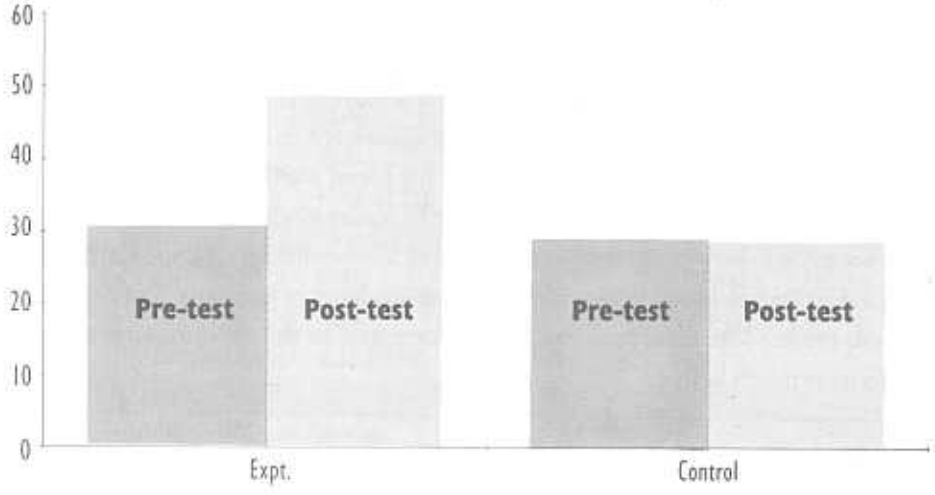
Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test scores of the experimental schools were found to be significantly higher than that of the control schools. The average post-test score of the experimental schools is greater than that of control schools by 20.11 scores (41.39%), which is highly significant.

The gain score of the experimental schools in the post-test over the pre-test is 17.74 points (57.50%) which is highly significant. However, the mean score of the control schools slightly decreased by 0.57 scores (1.96%) in the post-test as compared to the pre-test. It indicates that the achievement level of the

experimental school students is significantly higher compared to the level of the control school students.

Figure 6.5: Aggregate Mean Scores of Class 3 Students



Mean Score of Individual Districts

The mean scores of individual districts are shown in Table 6.6 and Figure 6.6 below.

Table 6.6 Districtwise Mean Scores of Class 3 Students

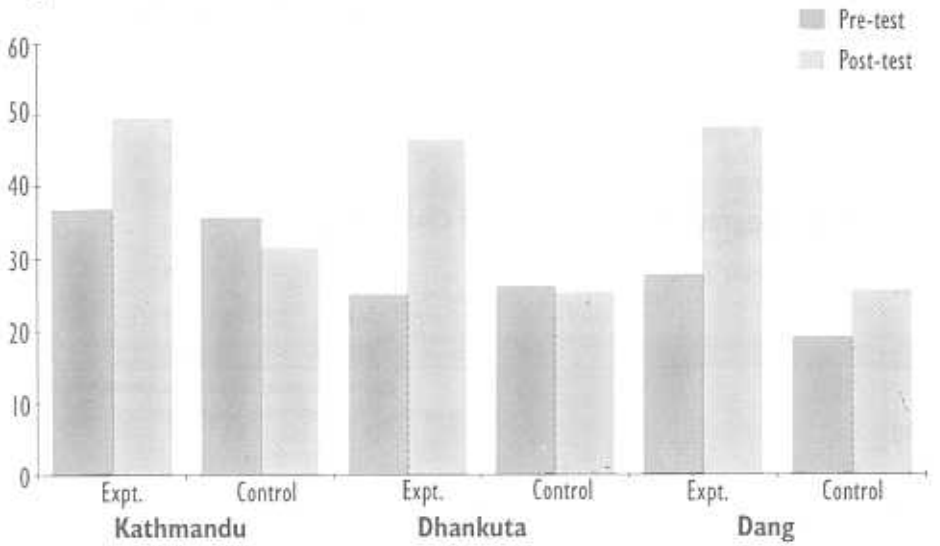
District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	36.95	35.76	1.91 (3.22)	0.37
	Post	49.88	31.63	18.25 (36.59)	6.43
	Diff.(Post-Pre)	12.93 (34.99)	4.13 (11.55)		
	t-score	3.70	1.57		
Dhankuta	Pre	25.04	26.02	-0.98 (3.91)	0.46
	Post	46.75	25.33	21.42 (45.82)	5.41
	Diff.(Post-Pre)	21.71 (86.70)	-0.69 (2.65)		
	t-score	5.50	0.31		
Dang	Pre	27.77	19.07	8.70 (31.33)	3.47
	Post	48.23	25.45	22.78 (47.23)	7.11
	Diff.(Post-Pre)	20.46 (73.68)	6.38 (33.46)		
	t-score	7.16	2.38		

Note: Figures in parentheses indicate respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference of the experimental and control schools is significant for only Dang. The pre-test score difference for experimental and control schools in Kathmandu and Dhankuta are negligible.

The score increase for experimental schools in the post-test over the pre-test is highest for Dhankuta whereas Dang and Kathmandu are in the second and third positions respectively. The score increase for all the districts are significant. On the other hand, in case of control schools, the score increase for all the districts except Dang is insignificant.

Figure 6.6 Districtwise Mean Scores of Class 3 Students



Although the performance of class 3 of control school students of Dang is relatively better than that of the two other districts, the performance level of the experimental schools is much higher than that of control schools of all districts.

Class 4

Aggregate Mean Score

The average scores for class 4 students of all the three districts combined are shown in Table 6.7 and Figure 6.7 below.

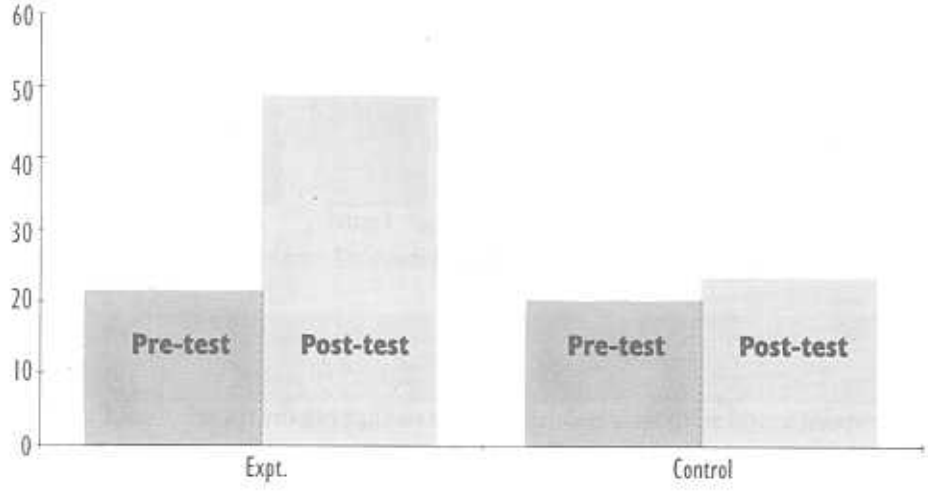
Table 6.7 Aggregate Mean Scores of Class 4 Students

Test	Type of Schools		Diff. Score (E-C)	t-score
	Expt.	Contr.		
Pre	21.62	20.29	1.33 (6.15)	1.02
Post	48.78	23.36	25.42 (52.11)	14.52
Diff.(Post-Pre)	27.16 (125.60)	3.07 (15.13)		
t-score	15.20	2.45		

Note: Figures in the parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The score difference for the pre-test of the experimental and control schools is only 1.33 scores (6.15%). This score difference is not significant. On the other hand their score difference in the post-test was 25.42 scores (52.11%), which is highly significant.

Figure 6.7 Aggregate Mean Scores of Class 4 Students



The score increase of experimental schools in the post-test over the pre-test was considerably greater than that of control schools; this is highly significant. This score increase is nine times more compared to the score increase of control schools. Though the score increase of control schools in the post-test over pre-test is significant, it is relatively small as compared to that of experimental schools.

Overall, though the control school students gained some scores in the post-test, the experimental school students performed significantly better.

Mean Score of Individual District

The mean scores of individual districts are presented in Table 6.8 and Figure 6.8 below.

Table 6.8 Districtwise Mean Scores of Class 4 Students

District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	23.74	22.88	0.86 (3.62)	0.63
	Post	57.19	27.92	29.27 (51.18)	10.93
	Diff. (Post-Pre)	33.45 (140.9)	5.04 (22.03)		
	t-score	11.51	2.62		
Dhankuta	Pre	15.37	17.06	-1.69 (10.99)	1.05
	Post	33.46	18.35	15.11 (45.16)	4.68
	Diff. (Pre-Post)	18.09 (6.32)	1.29 (7.56)		
	t-score	6.32	0.48		
Dang	Pre	24.00	19.11	4.89 (20.37)	2.26
	Post	50..85	20.22	30.63 (60.63)	10.88
	Diff. (Post-Pre)	26.85 (111.87)	1.11 (5.81)		
	t-score	9.90	0.51		

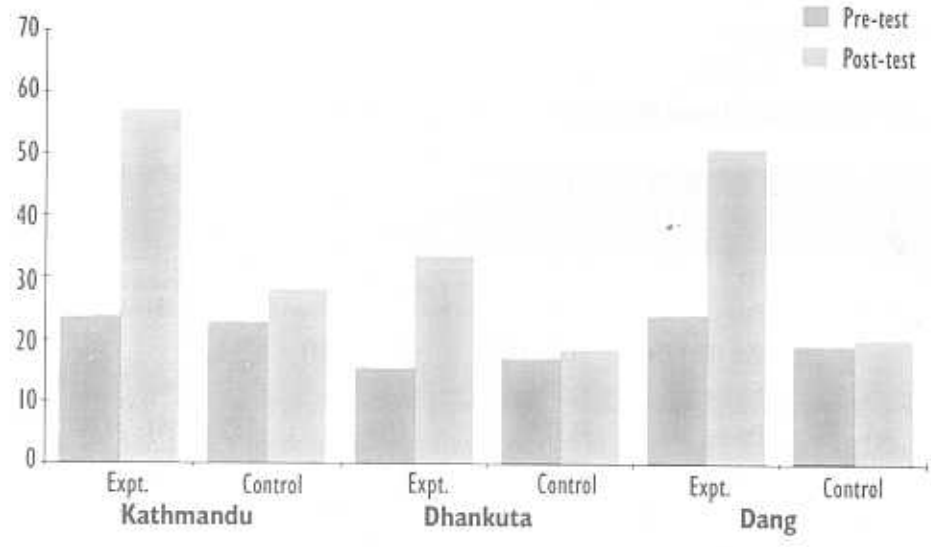
Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The difference in scores of the experimental and control schools in the pre-test is small in all the three districts. These score differences range from 1.69 to 4.89 scores. The scores of all districts except Dang are insignificant. The comparison of the post-test scores of the experimental schools with the control schools indicates that their score differences are highly significant. In this regard, the level of achievement of Dang and Kathmandu is relatively higher than that of Dhankuta.

The gain scores for the experimental schools of all districts is better compared to the control schools. The gain score of Kathmandu is the highest among the three districts. Dang is the second highest and Dhankuta is the lowest. On the other hand, the gain scores for all the districts are highly significant. The gain scores of the control schools are considerably low. The gain score of only Kathmandu is significant at .05 level .

As compared to the control schools the achievement level of the experimental school students is highly significant in all respects. In general the performance of class 4 students of the control schools did not change over the experimental period.

Figure 6.8 Districtwise Mean Scores of Class 4 Students



Class 5

Aggregate Mean Score

The mean scores of class 5 students of all the three districts combined are shown in Table 6.9 and Figure 6.9 below.

Table 6.9 Aggregate Mean Scores of Class 5 Students

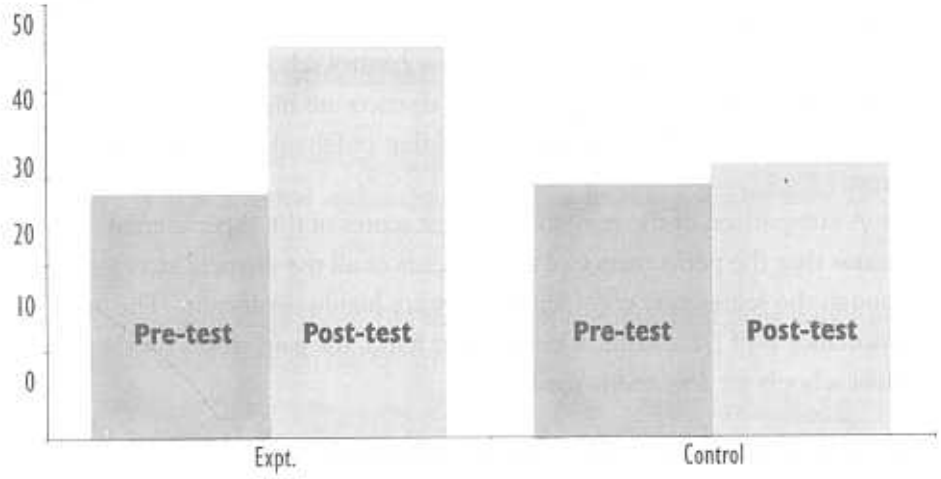
Test	Type of Schools		Diff. Score (E-C)	t-score
	Expt.	Contr.		
Pre	28.27	29.19	-0.92 (3.15)	0.53
Post	45.06	31.51	13.55 (30.07)	7.58
Diff.(Post-Pre)	16.79 (59.39)	2.32 (7.94)		
t-score	17.44	1.43		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

A comparison of the pre-test scores of the experimental and control schools reveals a negligible difference in score. On the other hand, their score difference in the post test was 13.55 scores (30.07%) which is highly significant.

The gain score of the experimental schools in post-test over the pre-test was 16.79 scores (59.39%) whereas that of control schools was only 2.32 scores (7.94%). The gain score of the experimental schools is highly significant but the score of the control schools is insignificant.

Figure 6.9 Aggregate Mean Scores of Class 5 Students



In conclusion the achievement level of the experimental school students is significantly higher than that of control schools.

Mean Score of Individual District

The mean scores of individual districts are presented in Table 6.10 and Figure 6.10 below.

Table 6.10 Districtwise Mean Scores of Class 5 Students

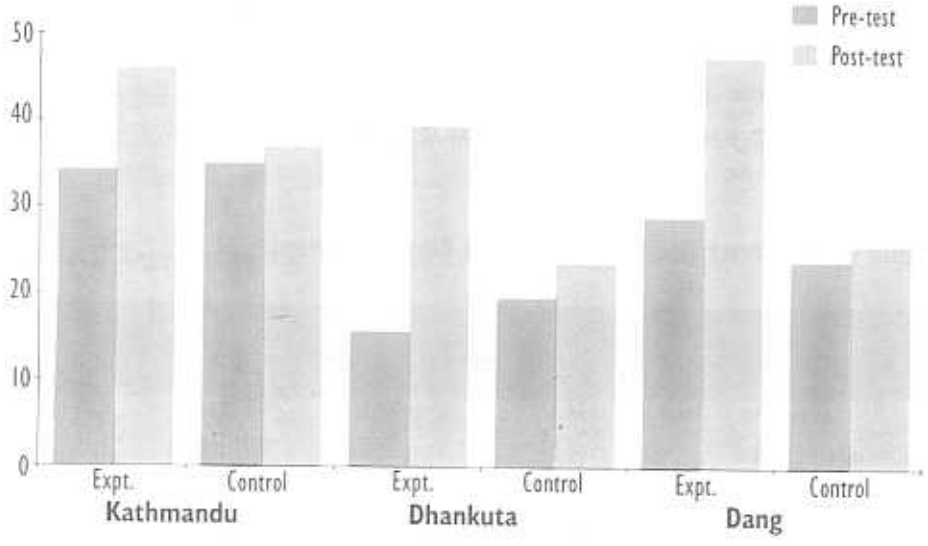
District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	34.32	35.17	0.85 (2.48)	0.49
	Post	46.07	37.08	8.99 (19.51)	3.35
	Diff.(Post-Pre)	11.75	1.91	(34.24)	(5.43)
	t-score	3.89	0.89		
Dhankuta	Pre	15.68	19.61	-3.93 (25.06)	1.56
	Post	39.31	23.54	15.77 (40.12)	4.25
	Diff.(Post-Pre)	23.63	3.93	(150.70)	(20.04)
	t-score	6.95	1.33		
Dang	Pre	29.08	23.93	5.15 (17.71)	1.67
	Post	47.47	25.81	21.86 (46.05)	8.18
	Diff.(Post-Pre)	18.39	1.88	(63.24)	(7.86)
	t-score	6.43	0.67		

Note: Figures in parentheses indicate respective percentages
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The districtwise pre-test score differences between the experimental and control schools range from -3.93 to 5.15 scores which are low and insignificant. Their score differences in the post-test vary from 8.99 to 21.86. These score differences are much better compared to the control schools. The score differences in the post-test of all the three districts are highly significant. The score difference of Dang is the highest and that of Dhankuta is the second highest.

A comparison of the pre- and post-test scores of the experimental schools indicates that the performance of the students of all the districts increased. Although the scores vary considerably they are highly significant. The best performance is of Dhankuta. On the other hand, the gain scores for the control schools are low and insignificant.

Figure 6.10 Districtwise Mean Scores of Class 5 Students



In sum, the performance of the class 5 students of the experimental schools in all respects were found better than that of control schools. There has not been any noticeable change in the performance of the control school students at the end of the experimental period.

6.2 Summary

This section of the report deals with the summary of statistical significance of the pre- and post-test scores and gain scores of the experimental and control

school students. The districtwise and aggregate summary are given separately in this section.

6.2.1 Summary of Statistical Significance by Districts

The districtwise summary of the significance of the pre- and post-test scores on knowledge of experimental and control school students is given below:

Kathmandu

The following table shows the summary of the statistical significance of the students' knowledge on the environment.

Table 6.II Statistical Significance of Students' Knowledge in Kathmandu

Class	Diff. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	••	-	-	■
2	-	••	••	-	○
3	-	••	••	-	○
4	-	••	••	••	○
5	••	••	••	-	○

Note: •• The difference score is highly significant; ○ The difference score of the experimental school student is significant;
■ The difference score of the experimental school students is insignificant.

The pre-test score differences of classes 1 and 5 of the experimental school students compared to the control school students are highly significant. On the other hand, the post-test score differences of all classes of the experimental school students are highly significant. In case of the gain scores achieved by experimental school students of all classes except class 1 are highly significant. The gain score of class 4 of the control school students is also found to be highly significant. However, as revealed by data the gain score of the experimental school students is significantly higher than that of control school students. In conclusion, the knowledge of the experimental school students except of class 1 increased significantly compared to the control school students.

Dhankuta

The statistical significance of student's knowledge of the experimental and control schools is given in the table below:

Table 6.12 Statistical Significance of Students' Knowledge on Environmental Aspects

Class	Diff. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	-	••	••	-	❍
2	•	••	••	-	❍
3	-	••	••	-	❍
4	-	••	••	-	❍
5	-	••	••	-	❍

Note: • Statistically Significant; •• The difference score is highly significant;
❍ The difference score of the experimental school student is significant;

The pre-test score differences of all classes except of class 2 of experimental schools compared to the control schools are insignificant. On the other hand, the post-test score differences of all classes are highly significant. Moreover, the gain scores of the experimental school students of all classes are highly significant whereas the students of all classes of the control schools could not achieve significant scores.

Overall, the data indicate that the experimental school students improved their knowledge significantly compared to the control school students.

Dang

The statistical significance of students' knowledge of the experimental and control school is shown in the table below:

Table 6.13 Statistical Significance of Students' Knowledge in Dang

Class	Diff. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	••	••	-	❍
2	••	••	••	••	■
3	••	••	••	•	❍
4	•	••	••	-	❍
5	-	••	••	-	❍

Note: • Statistically Significant; •• The difference score is highly significant; ❍ The difference score of the experimental school students is significant; ■ The difference score of the experimental school students is insignificant.

The pre-test score differences for all classes (except class 4 and 5 of experimental schools) compared to the control schools are highly significant. The score difference for class 4 is significant at .05 level whereas the score for class 5 is insignificant. On the other hand, the post-test score difference for all classes of the experimental school students are highly significant compared to the scores of the control school students.

Furthermore, the gain scores for all classes of the experimental school students and class 2 of the control school students are highly significant. The gain score for class 3 of control schools is significant at .05 level. While comparing the gain scores of experimental and control schools students, it is observed that in almost all the classes except in class 2, the gain score achieved by experimental school students are higher than those of control school students.

The data of post-test score differences and gain scores indicate that the experimental school students achieved, in general, more significant knowledge on the environment as compared to the control school students.

6.2.2 Aggregate Summary of Statistical Significance

This section deals with the significance of the aggregate summary of the knowledge of experimental and control school students in pre- and post tests.

6.2.2.1 Knowledge of Students

The scores of the students' knowledge on the environment are given in Table 6.14 and Figure 6.11 below:

Table 6.14 Distribution of Scores on Students' Knowledge

Class	Statistical Value	Diff. Score (Expt. - Contr.)		Gain Score (Post - Pre)		Remarks
		Pre	Post	Expt	Contr.	
1	% t-value	9.83	21.63	9.95	-1.86	+
		(14.48)	(27.79)	(14.66)	(3.20)	
		6.08	12.30	6.05	1.07	
2	% t-value	5.94	17.05	18.05	7.19	*
		(16.07)	(30.85)	(49.51)	(23.18)	
		2.88	7.26	8.10	3.34	
3	% t-value	1.76	20.11	17.74	-0.57	+
		(5.80)	(41.39)	(57.50)	(1.96)	

		2.19	10.56	8.77	0.34	
4	% t-value	1.33	25.56	27.16	3.07	+
		(6.15)	(52.11)	(125.60)	(15.13)	
		1.02	14.52	15.20	2.45	
5	% t-value	-0.92	13.55	16.79	2.32	+
		(3.15)	(30.07)	(59.39)	(7.94)	
		0.53	7.58	17.44	1.43	

Note: Figures in parentheses indicate their respective percentages; t-value = 2.58 : Significant at 1% level; and t-value = 1.96 : Significant at 5% level.; + Achievement level of the experimental school students is significantly higher.; * Achievement level of both of the experimental and control school students is highly significant.

Figure 6.11 Distribution of Gain Scores of Students

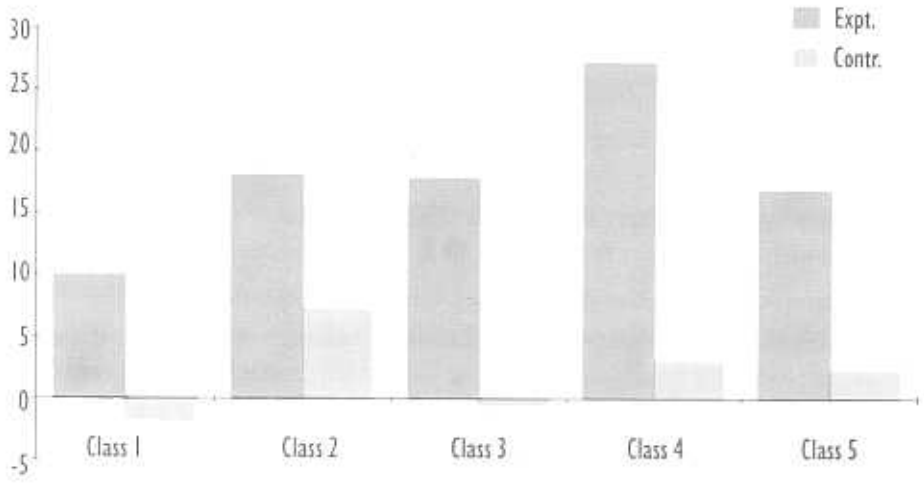


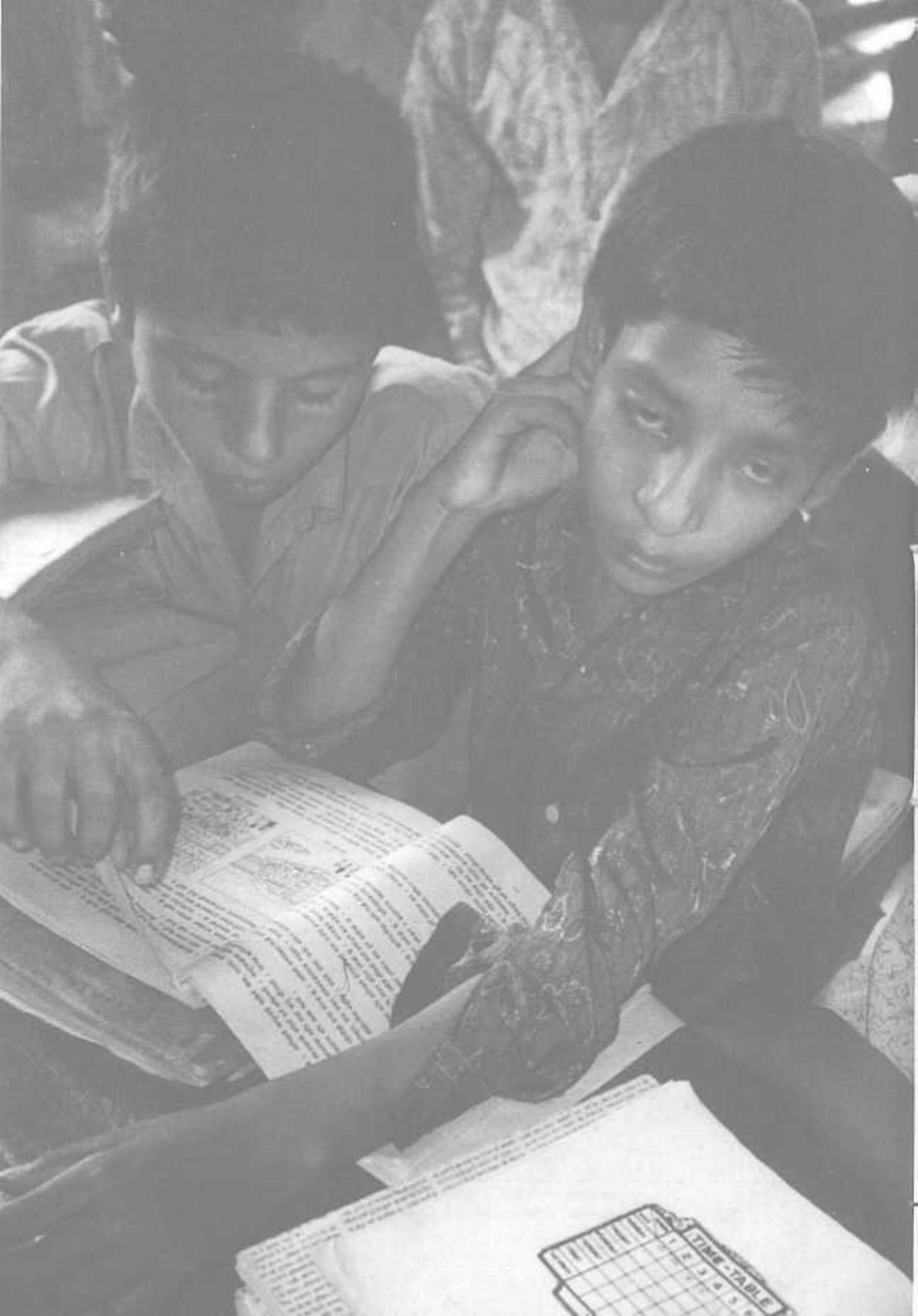
Table 6.15 Statistical Significance of Students' Knowledge Towards Environmental Aspects

Class	Diff. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	••	••	-	○
2	••	••	••	••	■
3	•	••	••	-	○
4	-	••	••	•	○
5	-	••	••	-	○

Note: • Statistically significant; •• The difference score is highly significant; ○ The difference score of the experimental school students is significant; ■ The difference score of the experimental school students is insignificant.

The gain scores and pre- and post-tests score differences show that the knowledge of the students of all classes except class 2 of the experimental schools, improved significantly compared to the control school students.

In sum, it could be claimed that experimental school students achieved a significantly higher level of knowledge than that of the control school students after the project inputs.


TIME-TABLE

CHAPTER 7

Change in Students' Attitude

This part of the study focuses on the analysis and interpretation of students' scores in the attitude tests. As in the analysis of knowledge scores, the analysis of attitude scores in this part deals with the comparison between experimental and control schools. The interpretation of data is given below in terms of aggregate mean score and individual mean score of each district by classes. Specifically, data of students' attitude on the environment (from classes 1 to 5) are presented in the following ways:

- a comparison of the pre-test scores of experimental and control schools;
- a comparison of the post-test scores of experimental and control schools;
- a comparison of pre- and post-test scores of experimental schools; and
- a comparison of pre-and post-test scores of control schools.

7.1 Interpretation of Students' Attitude Scores by Class

Class 1

Aggregate Mean Score

The mean scores of class 1 students of all the three districts combined are presented in Table 7.1 and Figure 7.1 below.

Table 7.1 Aggregate Mean Scores of Class I Students

Test	Type of Schools		Diff. Score (E-C)	t-score
	Expt.	Contr.		
Pre	29.09	25.76	3.33 (11.45)	3.91
Post	35.63	27.33	8.30 (23.29)	5.13
Diff.(Post-Pre)	6.54 (22.48)	1.57 (6.09)		
t-score	7.47	1.76		

Note: Figures in parentheses indicate their respective percentage.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score of the experimental schools is higher than that of control schools by 3.33 scores (11.45 %). This score difference is highly significant. Similarly, a comparison of the post-test scores indicates that the average score of the experimental schools is greater than that of the control schools by 8.30 scores (23.29%). This is also highly significant. This score difference is more than two times the pre-test score. It is obvious from table 7.1 that the score of the experimental school students in the post-test is considerably higher than that of control school students.

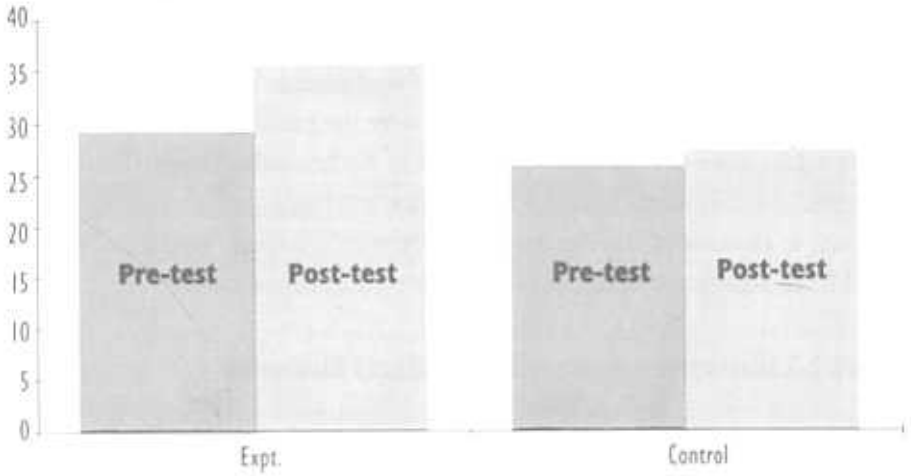
The pre-test score differences indicate that the scores of the experimental school students of classes 1 to 3 are significantly higher than that of control school students whereas the scores of class 4 and 5 are insignificant. The post-test score differences of all classes are highly significant in favour of experimental schools.

On the other hand, the gain scores of the experimental school students are highly significant in all classes. In the case of the control schools, the gain score for class 2 students is highly significant whereas class 4 is significant at .05 level. However, the gain score of experimental school students is higher than that of control school students.

A comparison of the pre- and post-test scores of the experimental schools (figure 7.1) shows that the post-test score increased by 6.54 scores (22.48%), which is highly significant. On the other hand, in the control schools, there was an increase of 1.57 scores (6.09%) in the post-test which is insignificant.

The students of the experimental schools scored four times more compared to the students of the control schools. This indicates that the experimental school students developed a significantly positive attitude towards the environment as compared to the control school students.

Figure 7.1 Aggregate Mean Score of Class I Students



Mean Score of Individual Districts

The mean scores of individual districts are shown in Table 7.2 and Figure 7.2 below.

Table 7.2 Districtwise Mean Scores of Class I Students

District	Test	Type of Schools		Diff. Scores	t-score
		Expt.	Contr.	(E-C)	
Kathmandu	Pre	32.40	28.02	4.38 (13.52)	2.88
	Post	33.47	31.16	2.31	1.33
	Diff.(Post-Pre)	1.07	3.14	(3.30)	(10.28)
	t-score	0.57	2.28		
Dhankuta	Pre	26.00	25.07	0.93 (3.57)	0.81
	Post	35.48	26.19	9.29 (26.18)	4.68
	Diff.(Post-Pre)	9.48	1.12	(36.46)	(4.47)
	t-score	8.80	0.82		
Dang	Pre	28.57	22.31	6.26 (21.91)	4.42
	Post	37.90	21.51	16.39 (43.24)	16.63
	Diff.(Post-Pre)	9.33	-0.80	(32.66)	(3.58)
	t-score	7.63	0.58		

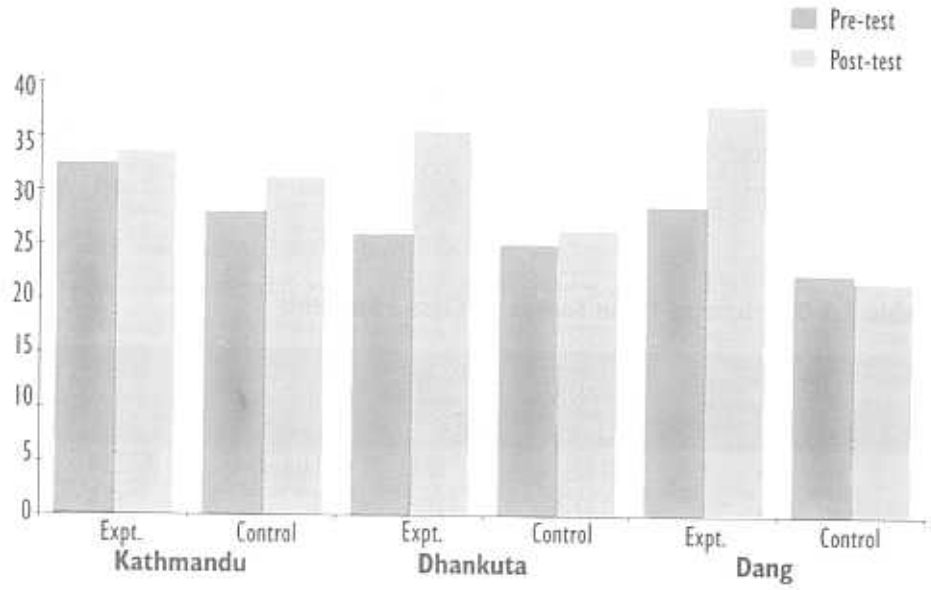
Note: Figures in parentheses indicate their respective percentages.

t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

A comparison of the pre-test scores of the experimental and control schools reveals that the score differences of Kathmandu and Dang are significantly higher, whereas that of Dhankuta is insignificant. The post-test score differences of the experimental and control schools of Dhankuta and Dang are highly significant whereas that of Kathmandu is insignificant.

A comparison of the post-test scores over the pre-test scores indicates that the gain score of experimental schools of Kathmandu is negligible. However, the gain scores of the other districts are highly significant. On the contrary, in the case of the control schools, the gain score of Kathmandu is found to be significant and that of other districts, insignificant.

Figure 7.2 Districtwise Mean Scores of Class I Students



The level of attitude of the experimental school students towards the environment is significantly higher than that of control schools in Dhankuta and Dang and in reverse, the gain scores of the control schools of only Kathmandu are significant.

Class 2

Aggregate Mean Score

The mean scores of class 2 students of all the three districts combined are shown in Table 7.3 and Figure 7.3 below.

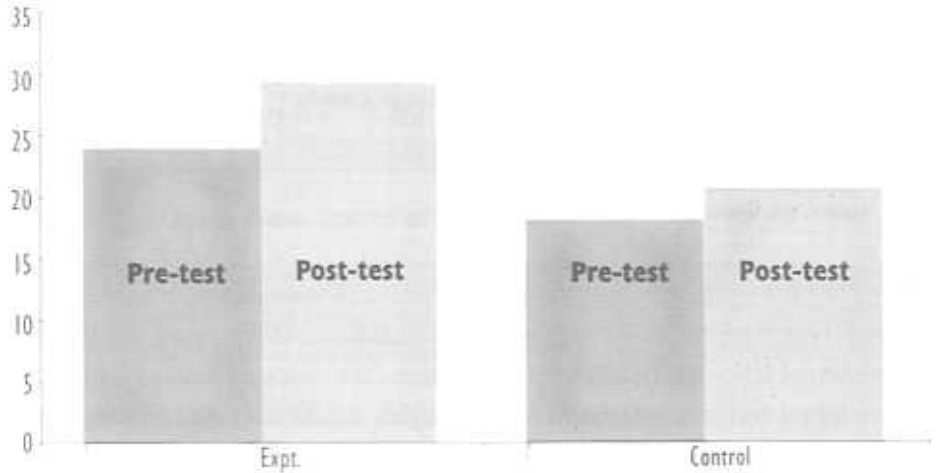
Table 7.3 Aggregate Mean Scores of Class 2 Students

Test	Type of Schools		Diff. Score	t-score
	Expt.	Contr.	(E-C)	
Pre	23.92	18.12	5.80 (24.25)	5.69
Post	29.33	20.69	8.64 (29.46)	8.49
Diff.(Post-Pre)	5.41	2.57	(22.62)	(14.18)
t-score		5.16	2.61	

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score of the experimental schools compared to the control schools is higher by 5.8 scores (24.25%) and that score difference is highly significant. A comparison of the post-test scores of the experimental schools with the control schools shows that the score of the experimental schools is higher by 8.64 scores (29.46%). This is highly significant. The score difference of the experimental schools is considerably greater than that of control schools in both pre- and post-tests.

Figure 7.3 Aggregate Mean Scores of Class 2 Students



A comparison of the post-and pre-test scores of the experimental schools indicates that the gain score is 5.41 scores(22.62%). This gain score is highly significant. The gain score of control schools which is 2.57 scores (14.18%) is also highly significant. However, the gain score of experimental schools is about double the gain score of the control schools.

In sum, although the mean scores of experimental schools are higher than those of control schools at the beginning, the level of positive attitude increase of the experimental school students after the project period is significantly higher than that of control schools in the same period.

Means Score of Individual District

The mean scores of individual districts are shown in Table 7.4 and Figure 7.4 below.

Table 7.4 Districtwise Mean Scores of Class 2 Students

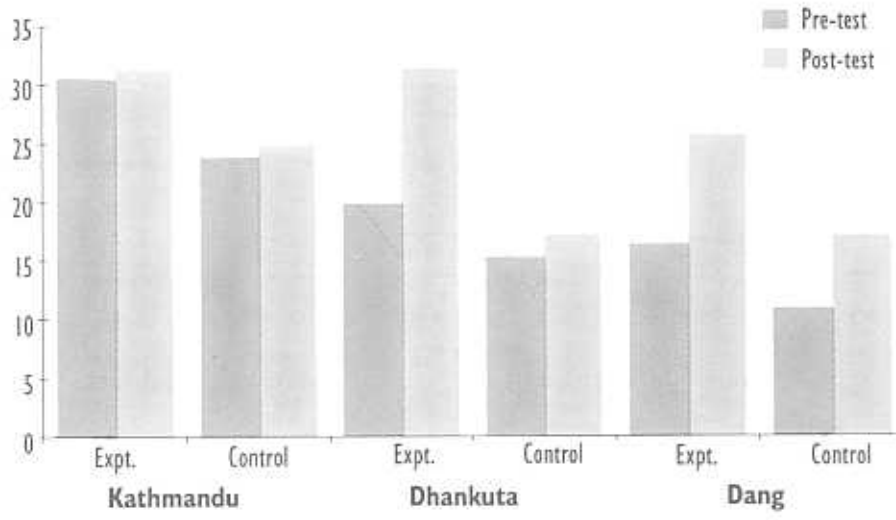
District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	30.44	23.79	6.65 (21.85)	4.92
	Post	31.24	24.76	6.48 (20.74)	4.07
	Diff.(Post-Pre)	.08	0.97	(0.26)	(4.08)
	t-score	0.59	0.62		
Dhankuta	Pre	19.90	15.27	4.63 (23.27)	2.70
	Post	31.38	17.09	14.29 (45.54)	8.10
	Diff.(Post-Pre)	11.48	1.82	(57.69)	(11.92)
	t-score	5.05	1.39		
Dang	Pre	16.40	10.85	5.55 (33.84)	5.18
	Post	25.64	17.07	8.57 (33.42)	9.51
	Diff.(Post-Pre)	9.24	6.22	(56.34)	(57.33)
	t-score	6.62	5.50		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The differences between the pre-test scores of the experimental and control schools of all the districts are highly significant in favour of experimental schools. The differences between the post-test scores of the experimental and control schools are also highly significant. As compared with the other districts the post-test score difference of Dhankuta is remarkable. The post-test score differences of other districts are not much beyond their pre-test score differences.

The gain scores of the experimental schools of all the districts are significant except for Kathmandu. In control schools, the gain scores of all the districts except Dang are insignificant. The gain scores of the experimental and control schools in Dang are very close in terms of their proportionate gain (approx. 57%).

Figure 7.4 Districtwise Mean Scores of Class 2 Students



The level of attitude of class 2 experimental school students in Kathmandu and Dang did not improve much compared to the control school students. However, the experimental school students of Dhankuta improved their attitude significantly higher than that of other districts.

Class 3

Aggregate Mean Score

The mean scores of class 3 students of all the three districts combined are shown in Table 7.5 and Figure 7.5 below.

Table 7.5 Aggregate Mean Scores of Class 3 Students

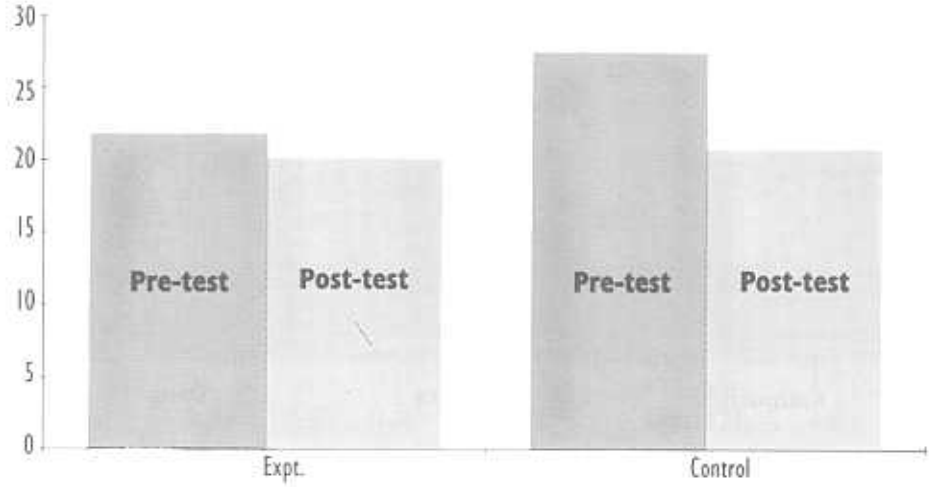
Test	Type of School		Diff.(E-C)	t-score
	Expt.	Contr.		
Pre	21.79	20.11	1.68 (7.71)	1.83
Post	27.54	20.81	6.73 (24.44)	6.63
Diff.(Post-Pre)	5.75	0.70	(26.39)	(.03)
t-score	5.96	0.72		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference for the experimental and control schools is statistically insignificant. The post-test score difference between experimental and control schools is about four times more than that of the pre-test score

difference. This is highly significant.

Figure 7.5 Aggregate Mean Scores of Class 3 Students



A comparison of the pre- and post-test scores of the experimental schools shows that the score increased by 5.75 scores (26.39%) in the post-test, which is highly significant; whereas in case of control schools the score difference is insignificant. This indicates that the level of attitude of the experimental school students towards the environment increased significantly compared to the control school students' level of attitude

Mean Scores of Individual Districts

The mean scores of individual districts are shown in Table 7.6 and Figure 7.6 below.

Table 7.6 Districtwise Mean Scores of Class 3 Students

District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	25.51	25.05	0.46 (1.80)	0.29
	Post	30.19	24.50	5.69 (18.85)	2.35
	Diff.(Post-Pre)	4.68	-0.55	(18.34)	(2.19)
	t-score	3.09	0.39		
Dhankuta	Pre	16.73	16.76	0.03 (0.18)	0.02
	Post	23.29	17.94	5.35 (22.97)	3.37
	Diff.(Post-Pre)	6.56	1.18	(39.21)	(7.04)

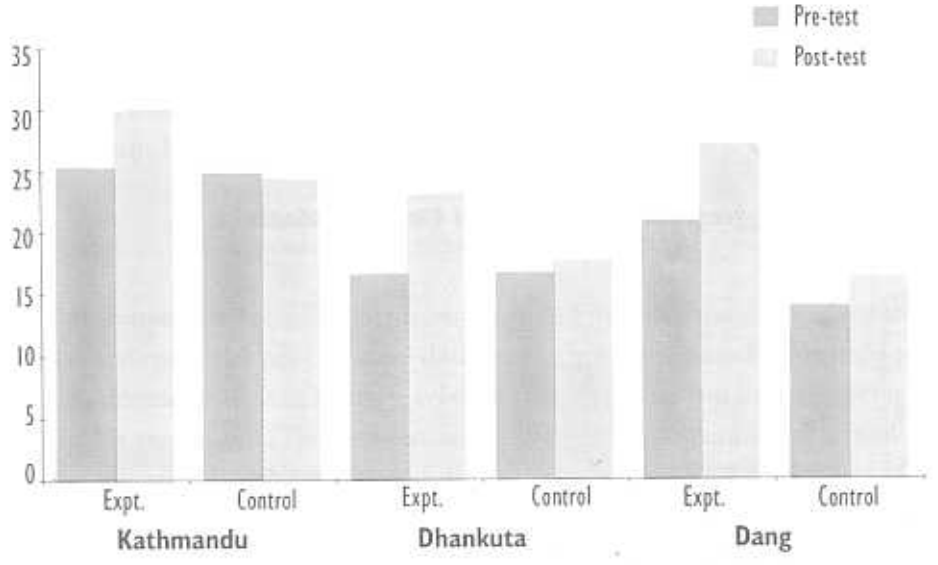
	t-score	4.29	0.87		
Dang	Pre	20.94	14.13	6.81 (32.52)	5.30
	Post	27.34	16.47	10.87 (39.76)	7.13
	Diff.(Post-Pre)	6.40	2.34	(30.56)	(16.56)
	t-score	4.93	1.56		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference for the experimental and control schools indicate that the score differences are insignificant in all the districts except Dang. On the other hand, the scores differences of the experimental schools in the post test are highly significant in Dhankuta and Dang districts. In case of Kathmandu, the score difference for the students is significant at only .05 level.

A comparison between the post-test scores and the pre-test reveals that the gain scores of experimental schools of all the districts are high and significant. But, the gain scores of the control schools are quite low and insignificant in all these districts.

Figure 7.6 Districtwise Mean Scores of Class 3 Students



The data indicate that the overall improvement in the level of attitude of the experimental school students is significantly higher than that of control school students in all the three districts.

Class 4

Aggregate Mean Score

The mean scores for class 4 students of all the three districts combined are shown in Table 7.7 and Figure 7.7 below.

Table 7.7 Aggregate Mean Scores of Class 4 Students

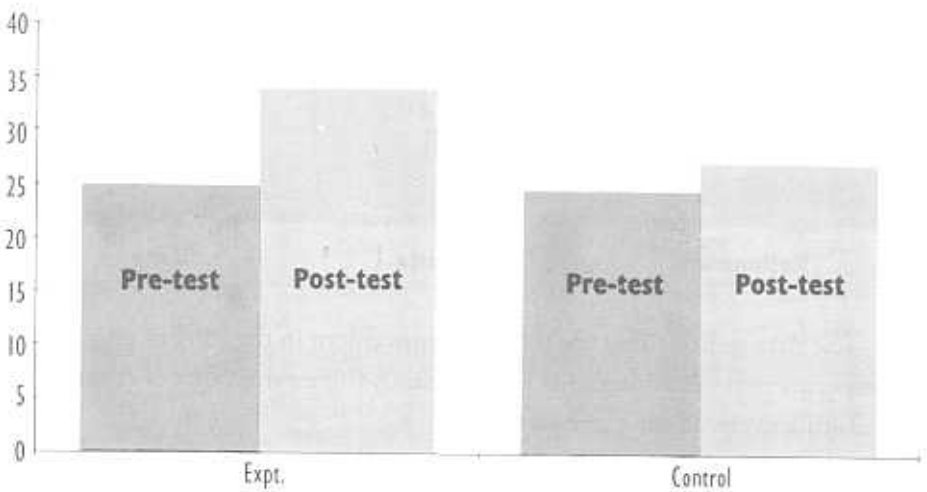
Test	Type of Schools		Diff. Score	t-score
	Expt.	Contr.	(E-C)	
Pre	24.91	24.54	0.37 (1.48)	1.08
Post	34.03	27.24	6.79 (19.95)	8.83
Diff.(Post-Pre)	9.12(36.61)	2.70 (11.00)		
t-score	12.02	3.60		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference for the experimental and control schools is a negligible figure. On the other hand, the post-test score difference is 6.79 scores (19.95%) which is highly significant.

A comparison between the post- and pre-test scores of the experimental schools indicates that the increased score is 9.12 scores (36.61%) which is highly significant. The score increase of control schools is 2.70 scores (11%) which is also significant. However, the score increase of the experimental school students is more than two times than that of control school students.

Figure 7.7 Aggregrate Mean Scores of Class 4 Students



The data reveal that the level of attitude of the experimental school students towards the environment increased comparatively to that of control school students.

Mean Score of Individual Districts

The mean scores for individual districts are shown in Table 7.8 and Figure 7.8 below.

Table 7.8 Districtwise Mean Scores of Class 4 Students

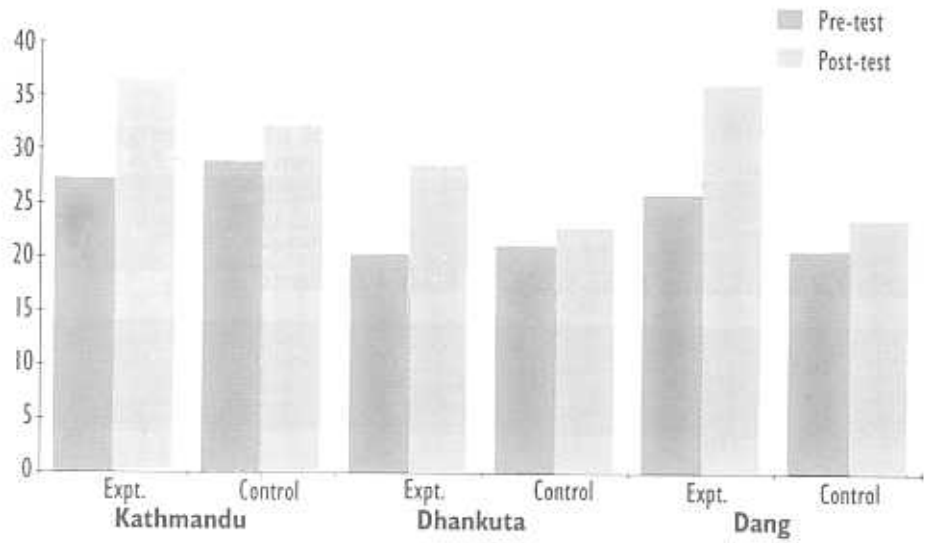
District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
Kathmandu	Pre	27.24	28.78	-1.54 (5.65)	1.38
	Post	36.16	32.00	4.16 (11.50)	3.86
	Diff.(Post-Pre)	8.92	3.22	(32.74)	(11.19)
	t-score	7.65	3.15		
Dhankuta	Pre	20.15	21.02	0.87 (4.32)	1.33
	Post	28.31	22.68	5.63	3.42
	Diff.(Post-Pre)	8.16	1.66	(40.49)	(7.89)
	t-score	5.33	1.53		
Dang	Pre	25.87	20.75	5.12 (19.79)	4.93
	Post	36.01	23.47	12.54 (34.82)	11.68
	Diff.(Post-Pre)	10.14	2.72	(39.14)	(13.11)
	t-score	9.47	2.72		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

A comparison between the pre-test scores of the experimental and control schools indicates that pre-test score differences are minimum in Kathmandu and Dhankuta whereas in Dang, it is better than the other two districts and it is also highly significant. The post-test score differences of experimental schools and control schools in all the three districts are highly significant. The post-test score difference in Dang is the highest compared to other districts.

A comparison between the post-test scores and the pre-test of the experimental schools indicates that the score increases for all the districts are highly significant. The gain scores for Kathmandu and Dhankuta are very close and the gain score for Dang is the highest. In the case of the control schools, the gain scores are relatively low and close to each other. The gain scores for only Dang and Kathmandu are significant.

Figure 7.8 Districtwise Mean Scores of Class 4 Students



The score differences for the experimental schools and the control schools of all the districts in the post-test are significantly higher. Likewise, the comparison between the post-test scores over the pre-test scores shows that the gain scores for the experimental schools of all the districts are significantly higher than that of control schools. This data reveal that the level of attitude of the experimental school students improved significantly more than that of control school students within the experimental period.

Class 5

Aggregate Mean Score

The mean scores for class 5 students of all the three districts combined are shown in Table 7.9 and Figure 7.9 below.

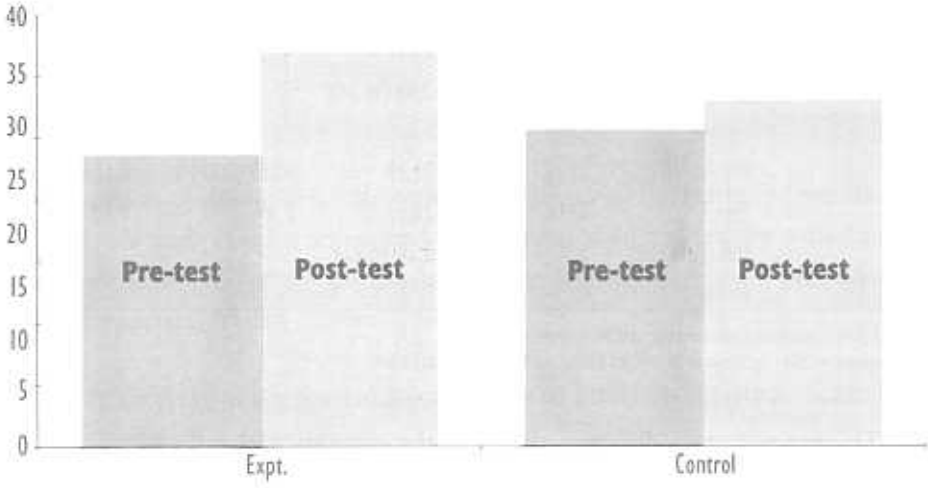
Table 7.9 Aggregate Mean Scores of Class 5 Students

Test	Type of Schools		Diff. Scores	t-score
	Expt.	Contr.	(E-C)	
Pre	23.63	25.60	-1.97 (8.33)	3.62
Post	31.97	28.01	3.96 (12.39)	5.17
Diff.(Post-Pre)	8.34 (35.29)	2.41 (9.41)		
t-score	10.07	3.16		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference for the experimental and control schools indicates that the score difference is highly significant in favour of control schools. On the other hand, the post-test score difference for the experimental schools is greater than the control schools by 3.96 scores (12.39%). This score is highly significant.

Figure 7.9 Aggregate Mean Scores of Class 5 Students



A comparison between the post-test scores over the pre-test scores indicates that the gain score for the experimental schools is 8.34 scores (35.29%) which is more than three times that of the gain score for control schools. The gain scores for both the experimental and control schools are highly significant.

The data reveal that the increased level in attitude of the experimental school students is higher than that of control school students'.

Mean Score of Individual Districts

The mean scores and that of individual districts are shown in Table 7.10 and Figure 7.10 below.

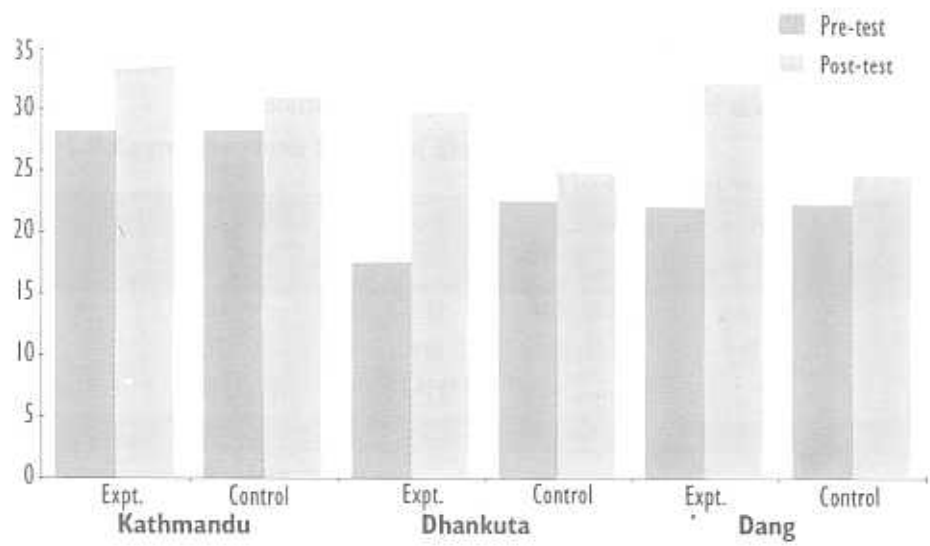
Table 7.10 Districtwise Mean Scores of Class 5 Students

District	Test	Type of Schools		Diff. Score (E-C)	t-score
		Expt.	Contr.		
	Pre	28.15	28.28	-0.13 (0.46)	0.36
Kathmandu	Post	33.19	30.79	2.40 (7.23)	1.40
	Diff.(Post-Pre)	5.04(17.90)	2.51(8.87)		
	t-score	4.07	2.53		
	Pre	17.55	22.46	4.91 (27.98)	7.67
Dhankuta	Post	29.55	24.76	4.79 (16.21)	2.87
	Diff.(Post-Pre)	12.00(68.38)	2.30 (10.24)		
	t-score	7.23	1.41		
	Pre	22.16	22.29	-0.13 (0.59)	0.12
Dang	Post	32.06	24.57	7.49	6.14
	Diff.(Post-Pre)	9.90(44.67)	2.28(10.23)		
	t-score	8.85	1.96		

Note: Figures in parentheses indicate their respective percentages.
t-value = 2.58 : Significant at 1% level and t-value = 1.96 : Significant at 5% level.

The pre-test score difference between the experimental and control schools are minimum in Kathmandu and Dang. In Dhankuta, the pre-test score for control schools is significantly higher than that of experimental schools. The difference for the experimental and control schools in the post-test scores in Dhankuta and Dang are significant .

Figure 7.10 Districtwise Mean Scores of Class 5 Students



A comparison between the post-test scores and pre-test scores indicates that the score increases for the experimental schools in all the districts are highly significant. The gain scores in the post-test for the control schools of Kathmandu and Dang are significant, whereas that of Dhankuta is insignificant. However, the gain scores for the experimental school students of all these districts are considerably higher than that of control school students'.

In sum, although the students of control schools of two districts gained significant scores, the level of attitude of the experimental school students is relatively higher.

7.2 Summary

This section of the report deals with the summary of the statistical significance of the pre- and post-test scores and gain scores for attitude of the experimental and control schools students. So the districtwise and aggregate summaries are given separately in this section.

7.2.1 Summary of Statistical Significance of Students' Attitude Score by Districts

The summary of statistical significance of the pre- and post-test score differences for the experimental and control schools and their gain scores are given by districts.

Kathmandu

The statistical significance of score difference on the attitude of the students of the experimental and control school students and their gain scores are given in the table below:

Table 7.II Statistical Significance of Students' Attitude in Kathmandu

Class	Diff. in Avg. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	-	-	•	■
2	••	••	-	-	■
3	-	•	••	-	○
4	-	••	••	••	○
5	-	-	••	•	○

Note: • Statistically significant; •• The difference score is highly significant; ○ The difference score of the experimental school student is significant; ■ The difference score of the experimental school students is insignificant.

The average pre-test score differences between experimental and control schools are highly significant in classes 1 and 2 only. The average post-test score differences for classes 2 and 4 students are highly significant whereas the score of class 3 is significant at .05 level. The average score for classes 1 and 5 are not significant.

The gain score for the experimental school students of classes 3, 4 and 5 are highly significant. In the case of the control schools, the gain score for class 4 students is highly significant and the gain scores for classes 1 and 5 are significant at .05 level.

In conclusion, the students of classes 3, 4 and 5 of experimental schools developed a significantly positive attitude towards environmental concerns compared to the control school students. But the students of classes 1 and 2 did not show any significant change in their attitude.

Dhankuta

The following table gives the statistical significance of the average score difference for experimental and control school students' attitude towards environmental concerns.

Table 7.12 Statistical Significance of Students' Attitude in Dhankuta

Class	Diff. in Avg. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	-	••	••	-	■
2	••	••	••	-	■
3	-	••	••	-	■
4	-	••	••	-	■
5	••	••	••	••	○

Note: ■■ The difference score is highly significant; ○/ The difference score of the experimental school student is significant;
■ The difference score of the experimental school students is insignificant.

The difference between average pre-test scores for classes 2 and 5 only of the experimental and control schools are highly significant. On the other hand, the difference in average post-test scores of all classes of the experimental schools are highly significant.

The gain scores for the experimental school students are highly significant. On the other hand, the gain score for the students of all classes except class 5 of the control schools are insignificant.

In sum, the experimental school students of almost all classes have

developed a significantly positive attitude towards the environment.

Dang

The table below shows the statistical significance of students' attitude score for Dang district.

Table 7.13 Statistical Significance of Students' Attitude in Dang

Class	Diff. in Avg. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	••	••	-	■
2	••	••	••	••	○
3	••	••	••	••	○
4	••	••	••	••	○
5	-	••	••	•	■

Note: • Statistically significant; •• The difference score is highly significant; ○ The difference score of the experimental school student is significant; ■ The difference score of the experimental school students is insignificant.

The difference in average pre-test scores for all classes except class 5 between experimental and control school students is highly significant, whereas the average post-test scores for all classes are highly significant.

The gain scores for all classes of the experimental schools are highly significant. In the case of the control schools, the gain scores for classes 2,3 and 4 are highly significant and the score for class 5 is significant at .05 level.

Overall, the students of all classes of the experimental schools developed a significantly positive attitude towards the environment. However, as compared to the control school students, the development of attitude of the experimental school students of classes 1 and 5 is found glaring.

7.2.2 Aggregate Summary of Statistical Significance

The aggregate summary of the attitude of the experimental and control school students towards the environment is given in the table below:

7.2.2.1 Attitude of Students

The scores for the students' attitude towards the environment are given in Table 7.14 and Figure 7.11 below:

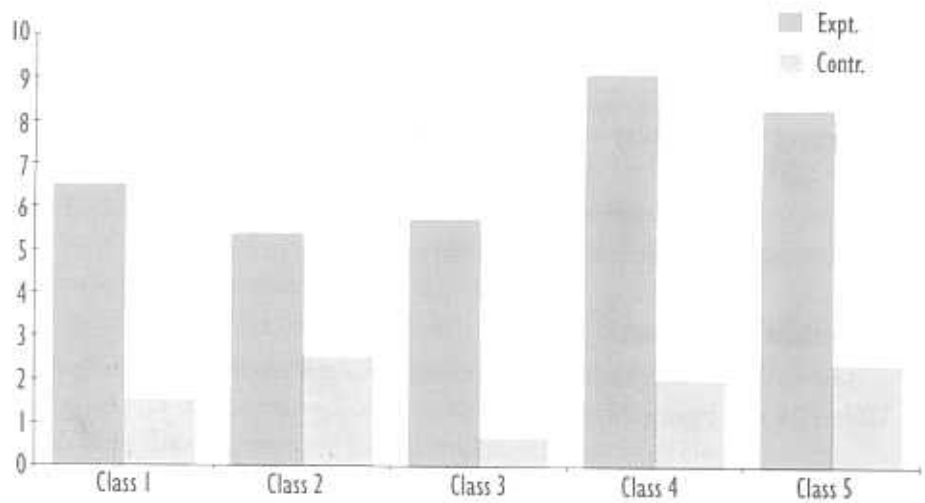
Table 7.14 Distribution of Scores on Students' Attitude

Class	Statistical Value	Diff. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
		Pre	Post	Expt	Contr	
1	%	3.33	8.30	6.54	1.57	
	t-value	(11.45)	(23.29)	(22.48)	(6.09)	+
		3.91	5.13	7.47	1.76	
2	%	5.80	8.64	5.41	2.57	*
	t-value	(24.25)	(29.46)	(22.62)	(14.18)	
		5.69	8.49	5.16	2.61	
3	%	1.68	6.73	5.75	0.70	+
	t-value	(7.71)	(24.44)	(26.39)	(.03)	
		1.83	6.63	5.96	0.72	
4	%	0.37	6.79	9.12	2.07	+
	t-value	(1.48)	(19.95)	(36.61)	(11.00)	
		1.08	8.83	12.02	3.60	
5	%	-1.97	3.96	8.34	2.41	*
	t-value	(8.33)	(12.39)	(35.29)	(9.41)	
		3.62	5.17	10.07	3.16	

Note: Figures in parentheses indicate their respective percentages; t-value = 2.58 : Significant at 1% level; and t-value = 1.96 : Significant at 5% level; + Attitude score of the experimental school students is significantly higher; * Attitude level of both of the experimental and control school students is highly positive.

On average, the pre-test score differences between experimental and control school students for classes 1, 2 and 5 are highly significant. On the other hand, the average post-test score differences for all classes are highly

Figure 7.11 Distribution of Gain Scores of Students' Attitude



significant.

The gain scores for the experimental school students of all classes are highly significant whereas in the case of control schools it is significant in classes 2, 4 and 5 only.

Table 7.15 Statistical Significance of Students' Attitude

Class	Diff. in Avg. Score (Expt - Contr)		Gain Score (Post - Pre)		Remarks
	Pre	Post	Expt	Contr	
1	••	••	••	-	■
2	••	••	••	••	○
3	-	••	••	-	■
4	-	••	••	••	■
5	••	••	••	••	○

Note: • Statistically significant; ••The difference score is highly significant; ○ The difference score of the experimental school student is significant; ■ The difference score of the experimental school students is insignificant.

The significance level of gain scores and average scores differences generally reveal that the experimental school students (except of classes 2 and 5) developed a significantly higher level of attitude towards the environment, compared to control school students.

In sum, almost all the students of all classes of the experimental schools developed a significantly positive attitude towards the environment.

7.2.3 Aggregate significance of knowledge and attitude scores

The aggregate summary of the significance of knowledge and attitude scores are shown in the table below.

Table 7.16 Aggregate Summary of Significance of Students' Knowledge and Attitude Scores

Class	Kathmandu		Dhankuta		Dang		Aggregate	
	Kn	Att	Kn	Att	Kn	Att	Kn	Att
1	■	○	■	■	■	■	■	■
2	■	○	■	■	○	○	○	○
3	■	■	■	■	■	○	■	■
4	■	■	■	■	■	○	■	■
5	■	■	■	○	■	■	■	○

Note: Kn: Knowledge; Att: Attitude; ■ Achievement level of the experimental school students is significantly higher; ○ Achievement level of both of the experimental and control school students is highly positive.

The data show that the experimental school students of almost all classes of all districts developed their knowledge significantly compared to the control school students except for the students of class 1 of Kathmandu and class 2 of Dang. In aggregate scores the experimental school students of all classes except of class 2 increased their knowledge on the environment significantly.

The attitude of all the students of all classes except of classes 1 and 2 of Kathmandu and class 5 of Dhankuta and classes 2, 3 and 5 of Dang developed a significantly positive attitude towards the environment compared to the control school students. In sum, the students of all classes except of class 2 and 5 developed a positive attitude towards the environment compared to the control school students.

CHAPTER 8

Suggestions

The school teachers involved in the implementation of the project were familiar with activities of the environmental education programme. They participated in all the activities of the programme throughout the project period. Almost all the parents(90%) were found to be aware of the environmental education programme implemented at schools. The parents of the community were in close contact with the teachers and students of their community. Therefore, they were asked to provide suggestions on the environmental education programme. The suggestions of teachers and parents are stated in the following paragraphs.

8.1 Teachers' Suggestions

Teachers provided some suggestions to be considered while planning and implementing environmental education programmes at schools and community levels. These suggestions are listed separately below in Table 8.1 and Table 8.2 respectively.

A day-long field-trip to Shivapuri Watershed Area gives teachers insights to practical activities

Table 8.1 Teachers' Suggestions for School Environmental Education Programmes

Suggestions Given by Teachers	No. of Respondents	Percent
Environmental education should be taught to students through drama, essay writing, quiz contest, poem composition, songs, dance, cultural activities and various types of competitions.	25	81
Organise training, seminar, talk programme and panel discussion about the environment on periodic basis to raise awareness of the teachers.	22	71
Promote students' participation in environmental protection activities, such as sanitation, plantation, picture competition and drama.	18	58
Total Respondents	31	100

Table 8.2 Techers' Suggestions for Environmental Education at Community Level

Suggestions Given by Teachers	No. of Respondents	Percent
Mobilise the community people to protect public places and to keep them clean.	27	52
Promote awareness of the community people on the various aspects of the environment.	24	77
Organise seminar on environmental issues, such as deforestation, proper use of resources and environmental sanitation.	17	55
Total Respondents	31	100

The teachers realised the need for environmental education for school children and community people. They suggested various practical approaches to make them aware of the concerns of the environment.

8.2 Parents' Suggestions

The parents were enthusiastic about knowing about the environment. They were interested in having environmental education programme at schools and at their communities. In this regards, the parents gave a number of suggestions which are as follows:

Table 8.3 Suggestions Given by Parents/Guardians with Regard to Environmental Education

Suggestions Given by Teachers	No. of Respondents	Percent
Organise seminars and talk programmes on relevant environmental issues and problems occasionally.	60	34
Conduct environmental awareness programmes for teachers and students at schools.	39	22
Encourage teachers and students to participate in the implementation of environmental education programmes.	28	16
Mobilise local people in conservation of various aspects of the environment such as forest, animals, birds, cultural heritage and public property.	8	5
Make community people aware of modern technology such as improved Chulo and Gobar Gas Plant that are environment friendly.	6	3
Total Respondents	176	100

The parents felt the need for environmental education for teachers, students and community people. The approaches of conducting environmental education should be different from one target group to another. The feeling of the teachers and parents regarding the suggestions provided are very close to each other . In view of raising awareness of teachers, students and public on various environmental concerns the suggestions given by teachers and parents are valuable and important.

8.3 Summary

8.3.1 Suggestions for School Environmental Programme

Teachers' Suggestions

The teachers suggested that environmental education should be taught to the students through various modes such as drama, essay writing, quiz contest, poem composition, songs, dance, cultural activities and various type of relevant competitions. They suggested organising trainings, seminars, talk programmes and panel discussions about environmental education in view of raising teachers' awareness. They suggested increasing the participation of the

students in environmental protection through involving them in sanitation, plantation, art competitions and drama.

Suggestions for Environmental Education at Community

The teachers suggested mobilising the community people to protect public places and to keep them clean. They felt the need for promoting awareness among the community people of the environment. They felt the need for seminars and discussion programmes on environmental issues such as deforestation, proper use of resources and environmental sanitation.

Parents' Suggestions

The parents suggested organising occasional seminars and talk programmes on relevant issues regarding the environment. They felt the need for raising awareness of the teachers, parents and students on environmental issues. They suggested mobilising teachers, students and community people in the environmental protection efforts. They felt the need for using modern technology such as improved *chulo* and *gobar gas* plants to protect the environment.

Teachers acquire information on local level crafts

CHAPTER 9

Summary of Major Findings

This chapter of the report deals with the summary of the findings of the experimental project activities. The findings of the study are classified in terms of the programme inputs, impacts of the programme and expected programme activities in general. The findings associated with programme inputs are further classified into teacher training and resource materials. Similarly the findings related to the programme impact are also further subdivided into impact on community, impact on school and impact on students. Lastly, the findings specific to the programme activities in general are subdivided into environmental education programmes related to school and community

9.1 Effectiveness of Teachers' Training

9.1.1 It was found that the 12-day teacher's training in environmental education helped the teachers develop their knowledge and skills of teaching environmental education at primary schools.

9.1.2 Teachers learnt the basic concept of environmental education, teaching methods and evaluation techniques from the training. They also developed skills of preparing lesson plans and teaching activities in view of developing students' knowledge, skills and attitude towards the environment.

9.1.3 The trained teachers in environmental education taught the environmental education course to students ranging from classes 1 to 5. During the teaching, it was known that the students of all classes were very much interested and enthusiastic to learn about

the environment. Consequently, the teachers emphasised the need for teaching environmental education to primary school children.

9.2 Resource Materials

9.2.1 Effectiveness of Resource Materials

9.2.1.1 The study showed that the environmental education resource materials were relevant to teachers and students. These materials helped them promote their knowledge of various environmental issues.

9.2.1.2 The environmental education resource materials were found simple, interesting and practical. Their presentation and description of the contents are clear and the activities given are useful to students. Almost all illustrations given in the resource materials are clear which also enhanced quality of the materials.

9.2.2 Difficulties Faced in using Resource Materials in Classes

9.2.2.1 The study indicated that some of the illustrations such as pictures showing pond, wastes and dust used in the resource materials were not clear for teachers. Further, the teachers found it difficult to explain clearly such illustrations.

9.2.2.2 Some words, such as pollution, germs, bacteria and deterioration were found difficult for students (especially for classes 1, 2 and 3).

9.2.2.3 The exercises such as preparation of field work, observation, comments and report preparation on various environmental issues given in the textbook and teacher's directives were essential for effective teaching of environmental education though it was found difficult to perform some of them due to time constraint.

9.2.3 Suggestions for Improvement of Resource Materials

9.2.3.1 Teachers suggested preparing some other resource materials for primary level students that should include the contents and illustrations relevant to local context. They stressed to print all the environmental education materials in colour to make them clear and realistic.

9.2.3.2 Teachers suggested preparing audio-visual materials in the context of the local environment. They perceived the need for different types of relevant posters and charts for teaching environmental education effectively. They felt the need for organising field trips for students on environmental issues to develop their practical knowledge.

9.3 Impact of Environmental Education on Community

9.3.1 It was found that 90 percent of the parents were aware of the school environmental education programme implemented in schools. They felt the need for an environmental education programme for community people as well to make community people aware of various issues regarding the environment, their importance and methods for their protection.

9.3.2 The environmental education programme implemented in schools contributed to raising awareness of the community on the importance of the environment and the need for its protection. It was also noted that the community people realised the need for keeping their village clean through their own initiatives.

9.4 Impact of Environmental Education Programme on Schools

9.4.1 The teachers noticed that the environmental education programme contributed to improving the environmental condition in schools such as cleanliness of the school compound and its surroundings. The students began to help the school in cleanliness through keeping waste papers and dirty material in their proper places. They also began using toilet properly. They felt the need for taking care of plants, orchards and kitchen gardens.

9.4.2 Change in Teacher's Perception of the Environment

9.4.2.1 The environmental education programme has helped develop knowledge, skills and attitude of teachers regarding the environment. Teachers felt the need for the protection of the environmental elements such as, birds and animals.

9.4.2.2 Teachers realised the need of conserving the environment such as conservation of land, forest, water resources through controlling deforestation and proper utilisation of resources. The environmental education programme implemented at schools has raised the teachers' awareness of the importance of the environment and its conservation. They also felt the need for environmental education for children and community people.

9.5 Impact of Environmental Education on Students

9.5.1 Expected Knowledge of Students

9.5.1.1 The parents expected their children to learn the importance of plants and animals and need for taking care of them. They should develop knowledge of the environment and its conservation. They should be conscious of personal hygiene and feel the need for keeping their house and its surroundings clean.

9.5.2 Expected Behaviour

9.5.2.1 The parents expected their children to develop the habit of throwing rubbish and wastes in pits or their proper places. They should behave properly and express affection to animals. They should cooperate with each other in environmental protection activities.

9.5.3 Change in the Knowledge of Students

9.5.3.1 The parents observed that their children have learnt the need for keeping their house and its surroundings clean. They realised the importance of plants and animals and their protection.

9.5.3.2 Parents noticed that their children learnt the importance of personal cleanliness and were also conscious of their personal hygiene. They also felt the need for preservation of social values, custom and culture.

9.5.3.3 The pre- and post-test data of the experimental and control

school students indicated that the level of the knowledge of the experimental school students except of class 2 developed more significantly than that of control school students. In sum, it could be concluded that the project school students have benefited significantly from the project inputs.

9.5.3.4 The achievement level of experimental and control school students by individual districts are given below:

Class 1

The gain scores for experimental school students of class 1 in the post test are highly significant in Dhankuta and Dang but not in Kathmandu. However, the gain score of the control school students in the post test are negligible in all three districts.

The data revealed that the achievement level of the experimental school students of class 1 is higher than that of control school students in Dhankuta and Dang whereas there is not any difference in student achievement between experimental and control school students in Kathmandu.

Class 2

The gain score for the experimental school students of class 2 of Dhankuta is found to be highest and Dang was at the second position. The gain score in the post-test of experimental school students of all three districts are highly significant. In case of the control schools, the gain score for Dang is the highest, that of Dhankuta is the second highest; and that of Kathmandu is the lowest. It was found that the gain scores for experimental school students of all districts except Kathmandu were highly significant.

The data indicated that although the students of class 2 of control schools made some progress, the level of achievement of the experimental school students is much higher.

Class 3

The gain scores for experimental school students of class 3 in the post-test over pre-test is highest for Dhankuta whereas Dang and Kathmandu are in the second and third positions respectively. The gain scores for all three districts are significant. In case of control schools, the gain scores for all districts except Dang are insignificant.

Although the performance of the control school students of class 3 of Dang district is relatively better than that of other two districts, the performance of the experimental school students of all districts are much better

than that of control school students.

Class 4

The gain scores for experimental school students of class 3 of all three districts are greater compared to control school students'. The gain scores for all districts are highly significant. The gain score of the students of Kathmandu is the highest among three districts. Dang is in the second position and Dhankuta is in the third. In case of control schools, the gain scores are considerably low compared to the experimental school students' scores. However, the gain score for only Kathmandu is significant at .05 level .

As compared to the control school students of class 4, the achievement level of experimental school students is highly significant. In general the performance level of the control school students did not increase significantly over the experimental period.

Class 5

The gain score of experimental school students of class 5 in post-test indicates that their performance level of all study districts is better compared to control school students. Although the gain scores vary considerably with individual districts, they are highly significant. The students of Dhankuta performed better compared to other districts. On the other hand, the gain scores for the control school students of all districts are low and insignificant.

9.5.4 Change in Behaviour of Students

9.5.4.1 The teachers observed that the students have developed their knowledge, attitude and skills regarding the environment and felt the need for knowing about the environment. They were conscious of the protection of the environment and were cooperative in the environmental protection initiatives.

9.5.4.2 The students realised the need for keeping the school neat and clean and began to help in these initiatives. Parents and teachers observed that children began to use the toilet properly. They were conscious of dirty materials or solid waste and began to throw them in their proper places. They also realised the need of clean water and fresh food for good health.

9.5.4.3 Similarly, it was found that the children helped the parents keep their house and its surroundings clean. They were conscious of personal hygiene and also began to use the toilet properly; which

helped to keep the house and its surroundings clean.

9.5.6 Change in Attitude of Students

9.5.6.1 The teachers pointed out that students felt the need for being aware of environmental conservation. They also started to participate in environmental protection activities and also felt the importance of clean drinking water and fresh food for good health.

9.5.6.2 The parents noticed that their children felt the need for protecting plants. They were interested in making orchards and kitchen gardens. They realised the importance of public places, cultural heritage and felt the need for their preservation. They felt the need of cleanliness of their house and its surroundings. They were conscious of personal hygiene.

9.5.6.3 A comparative analysis of the attitude test scores for the experimental and control school students clearly revealed that the experimental school students (except classes 2 and 5) have developed significantly positive attitudes towards the environment. Overall, the data indicate that the project inputs have contributed to developing a positive attitude of the experimental school students towards the environment.

9.5.6.4 The attitude of the experimental and control school students by individual districts are given below:

Class 1

The gain score for experimental school students of class 2 of Kathmandu (in the attitude test) towards environmental issues is negligible. However, the gain scores for Dhankuta and Dang districts are highly significant. On the contrary, in the case of the control school students, the gain score for Kathmandu is found to be significant and that of other districts insignificant.

The attitude level of experimental school students is significantly higher than that of control school students in Dhankuta and Dang.

Class 2

The gain scores for the experimental school students of class 2 in the attitude test were significant in all study districts except Kathmandu. In control schools, the gain scores all the districts except Dang are insignificant. The gain scores for experimental and control school students in Dang are very close in

terms of proportionate gain (about 57%).

The attitude of the experimental school students of class 2 of Kathmandu did not change as compared to the control school students. However, the attitude of the experimental school students of Dhankuta improved significantly as compared to other districts.

Class 3

The gain scores for experimental school students of class 3 of all the districts in the attitude test were high and significant. But the gain scores for the control school students of all these districts were quite low and insignificant .

The data indicate that the attitude of the experimental school students improved compared to control school students of all the three districts.

Class 4

The gain scores for the experimental school students of class 4 of all the districts in the attitude test were highly significant. The gain scores for Kathmandu and Dhankuta were very close to each other and the gain score for Dang was the highest. In the case of control schools, the gain scores were relatively low and close to each other. The gain scores of only Dang and Kathmandu were statistically significant.

The data reveal that the attitude of the experimental school students improved significantly than that of control school students within the experimental period.

Class 5

The gain scores for the experimental school students of class 5 of three districts in the attitude test were highly significant. The gain scores of the control school students of Kathmandu and Dang were significant whereas that of Dhankuta were insignificant. However, the gain scores for the experimental school students of all the study districts were considerably higher than that of control school students.

9.6 Suggestions for Environmental Education Programme at School

9.6.1 Teachers suggested organising trainings, seminars, talk programmes and panel discussions about the environmental education in view of

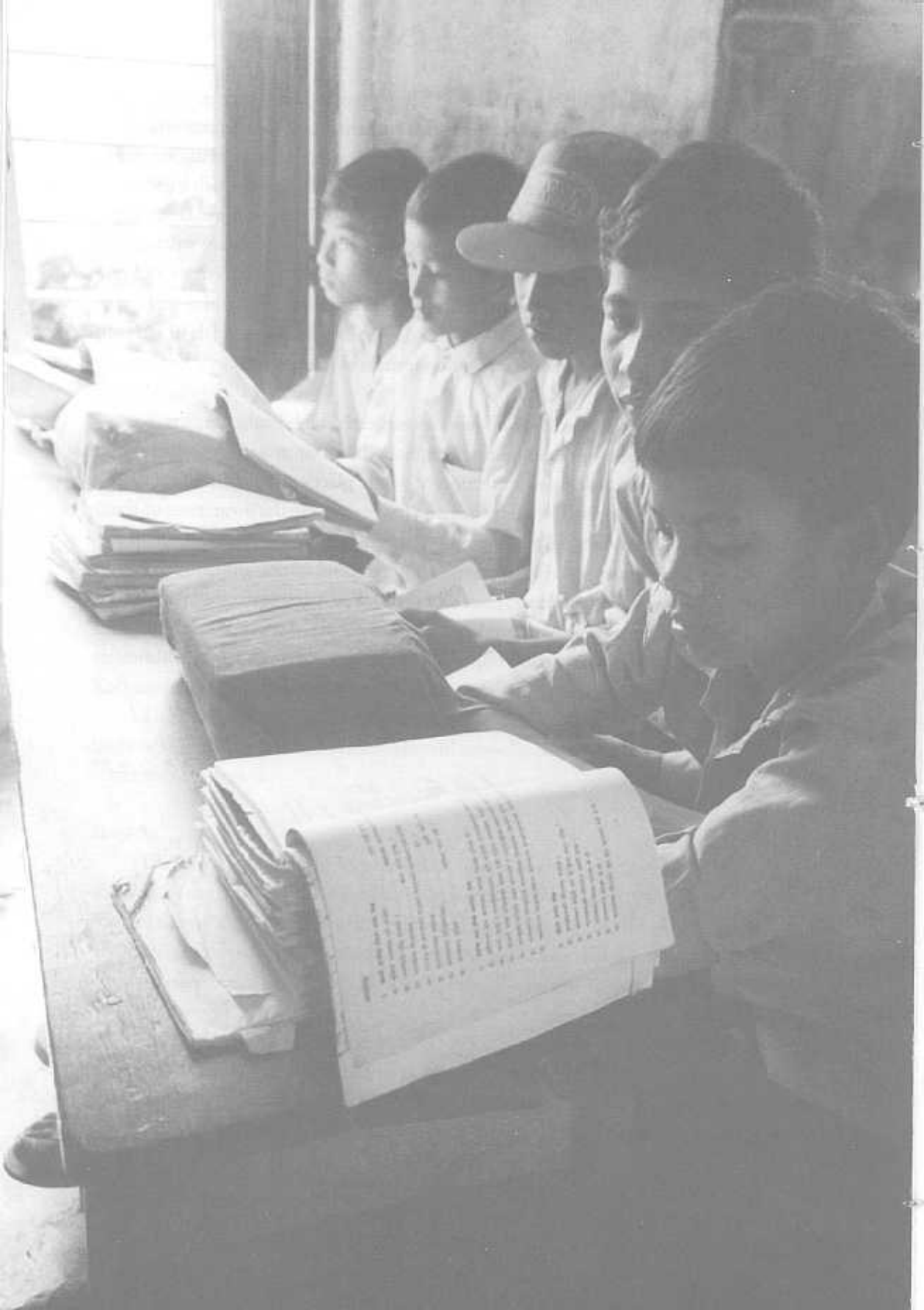
raising the teachers' awareness. They suggested increasing participation of the students in environmental protection programmes through involving them in sanitation, plantation, art competitions and drama.

9.6.2 The teachers suggested that environmental education should be taught to the students through various modes such as, drama, essay writing, quiz contest, poem composition, songs, dance, cultural activities and conducting various types of relevant competitions.

9.6.3 Suggestions for Environmental Education at Community

9.6.3.1 Both the teachers and parents suggested mobilising teachers, students and community people in the environmental protection activities such as protection of public places and maintaining their cleanliness. They felt the need for promoting the awareness of the community people on various aspects of the environment such as deforestation, proper use of resources and sanitation through organising seminars, workshop and discussion programmes.

9.6.3.2 Parents suggested publicising the importance of the modern technology, such as improved *chulo*, *gobar gas* plant and felt the need for using them to protect the environment.



Annex 1.1

Participating Schools in the Pilot Study

Kathmandu

Experimental School

Tyaud Secondary School, Tyaud
Bal Bikash Primary School, Shova Bhagabati
Bal Byabasayik Primary School, Siphal
Martyr's Secondary School, Gyaneshwor

Control Schools

Pravat Secondary School
Bagmati Secondary School, Naxal
Mangal Devi Primary School, Gaushala
Nepal Rastriya Primary School, Shova Bhagabati

Dhankuta

Experimental Schools

Saraswoti Secondary School, Siduwa
Bhimeswori Primary School, Parewadin
Namjang Primary School, Namjang

Control

Dibya Swori Primary School
Hile Secondary School, Hile
Mahamaya Primary School, Shalleri

Dang

Experimental Schools

Saraswoti Secondary School, Govardiha
Chainpur Primary School, Ganga Paraspur
Mahadev Primary School, Govardiha

Control

Kakrahawa Primary School, Kakrahawa
Janata Secondary School, Gadawa
Banghusri Primary School, Banghusri

Annex 1.2

National Level Steering Committee

Chairperson

Member
National Planning Commission

Members

Additional Secretary
Ministry of Education

Chief
Environment & Resource Conservation Division
National Planning Commission

Under Secretary
National Planning Commission

Under Secretary
National Planning Commission

Training Officer
Training Division
Ministry of Forest & Soil Conservation

Project Manager
Hotel Management and Tourism Training Centre

Director
Primary Education Project

Joint Secretary
Training Division
Ministry of General Administration

Director
Nepal Administrative Staff College

Chief
Women Development Division
Ministry of Education

Chief
Curriculum Development Centre
Ministry of Education

Chief
Central Agricultural Training Centre
Department of Agriculture

Joint Secretary
Ministry of Local Development

Senior Advisor
NPC/IUCN NCS Implementation Project

Annex 1.3

Resource Persons

Mr. Jit B. Thapa
Social Studies Specialist
Basic and Primary Education Project, Ministry of Education

Mr. Diwakar Dhungel
Nepali Language Specialist
Ministry of Education

Mrs. Durga Devi Regmi
Science Specialist
Curriculum Development Centre, Ministry of Education
Mrs. Rajya Laxmi Maskey
Health Education Specialist
Basic and Primary Education Project, Ministry of Education

Dr. Badri Dev Pande
IUCN Nepal

Mr. Uddhab B. Karki
IUCN Nepal

Consultants

Late Dr. Chandra P. Gorkhali
Dr. Tirtha B. Shrestha
Mr. Bimal Lal Shrestha

Annex 1.4

Resource Materials

1. Nepali Language Book

Nepali Language, Class 1
Nepali Language, Class 2
Nepali Language, Class 3
Nepali Language, Class 4
Nepali Language, Class 5

2. Social Studies Book

Social Studies, Class 1
Social Studies, Class 2
Social Studies, Class 3
Social Studies, Class 4
Social Studies, Class 5

3. Health Education Book

Health Education, Class 1
Health Education, Class 2
Health Education, Class 3
Health Education, Class 4
Health Education, Class 5

4. **Science Book**
   - Science, Class 4
   - Science, Class 5

5. **Nepali Language, Teacher's Guide**
   - Nepali Language, Teacher's Guide, Class 1
   - Nepali Language, Teacher's Guide, Class 2
   - Nepali Language, Teacher's Guide, Class 3
   - Nepali Language, Teacher's Guide, Class 4
   - Nepali Language, Teacher's Guide, Class 5

6. **Social Studies, Teacher's Guide**
   - Social Studies, Teacher's Guide, Class 1
   - Social Studies, Teacher's Guide, Class 2
   - Social Studies, Teacher's Guide, Class 3
   - Social Studies, Teacher's Guide, Class 4
   - Social Studies, Teacher's Guide, Class 5

7. **Health Education, Teacher's Guide**
   - Health Education, Teacher's Guide, Class 1
   - Health Education, Teacher's Guide, Class 2
   - Health Education, Teacher's Guide, Class 3
   - Health Education, Teacher's Guide, Class 4
   - Health Education, Teacher's Guide, Class 5

8. **Science, Teacher's Guide**
   - Science, Teacher's Guide, Class 4
   - Science, Teacher's Guide, Class 5

9. **Environmental Education Curriculum for Primary School**

10. **Environmental Education Teacher Training Manual, Exercise Book**

Annex 1.5

Questionnaire for Teachers

Name of School :

Address :

1. What did you experience from using resource materials of environmental education in classrooms ?
2. To what extent the training you received helped to teach environmental education resource materials for students ?
3. What type of impression did you develop from environmental education programme ?
4. Did you face any problems while using environmental education resource materials in classroom ? If yes, what are they ?
5. What should be done for using environmental education resource materials effectively in school ?
6. Has there been any changes in schools as a result of implementing environmental education programme for one academic year ? If there have been any changes, what are they ?
7. Has the environmental education programme brought any changes in students' behaviour ? If yes, what are they ?

8. Have the environmental education programme brought any changes in the houses of students ? If yes, what type of changes have been observed ?
9. Have there been any changes in the village or community of the students ? If yes, what are such changes ?
10. What type of environmental education programme can be conducted in your community ?
    a. Environmental Education Programme for School
    b. Environmental Education Programme for Community
11. If you have further comments on environmental education programme, please write below:

Annex 1.6

Questionnaire for Parents

Name of School:

Address:

1. Do you know that your children are studying environmental education in school ?
   a. Yes b. No
2. If yes, what have your children learnt from environmental education course ?
3. What type of changes in the behaviour of your children have been occurred as having been participated in environmental education programme ?
4. What type of changes did you observe as your children have been participated in the environmental education programme ?
5. What do you expect from your children to learn from environmental education programme ?
6. What type of behaviours do you want to develop in your children from environmental education programme ?
7. What type of impacts do you want to see from environmental education programme on your village or community ?
8. If you have further suggestions or comments please give them below: