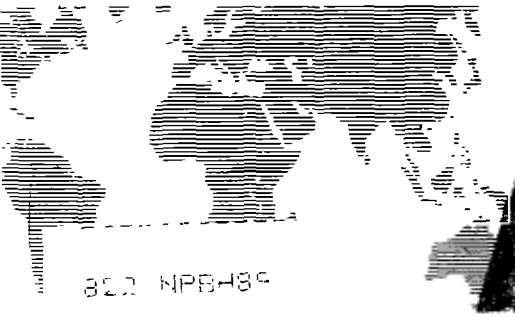

Community Development-oriented Health Education

Health Education Programme in Bhaktapur: An Experience

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Health Education Programme in Bhaktapur: An Experience

Kamal Bahadur Shrestha,
Pushpa Shrestha

Sponsored by
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Bhaktapur Development Project

Bhaktapur 1989

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APPENDICES

PREFACE

Bhaktapur Development Project holds a great deal of experience in various sectors of urban development. With this publication it is hoped that some of this experience will be preserved and be available for wider dissemination.

In the past, many programmes were only supply-oriented, assuming that services and supply once made available to the people would automatically be used and maintained. Bhaktapur and other experiences have proved that the case is not always in line with the assumption particularly in areas that require a change in attitude, behaviour and habit. As such, we see in this document the necessity of attaching equal importance to the software approach as to the hardware. In this context, it is a pleasure for us that a pilot effort has been made in Bhaktapur in the field of health education with a community development approach.

Bhaktapur Project has a long history of changes, both external and internal in its multidimensional aspects of development and this document is a result of those changes. It is my hope that this document, based on a concrete set of experiences, will provide a forum for thought evoking stimulation and further change in the field of relevancy, and prove to be of value for all concerned.

Secretary
Ministry of Panchayat and
Local Development

B. ACKNOWLEDGEMENT

This document is the result of a pilot effort made in the field of health education and participatory promotion of sanitation as part of an integrated urban development project in Bhaktapur. Our zeal and enthusiasm towards the completion of this work would have been diminished without the support, cooperation, participation, and advice of many individuals and institutions.

The programme owes its conception to the work of **Mr. Ingo Guhr**, GTZ Adviser for the Bhaktapur Development Project and Solid Waste Management Project. Mr. Guhr was very instrumental in all the components of the porgramme. Without his initiation, services, encouragement and advisory support, we feel that the programme would not have had any impetus, nor the continuous and contributory performance. This document has thus, as is evident, been influenced by much of his work. Mr. Guhr devoted his busy time in Germany to meticulously go through the document and provide valued comments and suggestions. It is with affection and appreciation that we acknowledge our grateful indebtedness to him. **Mr. Horst Matthaeus**, GTZ Team Leader for Bhaktapur Development Project and Urban Development Unit/GTZ was instrumental in the result-oriented continuation of the programme by providing his support, cooperation and encouragement for which we are gratefully indebted to him. His comments and suggestions on the first draft were gratefully acknowledged.

During the entire period of the preparation of the document, the authors received generous support and cooperation from the Urban Development Through Local Efforts Project (UDLE)/GTZ, and would like to extend our gratitude to Dr. H.H. Sawitzki, GTZ Director, Dr. B. Heinrichs, the UDLE Team Leader, Mr. Tara Dev Bhattarai and Mr. Shambhu Pokharel. Special thanks go to Mr. Laxman Gopal Rajbhandary, UDLE Local Expert and formerly BDP Coordinator, for extending his support to the programme implementation at BDP and documentation at UDLE.

We extend our grateful thanks to Mrs. Susan Baker for painstakingly going through the language of the text, thoughtfully editing it and word processing the final draft.

Cooperation was given by many individuals and institutions throughout the programme. Individuals and institutions which helped the Alternative Sanitation Scheme have already been recorded in the documentation of the same. However, we like to add here individuals and institutions for their cooperation in other components of the programme as well.

Special gratitude is extended to Dr. Narasingh Narayan Singh, Secretary, Ministry of Education and Culture for the approval of and inspirational cooperation in School Health Education Programme (SHEP). The support and cooperation extended by Dr. Kedar Nath Shrestha, the Chief, Curriculum Textbook and Supervision Development Centre (CTSDC) was instrumental in SHEP and is gratefully acknowledged. Essential cooperation extended by all six District Education Officers with whom we had the opportunity to work within the programme period is greatly appreciated.

The services provided by Mr. Balaram Khyaju were very instrumental and appreciable in the Health Education Drama, Alternative Sanitation Scheme and BDP Final Phase Publicity and Awareness Campaign.

The authors would like to express their sincere thanks to all well-known resource persons who took part in the 56 day teachers' training programme, specially to Dr. Kedar Nath Shrestha, the Chief, CTSDC; Dr. Rajendra Kumar Rongong, Director, Curriculum Development Centre, Tribhuvan University; Mrs. Chandni Joshi, the Chief, Women Development Section, Ministry of Panchayat & Local Development; Prof. Gobinda Narayan Jyapoo, National Training Commissioner, Nepal Scout; Dr. Kokila Baidya, Regional Director, Mid-Zone Regional Health Directorate, Ministry of Health; Dr. Yogendra P. Pradhananga, Institute of Medicine; Ms. Nupur Bhattacharya, Coordinator, Hatemalo Radio Programme. Warm appreciation is specialy extended to Ms. Chandni Joshi for acquainting one of the authors (Kamal) with various alternative training/teaching methodologies and to Dr. Yogendra P. Pradhananga for his cooperation on other occasions as well as during the training programme. We also express our appreciation to Mr. Gajendra Baidya, Headmaster, Shri Sharada Service Centre; Mr. Shiva Rajbhandary, Headmaster, Shri Gyan Bijaya Service Centre and Ms. Bina Rajbhandary, CTSDC; for their essential cooperation.

The programme also enjoyed the support of Mr. Uttam Ratna Dhakhwa, Project Coordinator, BDP; Mr. Goetz Hagmueller, German Team Leader; Mr. Kumar Lohani, the Chief, CDU/BDP; and Mr. Surya Raj Satyal, CDU/BDP. In later phases the support was extended by Mr. Laxman Raj Shrestha, Project Coordinator, BDP; Mr. Ratna Mehar Bajracharya, the Chief, CDU/BDP deserves to be mentioned here.

Our grateful thanks are also extended to UNICEF for assisting with the production and provision of educational materials, and to Integrated Family Planning and Parasite Control Project (IFPPCP) for providing data on worm diseases and technical support in conducting stool tests. The cooperation extended by Bhaktapur Town Panchayat, Bhaktapur Jaycees, Kala Pucha, and the Health Education Section/Ministry of Health also deserves to be mentioned here.

We also would like to record our sincere appreciation to the brother of one of us, Dr. Chandra Bahadur Shrestha, Hon'ble Member, National Planning Commission, for inspirational support on many occasions.

Above all, the help, cooperation and participation of the community workers and teachers was focal to the tangible progress of the programme. Many teachers had very creative ideas and took a leadership role in SHEP activities. We would like to express our warm thanks to Mr. Mahendra G. Karmacharya, Mr. Ram Sikho, Mr. Shiva Ram Rajchal, Mr. Debendra B. Joshi and all the teachers, a list of whom is given in the appendix, for their active, enthusiastic and creative participation, cooperation and initiation.

We also acknowledge the enthusiastic and reliable cooperation of the ennumerators in the household survey.

Finally, we would like to thank BDP and GTZ for providing invaluable experience in planning, implementation and evaluation of the programme and in the presentation of this document, and to all those who have directly or indirectly supported us.

Due to our limited experience, flaws may have arisen in this document and we take responsibility for any unwise statements which may have been made. Our task has been a great joy and we demand no recompense other than to emphasise that health education, participatory promotion of sanitation, other preventive measures and community participation is essential to any development effort if the target group is to be really benefited and real development is to take place. We urge that they should be widely undertaken with clear policies and planning guidelines.

Kamal Bahadur Shrestha
Pushpa Shrestha

C. SUMMARY

This is a description of a wide range of health education activities instigated in support of water supply and sanitation measures with a summary of the resulting changes in a given community.

The Bhaktapur Development Project (BDP) in Nepal has contributed to the improvement of Bhaktapur's sanitary conditions by building or extending the following physical infrastructure components:

- repairing and extending the water supply system;
- building a modern sewerage system;
- paving streets, courtyards and open spaces;
- constructing more than 30 public and 3400 private latrines

A health education programme was designed to make the town's people fully utilise these physical improvements and further promote sanitation. The major components of the programme are described in this report.

CHAPTER 1 gives a short project history followed by the rationale for starting health education by describing the health situation, the conditions of the physical infrastructure and the behaviour of the people before the start of the health education programme. (It was beyond the scope of this report to give details of the public and traditional health services provided in Bhaktapur).

CHAPTER 2 gives an overview of (a) the town cleaning campaign, (b) health education drama, (c) the alternative sanitation scheme and (d) final phase awareness campaign.

CHAPTER 3 mainly refers to the school health education programme with the programme preparation, the preparation of a teachers's guidebook for grades 1 - 7, the training of teachers and actions initiated by the teachers.

CHAPTER 4 touches briefly on the role of 2 local institutions.

CHAPTER 5 summarises the changes affected by the improvement of the infrastructure and the health education programme by evaluating the utilisation of private and public toilets, the use and conditions of private water taps and the decline of communicable diseases etc.

The authors have worked with the health education programme for more than 2 years following the completion of the Bhaktapur Development Project. They therefore have had the rare opportunity of observing the changes effected by the project as time is needed for any such changes to evolve.

D. OBJECTIVES OF THE REPORT

The main concern of the Health Education Programme of the Bhaktapur Development Project is the promotion of community-development oriented health education based on popular participation of local institutions and the community.

Various behavioural approaches and methodologies were used in the programme. One of the key elements in this programme is the systematice exchange of knowledge, and experience among different target groups.

The programme also applied careful monitoring and evaluation to improve the understanding required for more effective programme design, planning, and implementation.

With this background, the following objectives have been identified:

- to promote the exchange of the practical field experience of the health education programme;
- to stimulate alternative health improvement activities;
- to provide information on programme activities and their assessments;
- to describe important issues, strengths and weaknesses in the health education programme.

Due to the absence of co-ordinated efforts and proper recording of programme activities, the lessons learnt from past experiences of many effective and ineffective programmes were lost. To cope with a new development strategy that has been rapidly taking shape, the interest in technical information and in methodologies for alternative approaches is increasing. On the other hand, despite its promise of major effects in development, health education, demand approach and participatory promotion are given low priority in development efforts and in this regard only a little action has been taken. The programme described here is a pilot effort made as part of an integrated urban development project. It is hoped that what is learned from this pilot scheme will serve to develop future programmes more effectively.

In light of these facts, this document attempts to make the experiences of the health education programme in Bhaktapur available to decision makers, development officials, planners, specialists, programme organisers, trainers, teachers, technicians, and those personnel and institutions already involved or to be involved in health education and local development work.

C H A P T E R I

SITUATION IN 1982

A DEMAND FOR HEALTH EDUCATION

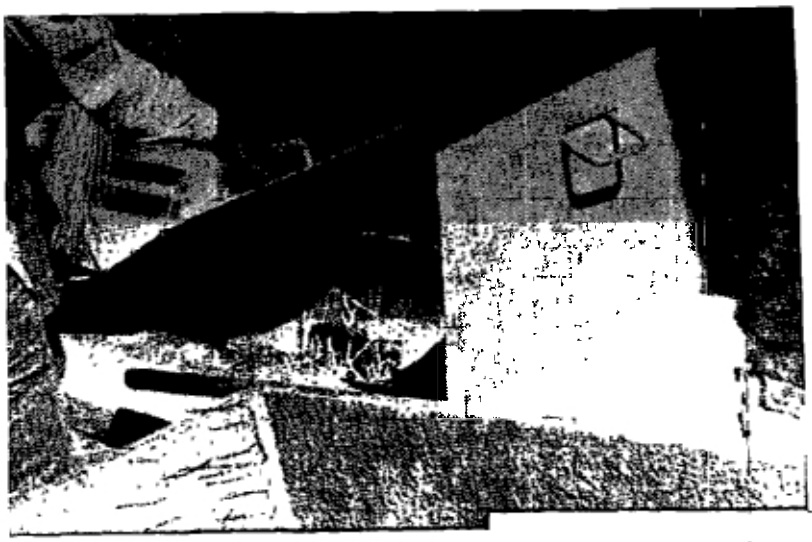
...road pavement with surface water inlet chambers...

...courtyard rehabilitation...

...modern public toilets with water supply: water tank, and taps, ...

...private toilets with taps...

...a waste disposal system...



...with satellite waste containers where people could deposit their waste.....

...central waste containers where waste collected from the satellite containers could be deposited.....

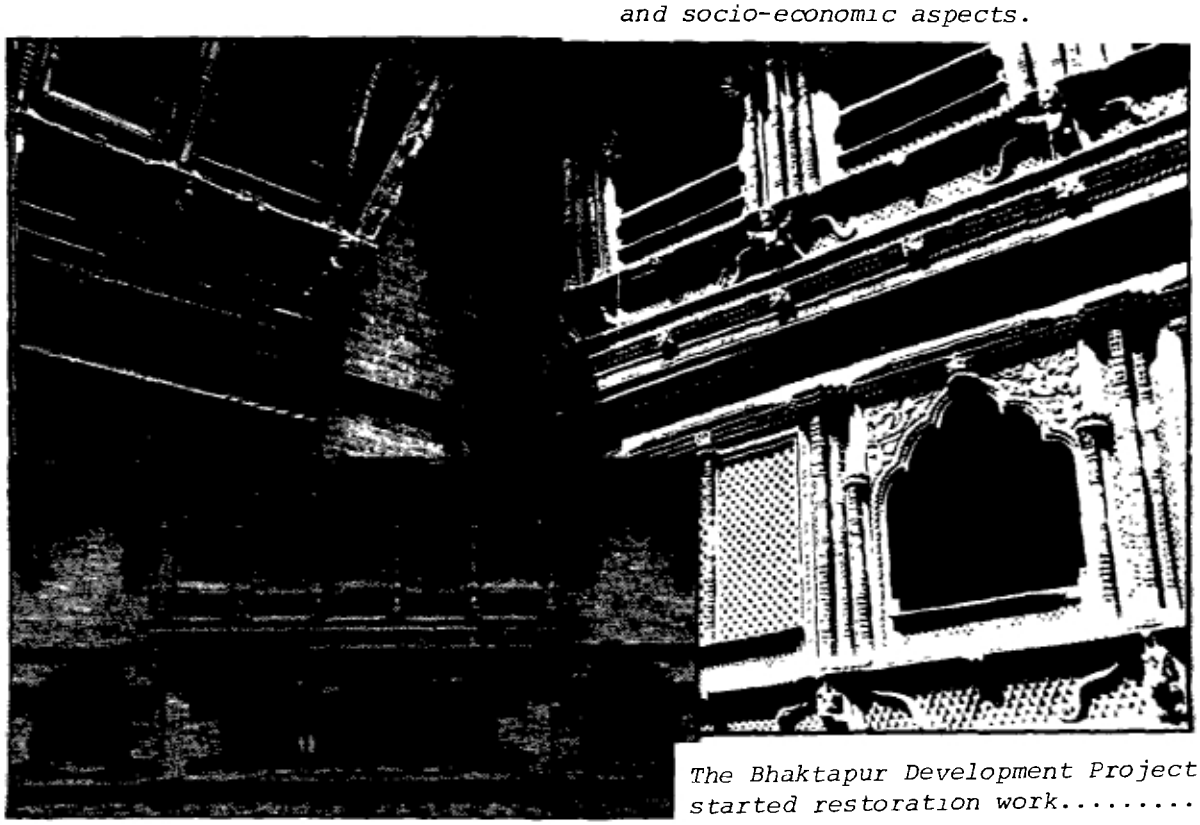
...and a compost plant for the production of compost fertilizer from the collected waste...

1. BACKGROUND

1.1 Pictorial Review

...an ancient medieval city, famous for its traditional socio-cultural heritage...

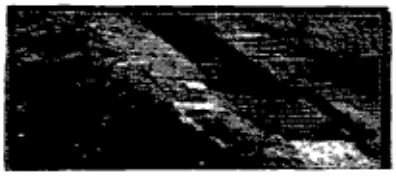
...was deteriorating in many physical and socio-economic aspects.



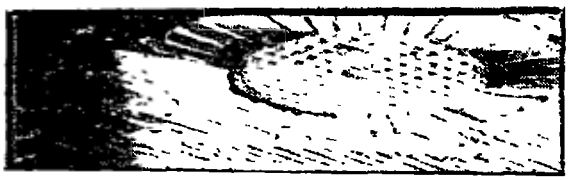
The Bhaktapur Development Project started restoration work.....

...following with urban infrastructure such as a water supply system,.....

..a combined sewerage system..



...with surface drainage and inlet chambers.....

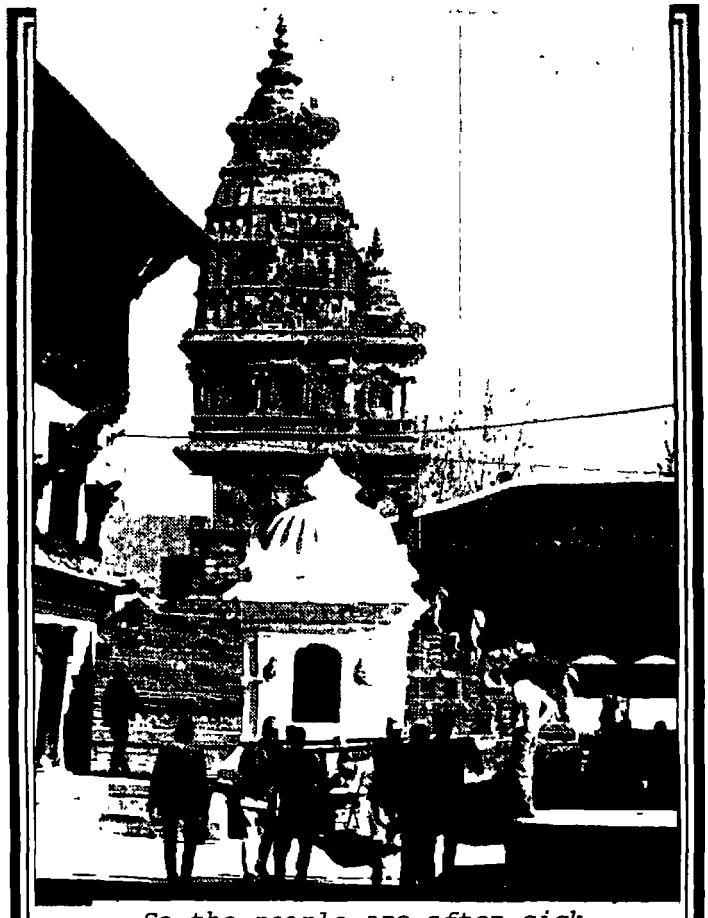


...manholes,...

...house connections...

...and treatment plant....

There are still tremendous examples of unhealthy practices.



So the people are often sick.

"What can I do ?"

"Let us decide, and start action together".
& Finally, BDP decided...

The covers of house connections were lost or damaged, and liquified waste was overflowing.

Many gratings of surface water inlet chambers were damaged or missing. Blocked inlet chambers prevented waste surface water draining into the sewer.

The deliberate blocking of sewer pipes provided a convenient supply of sewage for irrigation. Lost manhole covers and deliberate blockage allowed solid waste to block the whole system.

Renovated ponds again started to become dirty and polluted.

...and beautiful stone taps,
a place of waste accumulation.

Unpaved streets worsened considerably.

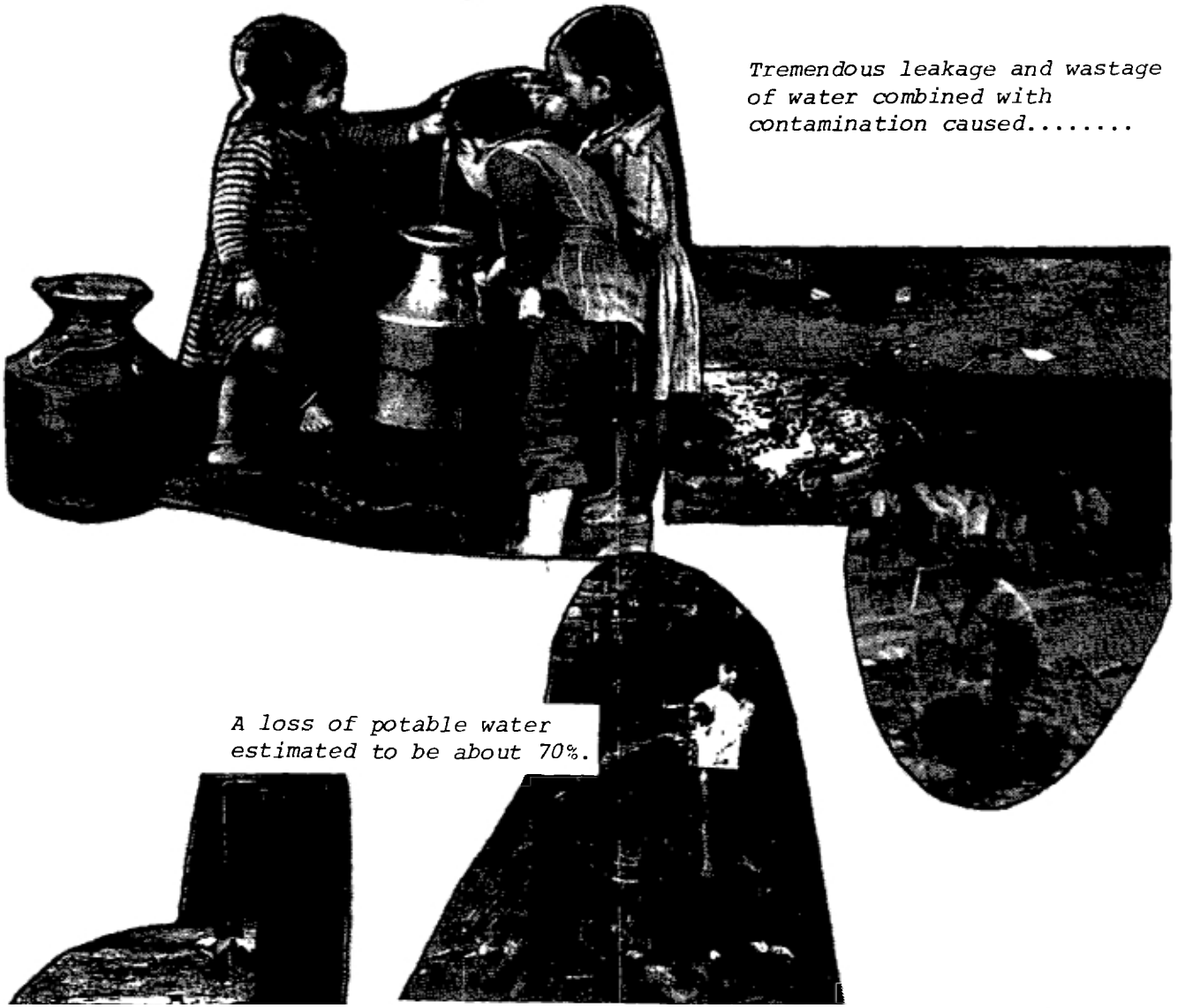
The condition in schools was no better...

Food being served beside rotting waste.

...a school compound.

...improper defecation.

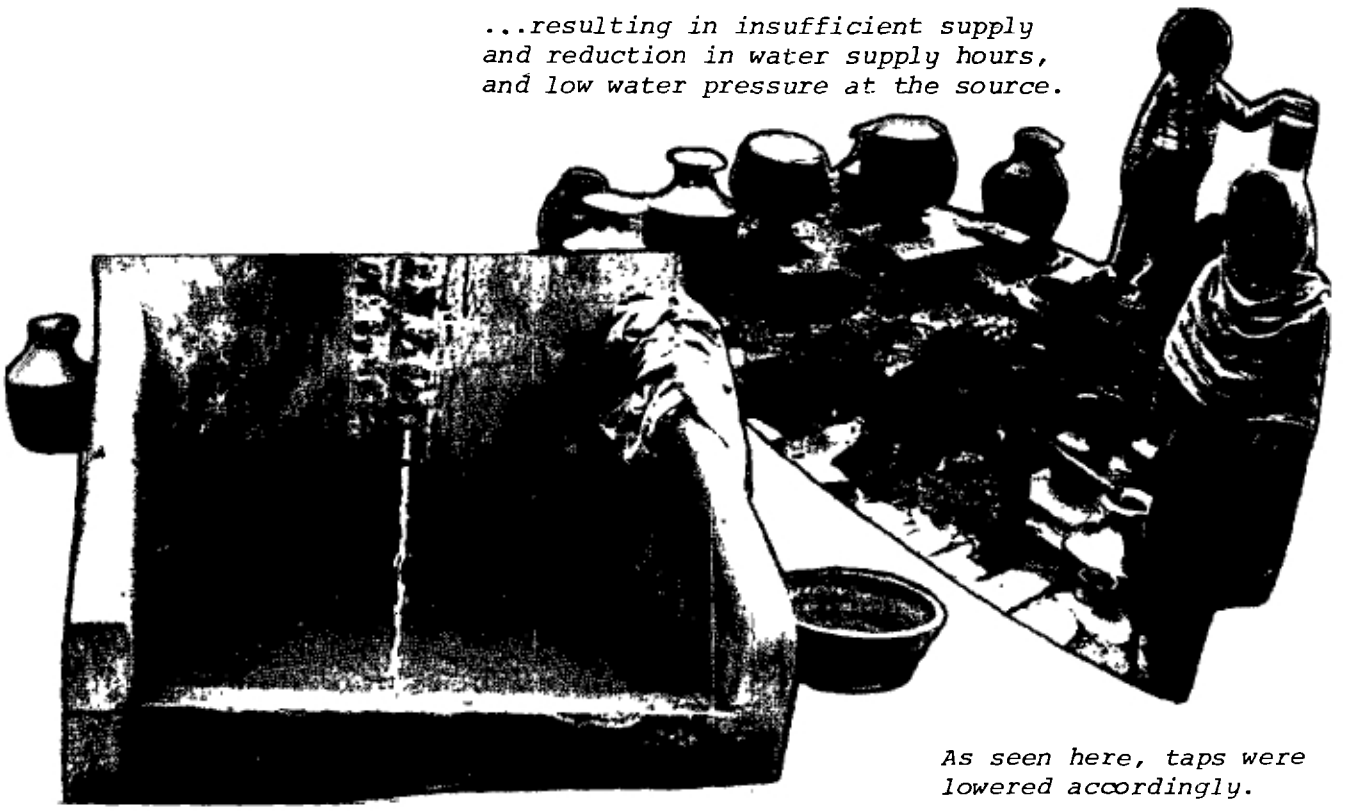
...and growth of pathogens behind a school.



Tremendous leakage and wastage of water combined with contamination caused.....

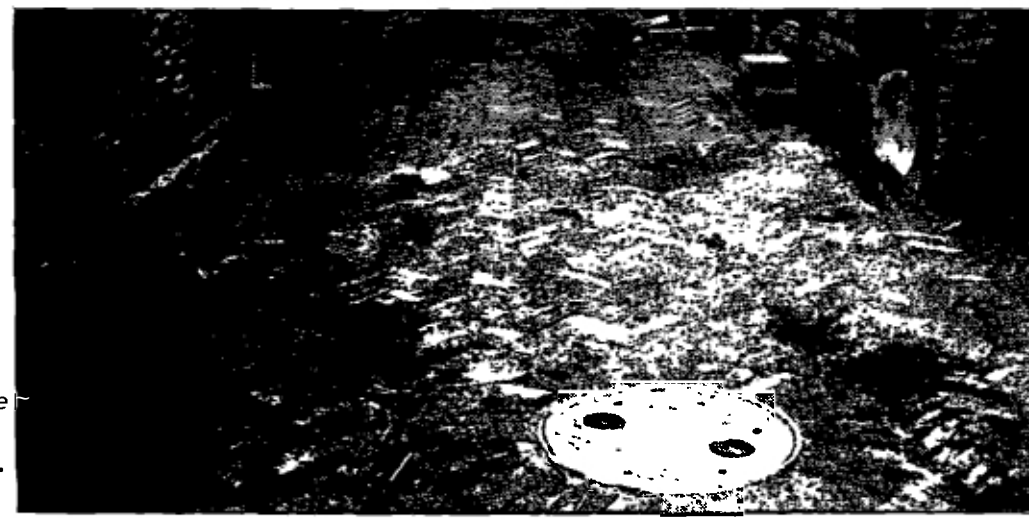
A loss of potable water estimated to be about 70%.

...resulting in insufficient supply and reduction in water supply hours, and low water pressure at the source.



As seen here, taps were lowered accordingly.

The people still continued defecation on the beautifully paved brick road.

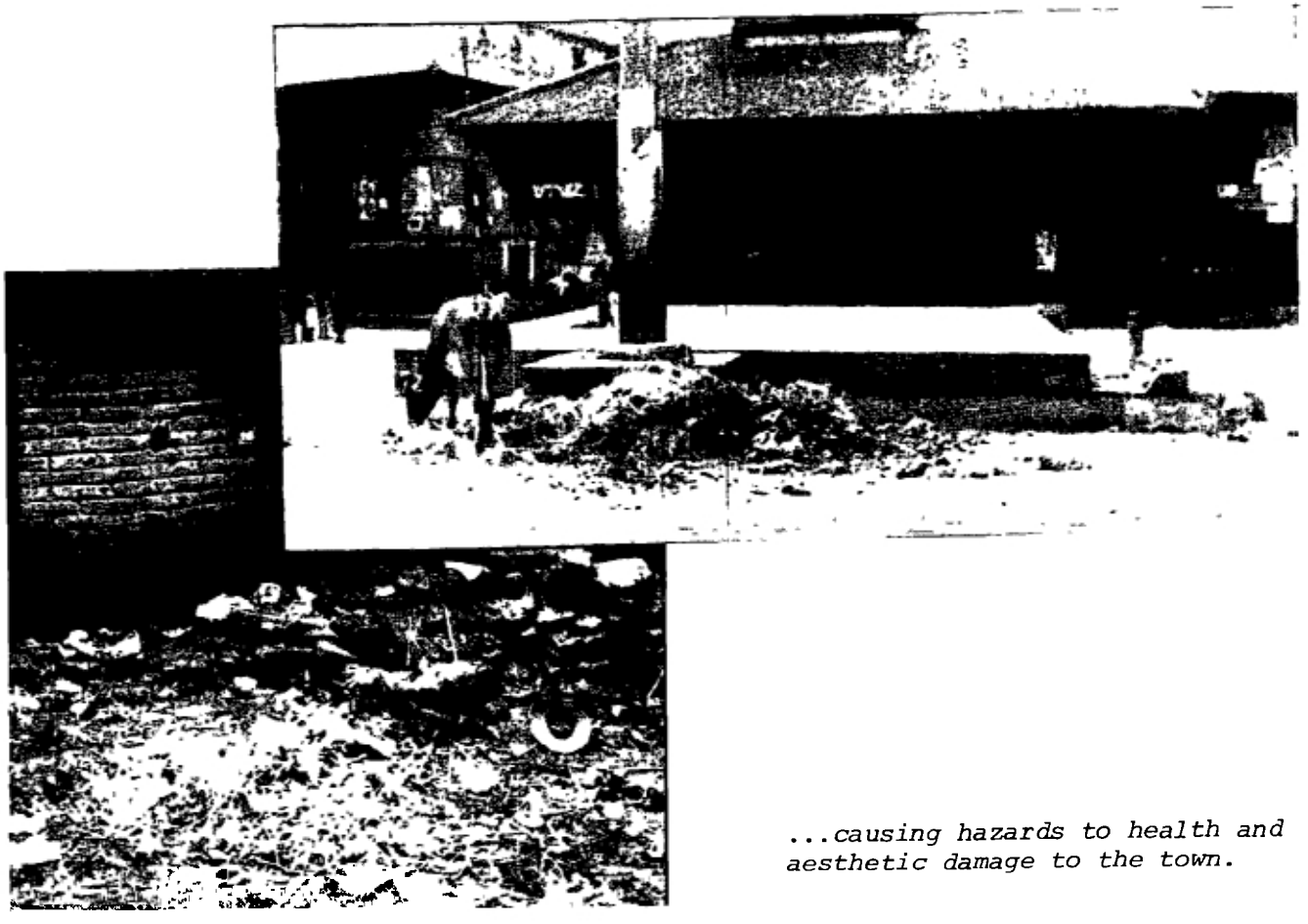


Wear and tear of the pavement was left unchecked.

The throwing of waste into beautifully paved streets and courtyards continued.

Initially, the people did not properly use the satellite waste boxes. At later stages, they slowly started to dismantle them. By 1982, almost all of 185 waste boxes were destroyed.

9 central waste containers suffered a similar fate.



...causing hazards to health and aesthetic damage to the town.

Wet composting at the open sewer outlet of the toilet - a further health hazard.

Blockage of the sewer connection caused faeces from the toilet to overflow.

The toilet design was also not acceptable to the users resulting in improper use.

Defecation around the toilet building was common.

Here, the house connection was misused for defecation.

Public toilets were not used. The majority of people, both adults and children, preferred open defecation.

Even in households with private latrines, the family members did not use them regularly.

Here: defecation was done at one side of the river while laundry and bathing was done on the other.

Wet composting at the open sewer outlet of the toilet - a further health hazard.

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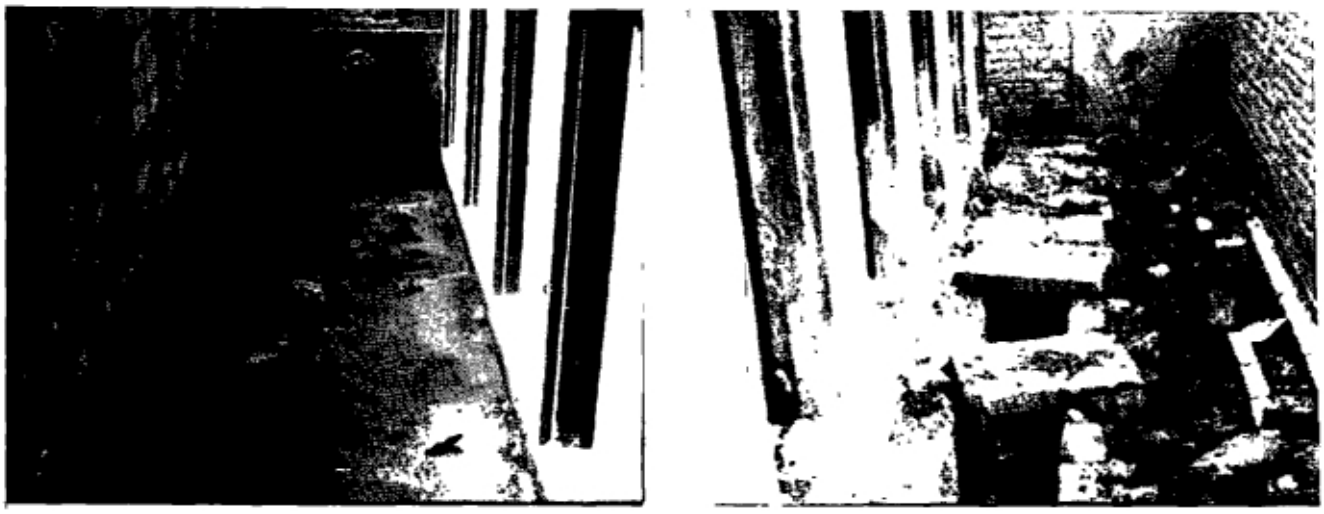
The assumption that the people will ultimately use and maintain the facilities proved to be wrong. The people questioned how the facilities are linked with their health or the improvement of their living condition. The tradition old habits, practices, and attitudes prevailed.

Almost all public toilets were used unhygeniecally.

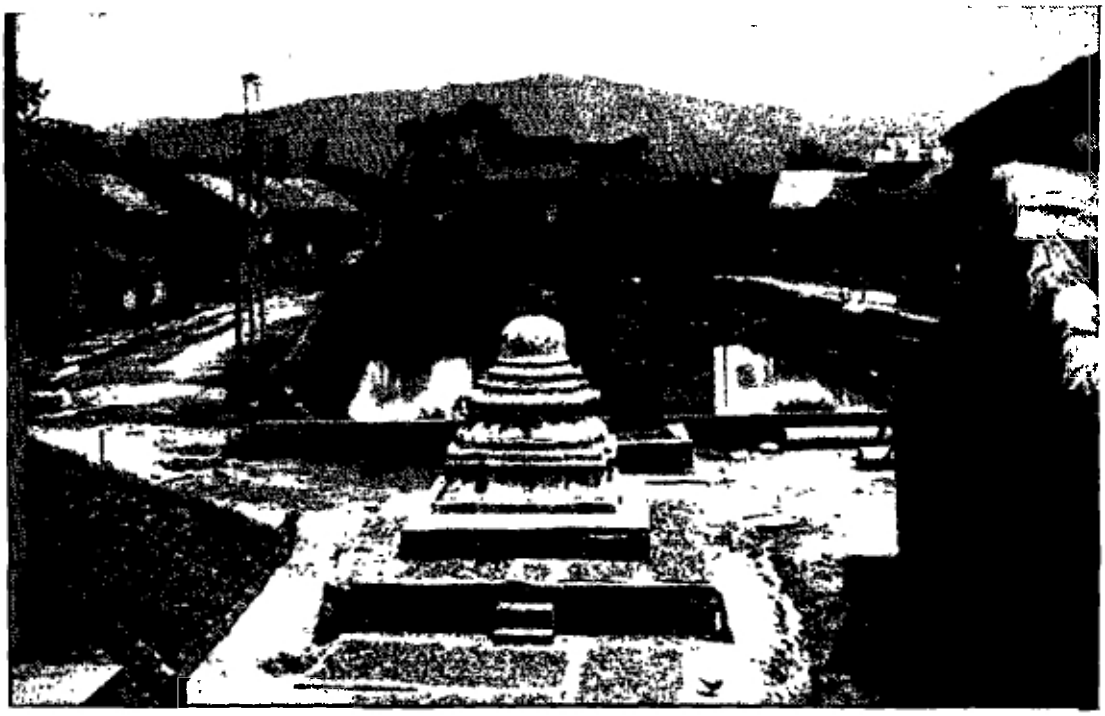
Even when schools possessed toilets they were in a hazardous condition.

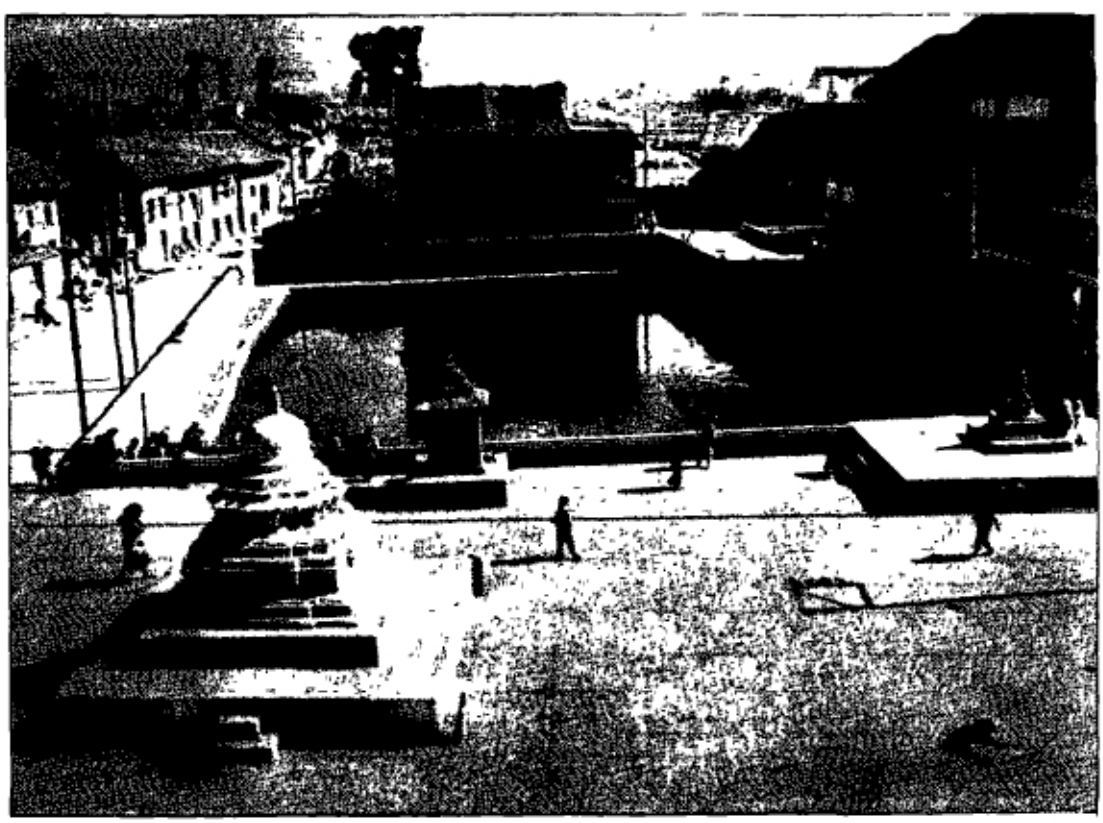


Faeces litter the entrance to the toilets; missing taps, damaged sewer connections and floors were typical.

In many cases, separation walls are totally dismantled. Here even the pans are destroyed. The toilet floor is totally covered with faeces.

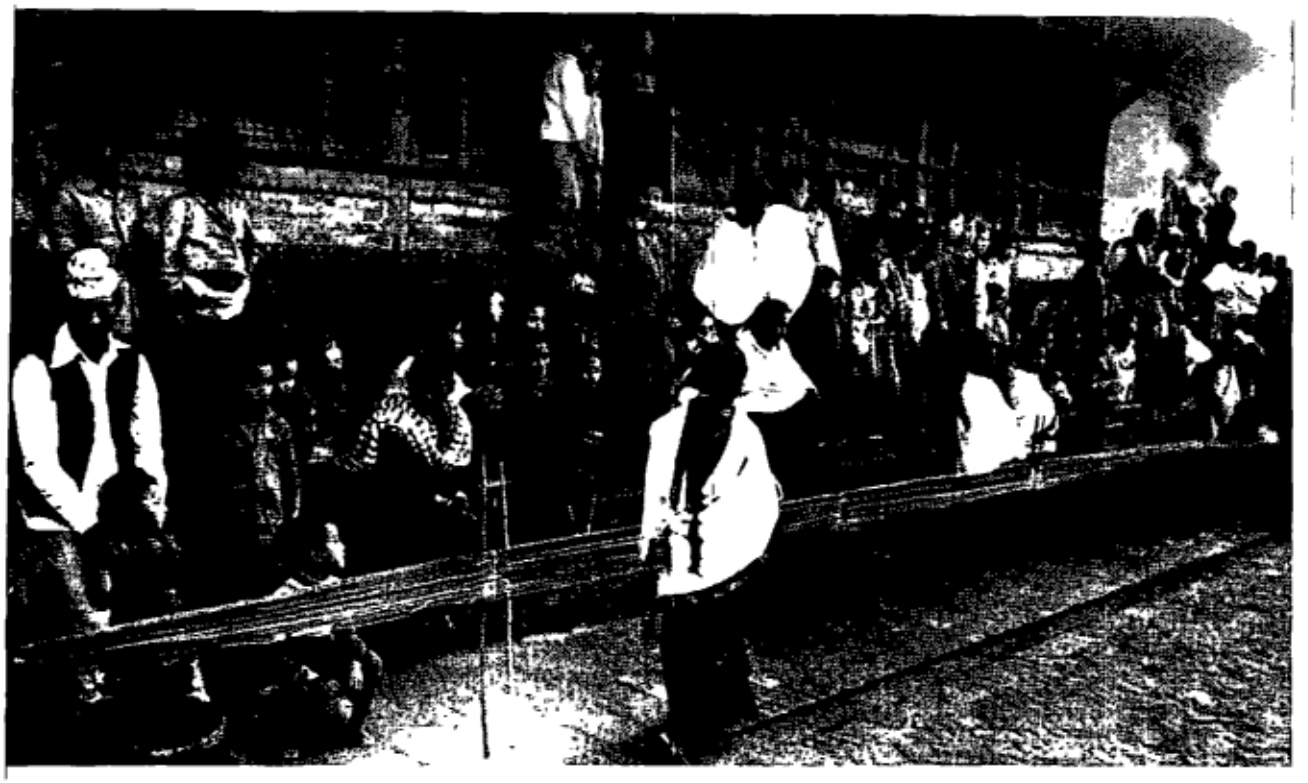
Roofs were also damaged in many cases.





Apart from the restoration of monuments and temples, the rehabilitation of ponds...

...and stone taps was also done.



The common link between these development works was the people's health, the sanitary and aesthetic improvement of, and the preservation of the cultural heritage of the town. The extent of the improvement, literally, of people's living condition after 8 years of project work is the subject of discussion.

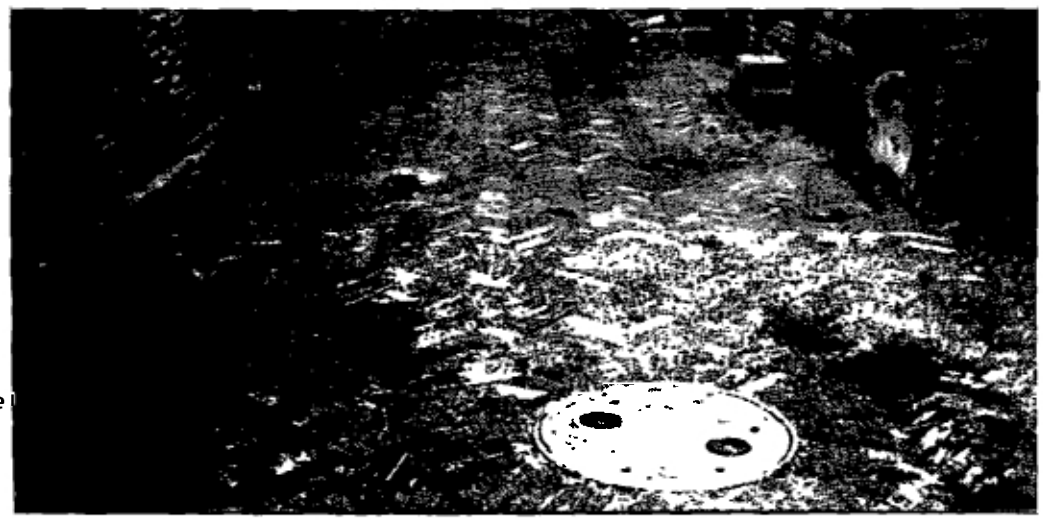
But there was no change in the pattern of morbidity.

Diseases were still on the increase.

The mortality and...

...birth rates were still higher than the national average.

The people still continued defecation on the beautifully paved brick road.



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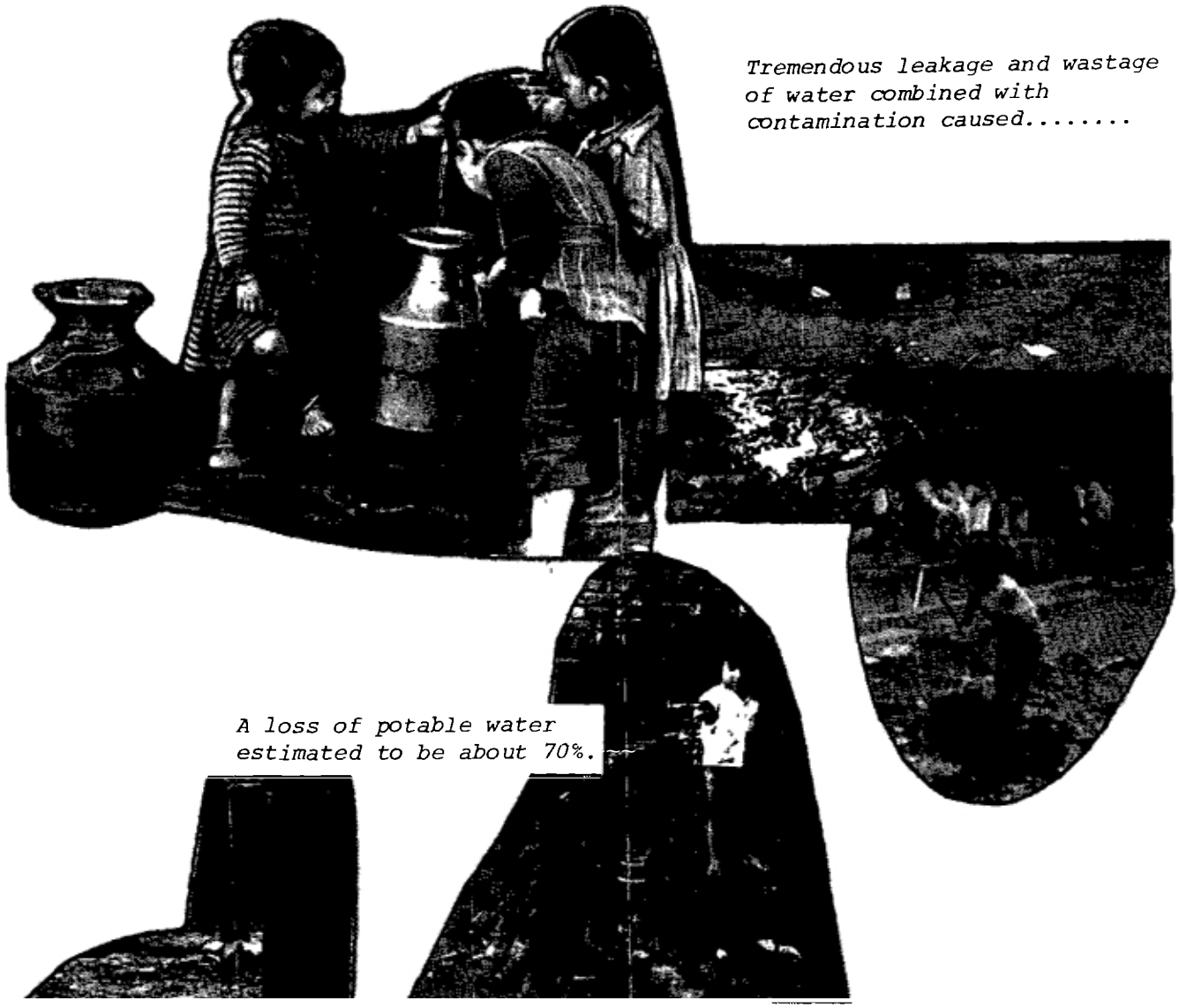

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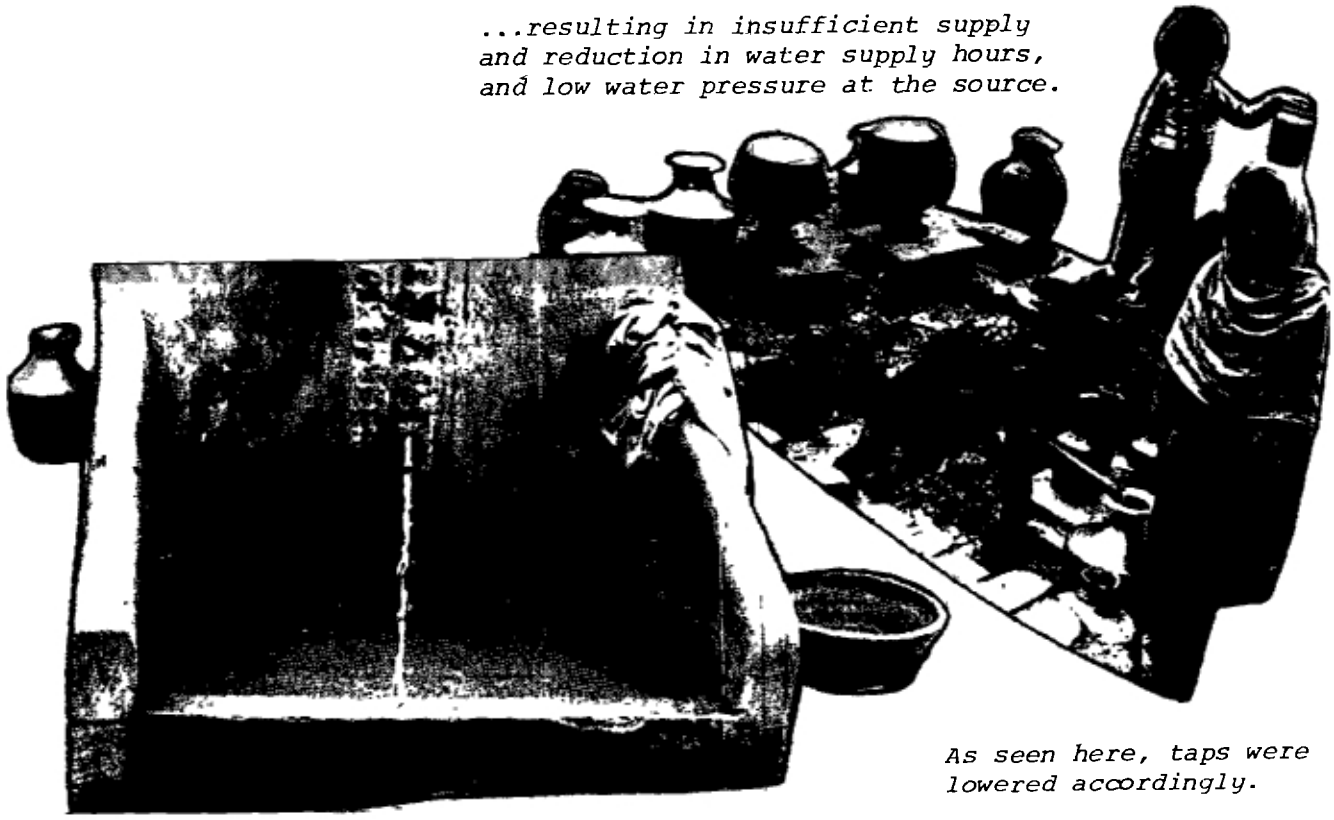

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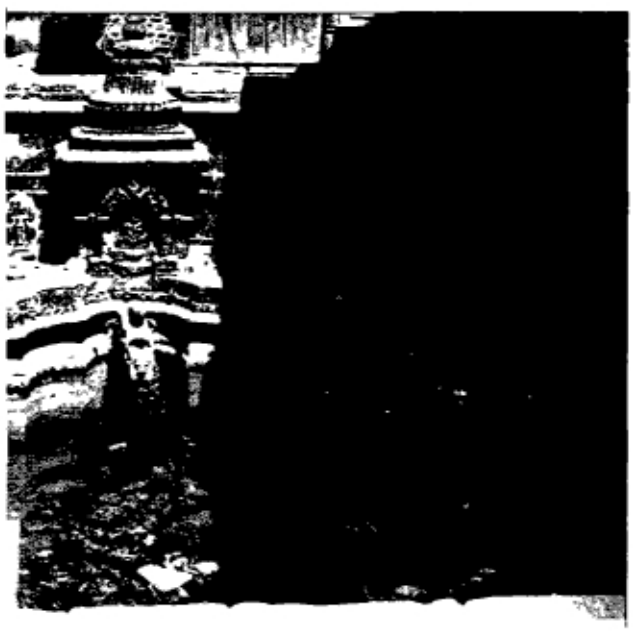

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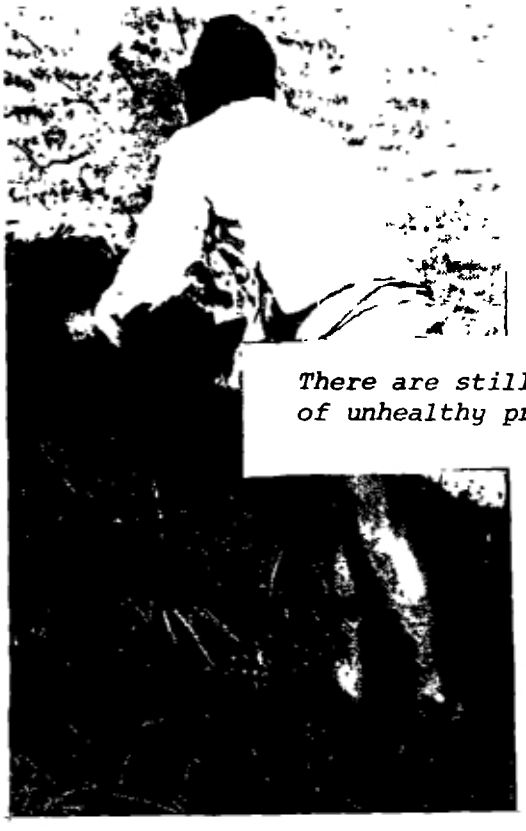

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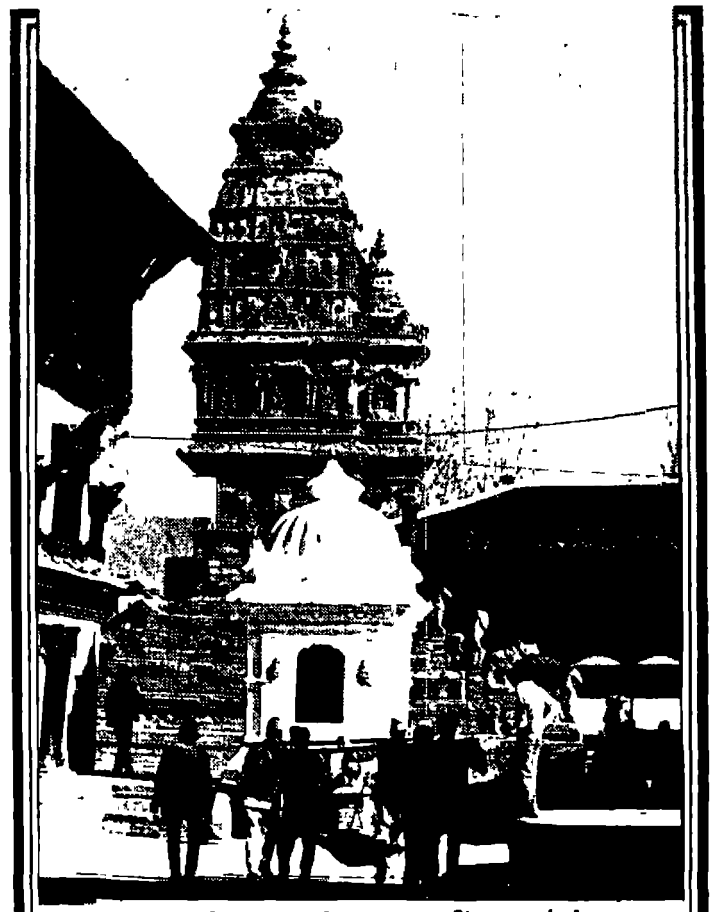


So the people are often sick.

"What can I do ?"

"Let us decide, and start action together".
& Finally, BDP decided...

1.2 Background Information

In 1974, the Bhaktapur Development Project (BDP) was started under the bilateral technical co-operation between His Majesty's Government of Nepal and the Federal Republic of Germany with the aim of "improving the living conditions of urban Bhaktapur".

The project, with its integrated approach to urban development, was extended in the following phases for a period of 12 years from 1974 to 1986:

The First Phase	1974 - 1976
The Second Phase	1976 - 1979
The Carry-over Phase	1979 - 1980
The Third Phase	1980 - 1983
The Final Phase	1983 - 1986

During the First and Second Phases, development works were carried out on urban infrastructure such as the water supply system, sewerage system, road pavement, private and public toilets, waste collection and disposal system including the compost plant, restoration of monuments, temples, ponds and stone taps and other town development, economic and tourism promotion activities. In technical terms, development works were successfully carried out but popular participation in the planning, decision making and implementation of project activities was not well thought out or given the necessary attention. As a result the people were irresponsible towards the implementation of development works and the utilisation and maintenance of the BDP inputs. BDP started to receive feedback which led to a change in its approach, working policy and methodology, from the third phase onwards.

The working base for the third phase was community participation and a user group approach. The new approach necessitated a change in the project organisation and decision-making. In order to help the new approach function well the Community Development Unit (CDU) was established. The main objective of the CDU was to make the process of local development self-sustaining. Local Development Committees (LDC's) were formed with the aim of giving the local people more freedom:

- to decide on the development priorities and projects in their neighbourhood;

- to implement local development works on their own with material, technical and financial support from BDP; and

- to mobilise local resources.

However, the experience with the new participation approach was mixed. Some LDC's functioned very well while others encountered problems.

The people were still not aware of how their health and living conditions could be improved by the physical infrastructure. The traditional habits, practices and attitudes of the people did not change as expected when facilities became available. The people understood little of how the provision of toilets and the proper functioning of a sewerage system could affect their living conditions; they continued to defecate in the streets and in other open spaces and showed little concern for the maintenance of the drinking water supply system. Many such examples were observed and a few will be discussed in the following pages.

In the face of such problems, the need for introducing health education into BDP was recognised. A project that aims to improve the living conditions of people cannot ignore the questions of health.

2. HEALTH

The following cases, highlighted on the basis of existing data and information, indicate the health situation in Bhaktapur before 1982.

2.1 Communicable Diseases

Data representing the exact morbidity pattern in Bhaktapur is generally lacking, however, the following facts and figures indicate a general picture of a continuing state of poor health.

2.1.1 Worm Infection

Stool tests carried out in 1979, 1980 and 1981 in three wards of Bhaktapur revealed the following situation with regard to worm infestation:

Table 1

Parasite Infection Rate in Bhaktapur, 1981

Total No of stool Tests	Parasite		Infection Rate	Estimated Total Infected Population, 1981
	Positive	Negative		
4,295	3,898 (91.0%)	397 (9.0%)	91%	45,925 (out of 50,468)

Source: Integrated Family Planning and Parasite Control Project, 1981

Within three years (1979, 1980 and 1981) stool tests of 4,295 samples of the population were carried out.

During those years the worm infection rates were 90%, 94% and 91% respectively. This indicates that approximately 45,925 out of a population of 50,468 in 1981 were suffering from worm diseases.

Table 2

Parasite Infection Rate by Age-Group, 1981

Types of Parasites	Age-group			Estimated Number of Infected Population
	1-12 yrs	13 yrs & above	Total	
Roundworm	1,544 (73.1%)	1,712 (78.4%)	3,256 (75.8%)	38,255
Hookworm	94 (4.6%)	209 (9 6%)	296 (6 9%)	3,482
Whipworm	853 (40.0%)	890 (40.8%)	1,743 (40 6%)	20,490

Source: Integrated Family Planning and Parasite Control Project, 1981

In tests, roundworm (ascaris) were found in 75.8%, hookworm in 6.9% and whipworm (t.trichuria) in 40.6% of cases.

Similarly in October, 1983, towards the beginning of the Alternative Sanitation Scheme in Bhelukhel, an area of Bhaktapur populated by the lowest caste group, stool tests were carried out on 467 people, 95% of whom were found to have parasites.

Table 3

Parasite Infestation Rate at Bhelukhel, Bhaktapur 1983

Type of Parasite	Total No of Infected People	Infection Rate
Roundworm	423	91%
Hookworm	30	6%
Whipworm	151	32%

Total Stool Tests carried out 467

Source: Field test, Community Development Unit, BDP with technical support from IFPPCP, 1983

With regard to parasite infestation, roundworm were found in 91%, hookworm in 6% and whipworm in 32% of cases in Bhelukhel.

The mean worm load in Bhaktapur is calculated as being 19.83 roundworms and 56.35 hookworms in an infected person. It should be noted that after medication, an infected child in Bhaktapur passed 64 roundworms.

2.1.2 Hospital Record

The following table of the annual distribution of the treatment of major communicable diseases in Bhaktapur Hospital reflects the trends in the pattern of morbidity in Bhaktapur and gives an indication of the necessity of preventive measures.

Table 4

Annual Distribution of Major Communicable Diseases recorded in Bhaktapur Hospital 1977-81

Diseases	No of Patients				
	1977	1978	1979	1980	1981
Gastro-enteritis (Diarrhoea, dysentry)	639	790	644	668	684
Abdominal Pain	69	161	165	109	124
Typhoid	10	9	2	1	10
Bronchitis	380	346	278	204	382
Tuberculosis	77	65	68	72	91
Worm Diseases	-	-	2	2	2

Source: Bhaktapur Hospital, 1982

It is evident from Table 4 that before 1982 communicable diseases in Bhaktapur were either static or on an upward trend. The cases recorded in the table are serious cases only as people do not visit the hospital until they are too sick to be treated at home. Hospital records also confirm this fact. Only 6 patients with worm diseases were recorded within 5 years in Bhaktapur Hospital, despite the findings of IFPPCP that 45,925 people were infected with worms in 1981.

2.1.3 Record of Public Health Centre of Bhaktapur Town Panchayat (BNP)

The records of communicable diseases in the Public Health Centre of Bhaktapur Town Panchayat also confirm the same upward or static trend of communicable diseases in Bhaktapur.

Table 5

Annual Distribution of Major Communicable Diseases in Bhaktapur Recorded in the Public Health Section, Bhaktapur Town Panchayat

Diseases	No. of Patients				
	1977	1978	1979	1980	1981
Gastro-enteritis (Diarrhoea, dysentry)	98	88	139	147	233
Abdominal Pain	35	28	60	44	37
Tuberculosis	3	3	-	1	2
Bronchitis	53	27	15	13	31
TOTAL	189	146	214	204	304

Source. Public Health Centre, Bhaktapur Town Panchayat

2.1.4 Findings of the Survey on Evaluation of the Private Toilet and Tap Programme

In conjunction with the hospital and the public health centre of BNP, a survey was carried out by BDP in 1982 to evaluate the impact of the private toilet and tap programme. Surprisingly, the prevalence rate in beneficiary households was higher, 57.3% against 40.7% in non-beneficiary households.

The limited evidence available indicated that the pattern of morbidity and prevalence of major communicable diseases in Bhaktapur have remained unchanged with no decline and even an upward trend in some cases before 1982.

2.2 Mortality Rate

The demographic sample survey, edited by UNFPA, 1976 reports a crude mortality rate of 18.5 per thousand in Bhaktapur. For almost the same period, 1977-78 the national mortality rate was estimated at 17.1 per thousand by the Central Bureau of Statistics. These figures suggest

that the mortality rate of Bhaktapur was higher than the national rate before 1982.

2.3 Birth-Rate

According to the 1981 census, the birth-rate of Bhaktapur is 6.7% which is higher than the national rate of 6.1%. A high prevalence of communicable diseases and a high mortality rate often result in a high birth-rate because parents have more children in order to ensure that some of their offspring survive.

All the aforementioned limited evidence indicates that the health situation in Bhaktapur before 1982 was appalling; high morbidity, high mortality and high birth rates with no indication of a decline in any of these even after physical infrastructure for hygiene and sanitation had been made available.

3. PHYSICAL INFRASTRUCTURE AND BEHAVIOUR (Main Problems and Trends)

Why did the availability of sanitary facilities not improve the health situation in Bhaktapur? A critical look at the conditions and use of the physical infrastructure before 1982 will provide a key to understanding the causes of the bad health situation.

3.1 Public Toilets

During an observation made jointly by the representatives of Bhaktapur Town Panchayat and Bhaktapur Development Project in 1982, the conditions of public toilets were recorded as follows:

Out of 24 public toilets built by BDP, only two toilets were found in a more or less satisfactory condition. All others were damaged and/or dirty. The defects in the toilets ranged from damaged roofs, walls, doors, pavement, water taps, water pipelines, water tanks, to stolen tap spouts, clogged waste water inlets, damaged sewer lines, broken or blocked pans and dismantled separation walls. The floors and the surrounding areas of 20 toilets were covered with human excrement. The conditions were mainly because of improper use and compounded by irregular cleaning and lack of maintenance. Cleanliness in and around public toilets depended in almost all cases on the work of sweepers. Cleaning by the sweepers was very irregular and the toilets remained dirty for long periods.

At a few toilets, the raw sewage is seasonally dammed, mixed with straw and allowed to ferment (both anaerobically and aerobically) for several weeks before being transported to fields for use as a fertilizer. This traditional method of wet composting with human excreta can also be seen at some open air ditch toilets and at the outlets of sewage lines at the side of the river.

School toilets were the dirtiest and most neglected in terms of outside defecation and lack of cleaning, repair and maintenance.

Some public toilets were hardly utilised. Children and adults could often be seen openly defecating on open spaces, river banks and in streets. An evaluation survey of the private toilet and tap programme carried out in 1982, revealed the fact that the favoured place for defecation for 80.5% of children and 42.5% of adults was still an open space even after the provision of public toilets.

3.2 Private Toilets

An 'Evaluation of the private toilets and taps programme' was carried out by BDP in 300 sample households in 1982.

Out of 150 households having private toilets installed by the project, 51 had family members not using the toilet. Adults preferred to use fields, river banks and other open spaces, while most of the children defecated in streets, lanes, pans, courtyards, sagal and in compost deposited on the ground floor of the house. It is interesting to note that even with a toilet in their own household, the family members of 34% of the surveyed households preferred other unhygienic substitutes.

3.3 Solid Waste Disposal

The pavement of the streets, squares and courtyards of large parts of the town and the provision of a sewerage system have greatly contributed to keeping the city clean, hygienic and attractive.

To facilitate proper solid waste disposal BDP had also built:

- 185 small satellite waste boxes, strategically placed for the local people to deposit their waste thereby obviating the need to throw waste into the streets or courtyards;

- 9 central waste containers at different places for depositing the waste collected from the satellite boxes, and

- a big compost plant for the utilisation of collected waste to produce compost fertiliser.

The Bhaktapur Town Panchayat was responsible for organising the cleaning of the streets and public spaces, as well as collecting the waste from the containers.

Despite all these efforts undertaken by BDP and the Bhaktapur Town Panchayat, the conditions did not improve as expected. The sweepers were still unable to organise a systematic cleaning system. The streets, squares, and

courtyards were neither satisfactorily swept nor the waste properly collected. Waste started to accumulate in the streets soon after they had been swept. Animal and human excrement, organic and inorganic waste still continued to be carelessly disposed of and the people cared little about the cleanliness of their homes or surroundings. The worst conditions were found in the courtyards. Generally, household waste, including children's excreta, was dumped or scattered in the couryards and then left to rot in a generally wet and odorous environment. Kitchen waste water was also openly disposed of on this dumping area. Outlets of the courtyards were usually blocked so that waste water could not run away. As a result, the courtyards and ground floors of the houses were always wet and muddy.

In households with animals, dung and often human excreta and urine also, was mixed with straw and ash and stored on the ground floor of the house to produce a compost fertiliser.

The 185 satellite waste boxes were not properly utilised; there was a general tendency to pile waste not only in the vicinity of the unemptied boxes but also in other areas not designated for waste collection. In many cases the boxes were never promptly or properly emptied. Slowly, all the boxes were dismantled and destroyed by the local people.

Similarly, the central waste containers were not properly used. The doors of almost all the containers were dismantled and used elsewhere. Roof tiles were stolen or destroyed and complete roof structures were removed. Wall structures were also damaged.

Intensive private waste composting was done seasonally in public areas, on the ground floors of houses, in private and public courtyards and sometimes at the sides of busy streets. Mostly, the people were handling raw compost, animal dung and human excreta with their bare hands and feet.

In those places where the pavement had sunk or was damaged the people took no steps to repair or maintain the paved surface. Such areas were usually filled with mud, waste water, and solid waste. People exhibited no concern about the waste.

3.4 Ponds, Wells and Stone Taps

There are at present about 30 ponds, 100 old shaft wells and a large number of stone taps. They have important social and ritual functions in Bhaktapur. BDP has supported the renovation of most of them. Even so, their condition and cleanliness has not improved. The ponds have again started to become dirty and polluted and to function as the major source of insect and mosquito breeding areas. In some cases, the contaminated water of the ponds is used for household purposes.

3.5 Water Supply System

The water reservoir is located at the eastern part of the town. According to water tests carried out at various tap stands in 1979, the quality of water deteriorated as it progressed to the western part of the town. This indicated that the water was contaminated mostly through leakages in the pipelines. When the water distribution network is partially emptied every day, the air, surface water and sewage are sucked into the pipelines and contamination results.

The loss of potable water due to the frequent leakages and wastage was recorded as about 70% before the leakage detection programme. The following common practices contributed to the wastage of water:

- unwillingness of the people to concern themselves with repair work even when the leaks in water pipes were apparent;
- the widespread use of potable water for irrigation purposes;
- leaving private and public taps running even when not actually in use;
- many other examples were common although not mentioned here.

Loss and contamination of water also takes place through poor handling and storage.

Most of the people were unfamiliar with the functioning of the water supply system. They did not understand that apart from the convenience and fulfilment of their daily requirements, their health was also dependent on the system. As a result potable water was either wasted or contaminated before consumption.

3.6 Sewerage/Drainage System

A combined sewerage/drainage system, designed to collect waste water, surface run-off and sewage in one pipe, had been introduced into Bhaktapur by BDP. Following the provision of the system the following problems and trends were observed:

The pipes were often blocked by solid waste. Many street surface inlet chambers had their gratings damaged or missing. The coverless chambers were usually filled with solid waste which impeded the access of surface water to the sewer line. The people often threw solid waste into the open manholes and inlet chambers.

Each household was provided with a satellite sewerage house connection manhole. In many cases the concrete covers had been lost or removed and the hole was used directly for

defecation by the children. Some central manholes, mostly in fringe areas of town, were also open because their covers had been lost or removed. In some cases, farmers intentionally blocked the manholes with soil in order to make the sewage flow into their gardens or fields for irrigation purposes. The farmers also blocked sewer pipelines close to manholes and directed the sewage which overflowed from the manhole to their respective fields. Such practices were observed in more than 24 instances leading to the obstruction of the sewerage system, malfunctioning of toilets and sewage overflowing in the streets.

In some cases, sewerlines end in fields or at river banks where many pits were formed to collect the sewage which was then used to prepare a wet fertiliser by mixing it with straw. The people handled the raw sewage with their bare hands and feet.

All the aforementioned problems and trends undoubtedly indicate that the majority of the people in Bhaktapur had little understanding of the fact that, convenience and aesthetics aside, the physical infrastructure provided by BDP is, to a large extent, a major determinant of their health and living conditions.

4. GENERAL HEALTH HAZARDS

Other examples of poor practices and behaviour relating to:

- Personal Hygiene
- Living Environment
- Household Hygiene
- Storage, preparation and eating of food;
- Nutrition,
- Child-care,
- Perception of the causes of disease and their prevention or treatment,

are too numerous to discuss here. However, they are widespread and self evident in all parts of the country.

5. CONCLUSION: A DEMAND FOR HEALTH EDUCATION

We can draw the conclusion from the above analysis that the people have a very low awareness of the origin and transmission of infectious diseases. There is a complete lack of understanding of the link between health, hygiene and sanitation and of the infectious nature of diseases. It clearly confirms that the provision of physical infrastructure in itself is not the solution for improving the health status and living standards of the population. The hypothesis is formed here that the improved access of the local population to health education is primarily responsible for the promotion and higher level of utilisation and maintenance of physical facilities, for lower birth and mortality rates, for the decline in the pattern of morbidity; and consequently for the

improvement of living conditions. Further, health education has some important influences in the following contexts:

- It helps communities to be more self-reliant and to determine their own priorities in looking after their own health in the broadest sense;

- It reduces the adverse factors affecting the mental and physical development of people, particularly children, as it prevents the spread of diseases which cause such impediments;

- It helps prevent the nutritional loss caused by communicable diseases. Taking worm diseases as an example: the mean worm load in an infected person is calculated as 19.89, that is, almost 20 roundworms. 20 adult roundworms can consume 2.8 gm. of carbohydrate and 0.7 mg. of protein daily. In Bhaktapur 76% of the population of 50,465, that is 38,353 people are infected with roundworm and therefore the daily loss of carbohydrate and protein caused by roundworm alone is in the region of 107.4 kg. and 26.8 kg. respectively. Similarly, hookworms can consume 0.38 to 0.8 ml. of blood per day. The infection rate of hookworm in Bhaktapur is 6.9% and the estimated number of infected people is 3,533 (7%). Therefore the daily loss of blood in Bhaktapur due to hookworm alone is approximately 1.3 litres.

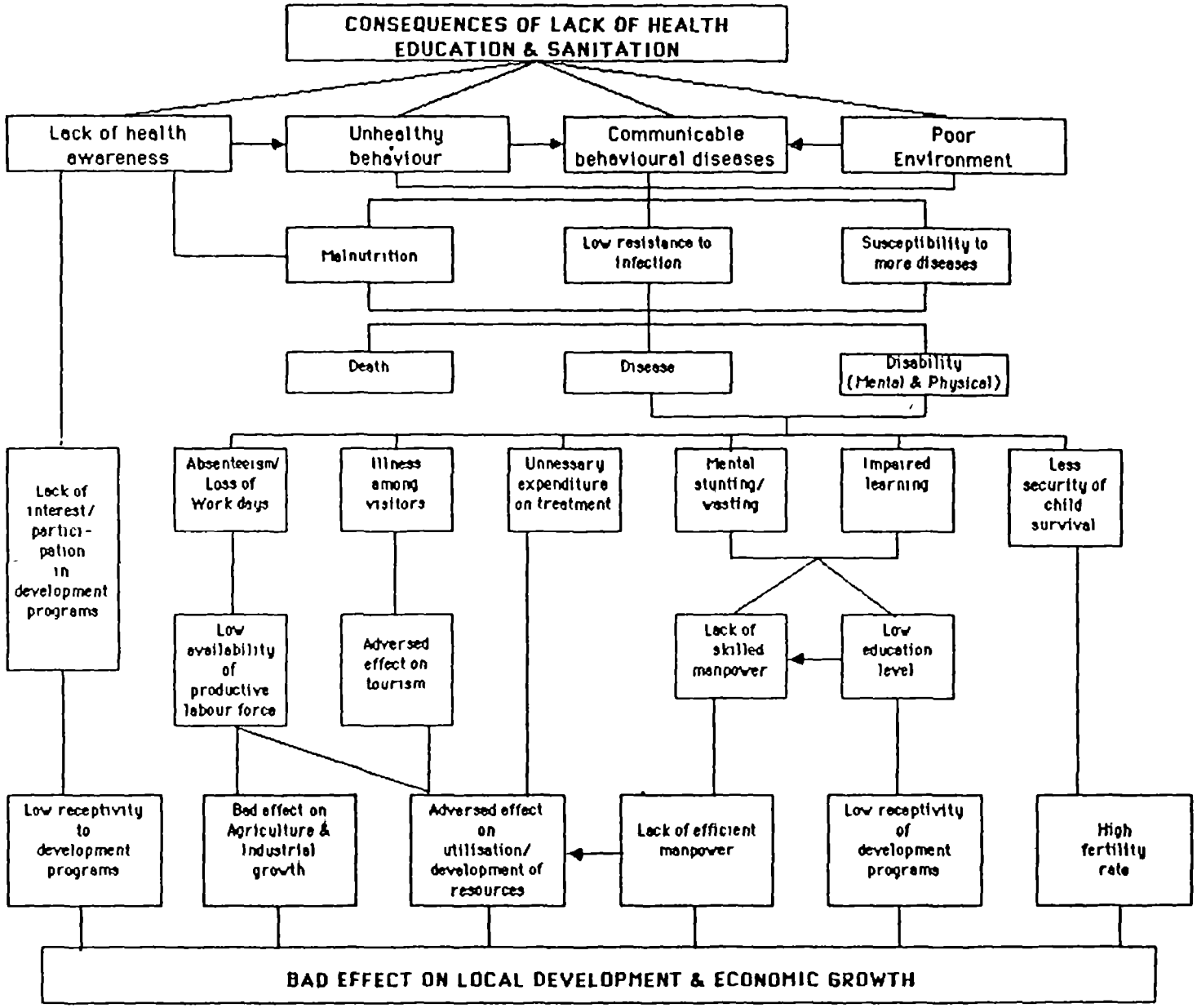
- It greatly reduces the material, financial and technical resources used in treating communicable diseases. Prevention costs a great deal less than curative measures.

- The spread of communicable diseases and the consequent high infant mortality rate induces parents to have more children to ensure that some of their offspring survive. Little can be done about population growth due to a high birth-rate until the people can be sure that their children will survive to adulthood. Good use of health education increases a child's chances of survival, parents no longer feel forced to produce so many offspring and the birth-rate decreases.

- The pressures to produce high numbers of offspring mean that women spend a great percentage of their lives in pregnancy. A reduction in the birth-rate would therefore significantly increase the status of women.

- Physical impairment caused by communicable diseases and malnutrition, particularly if suffered during childhood, seriously affect people's mental development and their ability to learn. An improvement in the general state of health would therefore have a 'knock-on' effect on the substantial and qualitative development of education.

- Premature death, absenteeism and general incapacitation caused by preventable sickness drastically reduces the availability of labour, manpower and consequently productivity.


CONSEQUENCES OF LACK OF HEALTH EDUCATION & SANITATION
Lack of health awareness
Unhealthy behaviour
Communicable behavioural diseases
Poor Environment
Malnutrition
Low resistance to infection
Susceptibility to more diseases
Death
Disease
Disability (Mental & Physical)
Lack of interest/ partici-pation in development programs
Absenteeism/ Loss of Work days
Illness among visitors
Unnessary expenditure on treatment
Mental stunting/ wasting
Impaired learning
Less security of child survival
Low availability of productive labour force
Adversed effect on tourism
Lack of skilled manpower
Low education level
Low receptivity to development programs
Bad effect on Agriculture & Industrial growth
Adversed effect on utilisation/ development of resources
Lack of efficient manpower
Low receptivity of development programs
High fertility rate
BAD EFFECT ON LOCAL DEVELOPMENT & ECONOMIC GROWTH

- The spread of communicable diseases discourages many potential visitors thereby adversely affecting the income from tourism.

- An estimated 1 out of 10 of the population have disabilities arising from 4 main preventable causes:

  - malnutrition,
  - infectious diseases,
  - problems associated with pregnancy and childbirth,
  - accidents.

  Almost all these cases could be prevented through health education.

The link can be extended even further; giving health education through a behavioural approach helps to build up the trust and credulity of a community in local development works. It leads to increased enthusiasm and commitment to the development works and promotes wider aspects of community participation.

The analysis discussed above shows very obvious reasons for demanding health education. The German Evaluation Mission for the Bhaktapur Development Project, in April 1982, recognised this demand and strongly recommended that a health component should be introduced into BDP's activities.

BDP actually started to work for health education from 1982.

6. HEALTH EDUCATION PROGRAMME OBJECTIVE

In order to satisfy the wide demand for health education, CDU/BDP started to design a programme to promote health education by mobilising all possible local resources and working through all possible local channels. It planned to support local groups, organisations and institutions with the purpose of institutionalising the programme so that health education activities would continue beyond the life of the project. However, the project had to assist them in formulating their needs into appropriate plans, proposals and implementation.

Like any other health project, the general goal of the health education programme was to improve the hygiene, sanitation and status of health in Bhaktapur. BDP had already provided the physical infrastructure necessary for such improvement so the health education programme set out to promote knowledge and thereby change attitudes and practices. With this in mind CDU/BDP developed a Public Health Education/Improvement Programme and a School Health Education Programme.

C H A P T E R I I

PUBLIC HEALTH EDUCATION/

IMPROVEMENT PROGRAMME

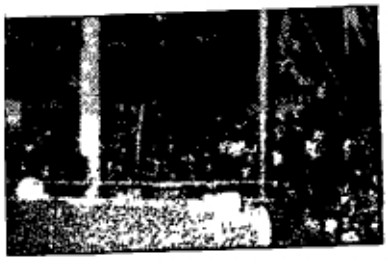
1. PICTORIAL REVIEW

1.1 Town Cleaning Campaign

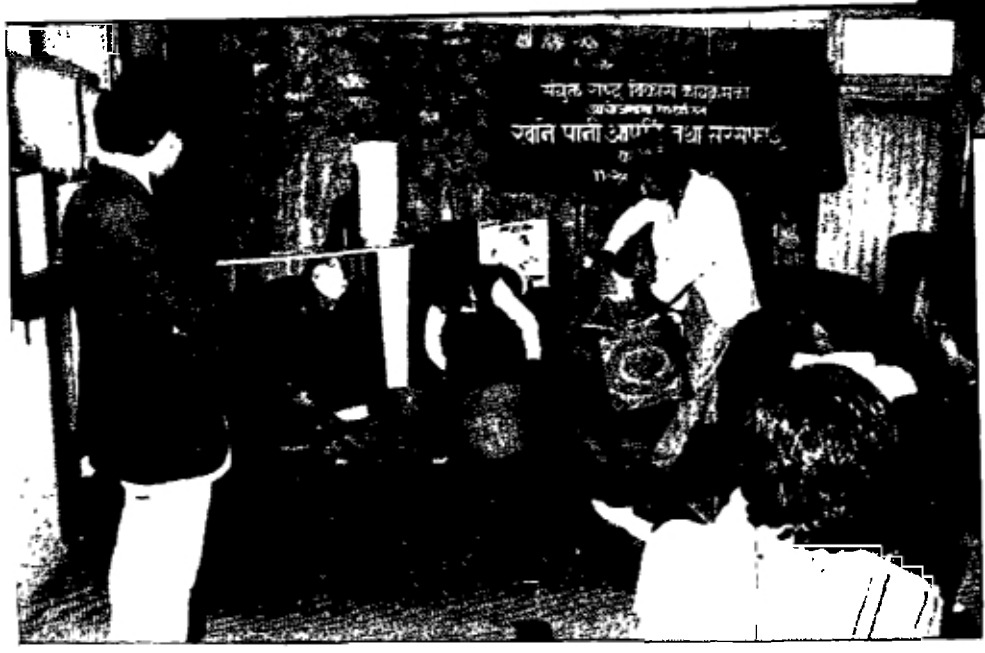
The programme started with the town cleaning campaign: a practical approach to health education.

1.2 Health Education Drama

Another component was health education drama...



...shown to several thousands of people in 6 performances,.....



...and to the water supply and sanitation workshop/UNDP in Kathmandu.

1.3 Alternative Sanitation Scheme

The scheme has been well documented in the report "Alternative Sanitation in Bhaktapur, Nepal" by Ingo Guhr and Kumar Lohani.

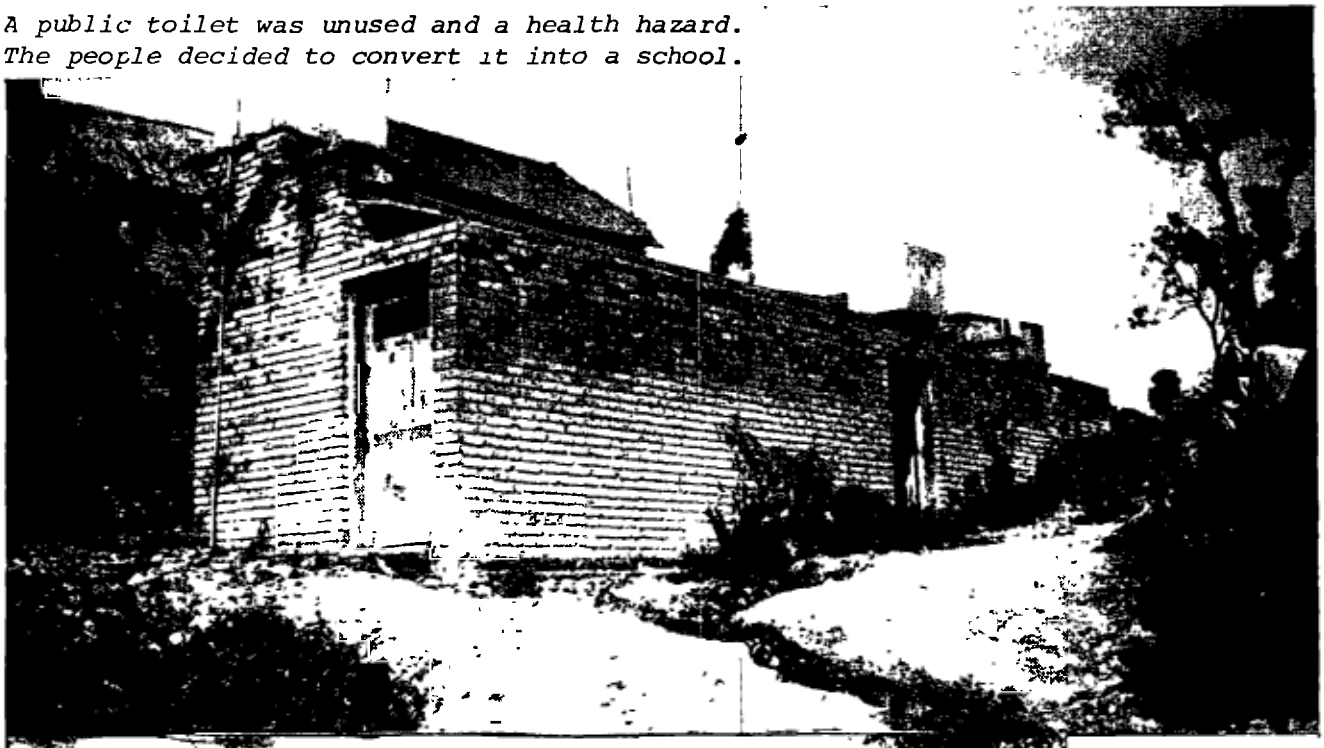
Before the start of the scheme, the area was in an extremely hazardous condition.

Now, conditions are relatively much improved.

Here: A few example of improvement.

Slowly the people started to become aware, participate in and initiate development works and improve the conditions.

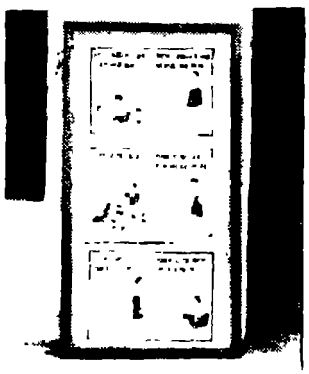
A public toilet was unused and a health hazard. The people decided to convert it into a school.



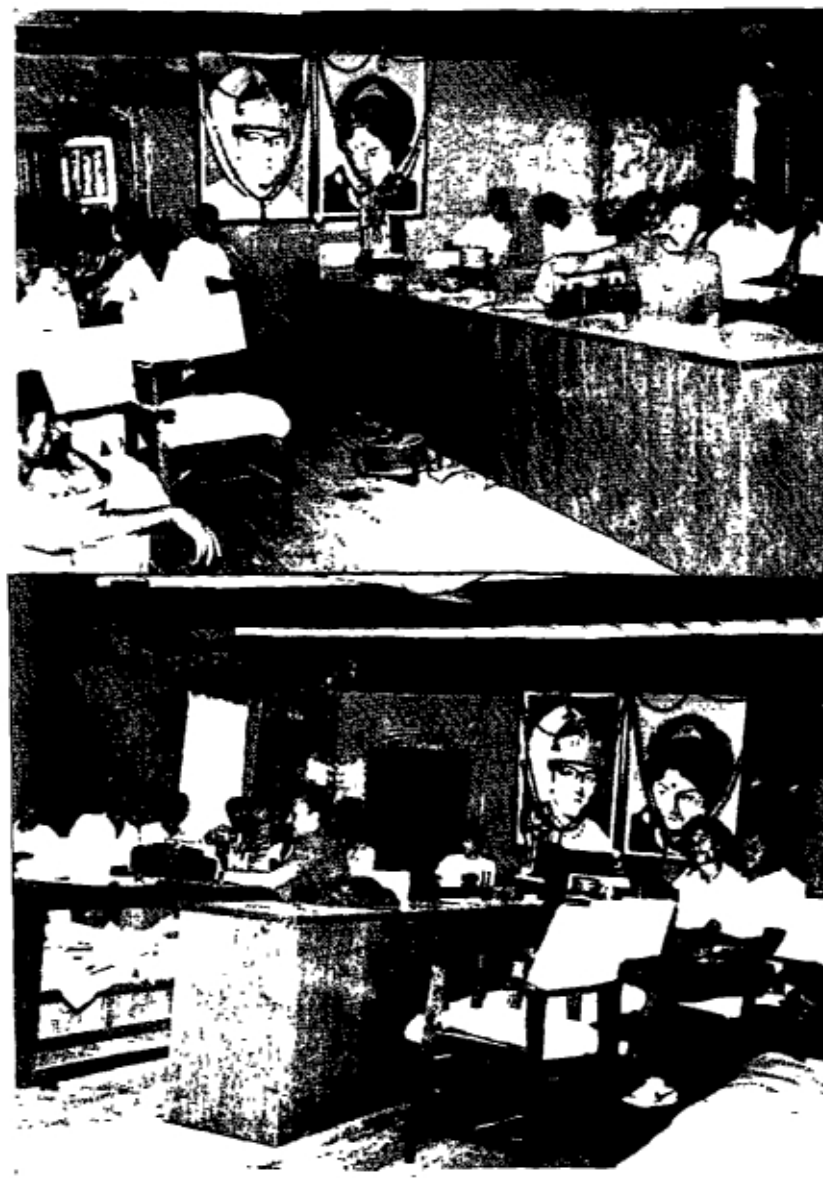
Finally they have succeeded in building it....

...and improving its surrounding environment. Now the classes have begun.

1.4 Final Phase Publicity and Awareness Campaign



Posters on proper use and maintenance of water system.



Health films and slide shows motivate the local leaders at the Town Panchayat to take action.

Health Education Drama was also part of the campaign.

Health Education Drama.

The drama was frequently supported by songs and dances.

2. THE FACTS:

The Public Health Education/Improvement Programme involved the following components:

1. Town Cleaning Campaign
2. Health Education Drama
3. Final Phase Publicity and Awareness Campaign
4. Alternative Sanitation Scheme

2.1 Town Cleaning Campaign

2.1.1 Objective and Input

The project supported a local initiative for a town cleaning campaign organised by Bhaktapur Jaycees. The main objective of the campaign was to encourage the people to recognise the benefits of sanitary facilities in improving public health and the importance of cleanliness.

The cost of materials for the campaign consisting of brooms, shovels, forks, cane baskets and materials for posters, signboards and banners was provided by the project. It was understood that these materials could be borrowed for future similar activities by any organisation.

The project also helped to create two characters: Mr. Messy and Mr.Clean to promote awareness of preventive measures. They would visit local areas and their quarrels with each other would show how cleanliness is related to health. Their easily identifiable faces were painted on signboards to familiarise the town's people with the characters.

2.1.2 Output

More than ten youth clubs and a number of schools sent delegations or volunteers to participate in the campaign and they were joined by a large number of local independent volunteers.

The Bhaktapur Town Panchayat supported the campaign by supplying wheelbarrows for transporting garbage, a number of sweepers, lime and disinfectant.

The campaign started with a programme of talks for the participants and local residents. Immediately after the talks, one group started to spread the message by talking to various people about the benefits of cleanliness. A second group started to clean the streets, lanes, ditches and drains and to remove the waste dumps. A third group spread lime and disinfectant, a fourth erected signboards incorporating messages advocating cleanliness at strategic points and a fifth distributed and displayed pamphlets and banners.

Each school contributed their own posters and pamphlets containing health education messages. All the sweepers were kept busy removing all the garbage that was collected. Unfortunately, the areas remained completely clean for a few days only before waste started to accumulate and they reverted to their previous dirty state.

It had been expected by BDP that similar campaigns would go ahead under the initiatives of local groups and organisations. Encouragingly, this did take place but gradually materials were either lost or not returned and the initial enthusiasm was lost.

However, the campaign was just a beginning and served as a good initial impetus to attract the attention of the community towards the necessity of cleanliness.

2.2 Health Education Drama

2.2.1 Objective and Input

Public entertainment evenings with a health education theme were organised to further motivate the local residents to take better care of their immediate neighbourhood.

BDP provided advisory support in the preparation of the drama as well as financial support in buying a musical drum and costume materials, hiring microphones and providing refreshments. A local cultural and social youth club organised the drama which was rehearsed for several days.

2.2.2 Output

At least six performances were given at different venues throughout Bhaktapur. Two shows were given, on request, outside Bhaktapur; one at Boday Village Panchayat and one at the exhibition ground in Kathmandu. The latter took place during the closing ceremony of the Water Supply and Sanitation Decade Workshop.

2.2.3 Summary of the Drama

The drama was satirical and humorous.

Act 1:

The scene starts with two people sitting in a room, one lying and crying with stomach pain and the other (father of the patient) confused as to what to do. The witch doctor arrives and tries to cure the patient in the traditional way. Since there is no bad spirit however, he is unable to cure the patient.

A friend of the patient enters the scene. He examines the patient, asks questions as to what and where he ate the day before while at the same time observing that his surroundings are extremely dirty and full of flies. It transpires that the patient ate stale food the day before and the friend comes to the conclusion that the trouble is caused, not by any supernatural thing, but by food poisoning caused by dirty surroundings and unhygienic behaviour. He explains this to the patient and demonstrates how dirty surroundings make people sick and how food becomes contaminated. He instructs the patient to be careful about cleanliness and to avoid eating stale food. After a dramatic scene he also succeeds in convincing the witch doctor. The patient is taken to hospital and the drama ends.

Act II:

A gentleman who had taken a great deal of trouble to get the courtyards and streets of his area paved and cleaned enters the scene. He has been away for a brief period. He becomes angry with what he sees around him. He finds the newly paved courtyard full of faeces and garbage dumps. He murmurs to himself, cursing the people who are responsible. In the meantime, he slips on the faeces and tumbles down to the ground. He is now furious and shouts at the neighbours. Unfortunately, from a window, a woman throws a bucket full of vegetable waste and this also hits the man. He loudly curses the woman. A man comes out of the house and begins to defend her on the grounds that she is not the only person responsible for all the dirt and garbage around. Hearing the shouting and quarreling, other neighbours began to gather on the scene and at the same time, a woman with a bucket of water passes by having left the public tap running after drawing her water. A prolonged discussion takes place concerning these bad habits with accusations being made against each other, and various institutions, as being apathetic towards public health and the unnecessary delays in carrying out relevant work. They also express their dissatisfaction with local bodies and their leaders.

At last they come to the conlusion that only through self-help activities can they guarantee a healthy atmosphere in their area. They form a committee for health improvement and vow to work for a cleaner environment.

Songs and dances illustrating health education themes were also performed.

It is recognised that significant changes in the behaviour of a community cannot be expected solely through drama, songs and fun and that many other similar inroads into public awareness must be pursued.

General opinion at the UNDP Water Supply and Sanitation Decade Workshop was that the drama should restrict itself to activities which were within the scope of the concerned institutes and not be over-critical of their lack of co-operation. It was felt that it would be useful to perform the drama periodically both for the community and top level officials.

2.3 Package Programme and Alternative

The project continued to support local institutions and organisations in organising health education packages and clean-up campaigns but such programmes were conducted only on a very small scale. It was felt that package programmes only were not sufficient to deal with health problems and unhygienic behaviour which had existed for many years. It was realised that in any further strategies, health education should be directed towards continuous and ongoing behaviour changes. It is desirable that campaigns and programmes should form part of a long term strategy and should be followed up on an ongoing basis by the established health and related systems.

The project thus started to plan a health improvement scheme with a different approach. The first programme planned was the Alternative Sanitation Scheme.

2.4 Alternative Sanitation Scheme

This scheme has been well documented in the report "Alternative Sanitation in Bhaktapur, Nepal" by Mr. Ingo Guhr and Mr. Kumar Lohani. A summary of the scheme with few additional information is given below:

2.4.1 General Objectives and Background

It was not possible to run the scheme in all parts of the town where it was required. It was intended as a pilot project so that components of the scheme could be duplicated in other parts of the town or country and any feedback used to improve future schemes.

The area selected for the application of the scheme was Bhelukhel, a small part of Bhaktapur, the residents of which were of the lowest caste group. The living environment of Bhelukhel was considered as the dirtiest and most unhygienic in Bhaktapur. The people even used to hazardously deposit faeces in their houses to produce maggots as the faeces fermented. These maggots were then fed to ducks domesticated for selling purposes.

No baseline survey was carried out before planning the scheme. The scheme was conceived as an action programme and the project decided to place its emphasis on gaining the trust of the local community and developing a system of participation in project

activities. A baseline survey would have given objective information and measurable data for future evaluation but it was felt that the problems of the people were similar to those found in comparable urban situations throughout the country and need not be redocumented. Baseline information was collected purely on the basis of:

- environmental sanitation walks,
- interviews of key informants such as youth club members, local leaders, and doctors working in the local hospital,
- existing reports of BDP and other organisations,
- a closer look at what has been done in other similar projects.

The results of the walks, interviews and reports were compiled and a draft outline of the scheme developed. The planned components of the scheme and the report on the procedures, results and components of a similar project: the semi-urban sanitation project of Khokana were prepared for comparison as a basis for discussion.

The concept of the scheme was approved by Bhaktapur Town Panchayat.

2.4.2 Planning Workshop

A planning workshop, with all concerned organisations participating, was held to finalise the programme of the scheme.

2.4.3 Mass Meeting

A mass meeting of the local people was held to discuss the scheme. It helped to create awareness about the programme from the very beginning.

2.4.4 Users' Committee

Within one week, a users' committee was elected and a working committee was formed. They were truly representative of the people since they were not imposed on the community by the project.

2.4.5 Household Representation

The community workers divided the neighbourhood into workable areas. Meetings were then held in which one representative from each household had to participate. In these meetings, information and data was collected which then formed the basis for decision-making by the users' committee.

2.4.6 Training of Community Workers

Training packages of four days per month were organised. The remainder of the month was spent putting into practice what had been learned during those four days. Each consecutive training session started with a recap of earlier sessions.

2.4.7 Deworming Campaign

The first training session concluded with a film show about roundworms. The films motivated the people to give their stool samples for testing. Out of 523 residents, 467 people responded. 445, that is 95% were infected by worm diseases. The infection rate in the 0-5 age group was 91%, in the 6-15 age group it was highest at 98%, and in the 16 and above age group it was 95%. Medicine was distributed to the infected people. More publicity came from the roundworm competition organised the following day. A seven year old girl won the competition by producing 64 roundworms from her intestines. The people were now convinced that there was something wrong with their health and hygiene.

2.4.8 House-to-House Health Education

The community workers visited each family to give practical advice on how they could prevent themselves becoming reinfected with worms and also other communicable diseases. The people were informed that they should contact the project should they need any assistance.

2.4.9 Immediate Local Actions

A few days later, a delegation of the users' committee requested assistance from the project with a) a local cleaning campaign, b) building latrines, and c) rehabilitation of an existing public toilet into a washing area.

2.4.10 Cleaning Campaign

Community workers assisted the users' committee. They went from house to house and discussed and demonstrated the links between health and sanitation. They concluded by inviting each family to take an active part in the cleaning campaign. Within the next two days the whole neighbourhood was cleared, the ditches were emptied and lined with old and broken bricks. It was a temporary effort but demonstrated their interest in the improvement of their living environment.

2.4.11 Demonstration Latrine

A demonstration sulabh toilet was built by the community workers during their training period. After the completion of the cleaning campaign, five more demonstration toilets were built, on request, at users' committee members' houses. The project provided all the costs of the toilets except the toilet houses which the people themselves had to provide.

2.4.12 Rehabilitation of Public Latrine into Washing Area

An existing public latrine which was in bad condition was upgraded by the users' committee into a washing centre. A water supply was installed, all the toilets restored and 2 showers and a large laundry slab built. The project provided building materials and skilled labour while construction drawings and cost estimates were secured with the help of a Town Panchayat mason. All other work was done by the people of Bhelukhel.

2.4.13 Cleaning Competition

Some days after the cleaning campaign the area was again dirty. It was felt that only continuous cleaning activities would make any difference. A cleaning competition among all families was organised for six weeks. Each family had a record card on which daily points on personal cleanliness, cleanliness of the house and the compound, use of the toilet etc. were marked. Prizes were awarded to the 3 cleanest families.

2.4.14 Household Latrines

The people were now convinced that the latrines were needed. They also needed to identify which type of toilet was most suitable for their living conditions.

The community workers and users' committee members used posters and leaflets on toilet types as well as their knowledge gained from their observation tour to explain the functions, advantages, disadvantages and the costs of each toilet type. In this way the people were in a position to make an informed choice. In the end 74 Sulabh toilets were built. The users' committee took over the responsibility of constructing the toilets. A few members were trained on how to build the toilet and they also made the slabs.

2.4.15 Safe Composting Campaign

Composting is carried out by sweepers for trading purposes. The planned campaign did not take place as it was felt that it was unnecessary. The sweepers were however, provided with training on the safe methods of pit and heap composting so that they should be aware of the health hazards related to the process.

2.4.16 Actions Initiated by the People

Action Groups

When the area again became filthy, a group of teenage boys started cleaning on their own. Girls also began to help by forming their own group. Both groups started to become more active in health education.

In order to maintain their enthusiasm they were given moral support and rewarded with organised sporting activities, a quiz competition and picnics etc. Anyone who wanted to participate in these activities had to be clean. After a few months, the majority of the youngsters were participating.

Health Education and Motivation for Children

During meetings with women, community workers developed a programme for the children. About 150 children participated. They were supervised daily and motivated to follow preventive measures for good health. Clean children were rewarded with low cost incentives.

Orientation Programme for Women

In collaboration with the children's programme an orientation programme for the women was also organised.

Day Care Centre

On the request of the local people, UNICEF undertook to support a day-care centre.

Informal Training

Pode caste people have little or no access to education facilities because they are considered as untouchables by higher caste groups. To rectify this, in their free time, the community workers started to run adult education classes and classes for children in reading and writing. Slowly, other classes, such as knitting, English language, martial arts and even singing were organised. A five month course was started under the 'Non-formal Girls Education Programme' and local people also began a scout group for the children.

2.4.17 Evaluation of the Scheme - Phase I

An evaluation of Phase I of the scheme was carried out to gain a clearer understanding of what should be retained and what should be modified in future programmes.

Comments and recommendations were compiled based on 77 household interviews, a five-hour "brain-stroming" meeting with the users' committee and informal talks with community workers, volunteers, visitors and BDP members.

2.4.18 Planning of the Scheme - Phase II

About two thirds of the original allocation of Rs. 500,000/- was not yet spent. The planning and decision making for future activities was to be done by the people themselves and this was facilitated by the community workers asking each family what should be done next. A list of proposals was then presented as drawings in order to facilitate decision-making by the users' committee. Rough cost estimates were provided on the back of each drawing. About Rs. 900,000/- would be required to fulfil all the requests but only one third of that amount was available.

With the help of the picture cards, the users' committee discussed how many people would benefit from each proposal, which proposals could be implemented immediately and which they could carry out themselves. They decided the priorities to make maximum utilisation of the limited funds available as follows:

1. Water connection, 2. Surface water drainage, 3. Road pavement, 4. School, 5. Improvement of popper domfo, the place for their traditional god, and 6. sports and games facilities.

2.4.19 Implementation of Phase II

After provision of a main water supply pipeline, many households installed private taps in their homes. The users' committee then started the construction of a drainage system. After that they worked to pave the road with bricks and stones. In the meantime, they improved existing public taps. They also improved a traditional public stone tap at their own cost. They were given sports and games materials by the project.

Efforts were now directed towards the establishment of a school. It was decided to convert an unused and non-functioning public toilet into a school building with financial support from the German-Nepal Help Association. Local families each contributed labour as well as an amount of Rs. 50/- to Rs. 200/-. They completed the construction of the building and protection wall, pavement of the school compound, made furniture for the classrooms and office and arranged games and office materials.

Classes began with more than 90 students being enrolled. The development of the school by the people themselves is a result of starting a process which the community can control.

Apart from the school, they have improved the popper domfo, the place of their traditional gods, through their own efforts and without any support from the project.

2.4.20 Results of Baseline Health Survey

Two years after the implementation of the scheme, a baseline health survey was carried out in four parts: 1. Participant observation, 2. Open-ended questionnaire, 3. Stool test and 4. Survey of environmental pollution.

Participant observation recorded improved hygiene and sanitation behaviour.

Open-ended questionnaires revealed that 87% of adults and more than 60% of children used the private latrines.

Stool tests recorded an average of 13% reduction in worm infection. In the 0-5 age group the reduction was 22% and in the 6 and above age group it was 12%.

Similarly, an environmental pollution test revealed that the worm infection in people's nails was nil; in kitchen dust it was 3.4%, in dust taken from near the toilet it was 10.3%, from dust taken from a playing ground it was 20.7% and in vegetable dust it was 20.7%.

Other achievements aside, the results of the baseline health survey alone indicate that the Alternative Sanitation Scheme has improved the situation considerably.

2.4.21 Colloquium

The relative success and still greater potential of the Alternative Sanitation Scheme to contribute to health improvement and to community based development is sufficient evidence that the scheme should extend its activities to include the whole town. The Town Panchayat was keen that such an extension of the programme should take place.

However, it was felt that during the short period of time remaining of the final phase of the Bhaktapur Development Project it was not possible to cover the rest of the town with such extensive health education as in Belukhel.

Health education on a large scale was needed to cover all parts of Bhaktapur. The project looked at the alternatives and finally, planned two programmes: the Final Phase Campaign and the School Health Education Programme.

2.5 Final Phase Awareness Campaign

2.5.1 Summary of the Planning

What to achieve?

* To create awareness on transmission of diseases.
* To create understanding of the water supply system, the sewerage system and the functioning of toilets and how sanitary facilites can prevent sickness.

* To create awareness that BDP will eventually end and that the benefits from sanitary improvements will be lost if maintenance is not done by the population.

Target Groups?

* Local leaders such as ward chairmen and ward committee members of the Town Panchayat, youth club members, teachers, etc. Ideally at meetings of 20 to 30 persons where slide shows and discussions would be possible.

* The population of Bhaktapur at mass gatherings with educational drama, film shows etc.

Schedule?

* In each of the 17 wards there should be one meeting for local leaders incorporating a slide show and discussion, followed one week later by a mass gathering of the people with educational drama and film shows.

Organisation

* Tasks of the Town Panchayat for Local Leaders Meetings

  - to provide space for the meeting,

  - to invite local leaders,

  - to open the meeting.

* Tasks of CDU/BDP for Local Leaders Meetings

  - to provide basic health education for local leaders,

- to provide slide shows on the water supply system, sewerage system and toilets,

- to give information on the "winding up" of BDP and request participation in maintenance of the infrastructure provided.

Local leaders meetings should end with a discussion on how the community could preserve and maintain those sanitary facilities built by BDP.

* Tasks of Town Panchayat for Mass Gatherings

- to motivate local leaders to organise mass gatherings,

- to select space for mass gatherings,

- to organise, with the help of local leaders, the stage set, film screen etc.,

- to open and close the performance.

* Tasks of CDU/BDP for Mass Gatherings

- to develop an educational drama on water supply, sewerage, toilets, health and the withdrawal of BDP and the need for the people to take over responsibility for these,

- to train youth groups to act in the drama, to make costumes and provide all equipment required for the drama,

- to provide funds for refreshments for the actors, and to hire microphones, loudspeakers, light tubes etc.,

- to provide health education and other films and a film projector.

At the end of such a mass gathering, the people should be aware of the relationship between sanitary facilities and their own health, about BDP's departure and the need for the people to take over and to participate in maintaining those facilities.

* Postering

  Posters on the misuse of water, to be produced by CDU/BDP, and posted at public taps by the Town Panchayat.

2.5.2 Output

A meeting was held with the Town Panchayat to discuss the plan and begin preparation. The project developed a draft script for the health education drama although subsequently the Town Panchayat developed its own script and prepared the drama. In the meantime, the project developed the slides and script for the slide show. Final rehearsal of the drama and slide show was carried out in the presence of representatives from both the institutes.

The campaign did not materialise as planned however. The Town Panchayat was prepared to take over all the tasks of the project but there was inadequate time for the plan to be implemented before BDP came to an end.

Only a few public performances of the drama took place in the city hall of Bhaktapur. The drama was recorded on video cassette in order to facilitate video shows wherever needed.

The health education film and slide shows were carried out in schools and various public places.

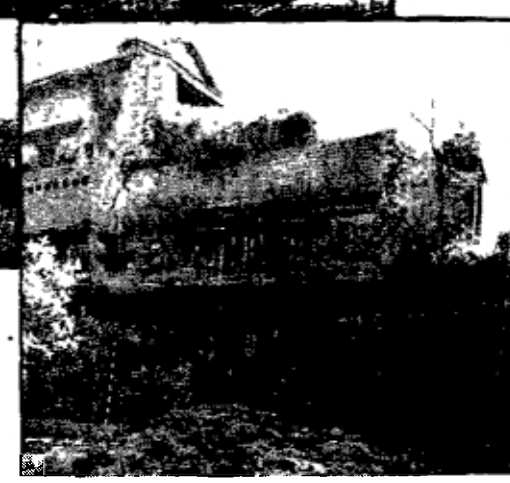
The posters prepared on the misuse of drinking water were provided to the Town Panchayat for posting at public taps.

Small picture cards depicting the misuse of drinking water were distributed to the public attached to the record cards of bills issued by the Water Supply and Sewerage Board.

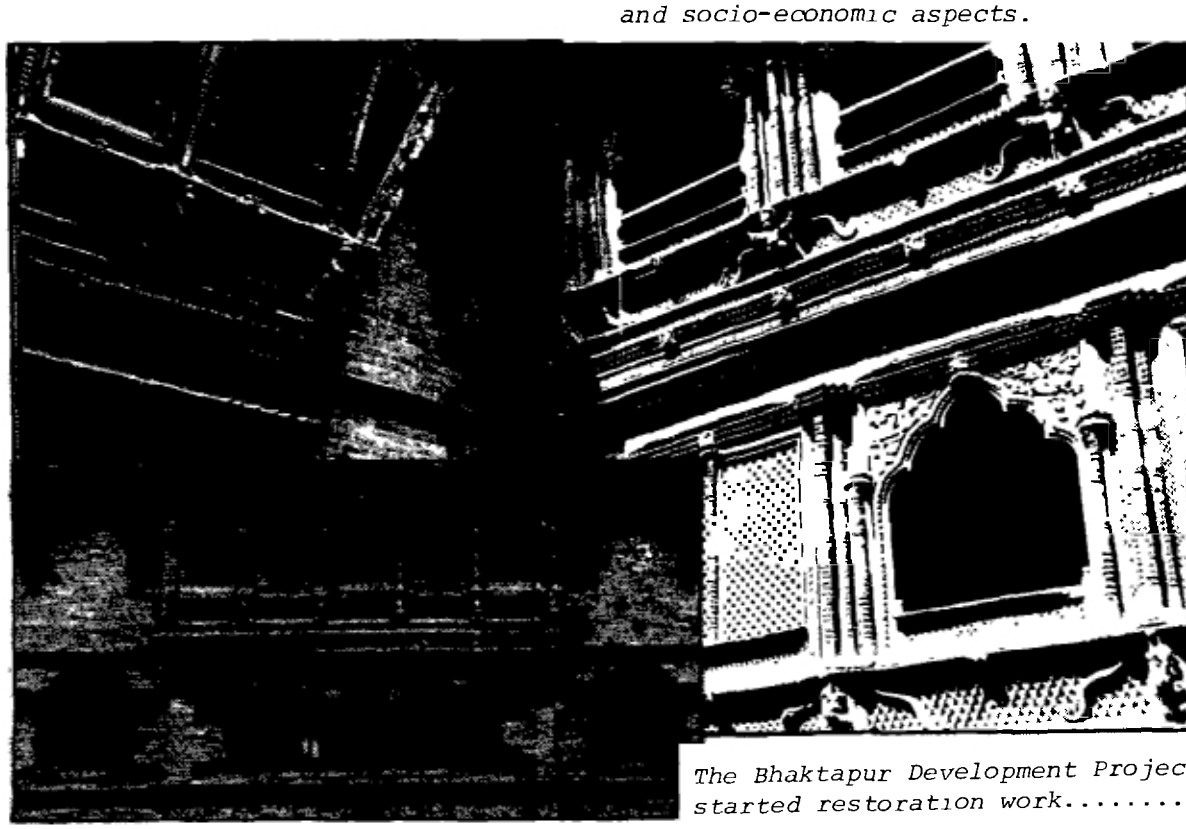
1. BACKGROUND

1.1 Pictorial Review

...an ancient medieval city, famous for its traditional socio-cultural heritage...



...was deteriorating in many physical and socio-economic aspects.

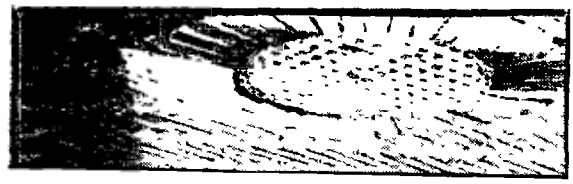


The Bhaktapur Development Project started restoration work.....

...following with urban infrastructure such as a water supply system,.....

..a combined sewerage system..

...with surface drainage and inlet chambers.....



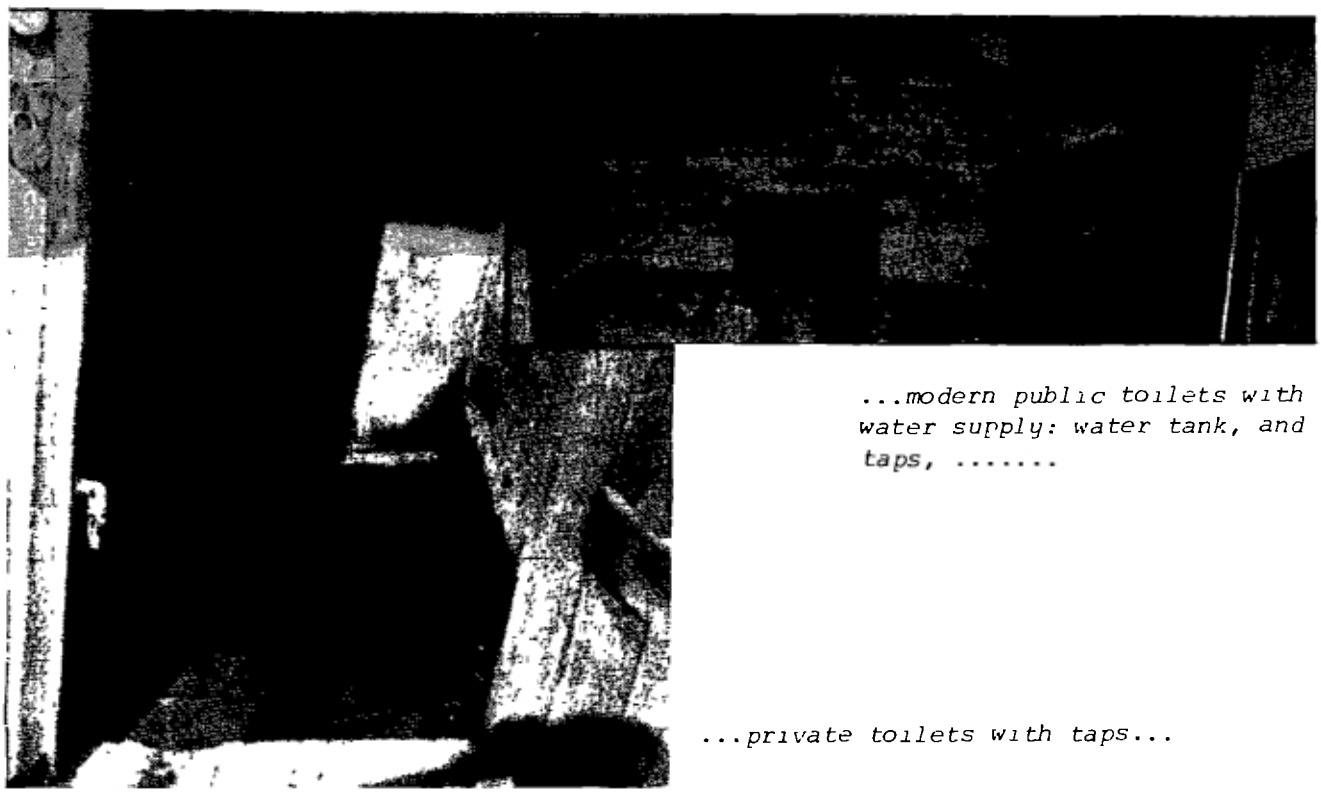
...manholes,...

...house connections...

...and treatment plant....

...road pavement with surface water inlet chambers...

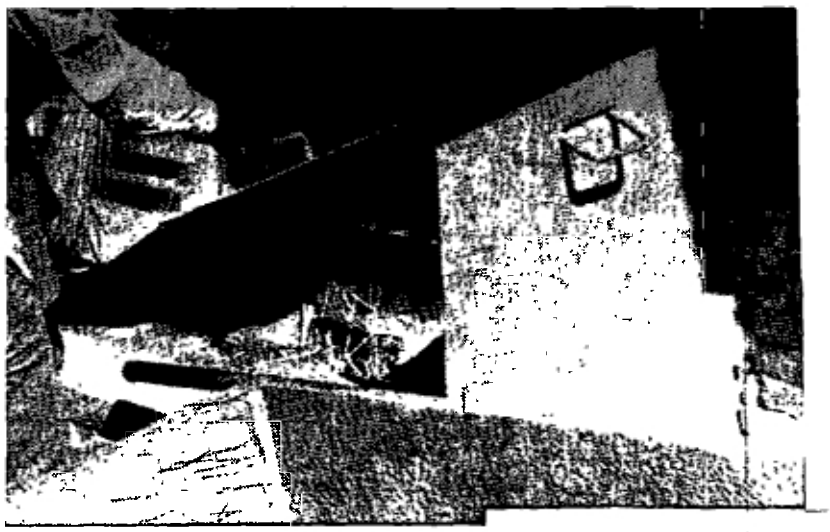
...courtyard rehabilitation...



...modern public toilets with water supply: water tank, and taps, ...

...private toilets with taps...

...a waste disposal system...

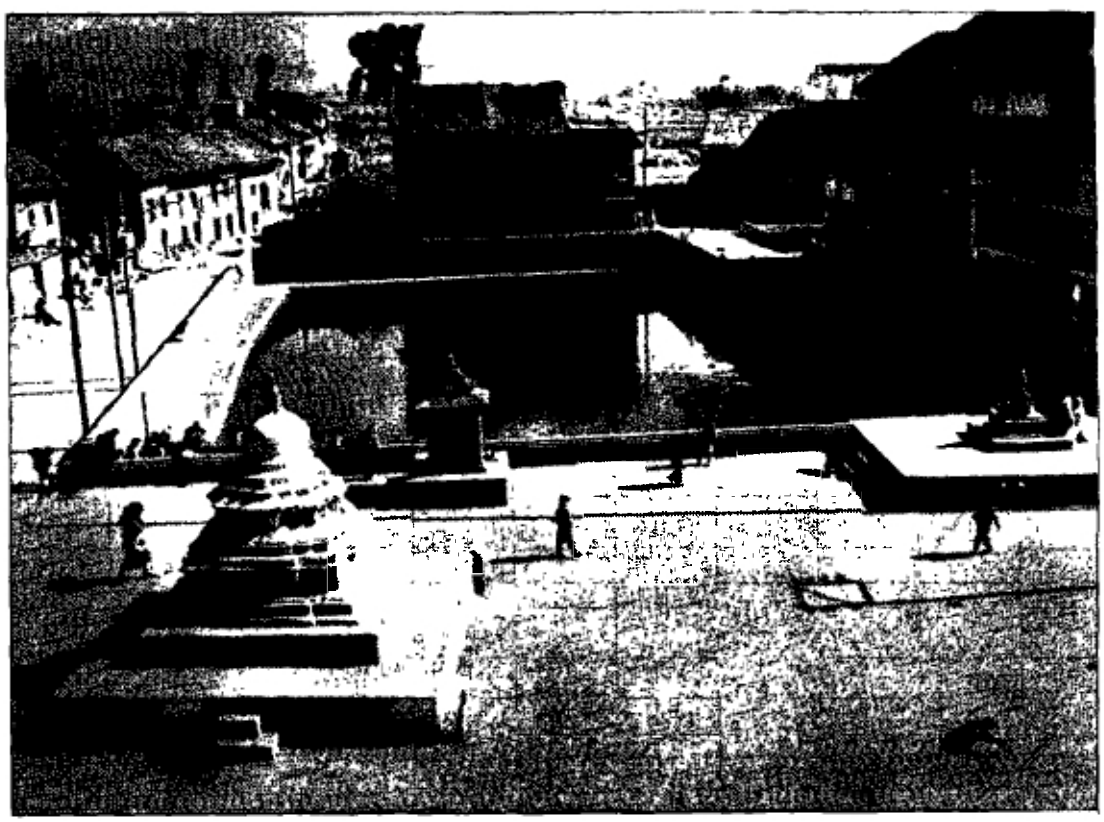


...with satellite waste containers where people could deposit their waste.....

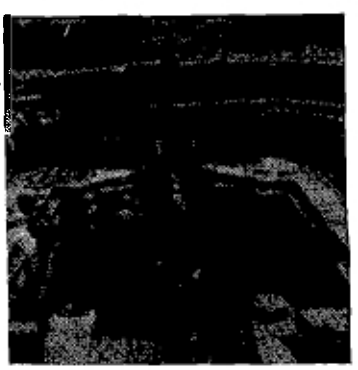
...central waste containers where waste collected from the satellite containers could be deposited.....

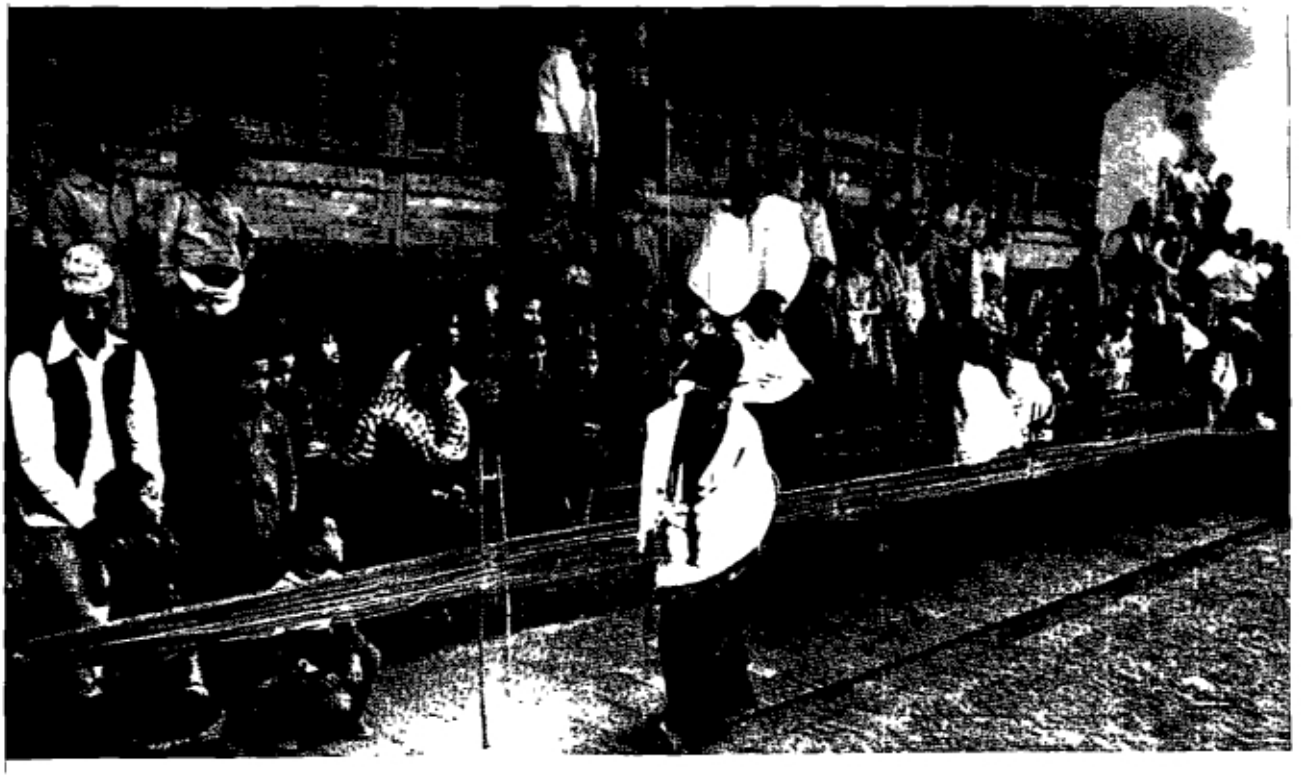
...and a compost plant for the production of compost fertilizer from the collected waste...

Apart from the restoration of monuments and temples, the rehabilitation of ponds...



...and stone taps was also done.





The common link between these development works was the people's health, the sanitary and aesthetic improvement of, and the preservation of the cultural heritage of the town. The extent of the improvement, literally, of people's living condition after 8 years of project work is the subject of discussion.

But there was no change in the pattern of morbidity.

Diseases were still on the increase.

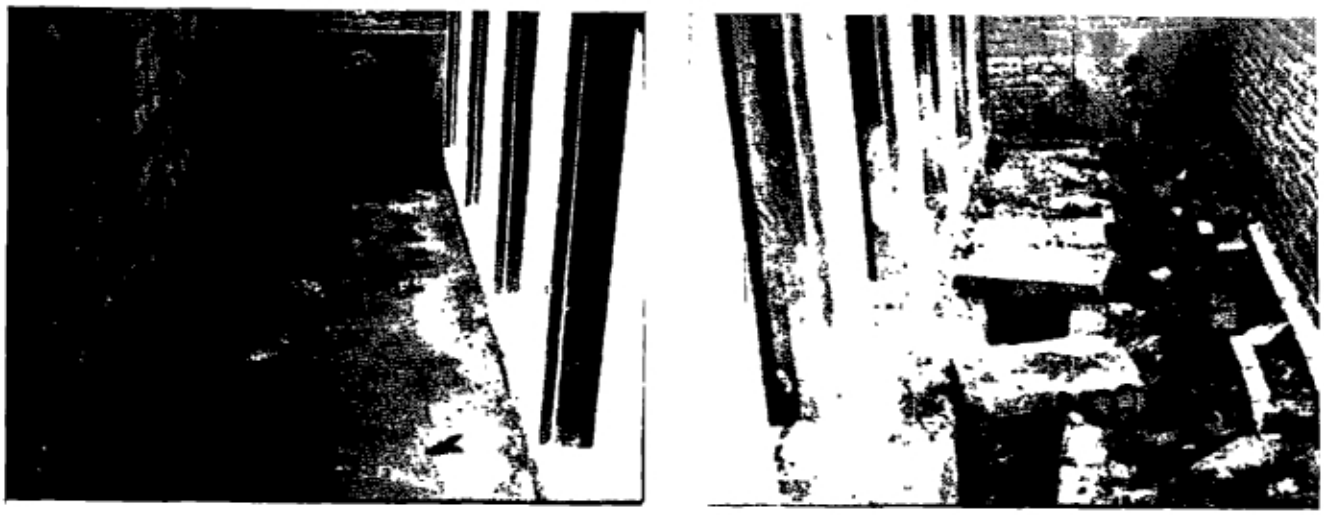
The mortality and...

...birth rates were still higher than the national average.

The assumption that the people will ultimately use and maintain the facilities proved to be wrong. The people questioned how the facilities are linked with their health or the improvement of their living condition. The tradition old habits, practices, and attitudes prevailed.

Almost all public toilets were used unhygeniecally.

Even when schools possessed toilets they were in a hazardous condition.



Faeces litter the entrance to the toilets; missing taps, damaged sewer connections and floors were typical.

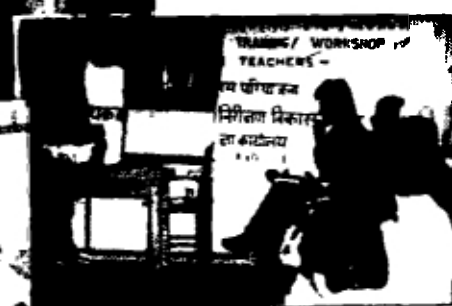
In many cases, separation walls are totally dismantled. Here even the pans are destroyed. The toilet floor is totally covered with faeces.

Roofs were also damaged in many cases.

Elastic string method for enlarging the drawing: a practice.

Preparation of flash cards, flip charts, posters, and picture scrapbook: practices.

Use of flash cards: a practice.



Preparation and use of flannel boards, picture cut pieces and flexiflans: practices.

Method of preparation of modeles & puppets: a practice.

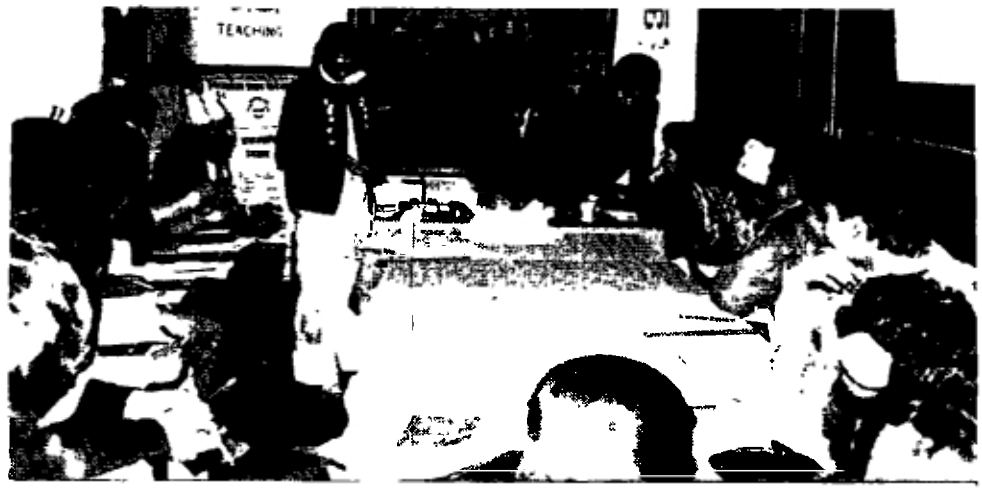
How to use the puppets in teaching: a practice.

TABLE OF CONTENTS

Health education greatly involves the effective use of communication.

How a message can distort while communicating from one person to another:
a communication game.

"An unbelievable fact when heard becomes believable when seen"
Prof. Gobinda Narayan Jyapoo.



Lettering a demonstration...

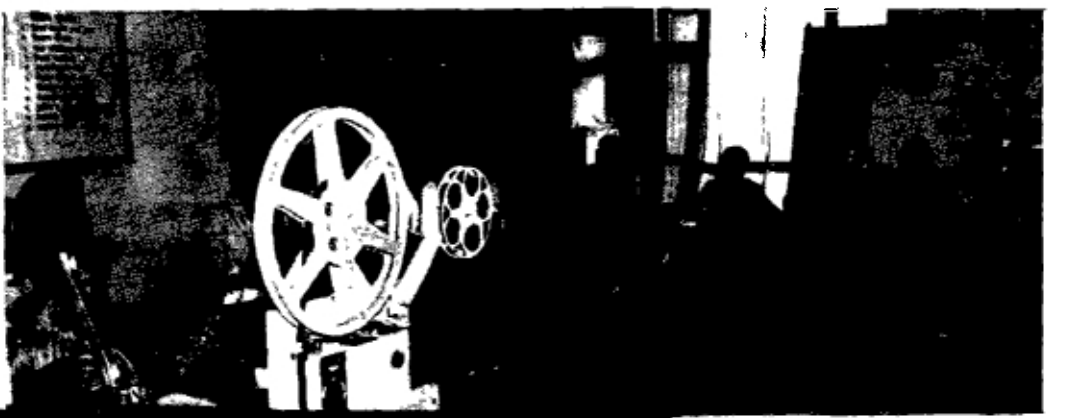
...and a practice.

Match stick drawing: a practice.

Systematic drawing technique: a demonstration.

Identification of problems and solution: a buzz group discussion.

Slide and film shows were frequently used.



Group findings were recorded on the cardboard and used for reference in coming sessions.

Goal agreement: "We agree to achieve the set training objectives".

Fundamental factors in health education: Dr. Devi Bdr. Shrestha.

Process of behaviour change teaching-learning and motivation: some important fundamental factors: Dr. Yogendra P. Pradhanang.

Ice-break and Warm-up Exercise.

Warming-up:

Close interaction between each others.

Merry-go-round:

Now we are in a friendly, comfortable and pleasant atmosphere.

Pre-evaluation...

...with written answers to a structured questionnaires.

Group division game...

...leading to unity, interactions and friendly co-operation.....

...before starting group tasks.

1. PICTORIAL REVIEW

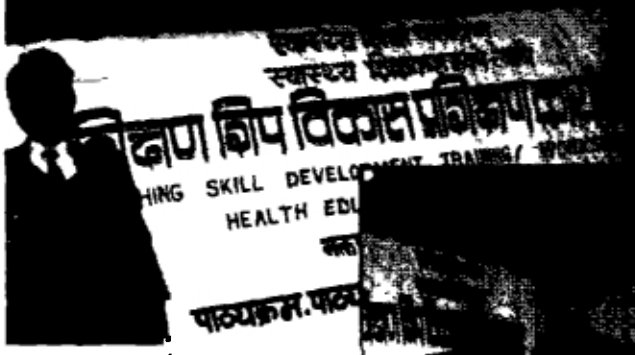
Teachers' Health Education Committee [THEC] was the participatory foundation of the programme.

Agreement of co-operation made the sharing of the responsibilities among the concerned institutions: CTSDC, DEO, and BDP, officially binding.

Inauguration of Teachers' Training.

"Health Education should be an Integral Part of Development", Inauguration speech by the Minister, MPLD.

"Participatory effort is important", the Hon'ble Act. Ambassador of Federal Republic of Germany.



"There is very important role to be played by the programme", Welcome speech by the Secretary, MPLD.

"Thanks for the participation and let us further participate for our own development benefits"; Vote of thanks by the Add. Secretary, MPLD.

Highlights on the programme: BDP Co-ordinator.

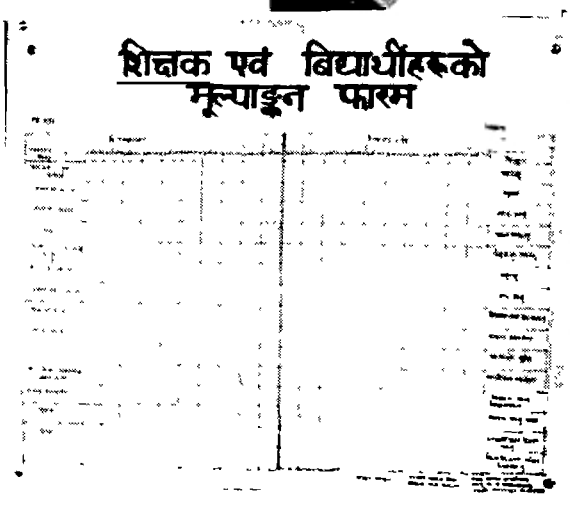
Participants in the inaugural function.

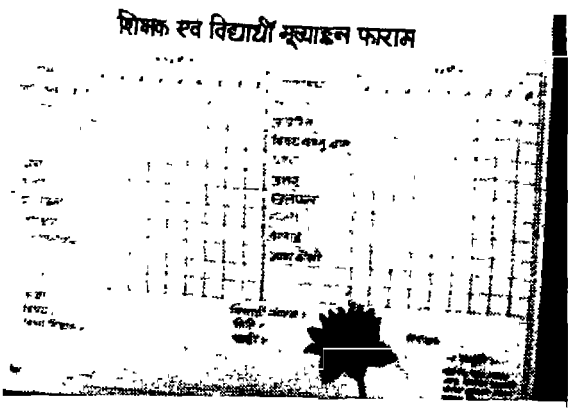
C H A P T E R I I I

SCHOOL HEALTH EDUCATION PROGRAMME

Use of cardboard figures in teaching.

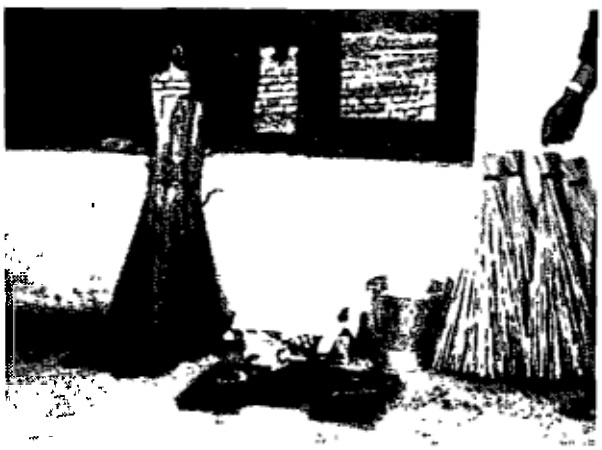
Use of game materials: a practice.





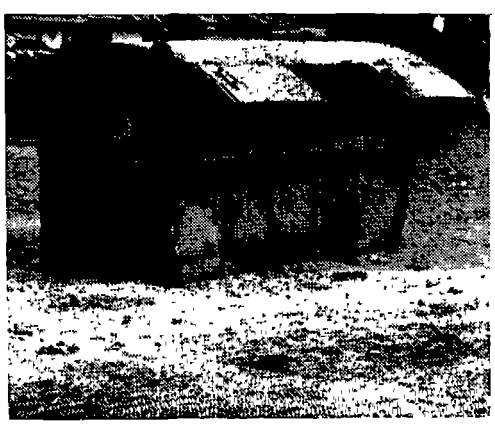
Preparation & use of charts and graphs in health education: a practice.

Preparation of specified materials for health education: practices.



...some of produced materials.

Materials providing direct experience have an effective role to play in teaching.

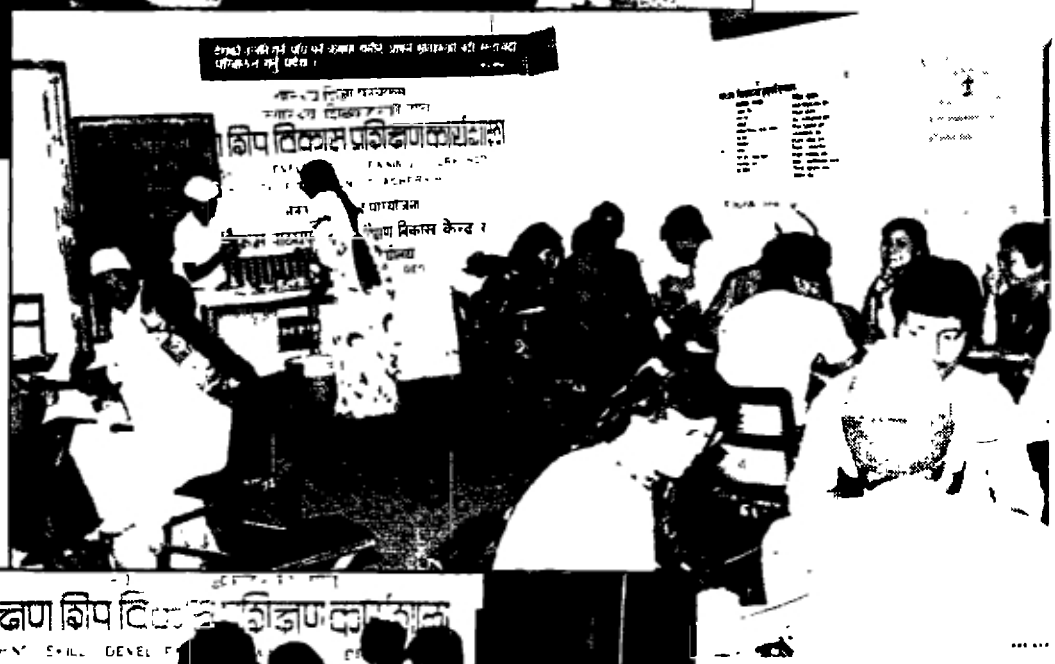


Effects of behavioural teaching: Dr. Kedar Nath Shrestha, the Chief, CTSDC/Ministry of Education & Culture.

Effective participation and management in teaching-learning activities: Mrs. Chandani Joshi, the Chief, Women Development Centre, Ministry of Panchayat and Local Development.

Alternative teaching methodology: Knowledge, skill & attitude: Dr. Rajendra Kumar Rangong, Director, Curriculum Development Centre, Tribhuvan University.

General discussion.



...and buzz-group discussion.

Carricature and role playing make health education stories interesting.

Demonstration method: tooth brushing....

...nail cutting...

...and proper waste disposal.

Project Method

Field study.

Project planning.

Collection of required materials.

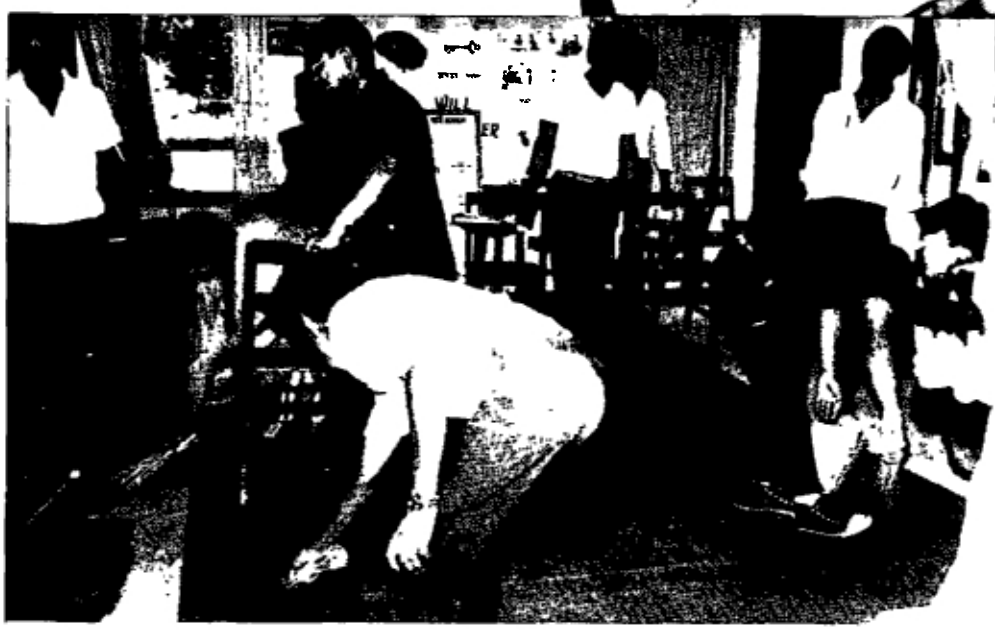
Motivation & awareness to the students for participation in project action.

Project works

A cheerful returns after accomplishment of the project work.

Project review and evaluation.

Step-by-step approach to problem solving.



Role plays...

...with puppets and,.....

...live actors.

Child-to-child Approach: a basic concept: Mrs. Nupur Bhattacharya.

...and practice on few topics of health education.

How monitoring and evaluation can be practically carried out: group discussion provides suggestions.

Lesson Planning:

a group practices...

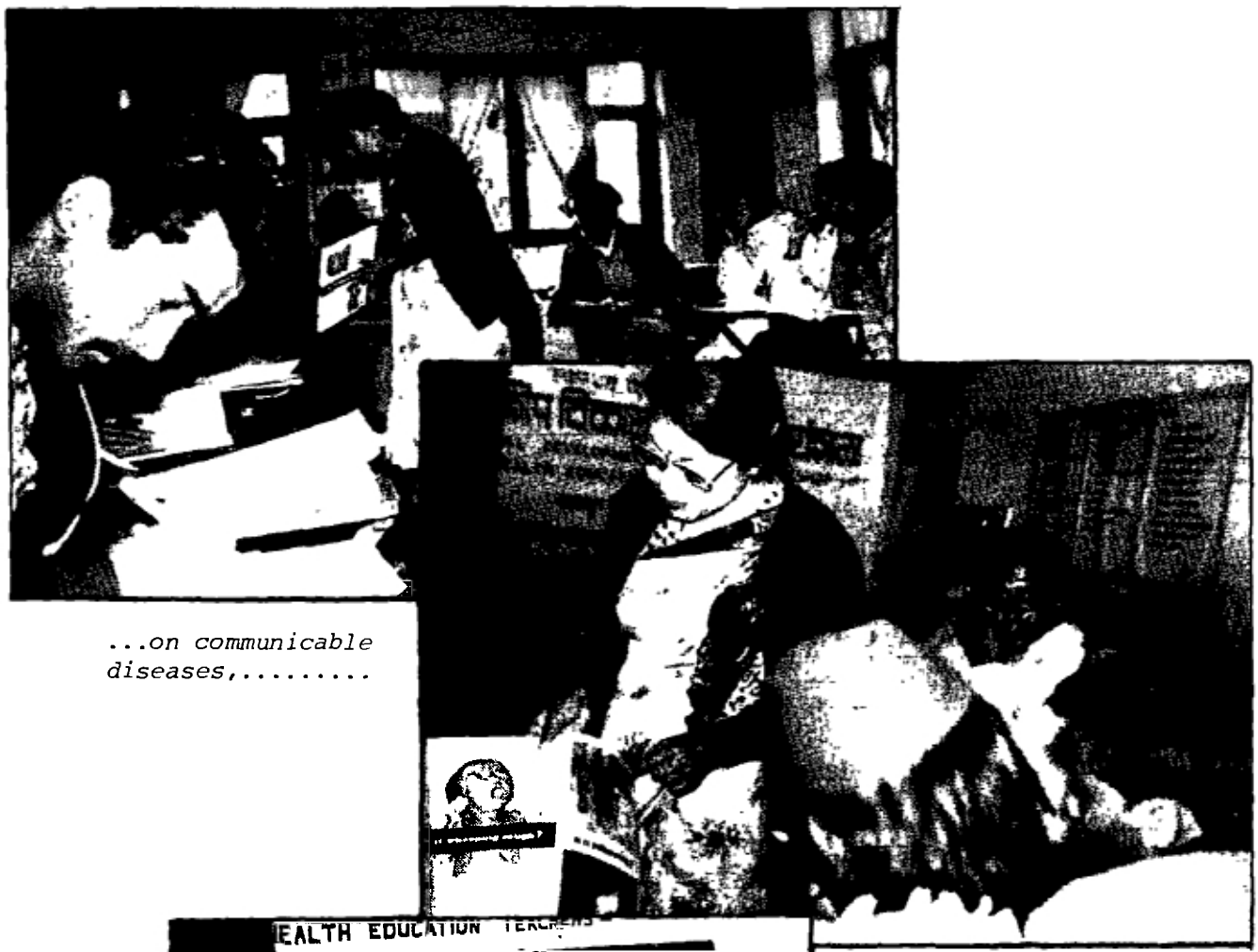
...on the roof...

...and individual practice.

Planned Education Process using various alternative methods and media.

Here: Few examples on the topics of personal hygiene.

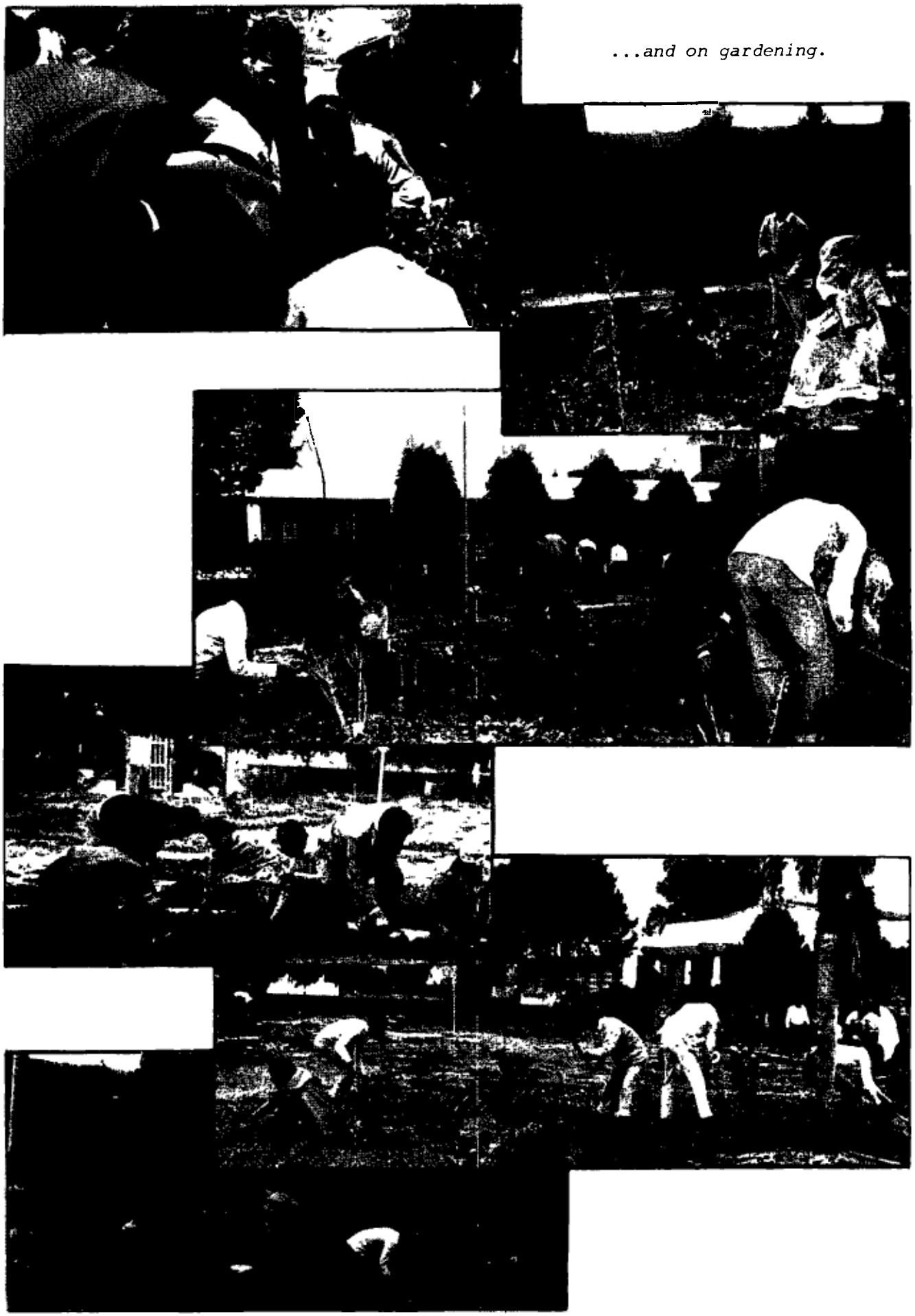
...on environmental sanitation.



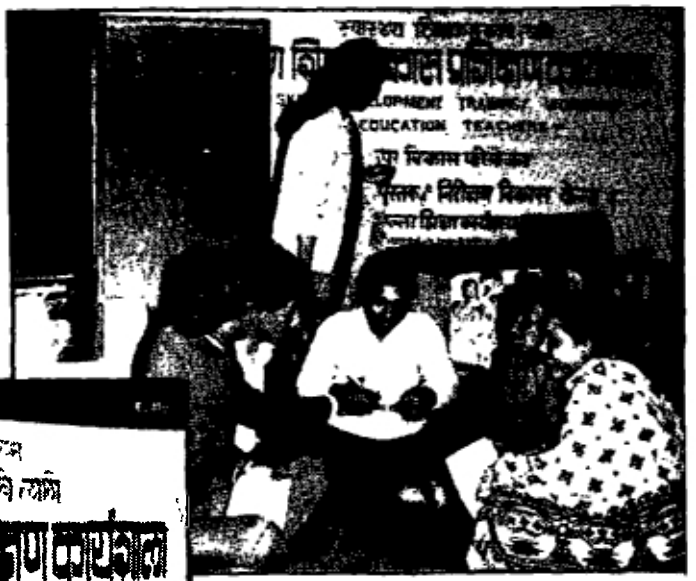
...on communicable diseases,.....

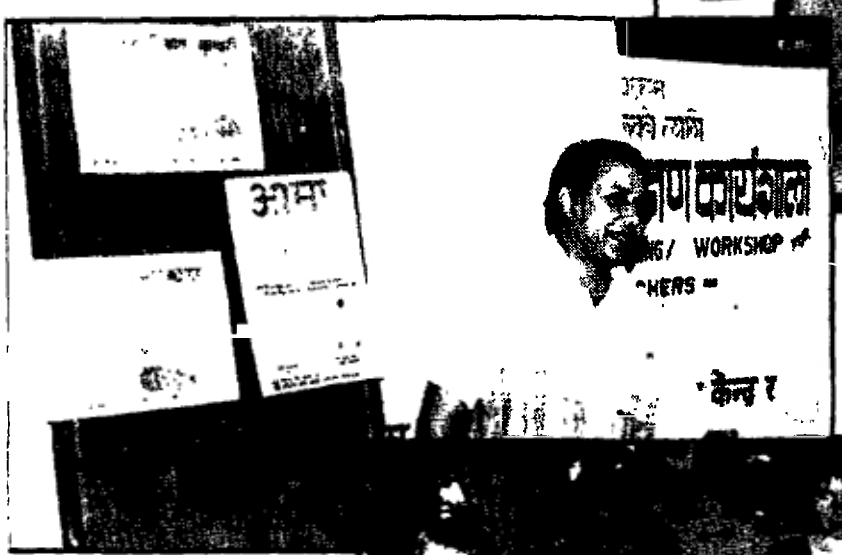
...on transmission routes of diseases.

...and on gardening.



Management game: a practice.





Nutrition for prevention of particular eye diseases:

briefing and pretesting of posters:

Dr. Chet Raj Pant, and Mrs. Anna Smith.

Refreshment.

A look at the training activities: Mr. Ingo Guhr.

A look at the training: GTZ and BDP officials.

The joy of learning: the participants were given many opportunities for a little light relazation and entertainment throughout the programme.

2. RATIONALE

To bring dynamic positive behavioural change in the community requires effective health education at grassroot level across a large part of the population. Promoting health education in schools is one method of achieving this which has several advantages:

Children form a large part of the community; they can be easily reached at school and taught to participate in health development activities. The majority of households have at least one or two children at school and any health education carried out at schools will therefore reach a much wider proportion of the community than the children alone. Schools have become the institution with the widest outreach.

HMG's curriculum already has a health education component which only needs to be reactivated and orientated towards effecting behavioural change.

Children respond more readily to new ideas and they are easy to motivate; teaching them good behaviour will improve their own health and they will function as conveyors of messages and change agents, therefore influencing their fellows, siblings, and parents. The initiation of behavioural changes at an early age will also have a long term impact on development work.

The major challenge of health education appears to be to maintain behavioural change. School health education is becoming increasingly more significant in this regard as it can form part of a long term strategy and can be followed up on an ongoing basis by the regular education system. It also has a positive influence on the teachers who can then use their positions and their potential leadership role as agents for change within the community as a whole. They constitute the most widespread organised force.

3. PROBLEM IDENTIFICATION

3.1 HMG Curriculum and Health Classes

The health education provided for on HMG's curriculum is insufficient. At best, only one class per week is taught in most schools and often, even this is not carried out. Many experts believe that the health education curriculum bears little relation to the local situation and needs.

3.2 Text Book

To encourage practical rather than theoretical classes, no provision of health education text books is made for grades 1, 2 and 3. In reality however, because teachers are unfamiliar with practical teaching methods and have

little access to the health education guidebook, health education classes in those grades either do not exist at all or are very ineffective.

For grades 4, 5, 6 and 7 the text book has very little scope and the course is incorporated as a small portion of the science text book. For grades 8, 9 and 10 health and hygiene is an optional course.

3.3 Knowledge, Attitude and Behavioural Change in Students

The main objective of health classes is to bring about behavioural change. While teaching health education, one has to look at:

- how many of the health education messages the students remember and accept;
- to what extent their behaviour changes in the desired way; and
- finally, to what extent those behavioural changes improve the health status and living conditions of the population.

In fact, no behavioural or attitude changes in students have been observed. The students receive the messages from the teachers and text books yet they still do not apply them in practice. The teachers instruct the children to use the toilet, and yet they still defecate in the street or any other open space. The reasons for no behavioural change are clear: the factors that influence behaviour are not well assessed and health education is not well designed.

"..... Little else is done apart from memorising the text book and from time to time having students repeat in exams what they have memorised. Little attempt is made to change the consciousness and perception of reality of the students, and even less to produce changes in behaviour and ensure that what is learned is immediately applied in the day to day lives of the students."

3.4 Knowledge, Attitude and Behavioural Changes in the Teachers

Similarly, there is a lack of health consciousness, knowledge, skill, attitude and motivation among the teachers which could lead to health improving practices.

The teachers lecture the students on the importance of keeping houses and compounds clean, while the school itself is a dirty place. They also lecture the students

about the importance of keeping clothes and bodies clean, while they themselves are wearing filthy clothes. "Unless teachers' attitudes are changed so that they are leading by example and actively participating in healthy behaviour, little can be achieved". Students will only apply in practice what they have learned if the teachers are seen to be already doing so.

3.5 Teaching Approaches, Methodologies and Lesson Planning

The majority of health teachers are not trained. The only methods of teaching used by them are lecturing, reading, writing and memorisation of what is included in the text. Therefore, the students do not apply in practice the lesson they have learnt. They memorise the lesson for repetition in exams and then forget it.

The teachers do not prepare the lesson because they lack the time, motivation, knowledge and skills to do so. Teaching is therefore unsystematic, non-motivating and ineffective. In some cases, the teachers themselves do not understand what they are trying to teach. They lack the skills to produce cognitive and behavioural change in the students.

Even among trained teachers, there is little motivation, due to lack of materials or incentives, to teach by any method other than lecture.

3.6 Monitoring and Follow-up

No monitoring or follow-up activities are carried out on an ongoing basis. A lack of appreciation, accompanied by a lack of equipment, has greatly limited the effectiveness of many health education activities in schools.

3.7 Evaluation System

The children who can correctly say how and why they should keep their clothes and bodies clean get full marks in the exams even though their faces, hands, and clothes are filthy. The students who can write about the importance of using the latrine get full marks even if they defecate outside the latrine. The evaluation system of student's learning is therefore not considered as scientific, practical or behavioural-change orientated.

3.8 Educational Materials

The lack of educational materials has been the main constraint on the effectiveness of health education. Even if the teachers try to teach the students practically about the use of the toilet, there is often no toilet in the school. There are no brooms or

cleaning materials with which to keep the environment clean. There are no relevant pictures for teaching about diseases. This reflects the general lack of teaching material in schools. There is also a complete lack of proper guidance materials including health education guidebooks.

Generally, teachers are not motivated and show little enthusiasm for preparing and using educational materials. They lack the skills to design, develop and use materials and furthermore, available materials are frequently under-utilised and poorly maintained. Because of these problems, the pattern of teaching has remained predominantly teacher-centred and pedantic and fails to change the behaviour of the children.

3.9 Health Hazards in School

It has already been mentioned that during a survey made by the Bhaktapur Town Panchayat and BDP in 1982, it was observed that out of all the public toilets, the few school toilets existing were the dirtiest and most neglected. This is just one example of the many apparent health hazards in terms of personal hygiene and environmental sanitation which were observed in almost all the schools. Health and sanitation were not recognised as problems by the school and the community. In such situations, one cannot expect the schools to contribute to the improvement of the health of school children and the community. It is important that the school should be a model of an healthy environment and healthy behaviour, and at the same time be a source of motivation to the people.

3.10 Participatory Process

There is very little participation by the community in the educational programmes and affairs of the school except for the initial construction of the school building. The community interest in the actual functioning of the schools is small and there is little parental concern about teaching methods or course content.

Equally, there is little participation or involvement of the school in community affairs. Indeed, even in the teaching/learning process, the teachers involve the students very little.

The major factors adversely affecting the effectiveness of school health education are thus summarised as follows:

- the general irrelevance of the curriculum and text books to the learners' needs;

- the lack of assessment of the factors affecting behavioural change and lack of knowledge, skill and motivation in designing innovative and alternative health education approaches and methodologies;

- lack of trained teachers;

- lack of behavioural change - orientated teaching/learning process and evaluation system;

- lack of supervision, monitoring and follow-up system;

- lack of proper motivation and dedication among teachers;

- non-availability of physical infrastrucure and poor maintenance of existing facilities;

- lack of educational materials;

- lack of participation;

- Lack of development activities related to health problems.

4. OBJECTIVE

The basic goal of the School Health Education Programme was to improve the behaviour of school children thus leading to the improvement of the health situation and the sanitary conditions in the schools of the Bhaktapur Town Panchayat area through community development orientated school health education activities.

The programme aimed to cover three areas namely (a) health education, (b) basic health care, and (c) healthy environment. Stress was laid on the practical application in the day-to-day life of the students and teachers of what had been taught about health and sanitation.

To achieve the objectives, proposed inputs comprised the following:

- the establishment of a Teachers' Health Education Committee and Resource Centre Schools;

- production, provision and development of instructional/educational materials for both teachers' and students' use;

- production of an health education guidebook for teachers;

- re-activating and improving the school health education curriculum;

- organising and supporting training workshops for health education teachers;

- the provision of skilled manpower and technical assistance;

- strengthening and improving the monitoring and evaluation system, and the management of health education activities;

- promoting community health through school health education;

- provision and improvement of physical facilities in schools;

- follow-up activities.

The main focus was placed on linking the activities of the school to community needs and to development efforts relating to health. The following improvements were expected:

- 90% of schools in Bhaktapur to have sanitation facilites.

- Environmental health hazards to have been removed from the compounds of 70% of schools.

- Sanitary infrastrucure in schools to be properly functioning. Improved sanitary conditions in schools to be maintained by the school children.

- 80% of the school children observing the rules of personal hygiene, sanitation and other preventive measures.

- Improved sanitary behaviour of the population of Bhaktapur through the correct use of BDP sponsored sanitary infrastructure:

  * 70% of private toilets being properly used,
  * 40% of public toilets being properly used,
  * 50% of the households having improved water storage,
  * A recorded reduction in the wastage of water,
  * 60% of rehabilitated courtyards remaining clean,
  * The rehabilitation of the health hazardous courtyards being continued.

- The health status of Bhaktapur to be improved:

  * A recorded reduction in communicable diseases,
  * The level of parasite infection to be reduced by 40%,
  * A recorded level of awareness of and increase in immunisation.

- The school family (teachers and students) to continue the Health Education Programme on their own.

5. PLANNING AND PROGRAMMING PROCESS

One of the first tasks of health education is to secure community participation in the planning of the programme. This is largely dependent on the willing co-operation of all the related institutions and of students, teachers, local leaders and the community in general. In implementing the health education programme, it is desirable to find a way to institutionalise community participation. To this end, the project developed the concept of involving the teachers and local concerned institutions such as the Curriculum Textbook and Supervision Development Centre (CTSDC) and the District Panchayat Secretariat Education Section (District Education Office - DEO) of Bhaktapur. However, in a few unavoidable cases the project itself had to inititate the programme. The following steps were taken:

5.1 Looking at Other Similar Projects

The first step was to look at other similar projects. The most influential was the 'Education for Rural Development (Seti Zone) Project' at Silgari, Doti. Inspired by its concept and ongoing activities, BDP developed the concept of the School Health Education Programme with certain modifications reflecting the problems and needs of Bhaktapur.

5.2 Proposed Concept and Institutional Support

The proposed concept was discussed with the CTSDC and DEO. The main objective behind seeking their participation was to institutionalise the programme so that it could be kept running, under their guidance, supervision and monitoring, after the end of BDP. Both institutions provided their formal approval of co-operation. For the initial stage, the following division of responsibilities was agreed upon:

- Support of District Panchayat Secretariat Education Section (DEO)

  * Formation of teachers' committee.
  * Selection of resource centre schools.
  * Selection of teaching materials.

- Support of CTSDC

  * General supervision and monitoring.

- Support by BDP

  * Building materials for the improvement of sanitation facilities.

* Funds for the production of teaching materials.
* Organisational support.

5.3 Formation of Teachers' Health Education Committee (THEC)

A Teachers' Health Education Committee (THEC), consisting of a representative from each school, DEO and CTSDC, was formed. The following criteria were established for the eligibility of teachers as a member of the THEC:

- Must be involved in health education.
- Priority given to those teachers with most experience.
- Must demonstrate their willingness and motivation to participate in the programme.

BDP, through the Community Development Unit, familiarised the THEC with the processes of planning, programming, implementation, monitoring, follow-up and evaluation.

In order to facilitate the functioning of the THEC, a working group was also formed under the chairmanship of the District Education Officer. The members were representatives of CTSDC and BDP, Service Centre School headmasters and 10 elected teachers.

Initially, the functions of the working group and the THEC were identified as follows:

Functions of Working Group:

- to decide on the detailed list of programme activities,
- to prepare a proposal for the selection of service centre schools,
- to define the tasks of service centre schools,
- to make time schedules and cost estimates of the programme,
- to select suitable teaching aids and, if necessary, to produce additional ones,
- to develop a monitoring and evaluation system,
- to plan and organise health teacher training,
- to select teachers to attend teacher training,
- to monitor and evaluate teaching done at the service centre schools,
- to propose that further teacher training be organised by the service centre schools.

Functions of THEC:

- to meet once a month, or as required, to decide on issues forwarded by the working group,

- to acknowledge and give suggestions on the activities planned by the working group for implementation,
- to approve the selection of service centre schools,
- to evaluate the programme every 4 months.

5.4 Agreement of Institutional Co-operation

The proceedings for the formal agreement of co-operation among the three involved institutions: DEO, CTSDC and BDP now began. Each institution developed a draft list of its own tasks and the division of work was finally agreed in a joint meeting. The agreement of co-operation was signed by the CTSDC Chief, the District Education Officer and the Project Co-ordinator of BDP.

5.5 Selection of Service Centre Schools

Altogether, 38 schools were included in the programme although pure secondary and pre-primary schools were excluded. The first task of the THEC was to select 2 service centre schools. Four schools were proposed by the working group and the THEC made their selection based on criteria of space availability, location, physical condition and the willingness of the school. Sharada Secondary School was selected to act as a service centre for the satellite schools on the eastern part of the town, and Gyan Bijaya lower secondary school for the western part of the town.

The functions of the service centre schools were initially decided by the THEC as follows:

- to call regular meetings of the THEC and working group,
- to initiate a workshop on management procedures and monitoring within service centre schools,
- to store building and educational materials,
- to distribute building and educational materials to the satellite schools,
- to extend the programme to its satellite schools after evaluation of the programme in its own school,
- to integrate a monitoring and evaluation system in the satellite schools,
- to organise subsequent teacher training as found necessary by the working group,
- to disseminate information about the health education programme to the community and to promote community support for school health education,
- to promote community health education activities.

5.6 Operational Plan for Service Centres

The service centre school was considered to be the main nucleus of teacher training activities, the supply of educational and building materials, teachers' meetings

and monitoring and evaluation activities, etc. There was a need to define how the service centres should carry out these activities. The District Education Officer, together with the service centre school headmaster and BDP specialists drew up the detailed operational plan comprising the following components:

- Grouping of satellite schools under each service centre.
- Tasks of service centres.
- Fund securing procedure.
- Educational materials: securing/purchasing, storing and distribution procedure.
- Building materials: securing/purchasing, storing and distribution procedure.
- Procedure for training and meetings.
- Monitoring and evaluation system.

5.7 Curricular Content

The next task was to decide on the curricular content and the topics which should be given priority in school health education. The government curriculum was reviewed and a scope and sequence unit chart of the curriculum for grades 1 - 7 was prepared. When necessary, curricular content was redesigned and additional topics added with the condition of approval by the THEC. Each topic was designed with the inclusion of detailed guidelines.

5.8 Health Education Guidebook

Having decided on curricular content, preparation of the guidebook proceeded. Three experts undertook to prepare the book. Unfortunately, the first draft was still in the old style: teacher centred and pedantic. It still recommended the use of lectures as opposed to behavioural teaching methods. An innovative approach and alternative modern methods of teaching were the most desired aspects of the guidebook and the project therefore started to work on a second draft with the support of the CTSDC.

The second draft was then used in the subsequent teacher training programme. The participant teachers were given opportunities to develop their own ideas for teaching activities and many of them were innovative and practical. These ideas were then incorporated in the revision of the guidebook.

5.9 Educational Materials and Training

The effectiveness of any health education programme to bring about innovation and change depends not only on the availability of instructional materials but also on

how they are used. Thus, the provision of educational materials, as well as training on the techniques of preparing/developing and using educational materials had to be considered. In this regard, the project specified the following activities:

5.9.1 Provision of Building Materials

The provision of building materials was made for the following purposes:

- to support the efforts of the schools in the development, building, repair and maintenance of sanitation facilities;

- to facilitate the use of building materials for practical teaching processes;

- to provide a link between teaching activities and development work by involving both students and teachers in building sanitary facilities;

- to facilitate the use of the existing, or to be built, sanitary facilities for instructional purposes as well as for habitual use;

on the provisos that:

- the need for building/repairing sanitary facilities had been identified by the school family (teachers and students) based on the objective needs of the school in health education;

- the school had submitted a written request for assistance for building materials stating:

  * the reasons for the project;
  * the approximate cost of the building activities;
  * how the school family would contribute to the building activities;

- a teachers' sub-committee had been formed to supervise the identified need of any building project, and approval and agreement obtained before work commenced;

- on completion of the building activities, the school must submit the bills of the building materials with a brief report of the completed building project;

- once building activities have been satisfactorily completed the final cost of the

building materials, based on the submitted bills, will be reimbursed to the school.

5.9.2 Provision of Demonstration Materials

It was agreed to support the schools in acquiring the demonstration materials required for practical health education. The teachers, the District Education Officer and CTSDC together with BDP identified the required materials:

1. Brooms, 2. Rough brooms, 3. Dust collecters, 4. Cane baskets (waste containers for classrooms), 5. Flower pots (waste containers for paths) 6. Toilet brushes, 7. Shovel, 8. Half drums (waste containers for school compound), 9. Buckets, 10. Mug, 11. Big water bowl, 12. Clay water pots (Gagro) 13. Nail cutters, 14. Toothbrushes, 15. Toothpaste, 16. Soap with case, 17. Towel, 18. Handkerchief, 19. Comb, 20. Mirror, 21. Scissors, 22. Spade, 23. Khurpa, 24. Small hoe, 25. Flat hoe, 26. Sickle, 27. Measuring tape, 28. Magnifying glass, 29. Materials for the preparation of flannel board, 30. First aid box.

The operational plan of the service centres gives the following procedure for the provision of these materials:

- a limited fixed budget is allocated to the service centre schools;
- the cost of materials and the quantity that can be purchased with the limited budget available is estimated (THEC);
- the total quantity of materials is divided into allocations to be distributed to each school;
- the materials are purchased, either by the service centres, or by the teachers themselves;
- the bills of the purchased materials are submitted to BDP;
- the materials are distributed through the service centres to each satellite school.

5.9.3 Provision of Support Materials

In addition to the materials mentioned above, the provision of the following educational material was another important aspect of the programme:

Health Education Guidebook: The preparation of this has already been detailed.

Supplementary Reading Material for Children: The project did not develop original supplementary reading material for the students. Material developed by the 'Educational for Rural Development

Project' which includes motivational stories relating to health, hygiene, nutrition , sanitation and participatory activities were reprinted. Altogether, 8 types of booklets, consisting of 36 stories were reproduced.

Each school received 30 booklets of each type. The school distributed them to the students and recollected them at the end of the educational year thus making the booklets available for the students of future years.

Flash Cards:on the prevention of sore eyes and diarrhoea had already been produced by the project in collaboration with UNICEF.

Leaflets and Posters on Different Toilet Types: had been prepared by the project under the Alternative Sanitation Scheme.

Posters on Misuse of Water: and on the cleanliness and maintenance of tapstands were prepared under final phase publicity and the Awareness Campaign.

Health Education Made Easy: leaflet was developed as a guide for the teachers. It can be used when discussing transmission routes of diseases.

Slides on health harzardous behaviour associated with the water supply system, sewerage system and toilets: These were produced, together with a script, to publicise the correct use and maintenance of said systems.

Educational Material from other Sources:
Other materials suitable for use in school health education were collected from various sources such as UNICEF, SCF, CTSDC, Health Education Section of Ministry of Health, etc. for distribution to the schools.

5.9.4 Training on Techniques of Preparing, Developing and Using Educational Materials

The availability of physical facilities and educational materials does not necessarily mean that health eductation will improve. The knowledge, skill, attitude and motivation to use them is essential. Therefore, the provision of training on preparing, developing and using educational materials is important in ensuring that teachers and students acquire the skills, attitude and motivation to effectively use the existing facilities and materials as well as equip them to produce any additional materials they may need. It was assumed

that if they produce materials themselves, they will feel a sense of achievement and will be more inclined to use them. Provided that the locally created materials are technically correct, are consistent with the overall programme and are easy to understand, they will be more appropriate and effective for local use.

6. HEALTH EDUCATION TEACHER TRAINING

After all the pre-requisites had been considered, produced and prepared the organisation of Health Education Teacher Training could began:

6.1 Preparation and Organisation Process

6.1.1. Preparation of Training Curriculum and Operational Plan

Training was the most crucial component of the School Health Education Programme. Any bottleneck or weakness in the training could have adversely affected the effectiveness of the programme. In order to make the training practical, productive and effective required adequate attention and a concerted effort.

The first draft of the developed curriculum was revised and a second draft prepared. The detailed operational plan was also included in the second draft. After taking account of the comments of various concerned persons on the second draft, the final revision of the curriculum and operational plan was carried out.

The first draft allowed a period of 12 days for training, the second draft allowed 18 days. Eventually, in the third draft 21 days were considered necessary to allow the training to be as comprehensive and wide-ranging as possible.

6.1.2 Training Management Team

A training management team was formed to organise and manage the training. It comprised of:

- Curriculum, Textbook and Supervision Development Centre, Ministry of Education and Culture,
- District Panchayat Secretariat, Education Section, Bhaktapur, Ministry of Education and Culture,
- Community Development Unit, BDP,
- Service Centre School, Bhaktapur.

The role of the team was defined as follows:

- To recruit effective and good trainers/resource persons.

- To brief the trainers/resource persons on training requirements and the concept of the programme.

- Together with the selected trainers, to draft and finalise the instructional objectives of each topic on the training curriculum.

- To help the trainers plan, organise and run their respective sessions.

- To help the trainers:

  * to develop training material, audio visual aids;
  * by providing available training materials, audio visual aids;
  * to develop hand-outs.

- To design training methodologies and approaches.

- To finalise the training schedule.

- To tap resources and make the necessary logistical arrangements.

- To co-ordinate the timing and content with the trainers/resource persons.

- To implement and organise the training programme.

- To make a plan for the evaluation of the training programme and to conduct the same.

- To compile a report on the training programme.

6.1.3 Training Objectives

The training objectives were determined as follows:

Orientation

- To brief the teachers on the health education programme and to motivate them.

- To expose the teachers to the importance of health education.

- To widen the teachers' understanding of the basic concept of health education including

fundamental factors such as behavioural change processes, learning processes, motivation, communication skills etc.

Educational and Building Materials

- To assess the need for educational materials and to develop practical guidelines for designing, developing and utilising them.

- To develop the knowledge, skills and attitudes of teachers in designing, producing and using appropriate educational aids based on locally available materials.

- To develop and practise methods of using demonstrations, educational materials, physical facilities and building materials in health education teaching.

Teaching - Learning Methodologies and Approaches

- To acquaint participants with the various alternative health education methodologies and innovative approaches.

- To develop the knowledge, skill and attitude of the teachers to design and use appropriate methodologies and approaches for effective health education.

- To develop and practise methods of using physical facilities, real educational materials and building materials for instructional purposes in health education.

Monitoring and Evaluation System

- To develop skill in the techniques of behavioural change orientated monitoring and evaluation of health education.

- To develop a monitoring and evaluation system for the Health Education Programme.

Health Knowledge, Skill and Attitude

- To widen the knowledge, skill and attitudes of the participants concerning:

    * Personal Hygiene
    * Environmental Sanitation
    * Communicable Diseases
    * Tranmission Routes of Diseases
    * Nutrition
    * School Gardening

Planned Education Process

- To review the health education curriculum of primary and lower secondary grades.

- To acquaint the participants with the methods of lesson planning.

- To provide the participants with the opportunity of designing and preparing a lesson plan for each topic on the health education curriculum, incorporating appropriate educational materials, alternative methods and approaches and practical monitoring and evaluation techniques. Ideas resulting from this exercise were to be incorporated in the revised version of the health education guidebook.

- To provide participants with teaching practice based on their own lesson plans.

Management/Leadership/Community:

- To instil management and leadership skills in participants of health education activities in school and the community.

- To develop techniques to improve rapport between the schools and the community.

- To encourage teachers to share their knowledge, skill and experience with each other.

- To develop efficiency in organising behavioural change-orientated health education activities.

6.1.4 Participants

Participants were selected by the health eduction sub-committee on the basis of the following criteria:

- Should already be teaching health education.
- Should preferably be permanently employed.
- Should undertake to continue teaching health education for at least one year after completion of training.
- If the trained teacher is compelled to leave his teaching post then he/she should train his successor.

In response to the invitation issued to 38 schools, 37 participated. Of the 37 participants, 8 were headmasters. In addition to the teachers and headmasters, two supervisors of the District Panchayat Secretariat, Education Section and a representative of CTSDC also took part as resource participants. One representative of the Solid Waste Management Project,

and one representative of the sweepers' community of Bhaktapur also took part as observers. Of course, there were many other frequent observers as well.

The participants were divided into two groups, each under one of the two resource centre schools. It was felt that smaller groups would lead to more effective participation.

Group A:under Shri Sharad Secondary School Service Centre

- The teachers and headmasters of schools with grades 1 to 7	18 persons
- The supervisor of the Education Section, District Panchayat Secretariat, Bhaktapur	1 person
- A representative of the Solid Waste Management Project	1 person
- A resource participant of CTSDC/ Ministry of Education and Culture	1 person
Total participants	21 persons

Group B: under Shri Gyan Bijaya Lower Secondary School Service Centre

- The teachers and headmasters of 20 primary schools	20 persons
- The supervisor of the Education Section, District Panchayat Secretariat, Bhaktapur	1 person
- A representative from the sweepers' community of Bhaktapur	1 person
- A resource participant of CTSDC/ Ministry of Education and Culture	1 person
Total Participants	23 persons

6.1.5 Resource Persons/Trainers

The resource persons/trainers were to form the mainstay of the training programme. They were to carry out the actual training work. To ensure that effective and good resource persons/trainers were recruited special steps were taken to screen them:

- Defining the areas of expertise required to carry out the training programme.

- Listing the resource persons with the required expertise.
- Deciding the number of resource persons/trainers required.
- Selecting a short list of potential resource persons/trainers.
- Finalising the team.

The resource persons/trainers selected were well known personnel from various government and non-government organisations and institutions. They were briefed in detail on the concept of the health education programme, training media and methodologies to be applied etc.

6.1.6 Venue

The training workshop for Group A was carried out partly at the Shri Gyan Bijaya Service Centre building at Dudhapati, Ward No. 17 and partly at the scout building in Durbar Square, Bhaktapur. The venue for Group B's training workshop was also the scout building.

6.1.7 Duration

The duration of the training workshops was planned as 7 hours per day for 21 working days. However, it became apparent that a few additional topics needed to be included and the training period was extended to 26 working days. The participants were allowed to take any holidays which arose during the training, therefore the training of Group A and Group B took 37 and 49 days respectively to complete.

6.1.8 Inauguration

The training workshop was declared open by the Hon'ble Minister for Home, Panchayat and Local Development on 1 January, 1986. In his inaugural speech the minister emphasised the need for widespread health education at grass root level. The welcome speech was delivered by the Secretary of the Ministry of Panchayat and Local Development. The BDP co-ordinator briefed on the needs and characteristics of the programme. The Acting chief of CTSDC/Ministry of Education and Culture highlighted the necessity of training assessment. The Rastriya Panchayat Member pointed out the necessity of giving priority to preventive aspects rather than merely investing in curative measures. The acting Ambassador of the Federal Republic of Germany appreciated the co-operation extended by the concerned institutions and personnel. The Additional Secretary, Ministry of Panchayat and Local Development delivered the vote of thanks. The inaugural function was chaired by the Pradhan Pancha of Bhaktapur Town Panchayat.

6.2 Training Procedures

The planned training courses were the same for both groups differing only in the specific subject matter to be used to allow for curriculum variations between primary and lower secondary schools. The programme covered a wide range of courses:

- Introductory components,
- Understanding the Health Education Programme and assessment of health education needs,
- About training,
- Basic concept and fundamentals of health education,
- Health education materials, media,
- Alternative health education methodologies,
- Techniques of monitoring and evaluation,
- Planned education processes:
  * Methods of planning health education lessons,
  * Planned education processes on:
    + Personal Hygiene,
    + Sanitation,
    + Transmission Routes of Diseases,
    + Communicable Diseases,
    + Nutrition,
    + School Gardening,
    + Safety and First Aid.
- Management and leadership skills,
- Monitoring and evaluation system for the Health Education Programme.

The proceedings of each component are detailed below:

6.2.1 Session 1: Introductory Components

Sub-session 1: Warm-up and Ice Breaking Exercises

The purpose of this sub-session was to create a friendly, comfortable and pleasant atmosphere to facilitate the full and active participation of all participants during all training sessions by giving them an opportunity to get to know each other and to dispel any shyness.

The following games and exercises were used in this sub-session:

- Health picture-matching, and pairing off for introductions,
- Merry-go-round,
- Nicknaming,
- Mapping,
- Warming-up.

Sub-session 2: Pre-evaluation

Structured (closed and open-ended) questionnaires were used to pre-evaluate each participant with the following objectives:

- to establish needs, and select priority training courses, as perceived by the participants;

- to ascertain the participants' existing knowledge, skills and attitudes concerning the training course;

- to record the hygiene and sanitary conditions of schools as witnessed by the participants;

- to acquire a base by which to evaluate the effectiveness of the course.

6.2.2 Session 2: Understanding the Health Education Programme and Assessment of Health Education Needs.

In many training workshops topics and problem areas are usually defined by the authorities. In this case however, the participants were invited to identify the problems and what could be done to improve health and sanitation. The areas already defined by the project were used to support their identification activities. Based on the participants' suggestions, some topics were added and the training periods were extended from 21 to 26 days. The session followed the following pattern:

- General discussion and briefing on health hazards and factors affecting health.

- Group division game, dividing the participants into four 'buzz' groups.

- Each buzz group was asked to identify health hazards and factors affecting health in the context of the school and the community.

- Each group's findings were reported by the group leader.

- General discussion and clarification of the findings.

- Slide shows on health hazards related to waste disposal, the water supply system, sewerage system, toilets and other general aspects of health were given in support of the discussions.

- The major findings were displayed on the wall of the training room to use as reference material throughout the training programme.

- Buzz-group and general discussion on the solutions to the problems and listing them as appropriate.

- The participants, now more aware of the immense need for health education, took part in

discussions about the value of health education from the socio-economic point of view, the vital role that could be played by health education in local development and the consequences if health education is lacking. General agreement on the concept and goals of the programme was reached.

6.2.3 Session 3: Review and Assessment

The first day ended with a review and assessment of the day's proceedings in order to obtain feedback and suggestions.

6.2.4 Session 4: About Training

This session started by posing the question whether or not present health education classes in schools have any behavioural effect on the students and community and if they do, on what evidence is such a claim based. The participants agreed that there was little or no behavioural effect. The only tool used to measure the effect of health eduction was the memorisation of lessons by the students. Teaching methods were based on lectures, question and answer sessions and general discussion i.e. they were totally teacher centred and pedantic.

Proceedings:

- A group division game was played which divided the participants into four groups.

- Problems requiring effective health education were identified by each group.

- General discussions on the findings of each group, and on problem areas, solutions, and training needs. Examples and experiences of the 'Seti Project' were explored.

- Explanation and discussion on training objectives, courses, nature of work and other information connected with the training.

- Goal agreement session: The participants agreed on the goals of the course and on the role to be played by the participants throughout the training period.

6.2.5 Session 5: Basic Concept and Fundamental Factors of Health Education

This session commenced with explanation and discussion of the basic concept of health education and an exploration of why health education is often ineffective. The session was divided into the following sub-sessions:

Sub-session 1: Behavioural Change Process

This sub-session concentrated on why health education should be aimed at changing behaviour and how could it achieve this. Lively discussion and demonstrations of the following points took place:

- Defining behavioural change.
- Ways of changing: compliance, identification and internalisation.
- Stages of: awareness, interest, mental evaluation, trial, experienced evaluation, adoption or rejection of behaviour.
- Hindrances to change and how to reduce them.
- Teaching methods that encourage change.

Sub-session 2: Teaching-Learning Process

The main focus of this sub-session was placed on the correct and effective teaching-learning process to produce changes in behaviour. Explanation, discussion and demonstrations took place on the following:

- Steps of the teaching-learning process.
- Methods of teaching-learning: hearing, seeing, doing, imitating, repeating.
- Factors affecting the teaching-learning process.
- Effective ways of teaching-learning.
- Maxims of teaching.
- Ways of teaching.

Sub-session 3: Motivation

Motivation directs the energy of an alert individual into desired channels and keeps it there. It involves understanding and acquiring new desirable motives. In other words, anything which moves an individual to act and maintains the will of that individual to act is motivation. It is for this reason that effective motivation is the foremost requirement of health education.

Proceedings:

- Defining motivation.
- Discussion, demonstration and role playing on the significance of motivation in achieving behavioural change through health education.

- Explanation and general discussion on the principles of motivation, the hierarchy theory of human needs and motivating factors.

- Discussion and demonstration of motivation techniques.

Sub-session 4: Communication

Communication is vital if health education is to be successful.

Explanation, discussion, demonstration and role playing on the following:

- Defining communication,
- Significance of communication in health education,
- Purpose of communication in health education,
- Nature and processes of communication,
- Elements of Communication:
  * Communicator's communication skill, attitude, level of knowledge, socio-cultural aspect and ability to receive feedback.
  * Message
  * Communication channel/media
  * Receiver's ability to receive information, attitude, level of knowledge, and condition of social aspects.
  * Effect of Communication: changes in knowledge, attitude and behaviour.
- Basic principles for effective communication.
- Communication methods in general.

6.2.6 Session 6: Micro-Teaching

Micro-teaching was to be used as a constructive training technique to provide participants with teaching practice and to gain feedback for the further modification of teaching behaviour at coming sessions.

- Explanation and discussion on the following:

  * Defining micro-teaching,
  * Objectives of micro-teaching,
  * Steps in micro-teaching,
  * Characteristics of micro-teaching.

- Practice of micro-teaching techniques by the participants.

6.2.7 Session 7: Review and Assessment

The third day of the training programme ended with the review and assessment of the previous two days' activities. Participants' views of the course so far were obtained together with suggestions for improvement.

6.2.8 Session 8: Health Education Materials/Media

This session was aimed mainly at developing the skills and attitudes necessary to design, develop and make use of appropriate materials as well as locally available existing ones. All materials required for gaining direct, vicarious or symbolic experience during health education activities were considered.

- Explanation, discussion and demonstration of the necessity and value of health education materials.

- Development of strategies and guidelines for making and using appropriate health education materials.

- Classification of the materials into two types: existing/available materials and low-cost materials that can be locally developed or produced.

  There is a great deal of overlap between the categories and it was therefore not possible to classify them rigidly. For convenience however, an attempt was made to do so. It was also tried to classify materials based on whether they provided direct experience or illustrated an abstract idea.

- Techniques of making and using Educational Materials.

This session was divided into 19 sub-sessions.

Sub-session 1: Lettering

Lettering has a very important role to play in the production of health education material such as posters, pamphlets and any other materials where attractive and effective lettering is required.

Proceedings:

- Briefing, discussion and demonstration on the importance and use of lettering for various purposes.

- Demonstration of making various types of nibs from a match box, broom, bamboo sticks and wooden sticks.

- Practice of making nibs by the participants.

- Demonstration of writing with different types of nibs.

- Practice of lettering technique by the participants.

The participants produced some posters using the lettering techniques they had learned.

Sub-session 2: Matchstick Drawing

This is a fairly quick and easy technique of line drawing. It is very useful in a variety of situations where the presentation of several structured items is needed. This method of drawing can be easily learned by anyone.

Proceedings:

- Drawing techniques were demonstrated.
- Their application to health education purposes was discussed.
- All participants practised and became competent in matchstick drawing.

Each participant carried out a micro-teaching exercise on a topic of health education using matchstick drawing.

Sub-session 3: General and Figure Drawing

By learning systematic drawing techniques it became less difficult to draw general objects and figures. Similar proceedings as for matchstick drawing were followed.

Sub-session 4: Mass Drawing

This technique can be used by those who find the techniques in sub-session 3 unsatisfactory. Similar proceedings as for matchstick drawing were followed.

Sub-session 5: Methods of Copying, Enlarging and Reducing Drawings/Pictures

These methods enable teachers to develop their own appropriate drawings/pictures from other available materials when there is a lack of existing educational materials. The following techniques were practised:

- Tracing Method: for copying,
- Template Method: for copying,
- Square Method: for enlarging or reducing,
- Matting and Mounting Method: for enlarging,
- Pounce Method: for copying,
- Elastic String Method: for enlarging.

Sub-session 6: Preparation and Use of Flash Cards

Flash cards are loose cards used to show a series of pictures with messages/information in a step-by-step or flexible manner.

Proceedings:

- Briefing and demonstration of the use and preparation of flash cards.

- Demonstration of games that can be played with flash cards.

- The participants were divided into five groups. Each group prepared flash cards using the techniques of drawing, copying and matting and mounting already learned.
- Each group demonstrated the use of the flash cards they had prepared.

Sub-session 7: Preparation and Use of Flip Charts

Flip charts are didactic materials which are used ot present messages/information in a step-by-step manner. They consist of pictures placed in a specific order, linked together or rolled onto a stick so that each picture can be flipped into view consecutively.

Proceedings:

- Briefing and demonstration on the use and preparation of flip charts,

- Division of participants into 5 groups. Each group prepared a flip chart and then demonstrated the use of their flip chart.

Sub-session 8: Preparation and Use of Posters

Posters are large pictures which carry a specific or open-ended message.

Proceedings:

- Briefing and demonstration of the preparation of posters.

- Each participant prepared a poster on a given health topic and then demonstrated how they would use the poster in practice.

Sub-session 9: Preparation and Use of Picture Scrap Book

Due to carelessness, drawings used as educational material often become lost or damaged. It is very time consuming to prepare or collect new pictures so the participants were shown how to make a scrap book in which the pictures could be stored in a systematic manner, taken out when in use and then stored again after use. It is a kind of picture dictionary.

The participants were divided into 5 groups each of which practised making a scrap book.

Sub-session 10: Preparation and Use of Flannel Board

In order to make health subjects interesting, enjoyable and memorable, pictures can be placed on a flannel board as the health story or talk proceeds. Pictures in flannel board can be presented in a step-by-step or flexible manner making the presentation of messages lively.

Each participant prepared a flannel board together with cut-outs and flexiflans to mount on the board. They then practised using the boards and cut-outs they had prepared.

Sub-session 11: Preparation and Use of Models

When an object cannot be exhibited in the classroom, either because it is too big or small or not available, then models can be used instead.

Proceedings:

- Briefing and demonstration of different types of models.

- Demonstration of the preparation techniques of models.

- Preparation of models by the participants.

- The participants practised using the models they had prepared.

Sub-session 12: Making and Using Puppets

Dramatisation with puppets has immense potential as a tool for health education. Puppet shows can be very effective because they present ideas with extreme simplicity as well as being colourful, lively and fun.

Proceedings:

- Demonstration of each step in the puppet making process.

- Division of participants into 5 groups by playing a group division game.

- Selection of a health topic for a puppet show. Discussion by each group on the characters of the puppets to be prepared.

- Preparation of the puppets.

- Each group organised a puppet show on the selected health topic using the puppets they had prepared.

Sub-session 13: Making and Using Cartoons and Comics

Humorous drawings depicting health education messages help to create interest in the message.

Proceedings:

- Briefing and demonstration of the use of cartoons and comics in health education.
- Demonstration of writing techniques for cartoons and comics.
- The participants practised writing cartoons and comics.
- The participants prepared cartoons and comics with a health education message.

Sub-session 14: Cardboard Figures

A set of cardboard figures can be used for teaching health education in many ways. The figures should be as lifelike as possible. Those people who find it difficult to draw realistically can copy or trace from other figures.

Proceedings:

- Briefing and demonstration of the use of cardboard figures.
- Demonstration of making cardboard figures.
- The participants practised making and using them.

Sub-session 15: Preparation and Use of Game Materials which help Children Learn about Health

Health education games have immense value in health education. They create an emotional situation and this catharsis helps to maintain balance and interest. Again, it makes health education a colourful, lively and fun experience which is beneficial in any education situation.

Focus was placed on the following games:
- Snakes and Ladders,
- Puzzles,
- Picture Card Game,
- Playing Card Game,
- Bridge Game,
- Board Game.

The participants were briefed and demonstrations given on the use and production of game materials. They were divided into four groups. Each group prepared the materials for each of the games and then practised using them.

Sub-session 16: Preparation and Use of Charts and Graphs

Charts and graphs are a combination of graphic and pictorial material to show statistical data or relationships, which can be used during monitoring and evluation of health education activities.

Demonstration, preparation and use of the following charts and graphs were carried out:

- Bar Graph,
- Table/Time Chart,
- Striptease Chart,
- Evaluation Chart,
- Pictorial Graph,
- Record Chart.

Sub-session 17: Making and Using Specific Health Education Materials

There are several materials that can be prepared and used for specific health education activities. This sub-session was devoted to the practice of the preparation and use of the following materials:

- The strip for measuring malnutrition of children in the 1 - 5 age group,
- Demonstration materials for teaching about diarrhoeal diseases,
- 'E' chart for testing eyesight,
- Homemade stethoscopes,
- Model of thermometer.

Sub-session 18: Using Existing, Available and Provided Demonstration Materials

In schools generally, initiative is lacking and no serious efforts are made to identify, mobilise or utilise available materials and resources for health education. The main objective of this sub-session therefore, was to provide the knowledge, skill and motivation to identify and properly use materials for practical instruction and demonstration in health education.

Proceedings:

- The participants identified and listed locally available instructional materials which could be used for health education purposes.

- The listed materials were compared with the materials already purchased.

- Brief demonstrations of the use of all the listed materials were given.

- Discussion of the instructional use of facilites such as toilets, taps, drainage and other physical facilities, the human body, one's living surroundings and all types of relevant material freely available in the environment took place.

- The procedure laid down in the operational plan of the service centres for the provision of demonstration and building materials was discussed.

- Discussion on the techniques of using the supportive and supplementary materials to be provided by the project also took place.

Sub-session 19: Review and Assessment

The previous 18 sub-sessions had taken 8 days and it was felt that it was appropriate to spend some time reviewing and assessing what had been learned about health education materials and media. This sub-session used the 'brainstorming' method to give the participants an opportunity to air their views and suggestions for improvement. Written comments were also collected.

6.2.9 Session 9: Alternative Health Education Methodologies

There are an infinite number of methods and combinations of methodologies for carrying out health education. It is not practical to lay down here which method should be used in any given circumstance. It is part of the work of the teacher to assess each particular teaching situation and use the methods he considers most suitable and most effective to motivate and impart knowledge and skills to his students. To do this, the teachers must themselves first have practical experience of the various alternative methodologies. This session was divided into 13 sub-sessions.

Sub-session 1: Review and Assessment of Teaching Methodologies Used in Schools before The Training Programme

During this sub-session discussions revealed that the methods used by the participants were lecture, discussion and question-answer. Teaching was pedantic and biased towards 'preaching'. The participants agreed that these methods produced little or no behavioural effect. Discussion took place on the availability, necessity and importance of various

alternative methods. Some examples were given to make the participants realise how the use of a particular behavioural method, or a combination of innovative and practical methodologies, can make health education more effective in achieving changes in attitude and behaviour.

Sub-session 2: Telling and Lecture Method

This method consists of making an oral presentation on a particular topic or problem.

Proceedings:

- Demonstration of lecturing on a topic was given. The method was defined. Participants drew on their own experiences to discuss situations where this method would be appropriate, as well as its advantages and limitations.

- Guidelines for the use of the lecture method were formulated through discussion and role play. One important guideline was that the lecture method is not very effective in meeting the behavioural objectives of health education. It should therefore only be used when it is not possible or convenient to use behavioural methodologies. Only occasional and informal use of this method, for periods of no longer than 15 or 20 minutes, was recommended.

Sub-session 3: Discussion Methods

The discussion method is an ordered process of conversation which takes place for collective decision-making, for gathering and sharing information, for initiating and clarifying ideas and for exchanging opinions on a particular issue or situation.

Proceedings:

- Defining the method and discussing its purpose.

- Briefing, characterisation and role play of the types of students or participants that teachers may encounter:

  * the quarrelsome type
  * the know-all type
  * the shy type
  * the uninterested type
  * the persistent questioner.
  * the positive type
  * the talkative type
  * the unco-operative type
  * the high-brow type

- Discussion produced advice on dealing with different types of student/participant.

- Consideration was given to two types of discussion:

General Discussion Method

In this method all the students or participants discuss together, led by the teacher or discussion leader. This method is suitable for groups of up to 20 persons.

Proceedings:

- Demonstration on suitable seating arrangements.

- Briefing on the task of the discussion leader or teacher:

  * To prepare a discussion plan and to establish the purpose of the discussion,
  * To introduce the topic and to open the discussion,
  * To guide, stimulate and conduct the discussion,
  * To summarise and close the discussion.

- Briefing on questioning techniques and ways of making a general discussion useful.

- Practice of general discussion using the topic 'prevention is better than cure'.

- Consideration on the value of the general discussion method.

Buzz-Group Discussion Method

In this method participants are divided into groups of 3 to 10 persons. Each group elects a leader who then chooses a spokesman whose job is to take notes and list the main points and findings of the buzz-group discussion.

Proceedings:

- Briefing on buzz-group discussion procedures.

- Consideration of the role of the discussion leader and on the techniques of leading a buzz-group.

- Consideration of the role of the spokesman.

- Division into 4 groups of 5 persons and election of a chairman/leader and spokesman for each group.

- Demonstration of suitable seating arrangements.

- Each group was given 10 minutes to discuss the topic 'the need and importance of using and maintaining the toilet'. (It is recommended to spend between 8 and 15 minutes on each topic for buzz-group discussion.)

- The groups then met together to hear one another's findings. Further general discussion took place. All the points made by the groups were summarised, emphasising the most important and adding any which had been overlooked.

- To conclude the session, the advantages and limitations of buzz-group discussion were briefly considered.

Sub-session 4: Question-Answer Method

Proceedings:

- Discussion took place on how the teachers were using the question-answer method in school and examples of the questions they asked were collected. Using the examples, the art of asking questions was considered. Different types of questions such as oral and written questions, open-ended questions, closed questions, trick questions, motivational questions, etc. and how to use them were examined. Points to be considered when using the question-answer method were summarised.

- Participants provided a list of questions and examined whether or not each question was appropriate and what made it so.

- A demonstration of the application of this method was given.

- The participants were divided into 10 groups with 2 members in each. One person in each group practised teaching health topics to his partner using micro-teaching.

- The value of using the question-answer method was considered.

Sub-session 5: 'Brainstorming' Method

Brainstorming is the technique of allowing everybody to say whatever comes into their mind on a certain topic. In this way the maximum number of ideas, opinions and information is collected in the shortest time.

Proceedings:

- The method was defined.

- The participants were arranged in a semi-circle so that each person was able to see everyone else. A leader was selected to facilitate the running of the session. Two recorders were also selected to take responsibility for recording the ideas.

- The topic: 'solution to the problem of environmental health hazards' was given. The purpose and rules of brainstorming were explained.

- 'The leader's job was to create an atmosphere of excitement and game spirit, encouraging everyone to come up with bigger and better ideas.' The leader called on each person in turn to give his ideas. Participants had to offer one idea or 'pass' if they had no new ideas on that round. The leader proceeded quickly from person to person, in sequence. Subsequent rounds were carried out, without pause, until a round was completed in which all the participants said 'pass'. It was then assumed that the participants had exhausted all their ideas.

- All the ideas were recorded by the two recorders alternately. The two lists were combined and the leader and recorders then added any ideas of their own.

- All the ideas were evaluated. The initial step was to eliminate any ideas which were irrelevant, undesirable or not feasible. Similar ideas were grouped together and their suitability for implementation was considered.

- The method of brainstorming was discussed highlighting several points of note.

- To conclude the session, the advantages of using the brainstorming method for health education was discussed.

Sub-session 6: Story Telling Method

Proceedings:

- A story was told which conveyed several health education messages.

- The participants were asked to make a list of the important health education points which were contained in the story.

- Discussion of the health education messages and how stories can be used as teaching tools.

- Briefing, demonstration and discussion of the following ways to use stories as a teaching aid:

  * Stories that help people to think about local problems,
  * Stories which aim to motivate,
  * Stories to be told by a group,
  * Stories with comparative health messages,
  * Role playing or acting out stories,
  * Analysing stories for hidden messages,
  * Stories with pictures,
  * Comic stories.

- Each participant developed a story on a topic of their own choice.

Sub-session 7: Stick Game

The stick game is a method of involving all persons in a discussion by giving each person the chance to speak.

Proceedings:

- Explaining the purpose of the stick game.

- The participants practised the stick game.

- Reviewing the process by looking at the examples.

- Discussion of the value of the stick game.

Sub-session 8: Demonstration Method

The demonstration method involves the presentation of an arranged series of events to a group of people to show in a practical way how some skill, activity or procedure is done. This is accompanied by explanatory remarks and is often followed by the students carrying out the activity themselves under the guidance of the teachers.

Proceedings:

- Defining the method and explaining its purpose.

- Demonstration of the correct method of tooth brushing and on the transmission of diseases by flies.

- Discussion of the applications of the demonstration method with referral to the examples already practised.

- Division of the participants into 5 groups of which one member then demonstrated a topic of his choice.

- Discussion of the advantages and limitations of the method.

Sub-session 9: Project Method

The project method consists of a problematic or purposeful activity being carried out to completion in its natural setting; a process whereby students discover and work things out for themselves. The project is carried through to completion and the situation resolved. In this way, students are made responsible for planning, implementing and evaluating their activities.

Proceedings:

- Defining the method.

- Explaining the essential characteristics of the project method and how a project should be organised.

- The participants were divided into 3 groups. Each group was then assigned one of the projects listed below which they then had to carry out under the supervision of the trainer.

    * Identification of the diseases, and the perceived causes, suffered by the participants within the last six months.
    * Removal of health hazards from the training venue.
    * Maintaining environmental cleanliness in a school.

- The groups came together again, each group reported on its own project which was then discussed by all the participants as a whole.

- The project method was reviewed and its advantages and limitations discussed.

Sub-session 10: Problem Solving

Problem solving looks carefully at a situation, analyses existing problems, determines and carries out steps to improve the situation.

Proceedings:

- The method was defined.

- Discussion of the step-by-step method of problem solving. Participants were each assigned a problem and asked to identify various steps by applying it to a real situation. This exercise identified 5 steps in the problem solving process.

- The participants were divided into 3 groups. Each group had to identify the sanitation problems of a school and try out possible immediate solutions.

- General discussion of the importance and limitations of the problem solving process as highlighted by their own experiences.

Sub-session 11: Role Playing

Role play is the acting out of real life situations; as they are in reality; and, as they would be if the situation were to improve. This method can be carried out either with live actors or with puppets, and involves lively, realistic behaviour in imaginary situations.

Proceedings:

- Defining role play, both with live actors and with puppets.

Role Play using Live Actors

- Demonstration of role play using live actors.

- Explanation and discussion of the techniques used in preparing a role play plan.

- The participants were divided into 4 groups. Each group prepared a role play plan on one of the following subjects:

  * Tooth Decay
  * Typhoid
  * Worm Disease
  * Environmental Cleanliness

- On the basis of the plan they had developed, each group carried out the role play. There was general discussion on each play.

- Discussion of the importance and limitations of role play with live actors.

Role Play using Puppets

- Demonstration and discussion of role play using puppets.

- Step-by-step demonstration of puppet-making.

- The participants were divided into 4 groups. Each participant developed a different puppet depending on his group's role play plan.

- Each group performed their play using the puppets they had made.

- Discussion of the importance and limitations of role play using puppets as demonstrated by each group's play.

Sub-session 12: More Ideas on Health Education Methodologies

Discussions, demonstrations and role plays were conducted on further aspects of health education methodologies:

- Starting With What is Already Familiar to Students,
- Method of Introducing New Ideas by Building on Old Ones,
- Method of Comparative Association of Ideas,
- Method of Presenting Ideas Through Real Situations,
- Choosing an Appropriate Time for Instruction,
- On-the-Spot Surveys,
- Starting With Students' Needs as Felt by Themselves - Then Helping Them to Explore Their Real Needs.

Sub-session 13: Child-to-Child Approach

The child-to-child approach is an international programme designed to teach and encourage school-aged children to concern themselves with the health of others. They learn simple preventive and curative measures appropriate for their communities and pass on what they have learned to other children, their parents and families using various methods and media:

Proceedings:

- Explaining the concept of the child-to-child approach.

- Demonstrations of child-to-child activities.

- Discussion of the importance of child-to-child activities.

- Discussion of the ways of involving non-school children in child-to-child activities.

- Suggestions for trying out child-to-child activities.

- Developing and discussing the possible methods of following-up child-to-child activities.

- Each participant developed and practised child-to-child activities for different health lessons.

6.2.10 Session 10: Monitoring and Evaluation

Sub-session 2: Monitoring

Monitoring means comparing the planned process with what actually takes place and acting on problems that arise, thus making sure that health education activities are operating effectively as intended. Monitoring guides the effectiveness of health activities.

Explanation, discussion, demonstration and role play took place with regard to:

- Defining monitoring,
- Why monitor?
- Methods and ways of monitoring,
- Different styles of monitoring,
- Deciding how to monitor,
- Planning monitoring activities,
- Guidelines for monitoring,
- Preparing monitoring sheets,
- Formation of a circulatory system of committees of students responsible for monitoring activities.

Sub-session 2: Evaluation

Evaluation is the process of finding out how well a particular process is being carried out, how effective it is and whether or not the objectives set out are achieved. It is learning from experience so that future activities can be more satisfactorily planned and implemented.

Explanation, discussion, demonstration and practice of the following were carried out:

- Defining evaluation,
- Types of evaluation: final, follow-up, periodic and continual,
- Suggestions for conducting evaluation,
- Involving students in the evaluation process,
- Skills of constructive criticism and appraising students, performance,
- Action-orientated evaluation,
- Teachers' self-evaluation,
- Checklist for evluating teaching,
- Suggested stages of evaluation.

6.2.11 Session 11: Review and Assessment

Session 11 was meant totally as a review and assessment of the training courses and activities carried out in the previous sessions. The brainstroming method was used to facilitate the session.

6.2.12 Session 12: Lesson Planning/Health Education Activities

Having learned so much about health education and its methods, media and techniques, the participants were now required to apply them practically, systematically, and effectively in the field. To do so, they had to plan their health education lessons prior to the running of classes or activites.

Proceedings:

- Discussion of examples of lesson plans previously prepared by the teachers.
- Reasons why lesson plans may not be prepared and the ensuing problems.
- Discussion of the concept and requirements of lesson planning.
- Examples of different types of lesson plans.
- Division of participants into four groups. Each group listed the the components of a lesson plan by looking at the examples given.
- The lists were combined.
- Looking at the combined list, each group again developed a simple and practicable lesson plan format.
- The lesson plan format was finalised and discussed by all the participants in conjunction with the trainer.
- Explanation, discussion and practice on the following:
    * How to determine behavioural objectives,
    * How to develop subject matter according to behavioural objectives,
    * How to plan behavioural health education activities based on the subject matter and objectives,
    * How to plan health education material/media for the activities,
    * How to plan monitoring and evaluation,
    * Integration of all the components.

6.2.13 Session 13: Teachers' Health Education Guidebook

The function of the guidebook is to support and help the teachers in the planning, implementation, monitoring and evaluation of health classes and health education activites. The first draft of the guidebook had already been prepared but it needed to be more

practicable. The teachers' ideas for health education activities were to be incorporated in the guidebook.

Proceedings:

- Presentation of the guidebook as developed by the project.

- The participants studied a selection of health topics in the book.

- Discussion of what support they would get from the book, its characteristics and limitations.

- Discussion of the role of participants in improving the guidebook. Briefing and discussion of the relationship between the lesson plans to be developed by the participants during coming sessions and the use of the resulting ideas in the guidebook.

- The participants studied guidebooks developed by other institutions as well and discussed the applicability and practicability of each.

- Discussion of how to use the guidebook for teaching-learning activities in the school and the necessity of making the guidebook more practical.

6.2.14 Session 14: Planned Education Process on Personal Hygiene Topics

The objective of this session was mainly to let the participants practice the planning of lessons on personal hygiene and to provide them with the opportunity of practice-teaching based on their own developed plans by using alternative methods and media.

Proceedings:

- HMG's curriculum was reviewed and a scope and sequence chart prepared.

- A model lesson plan was prepared through participant involvement in a lesson i.e. cleaning of teeth.

- Micro-teaching demonstration of the lesson.

- Collection of comments:
  * Effectiveness,
  * Feedback,
  * Suggestions for improvement.

- Division of participants into 10 groups of 2 members each. Each group prepared a lesson plan on topics, using reference materials which were provided, as assigned below:

Group A: Cleanliness of hands,
Group B: Cleanliness and cutting of nails,
Group C: Cleanliness and care of teeth,
Group D: Washing and care of the face,
Group E: Cleanliness and care of feet,
Group F: Bathing and care of the skin,
Group G: Cleanliness of clothes and personal items,
Group H: Care of the eyes,
Group I: Care of the nose,
Group J: Care of the ear.

- Collection and preparation of materials required for micro-teaching practice.

- A member of each group carried out micro-teaching practice on his assigned topic which was then commented on and discussed by the participants.

6.2.15 Session 15: Planned Education Process of Environmental Sanitation Topics

This session was meant mainly as a practice of lesson planning of environmental sanitation topics and of teaching based on the participants' own developed plans by using alternative methods and media.

Proceedings:

- Defining environmental sanitation.

- Listing the environmental sanitation topics for grades 1-7 covered by HMG's, and the proposed curricula. Preparation of a scope and sequence chart.

- Preparation of a model lesson plan on a topic, e.g. the toilet, through participant involvement:

  * Necessity of toilets: Defecation habits and places, dangers of excreta, health hazards resulting from openly disposed excreta, proper methods of disposal,
  * Alternative toilet types and how they function,
  * Planning and organising the construction of a suitable toilet,
  * Proper use and maintenance of the toilet: Hazards from improperly used and maintained toilets, proper use and maintenance of toilets, organising the cleaning of the toilet.

- Collection and preparation of the materials required for micro-teaching practice.

- Micro-teaching practice and collection of comments.

- Division of the participants into 7 groups of 3 members each and assignment of the following topics for the preparation of a lesson plan:

  Group A: Healthy School Environment
  Group B: Healthy Home Environment
  Group C: Solid Waste Disposal
  Group D: Liquid Waste Disposal/Drainage or Sewerage System
  Group E: Surface Levelling/Paving the Ground
  Group F: Water Supply System and Safe Water
  Group G: Healthy Family Life

- Collection and preparation of materials for micro-teaching practice.

- Micro-teaching practice by each group on its assigned topic which was then commented on and discussed by the participants.

6.2.16 Session 16: Planned Education Process on Transmission Routes of Diseases

The main objective of this session was to provide the participants with the opportunity of practising the preparation of lesson plans on transmission routes of diseases and of teaching based on their own developed plans by the use of alternative methods and media.

Proceedings:

- Introducing transmission routes of diseases.

- Identifying the routes.

- Preparing a model lesson plan on one aspect of transmission routes i.e. flies, through participant involvement.

  Flies

  * Why flies are dangerous,
  * Examples of diseases transmitted by flies,
  * How to get rid of flies.

- Collection and preparation of required materials.

- Micro-teaching practice of the lesson followed by comments from the participants.

- Division of the participants into 7 groups of 3 members. Each group was assigned topics as follows:

  Group A: Foods
  Group B: Hands
  Group C: Insects/Animals/Human Body
  Group D: Soil

Group E: Air
Group F: Water
Group G: Direct contact with germs

- Each group prepared a lesson plan.

- The materials required for micro-teaching practice were collected or prepared.

- Each group practised micro-teaching of their topic which was then commented on by the participants.

6.2.17 Session 17: Planned Education Process on Communicable Disease Topics

This session was also meant as a practice of lesson planning on communicable disease topics and as a teaching practice based on their developed plans by using alternative mehtods and media.

Proceedings:

- Introducing diseases.

- Distinguishing between communicable and non-communicable diseases.

- Listing major communicable diseases.

- Preparing a model lesson plan on a communicable disease topic, i.e. sore eyes, through participant involvement.

  Sore Eyes:

  Introduction, symptoms, dangers, causes and modes of transmission, prevention, treatment.

- Collection and preparation of materials required for micro-teaching practice, demonstration of micro-teaching and collection of comments.

- Each participant was assigned a communicable disease topic:

Participant		Participant	
A:	Scabies	B:	Lice
C:	Diarrhoea	D:	Dysentery
E:	Roundworm	F:	Hookworm
G:	Typhoid	H:	Hepatitis
I:	Polio	J:	Malaria
K:	Tuberculosis	L:	Measles
M:	Whooping Cough	N:	Tetanus
O:	Diptheria	P:	Meningitis
Q:	Riketus	R:	Sore Eyes

- Each participant prepared a lesson plan for his assigned topic.

- Each participant collected and prepared the materials required for micro-teaching practice. The practice was then carried out by each participant and commented on and discussed by the other participants.

6.2.18 Session 18: Planned Education Process on Nutrition Topics

6.2.19 Session 19: Planned Education Process on Safety and First Aid Topics

Due to lack of available time, sessions 18 and 19 were not carried out.

6.2.20 Session 20: Planned Education Process on School Gardening

The objectives of promoting school gardening was to protect the environment and improve nutrition.

Explanation, discussion, demonstration and practice of the following took place:

- The need and importance of school gardening.
- Planning and organising a school garden:

  * Space selection,
  * Soil test,
  * Planning plots, seeds and planting,
  * Planning manpower,
  * Field work on the selected plot,
  * Practice of methods of planting seeds, plants, flowers and trees,
  * Methods of irrigation,
  * Weeding,
  * Taking care of the garden,
  * Managing the garden produce,
  * Annual work schedule for school gardening.

6.2.21 Session 21: Management and Leadership Skills Required for Health Education Activities

Even the best laid plans do not necessarily assure success. The outcome of a programme is also dependent on the quality of its leadership and management. Without effective management and leadership skills, teachers' attempts to implement health education activities will meet with little success.

Sub-session 1: Management Skills

Management is the organisation and successful running of activities using all resources in the most efficient way leading to the achievement of predetermined objectives.

Proceedings:

- Defining management skills.
- Management Game.
- Management in day-to-day life.
- Management styles.
- Qualities necessary for management.
- Understanding human behaviour.
- Principles of human behaviour and motivation.
- Management in meeting the objectives of health education.
- Management skills: learning from experience.

Sub-session 2: Leadership Skills

Leadership is the ability to motivate oneself and others; to obtain the maximum support and effort from the group; to see a problem, recognise it, plan a solution and execute it without having to be prompted by someone else; to visualise the goal, raise the performance and build the personality; to make people want to do the things they would not ordinarily think of doing and make them accept the goal and action as their own influencing them to achieve the goal.

Proceedings:

- Defining leadership.
- Attitudes of leadership.
- Leadership in day-to-day life.
- How a person becomes a leader.
- Leadership qualities: how one stands out as a leader.
- Styles and types of leadership.
- Motivation and keys to leadership success.
- Functions of a leader.
- Leadership skills in meeting health education objectives.
- Leadership skills: learning from experience.

6.2.22 Session 22: Monitoring and Evaluation of a Health Education Programme

The monitoring and evaluation system, as already developed under the operational plan for the Service Centre Schools, was explained and discussed.

6.2.23 Session 23: Post-Evaluation

This last session of the training programme used a structured open and closed questionnaire to evaluate the effectiveness of the programme in bringing about changes in the participants.

6.2.24 Session 24: Closing

At the end of the training programme the participants were interviewed in a broadcast of the Educational Programme of Radio Nepal. The training organisers thanked each participant for their energetic, enthusiastic and active participation in all the training sessions.

7. ACTIONS INITIATED BY THE TRAINED TEACHERS

7.1 Pictorial Review

Formation of Groups:
Groups:

Lower secondary/ secondary teachers formed, Health Teachers Working Committee.

Group-A

Similarly, primary teachers formed their committee.

Group-B

Picnic: A Get-together:

Picnics achieved a clean-up at the picnic spot.

First Meeting: Making a start:

Sharing of their experiences and putting together an action plan.

Headmasters' Meeting:

Group-A

One of the authors' briefing the headmasters on the activities undertaken upto now and on the expected goal/ purpose, outcome of the programme.

Major health education problems and their resolutions as felt by the headmasters were also recorded.

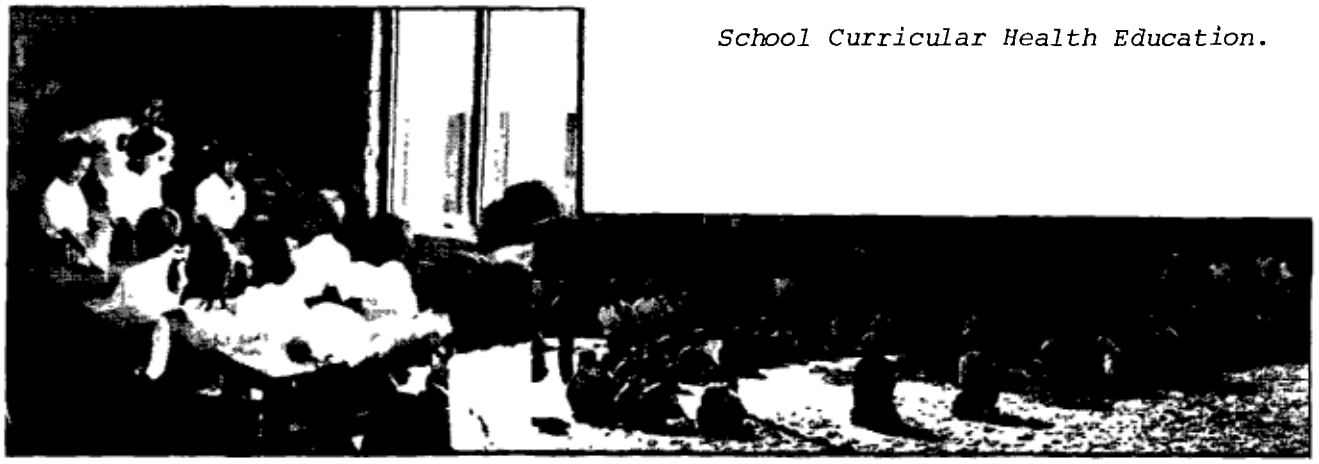
Group-B Headmasters with Health Teachers.

Headmasters agreed to extend their full support to the health teachers' innovative activities.

Collection of Educational Materials:

The teachers did everything.

The students were equally energetic.



School Curricular Health Education.

Putting new skills into practice in the field.

School Curricular Health Education:

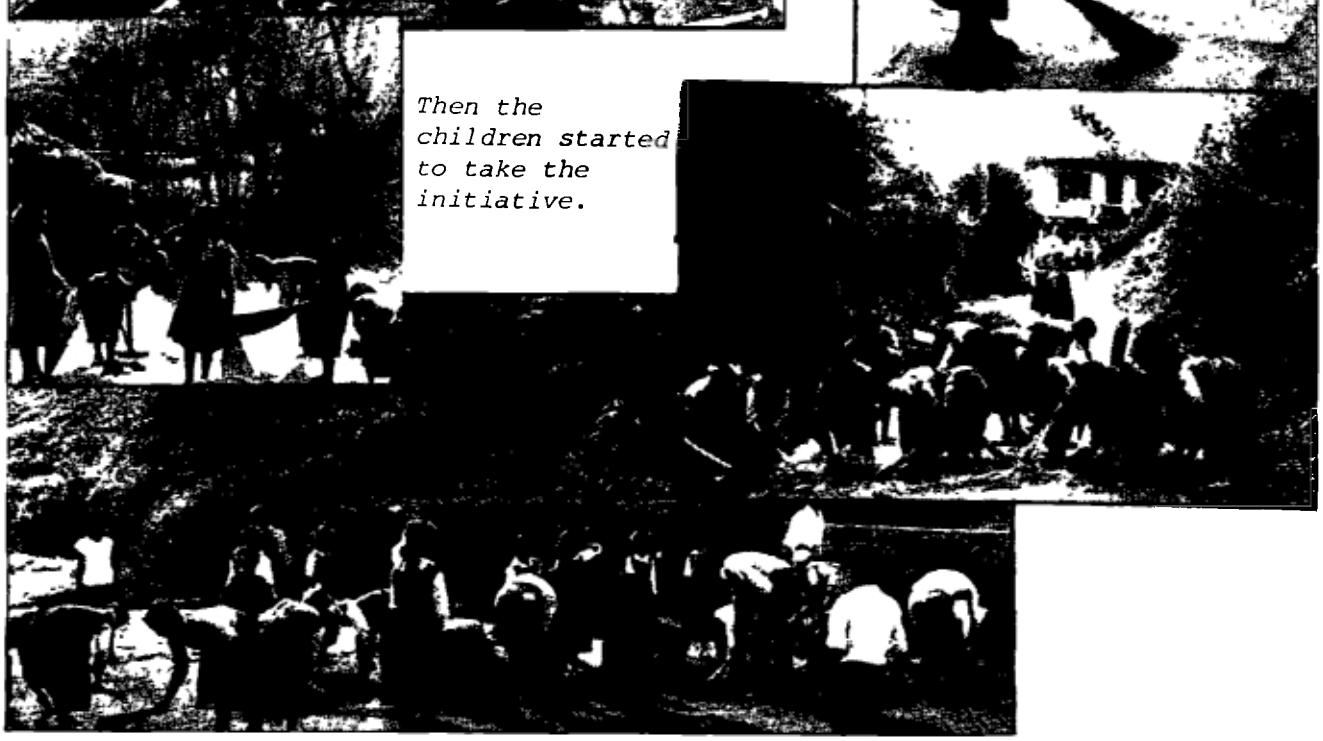
School Curricular Health Education.

The children greatly enjoyed participating in practical and innovative activities.

School Curricular Health Education.

Initially, the teachers train the children practically.

Then the children started to take the initiative.



School Curricular Health Education.

Cleaning up and proper waste disposal.

...an initiative by the children.

Students were hesitant to carry out cleaning duties traditionally carried out by the lowest group in society.

Teachers had to lead by example.....

...and eventually children would actively participate and even initiate toilet cleaning.

Teaching the children proper use further improved the situation.

School Curricular Health Education.

Involving students in the development of sanitary infrastructure gives them more motivation to use & maintain it properly.

The consequences of a malfunctioning sewerage/ drainage system - and how to prevent it: a practical teaching to the students.

Consequences of an uneven surface:

Here: a temporary solution.

School Curricular Health Education:

Surface levelling: practical teaching.

The aesthetic improvement of the school area.

A look at the clean school:
how pleasant and healthy!

Monthly Monitoring and Evaluation Meetings:

A regular forum for discussion, suggestion, sharing success and failures,.....

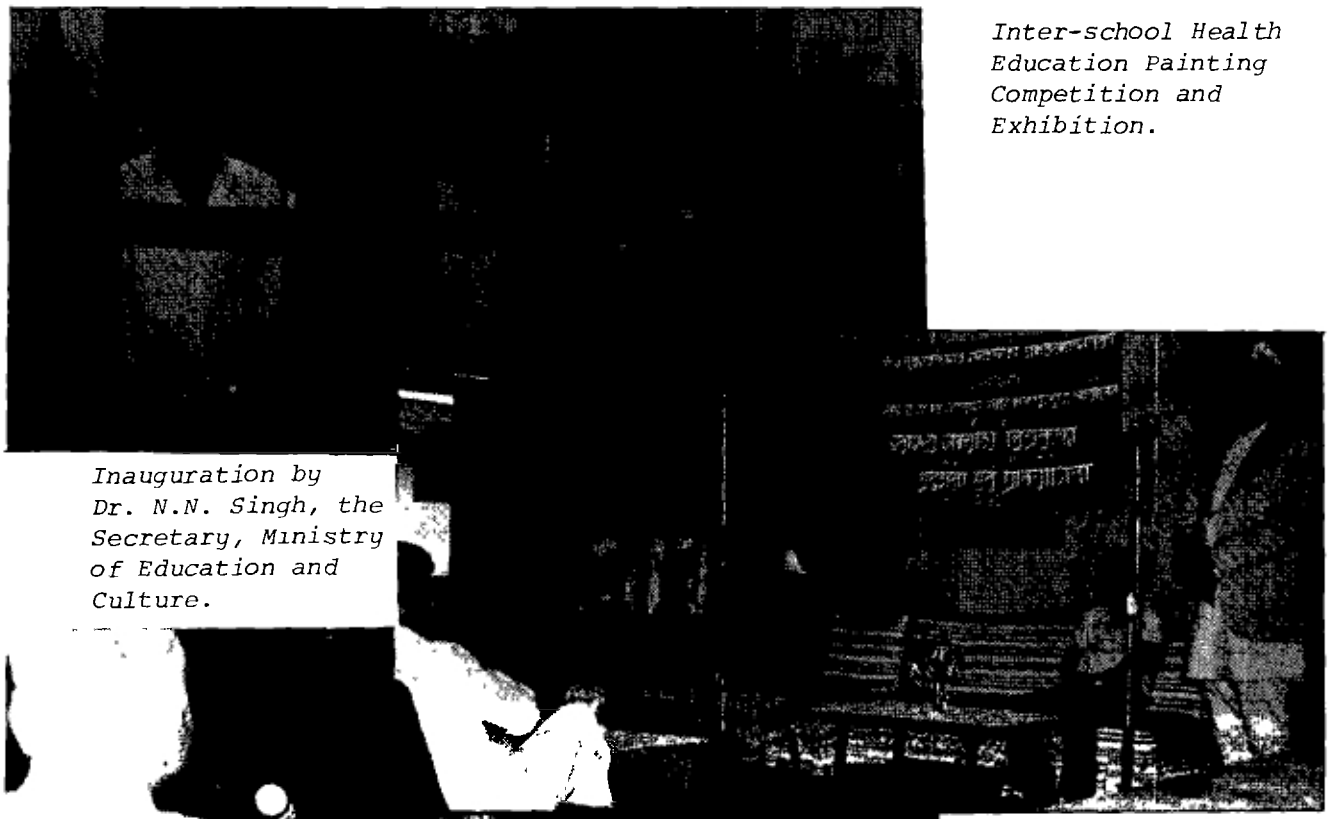
...and deciding on future activities.

Deciding together makes them back each others' actions.

Community Clean-up:

An effort to practically convey the message to the community.

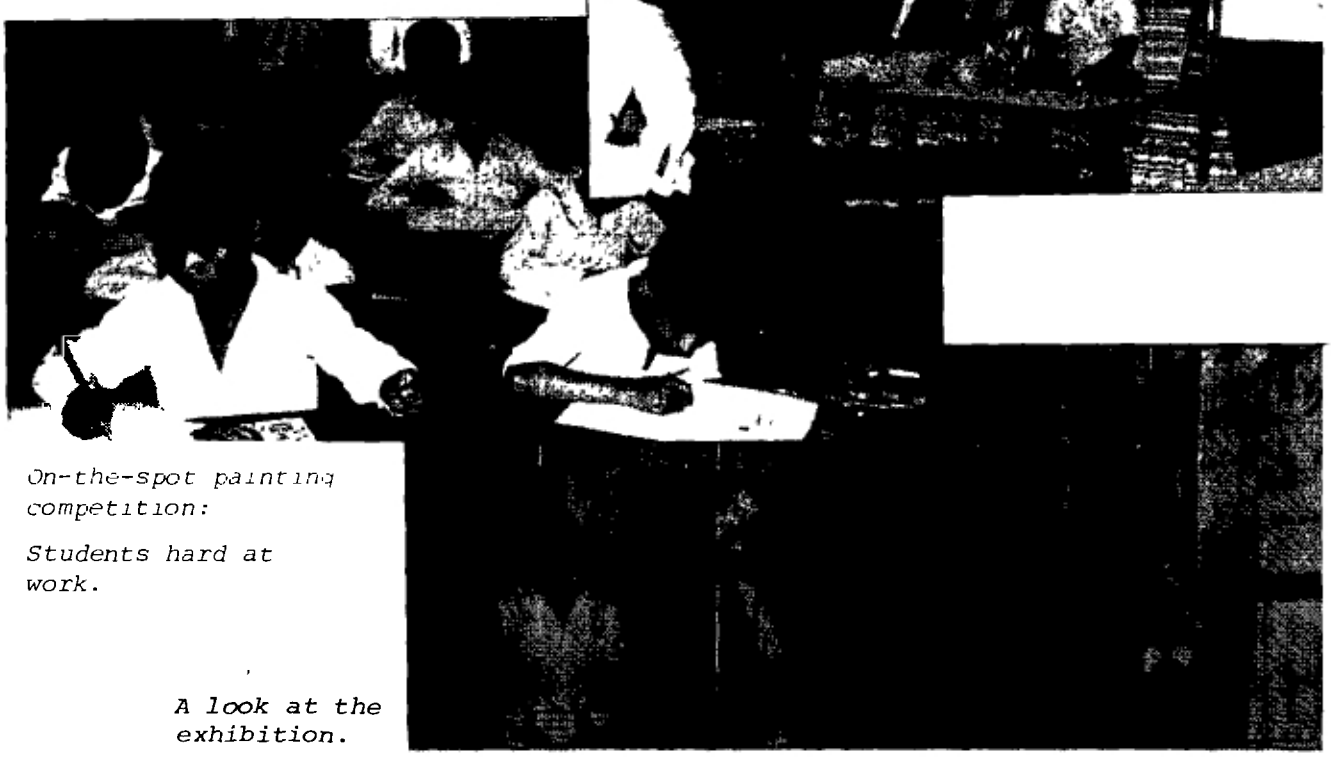
Inter-school Health Education Painting Competition and Exhibition.



Inauguration by Dr. N.N. Singh, the Secretary, Ministry of Education and Culture.

On-the-spot painting competition:

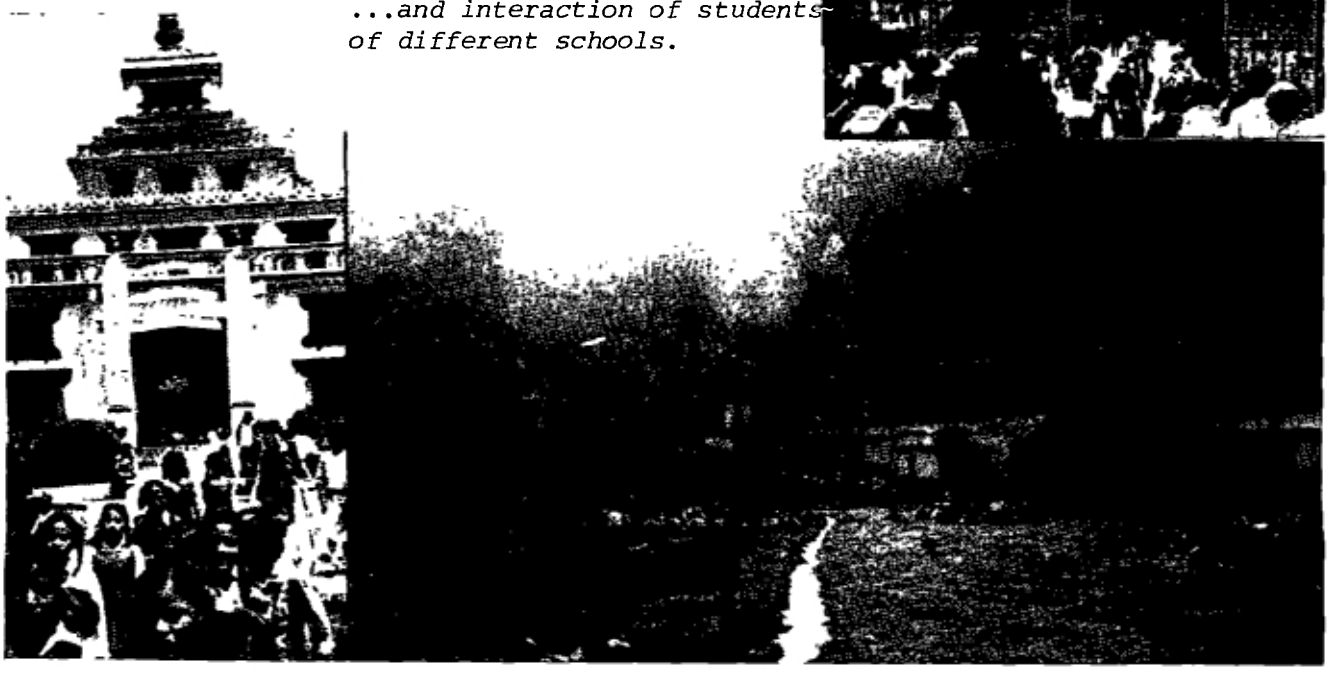
Students hard at work.



A look at the exhibition.

An opportunity of familiarisation with a wider environment,.....

...and interaction of students of different schools.



Inter-School Health Education Essay Competition:

An evaluation:

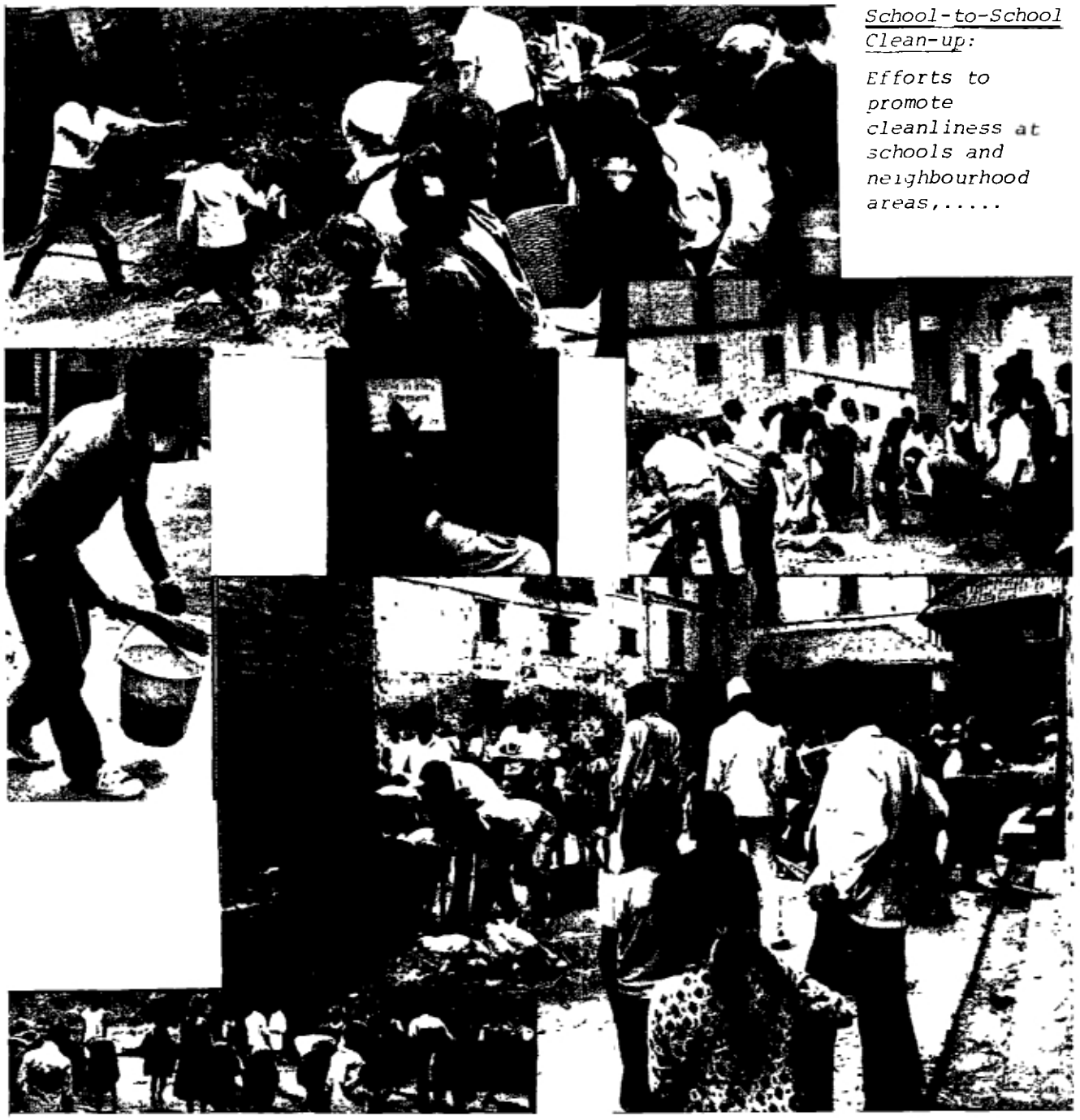
How far are students aware of preventive measures ?

Inter-School Health Film and Slide Shows: further motivation and awareness raising.

Inter-School Health Education Quiz Contest:

An evaluation of students' knowledge & reinforcement for further knowledge.

Many schools organised internal quiz contests as well.



School-to-School Clean-up:

Efforts to promote cleanliness at schools and neighbourhood areas,.....

The extremely dirty surrounding of a school....

...is clean now.

Child-to-Child Activities:

A behavioural method of training.....

.....children.....

and their parentes/ families and other community people...

...by children.

Sanitary Improvement Works:

The teachers used behavioural method to make sanitary improvement to the school.

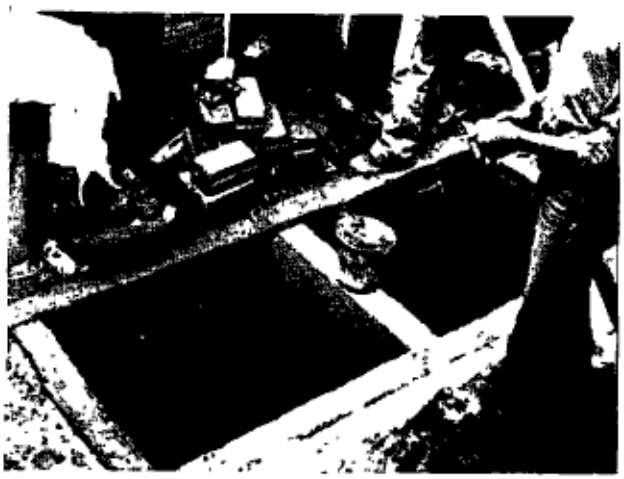
First, set an example.....

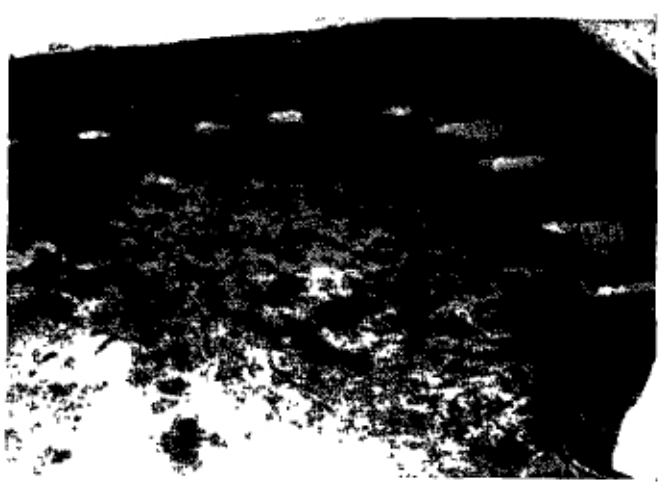
...then involve the students...

to improve appaling sanitary conditions.

Physical improvement of the existing sanitary facilities.....

...and building of new facilities followed: Here sewer connected water seal type, sulabh type and trench type of toilets.....



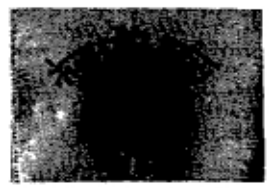


They started to improve...

...the surrounding environment,

...to organise proper waste disposal.

...to install taps and water tanks,



...to improve or build the sewerage/drainage systems.

...and to improve or pave the class-rooms, school compounds.

In some cases the students were actively involved.

Planting a school compound during World Environment Day.

After the school condition had been relatively improved...

...they went outside the school.

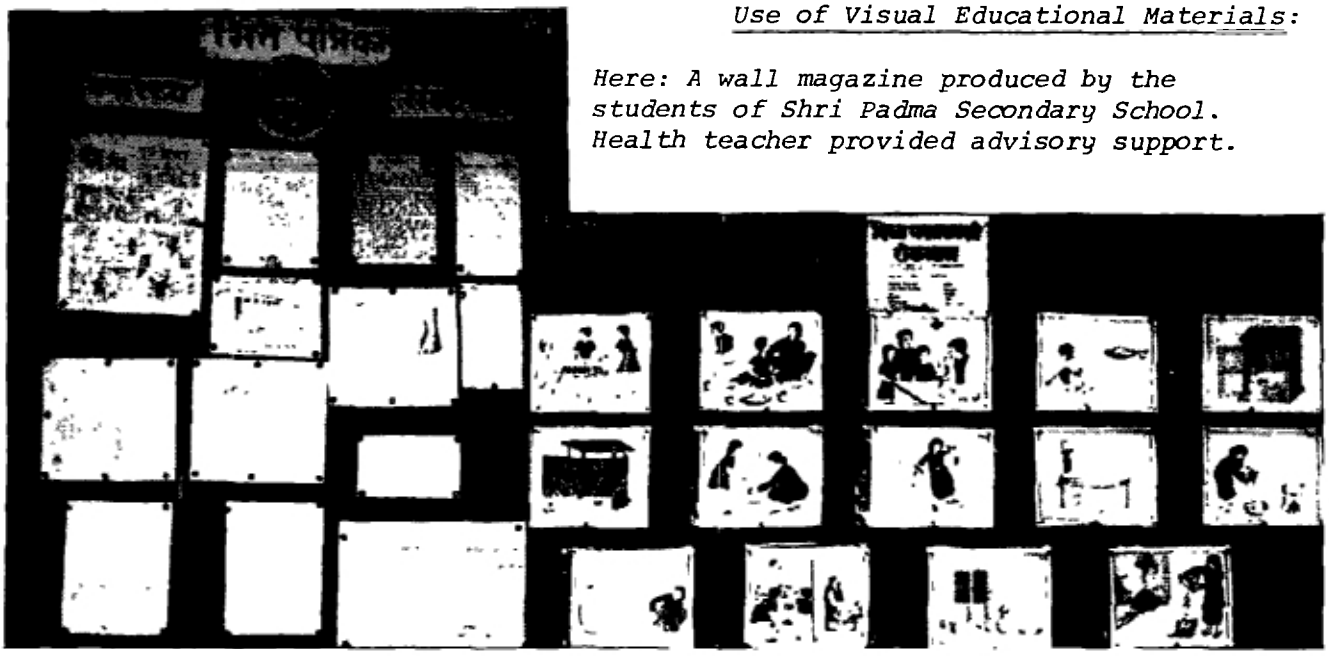
Here: Surface water inlet chambers....

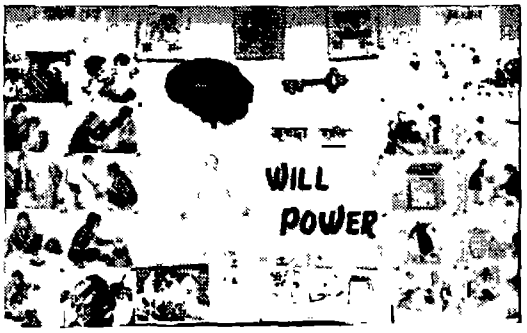
...were cleared out.....

...and improved.

Use of Visual Educational Materials:

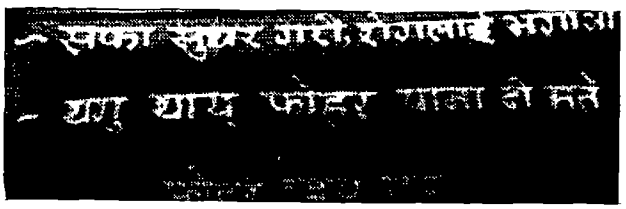
Here: A wall magazine produced by the students of Shri Padma Secondary School. Health teacher provided advisory support.



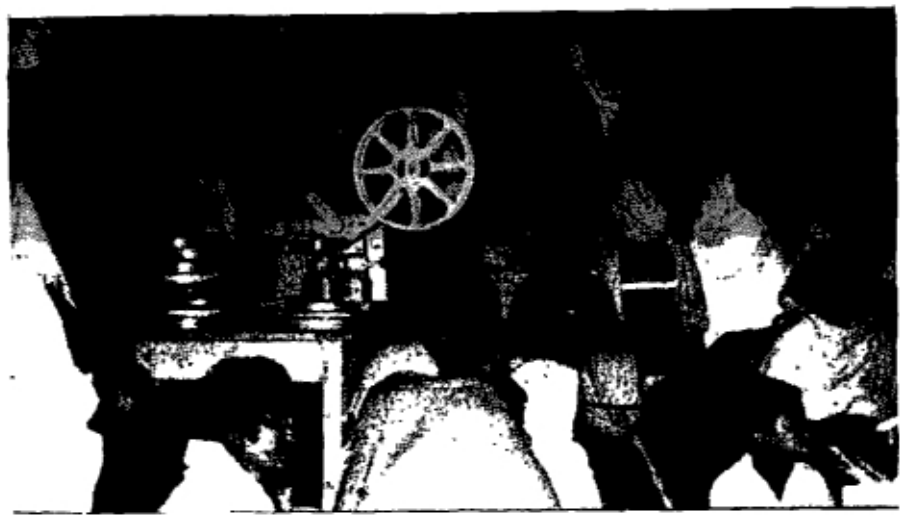


Display of Educational Materials:

Let us adopt the measures to prevent diseases instead of getting sick and troubles.

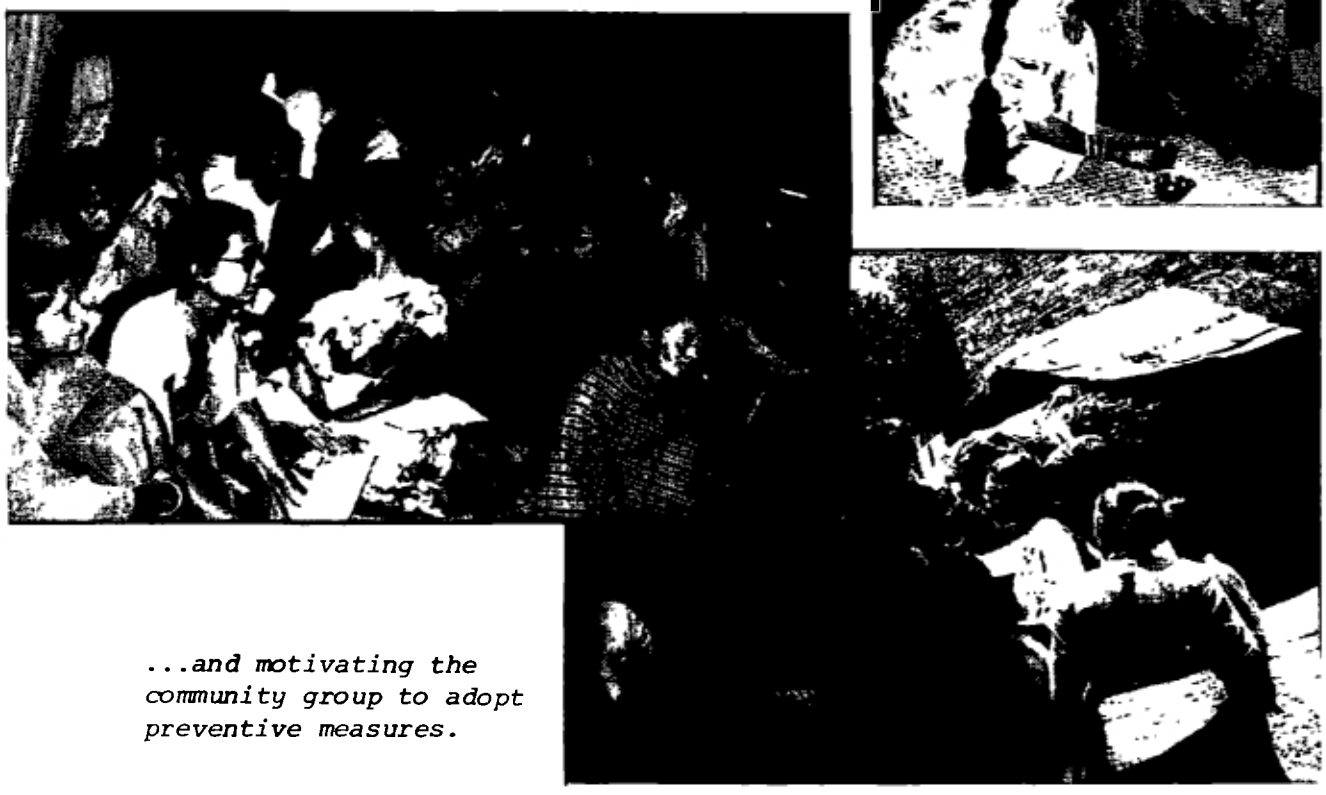


Some Health Teachers worked extensively in the community in an individual basis...



e.g. giving film shows to adult education classes and the general public.....

...teaching at women's groups and non-formal education classes



...and motivating the community group to adopt preventive measures.

Here: the community initiative in cleaning a dirty pond and stone tap,.....

...and clearing solid waste from the blocked sewerage system.

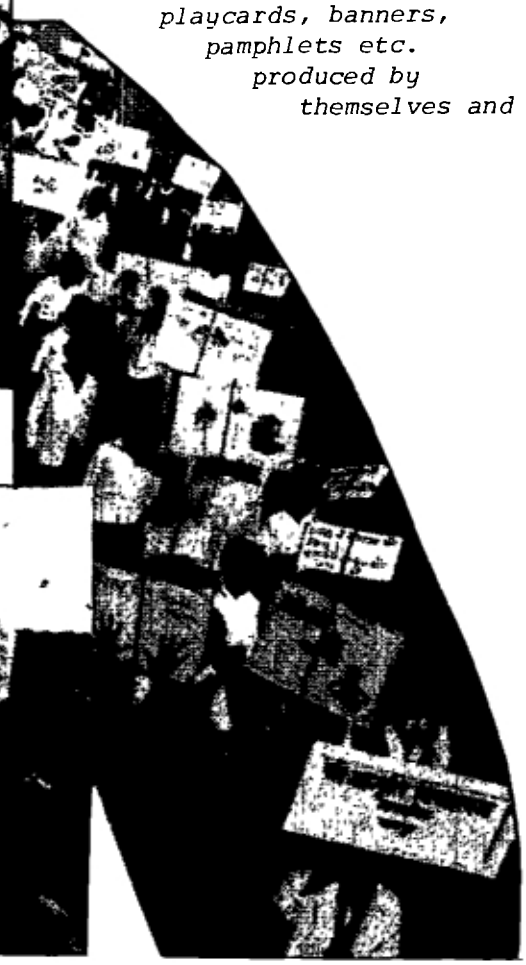
Here: One of the places, the local people taking initiative to maintain cleanliness of the area.

"WALK FOR HEALTH": HEALTH EDUCATION RALLIES:

Children led the rally beating the drum and carrying the posters.

They were followed by the teachers

...and students carrying playcards, banners, pamphlets etc. produced by themselves and



...announcing messages by hand mikes.....

The children felt proud to.....

...convey their messages to the community.

Teachers and volunteers took the leadership in the organisation of 1st. and 2nd. rallies.

In the third rally, the students took the lead in the organisation

Thousands of people watched from....

...the roadside and overlooking windows.

Beating the drum to attract people's attention.

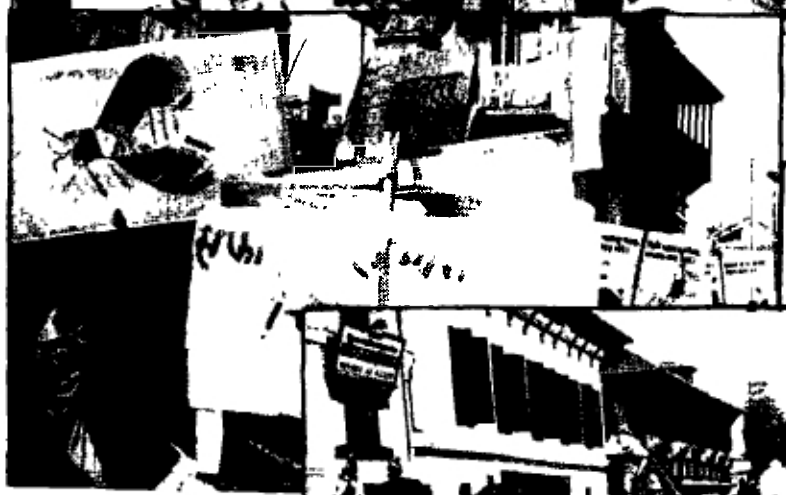
A blind volunteer joins in...

All three rallies, centred around personal hygiene, environmental sanitation, immunization & nutrition.

Pamphlets distributed to the people.

JAYCEES Volunteers take their turns to the mike...

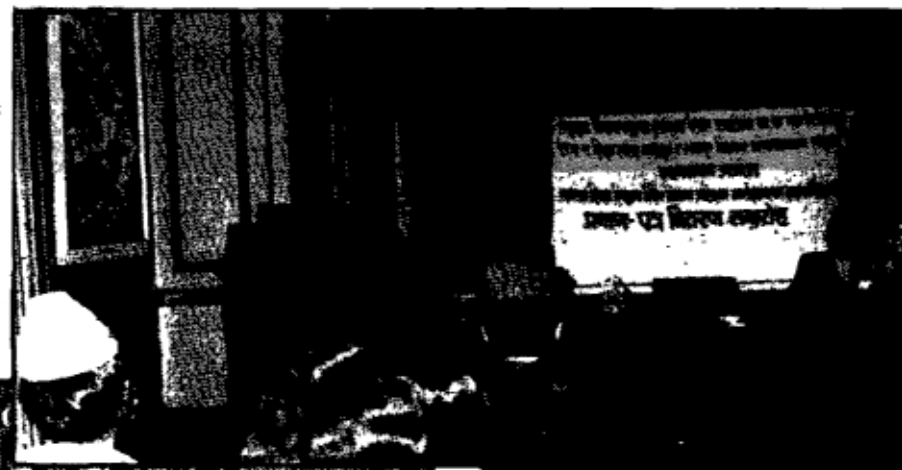
community motivation.



Children were a credit to all the rallies.

At the end of a rally.

Distribution of Training Certificate & Certificate of Appreciation to the Teachers.



...by Vice-Chairman, National Planning Commission.

Secretary/MOEC

Chief, CTSDC/MOE

DEO, DPSES

Resource Person, Training

Headmaster, Shri Sharada Service Centre

Participants in the function.

Health Teacher, Shri Padma Sec. School

Joint Planning Meeting:

Development of Annual Action Plan: Group Task Force.

Finalisation and decision of Annual Action Plan.

7.2 Actions Inititated by the Trained Teachers

It was important that the teachers understood that they were to provide the impetus for the initiation of intervention activites. They had been trained to react to changing circumstances and were therefore competent to work within an open and flexible planning system. The objectives of the programme had been stated as intentions and, although ideas for appropriate activities had been explored, those ideas were open to improvement or change if they became unrealistic, providing adequate reasons for the change could be given.

Too often, training programmes are completed with no further use in the field of what has been learned. The project was concerned that this might again be the case here but, a few days after the completion of the programme, it became obvious that the teachers were making great efforts to implement what they had learned and working for the success of the programme.

Immediately on completion of the training programme, the lower secondary and secondary school health teachers (hereinafter referred to as group A) formed their own group, and the primary school health teachers (hereinafter referred to as group B) formed a committee. Each group planned to start separate health improvement activities in their own way.

7.3 Picnic - A Get-together

Within a week of the completion of the training programme group A organised a picnic at Surya Binayak. Group B also organised a picnic at Mahakali. One of the interesting activities of the picnics was carrying out a clean-up campaign at the picnic spots. The teachers prepared posters conveying health education messages and posted them at strategic places and, as brooms were not available, wheat stalks were used instead. The cost of the picnics was shared proportionally by all the teachers.

7.4 Ideas for an Action Plan

In the second week, a group of teachers came to the CDU office to discuss their ideas for an annual action plan of health education activities. The following activities were proposed:

- Scheduled health classes in schools,
- Monthly monitoring and evaluation meetings,
- Child-to-child health education activities,
- Children-to-family health education activites,
- Public cleaning campaigns,
- Childrens's health education painting competition,

- Health education painting exhibition,
- Joint educational tour for students of all the schools,
- Community health awareness activities,
- Sanitary improvement works.

The primary school teachers subsequently added a school-to-school cleaning campaign to their plan.

7.5 First Meeting - Making a Start

Approximately one month after the completion of the training programme, group A held their first meeting with very encouraging results. By now, they had spent one month in the field implementing what they had learned and they shared their experiences with each other. In this way they gained a sense of achievement and developed a greater sense of awareness and confidence.

The ideas for the action plan were discussed and endorsed and the teachers readily accepted the challenge of accomplishing the plan. A tentative annual time schedule for the proposed activities was put forward. Additionally, they decided to hold monthly monitoring and evaluation meetings; to be organised at each school on a rotational basis.

Group B held a similar meeting during the first few days after the training programme, where they made the further decision to organise weekly, or bi-monthly, school-to-school cleaning campaigns.

7.6 Sharing the Information, Knowledge and Skill

The teachers returned to their schools where they shared their knowledge, skills and experience with other subject teachers with the intention of involving them in health education activities. In most cases, other subject teachers and headmasters were co-operative, although some headmasters still remained sceptical.

7.7 Headmasters' Meetings

These meetings proved to be rewarding. Each headmaster compared the differences between health education activities carried out before and after the training of the health teachers. The experience of one headmaster is worth mentioning here:

"Health education activities became a reality. The students became actively involved in cleaning the classrooms, school compounds and so on. When it came to the lesson on the toilet the teacher took the students to the appallingly dirty toilet and explained the reasons why the toilet should be kept clean.

Traditionally the responsibility for keeping the toilet clean has been assigned to the lowest strata of society: the sweepers and consequently the students were very reluctant to take part in any cleaning activities in this case." The headmaster, who was watching and listening to the argument, took the toilet brush and other cleaning materials and started to clean the toilet. This had the desired effect on the students, they could not just stand and watch the headmaster clean the toilet, they felt obliged to help. Arguments did not change the traditional attitudes but the demonstration did.

The meeting also gave an opportunity for briefing and discussion on the necessity and concept of the health education programme, the training programme itself, and the role of headmasters in the success of the programme. They agreed to extend their full support to their health teachers' innovative activities and to increase the number of scheduled health education classes to a minimum of two each week.

The meeting also recorded what the headmasters felt to be the major problems of health and sanitation facing schools today and their suggestions as to the solutions.

7.8 Collecting Educational Materials

All the teachers gathered at the service centre to collect the educational materials. They did everything from taking the materials from the store, arranging them in equal shares, completing the handing-over forms and carrying the materials to their respective schools. The students also made a significant contribution in helping to carry materials to the schools. The teachers also brought the materials, produced by themselves, or collected from other sources (UNICEF, CTSDC etc.), during the training programme.

The project also donated a sum of Rs 15,000/- for the purchase of the demonstration materials required for 38 schools. In monitoring and evaluation meetings the teachers placed the required materials in order of priority, calculated the cost and made the final selection of essential materials in order to meet the availability of funds. They formed a purchasing committee to buy the materials and submit the receipts to the project. The materials were then distributed through the service centres.

7.9 School Curricular Health Education

The teachers started to give health education classes on those topics covered by the school health education curriculum using all they had learned during the training programme to attain basic changes in the

attitudes and behaviour of the children, their families and of the community as a whole. Many practical examples of the teachers' work and achievements could be cited but it is not practicable to describe them here. However, many of the ideas are incorporated in the health education guidebook.

7.10 Monthly Monitoring and Evaluation Meetings

Monitoring and evaluation meetings had many important functions:

- to share the experiences of each school's health education activities during the previous month i.e. to discuss the problems faced, feedback received, solutions tried and their outcome,

- to report on the specific and particular health education activities carried out in the last month and to use the resulting experience to decide on future activities,

- to explore, develop and discuss new health education ideas,

- to discuss the action plan, decide on the activities for the future month, form particular committees with specific responsibilities, and plan the activities giving clear indications of who was to do what, when and how.

Group A finished their training in March 1986 and group B in May 1986. They were awarded their certificates in September 1987. This document has covered the school activites carried out only during the intervening period i.e. 16 months for group A and 14 months for group B. During that time 16 and 18 monitoring and evaluation meetings were held by group A and B respectively. The monthly meetings were hosted by each school in turn, reducing the burden on the service centres and serving to mobilise and activate each and every school at the same time. Essentially, the meetings provided the teachers with a regular forum for discussion, suggestion, sharing their successes and failures, and exploration and decision of future activities. They were occasions for their own analysis of what had gone wrong rather than being told their mistakes. They also helped to motivate the teachers and maintain their involvement and commitment.

7.11 Public Cleaning Campaign

The campaign was designed during a group A meeting held at Kamal Binayak and Gachhen in Wards nos. 4 and 3. Materials for the campaign were provided by the schools and the project.

The students and teachers gathered at 10.30 a.m. They began by sweeping the streets and courtyards, clearing the ditches and removing the waste dumps. The mud-filled streets were cleaned and their sunken or damaged surfaces were paved with broken bricks which were collected from a brick factory located nearby. Posters portraying health education messages, prepared by the teachers, were posted at strategic places.

7.12 Inter-School Health Education Painting Competition

Following the cleaning campaign, group A's next activity was to organise an inter-school health education painting competition for children.

They formed a committee which decided to organise the competition with two categories; one for 7 - 11 year olds and one for 12 - 14 year olds. 19 schools took part and 114 paintings were entered. The judging committee, formed from the artists, decided the winners of the competition.

Similarly, group B organised an on-the-spot health painting competition.

In both cases the teachers covered all the costs except for the purchase of painting cardboard which the project provided.

7.13 Health Education Painting Competition

A 3 day exhibition of all the painting competition entries was organised. All the teachers and students worked hard to prepare the exhibits, decorate the halls and the platform for the inauguration, arrange chairs and organise refreshments etc.

The exhibition was opened by Dr. Narasing Narayan Singh, the Secretary of the Ministry of Education and Culture. In his inaugural speech, he spoke of the value of the school health education programme in reinforcing health messages to the children and community. The Pradhan Pancha of Bhaktapur Town Panchayat commended the efforts of the health teachers in the health development of Bhaktapur but queried the timing of the exhibition as it was organised during the rainy season, when most of the local people were working in their fields.

Each school contributed Rs 25/- (three schools, in fact, donated Rs 100/-) to cover the cost of the exhibition. The only support required from the project was in an advisory capacity.

7.14 Educational Tour

The schools of group A and group B each organised separate educational tours with the following objectives:

- to familiarise the students with the environment outside Bhaktapur,
- to provide incentives to the students for their active participation in health education activities,
- to facilitate the interaction of the students of all the schools.

The day's tour included visits to the national museum, the national history museum, the national botanical garden, the zoo and balaju garden. The day ended with the two groups joining together for refreshments and educational games.

Group A covered the cost of the tour by collecting Rs 10/- from each student and Rs 25/- from each health teacher. Group B however, were partially assisted by the project with the cost of transportation.

7.15 Inter-school Health Education Essay Competition

The on-the-spot essay competition was open to students of grades 6 and 7. 14 of 18 eligible schools participated and sent the 2 students selected to the competition venue; Shri Sharada Secondary School Service Centre. The entrants were given 1 hour 30 minutes to write an essay on the topic 'Measures for Prevention of Communicable Diseases'. The winners were decided by the judging committee and each entrant was awarded with a pen which had been supplied by the project. All other costs were covered by the teachers.

7.16 School-to-School Health Film and Slide Shows

The teachers formed a committee to organise film and slide shows. The film projector was provided by the project. Health films were collected from various sources such as UNICEF, Health Education Section of the Ministry of Health, IFPPCP, and the Audio-Visual Unit of CTSDC. Slides on waste, toilets, and water and sewerage systems already developed by the project were used.

7.17 Inter-school Health Education Quiz

A committee was formed to develop criteria for, and subsequently organise, a quiz-contest. Each health teacher was requested to develop ten questions from which the quiz master selected the best for use in the contest. 18 lower secondary and secondary schools

participated in the contest which continued for 3 days.

The project assisted with the cost of hiring microphones while the teachers covered all other costs.

7.18 Review and Assessment of Health Education Activities

As a basis for general discussion, all the teachers presented written reports centred on the following points:

- Report on behavioural activities carried out under the school curriculum.
- Achievement and impact of the activites/What and how the changes took place?
- Participation of other subject teachers and local population in the activities.
- Feedback.
- Suggestions for the improvement of future activities.

Floor discussion clarified the presentation well.

7.19 School-to-School Cleaning Campaigns

This weekly or bi-monthly campaign was designed by group B in their first meeting. At each school in rotation, on Friday of the relavant week, the following programme was carried out:

- All the teachers gathered at the relevant school.
- Health classes for grades 4 and 5 were conducted by teachers assigned previously at the meeting.
- Teachers organised the students of grades 4 and 5 to carry out the following cleaning activities:
    * sweeping the classrooms, the path, the compound and the area surrounding the school,
    * removing the waste dumped around the school area,
    * cleaning the public tap stands and stone taps located near to the school,
    * cleaning the ditches, drainage lines and clogged surface water inlets of the streets around the school.
- Preparation and posting of posters in the school and its surrounding area.

- Provision of health education to the local inhabitants and seeking their active participation in maintaining environmental cleanliness.

- Finally, organisation of a meeting to decide on the venue and implementation of the next campaign.

Within 4 months, cleaning campaigns had been carried out in almost all the schools of group B.

7.20 Sanitary Improvement Works

By 1984, prior to the school health education programme, BDP had assisted most of the schools in Bhaktapur Town Panchayat to improve their physical situation, including the construction and improvement of toilets, drinking water supplies and other sanitation facilities, in the following ways:

- repair and extension of the existing schools,

- renovation of buildings for use as schools,

- construction of new schools,

7.20.1 Problems

In spite of the support for physical improvements, sanitary facilities were either maintained in appalling condition or the building of them was not given priority in schools where they were not available. Peons were made solely responsbile for all cleaning activities and no consideration whatsoever was given to health and sanitation. The major problems, as recorded in 1984, were as follows:

- Of the 38 schools so far assisted by BDP, only 19 had built a toilet. The other 19 schools gave priority to the extension of classrooms. Students of those schools urinated and defecated in any hidden areas of the school compound or any nearby open space.

- A survey carried out by BDP, and the observation report of the teachers committee for sanitary improvement work revealed that even in those 19 schools already with toilets, appalling sanitary conditions were still prevalent:

    * in 5 toilets, dried faeces had accumulated to cover the entire floor of the toilets,
    * in 3 toilets, either the pans or sewer connections were blocked, faeces were overflowing from the pans, in two cases to cover the entire floor,

* in 7 toilets, defecation had been done haphazardly,
* in many toilets urine or mud was overflowing,
* only in 4 toilets was there no evidence of haphazard defecation,
* in almost all of the 19 toilets pieces of paper and other litter were scattered around.

- Of the 38 schools, 17 did not have taps or proper water storage facilities. Taps in the other 21 schools were badly maintained. Water was available from those taps for only about one hour during school time and few of them had proper water storage facilities. Mud and waste was accumulating in and around many of the tapstands. At many taps, spouts had been removed and leakages were observed. Only 7 taps were found in more or less good condition.

- Many school compound surfaces were not well maintained, and were usually filled with mud, waste water and solid waste. The conditions were worst during the rainy season. In many schools the floors of the classrooms themselves, and also the paths to the classrooms, were seen to be in a badly delapidated condition.

- In almost all the schools, litter, dust and other waste was scattered all around the classrooms, school buildings and school compounds. The conditions were worst at the rear of the school buildings.

7.20.2 Improvements

After the training programme, the health teachers returned to the schools and started to impart practical health education to the students and involve them in solving as many of the immediate problems as possible. Many schools were innovative in using their own resources to bring about immediate changes in unhealthy situations. One school had the clever idea of calling the fire brigade to clean away the volumes of dried faeces. After setting in motion any solutions which could immediately be carried out the teachers then concentrated on the long-term work of building or improving the sanitary facilities. In this, the project was willing to assist with a percentage of the total development costs with the following provisos:

- Each school had to compile a list of their requirements for building or improving sanitary facilites.

- The teachers had to elect a committee to evaluate the school's proposals.

- The committee, in conjunction with the teachers of the school in question, had to list the requirements in order of priority.

- Each school then had to submit a letter of application stating:

  * the cost-estimate of the proposed building activities,
  * the proposed contribution of resources, including manpower, materials and funds, of the school,
  * the assistance expected from the project.

- Approval and agreement had to be obtained before the start of any building activities.

- After a final inspection of the completed building, an agreed portion of the cost, based on the submitted bills, would be reimbursed to the school.

Now, 36 of the 38 schools have toilets. Of those 36 schools, 19 already had toilets before the school health education programme, albeit in appalling condition as previously described. Of them, one school totally reconstructed its toilet to change it into a trench type toilet and 12 other schools carried out repair work of a greater or lesser degree; building sewer connections, changing or improving the pans, levelling or plastering the toilet surface, building or repairing the toilet walls, installing or repairing the toilet doors, repairing the toilet roofing, replacing the tap spouts, repairing the water tanks and water pipes etc.

17 schools built new toilets. One school built a sulabh toilet (the health teacher was trained in building sulabh latrines), another school built a trench type and the other schools built the sewer connected watershield type.

Apart from the well maintained, properly used and functioning toilets, all 37 schools now have water facilities as well. Of them 27 schools have both taps and water tanks, 6 schools have taps only and 4 schools have tanks only.

Other improvement work carried out was the pavement (in 2 cases) or levelling of the school compounds, levelling and pavement of school classrooms by 3 schools, building brick waste containers by 3 schools (all other schools used half drums), relocating tap stands to a convenient and safe place by 3 schools, improving drainage lines by 7 schools, and so on.

It is encouraging to note that the children were enthusiastic and active participants in many of the activities described above. Because of their involvement the children took great care to maintain and use the sanitary facilites properly.

7.21 "Walk For Health": Health Education Rallies

Three "Walk For Health" rallies were held during the 16 months following the completion of the training programme.

7.21.1 "Walk For Health" : The First Rally

The first rally was held on Bhadra 2, 2043. CBR/Bhaktapur Jaycees and health teachers initiated the organisation of the rally with assistance, in the form of materials, from the project, UNICEF and EPI (Extended Immunisation Programme). About 1100 students and 30 teachers from 24 schools together with 60 Jaycees and Junior Jaycees participated. They walked around the town spreading health education messages by carrying posters and banners, making announcements over a microphone and passing information from person to person by word of mouth. The theme of the messages was immunisation, sanitation and other preventative measures.

During the three days following the rally EPI, with the support of UNICEF, opened immunisation camps at three main centres in Bhaktapur; Datatraya, Durbar Square and Bhaktapur Hospital. As a result of the publicity given to the health education rally, more than 3000 children were brought by their parents to be immunised. According to the EPI the number of children being immunised within 3 days was the highest in its history.

7.21.2 "Walk For Health" : The Second Rally

The health teachers designed this rally in a monitoring and evaluation meeting. Each school took responsibility for developing, preparing and collecting materials such as various health posters, pamphlets, placards, banners, etc., required for the rally. 4 microphones were borrowed locally.

At 7.00 a.m. on the appointed day, over 5,200 students and 104 teachers from 38 schools gathered at Gyan Bijaya Service Centre, Dudhpati. They were joined by approximately 150 scouts and a number of volunteers and local leaders. The parade lasted for more than 3 hours, 7.30 a.m - 10.45 a.m., and enthusiastically covered all parts of the town. The rally was led by a group of scouts carrying posters and beating drums with the purpose of attracting people's attention. Behind them came a group of teachers announcing health education messages over the microphones. They were followed by a large group of students carrying health education posters, placards, banners, etc. They, in turn, were followed by a group of students announcing health education messages and slogans over microphones. Students carrying materials with health education messages followed them. This pattern continued. Behind the whole parade was a group of teachers and children distributing pamphlets and disseminating information on preventive measures to the spectators. It is believed that this rally was the first of its kind in Nepal and it aroused great interest. Thousands of people watched from their windows or the roadside and local opinion was that the rally was exciting and informative. The theme of the rally centred mainly on messages about personal hygiene, environmental sanitation, immunisation and other preventative measures.

7.21.3 "Walk For Health" : The Third Rally

This 'walk for health' was organised by the children and not by the teachers. The students of Shri Padma Secondary School had formed a Junior Red Cross group who did all the organisation. About 2,500 students participated in this rally and it followed a similar format to the second 'walk for health'.

7.22 Child-to-Child Activity

The child-to-child approach was discussed, developed, associated and practised in the health teachers' training programme. The ideas greatly stimulated the teachers who incorporated them in their annual action plan of health education activities as follows:

- The health teachers used the child-to-child activities as a behavioural method of educating the students on appropriate health topics on the school health education curriculum.

- The children practised the activities with their classmates, the lower grade students and their brothers and sisters. They also used the activities to share the health knowledge with their parents.

- During the initial period of the intervention activities following the training programme, child-to-child activity techniques were demonstrated by a specialist who visited several schools. The teachers then used the techniques in their health classes.

- The activity sheets produced by the Institute of Child Health in London, with modifications to suit them to the local context, were frequently used in carrying out the activities.

- Many of the health education activities already described were carried out by directly or indirectly incorporating a child-to-child approach.

- The teachers also developed their own ideas for child-to-child activities.

7.23 Health Teachers in Different Activities

As well as their school activities, many teachers did not miss any opportunity to improve the standards of health and sanitation in the community in their individual capacities. Some of the activities in which they were often involved were:

- Conducting health classes in adult and informal education.

- Organising health film shows for adult education classes and the general public.

- Initiating the cleaning of particular dirty ponds to facilitate their use as fisheries and utilising the resulting income in local community development activities.

- Organising the cleaning of particular local public toilets and repair of defunct stone taps.

- Motivating and organising local clubs to carry out cleaning campaigns.

- Taking responsibility for organising and maintaining the cleaning of certain street areas, courtyards and squares around their respective schools.

- Campaigning in the community for vaccination against communicable diseases and for other preventative measures.

7.24 Training Certificate Distribution

It is often observed that people complete a training programme, accept their certificate and then do not apply what they have learned to their work in the field. Every effort was made to make this case different. A very significant factor in this was that the trained teachers were awarded their certificates only one year and four months after completion of the training programme. During that time they had to implement what they had learned in their respective fields.

Certificates were finally awarded by Dr. Mohan Man Sainju, Hon'ble Vice Chairman of the National Planning Commission at a ceremony organised jointly by the BDP follow-up/Health Education Programme, CTSDC and the Bhaktapur District Panchayat Secretariat, Education Section, at the auditorium of the Ministry of Public Administration, Harihar Bhavan, Pulchowk, Patan. Dr. Sainju highlighed the importance of health education in the context of the Basic Needs Programme. Speaking from the chair, Dr. Narasingh Narayan Singh, the Secretary, Ministry of Education and Culture, stressed the importance of consolidating the health education programme and extending similar programmes all over the country on a massive scale. Dr. Kedar Nath Shrestha, the Chief, CTSDC, threw light on the programme and the committed and dedicated efforts of teachers without whom the programme could not have made such tangible progress. The District Education Officer of Bhaktapur delivered a vote of thanks. Other speakers in the programme were Dr. Yogendra Pradhananga, resource person in the training programme; Mr. Gajendra Baidya, the Headmaster of Shri Sharada Secondary School Service Centre; Mr. Mahendra G. Karmacharya, the health teacher, Shri Padma Secondary School.

7.25 Joint Planning Meeting

During the first educational year subsequent to the training programme, many activities were run separately by the teachers of group A and group B in accordance with their own action plans. In order to broaden the effectiveness of health education activities the teachers now decided to organise programmes jointly.

With this in mind, Gyan Bijaya Lower Secondary School Service Centre called a joint planning meeting in which all the teachers of both group A and B participated.

In the meeting, they formed 5 working groups, each of which developed an action plan. The plan for the forthcoming educational year was finalised by combining the best ideas of each group.

C H A P T E R I V

LOCAL INSTITUTIONS MORE ACTIVE IN HEALTH EDUCATION

1. DISTRICT PANCHAYAT SECRETARIAT (DPS) - EDUCATION SECTION

As well as giving regular support to the School Health Education Programme, the DPS Education Section undertook the following activities:

- Circulating a formal letter to all the schools requesting the promotion of behavioural activities on health, hygiene and sanitation.

- Organising cleaning campaigns by involving all the lower secondary schools. Each school took over the responsibility of organising cleaning of the public areas within a fixed radius of the school.

2. BHAKTAPUR TOWN PANCHAYAT (BNP)

The Bhaktapur Town Panchayat has started to improve and extend its activities in the field of health education and sanitation.

- Health education has recently been included in women's adult education classes in all wards of Bhaktapur Town Panchayat, and the Service Centre, Adult Education Programme. This should have a favourable impact on the families of the participants of those classes.

- Panchayat Magazine, the monthly publication of the Town Panchayat includes health education messages in every edition.

- The Public Health Centre, run by the BNP, benefits hundreds of patients every month.

- Cleaning campaigns organised by any group are supported.

- The Town Panchayat has recently started to organise health film shows at public places.

- The Town Panchayat is trying an experimental cleaning plan for the town. In each ward, 4 or 5 cleaning workers are assigned responsibility for organising the cleaning work. In Ward No. 8, a group of local youths are hired on a contract basis to maintain cleanliness in the ward. For waste disposal, 150 waste containers are distributed all over the town with 7 or more containers in each ward. Tractors are used to collect the waste from the containers and dispose of it at the compost plant.

- The Town Panchayat is involved in maintaining public toilets as well. Some toilets have been improved but much work still needs to be done. Many toilets are badly designed with insufficient light or ventilation and some are inconvenient to use, the sewer connection is often blocked, there is often a problem with water

supply and in many cases user education is still required.

- The Town Panchayat has formed a committee consisting of the Chief District Officer, 3 plumbers and representatives from the Police and the Water Supply and Sewerage Corporation, to be responsible for preventing leakage and wastage of drinking water.

- Other activities are going on but a lack of formal information prevents description of them here.

3. COMMUNITY BASED REHABILITATION PROJECT

Within the follow-up period of the Health Education Programme, after the holding of preliminary discussions by the authors, UNICEF agreed to extend assistance to the Bhaktapur Jaycees in running the Community Based Rehabilitation Project (CBR) for disabled children. Disability is largely caused by preventable infectious diseases such as diarrhoea, tuberculosis, ascariasis, poliomyelitis and other preventable nutritional deficiencies, accidents and problems associated with pregnancy and childbirth etc. The project has been effectively continuing its activites to help the work of rehabilitating disabled children in Bhaktapur. However, it still has a long way to go in the field of disability prevention through health education.

4. PICTORIAL REVIEW

Community Based Rehabilitation:

Training on health and hygiene for disabled children and their parents.

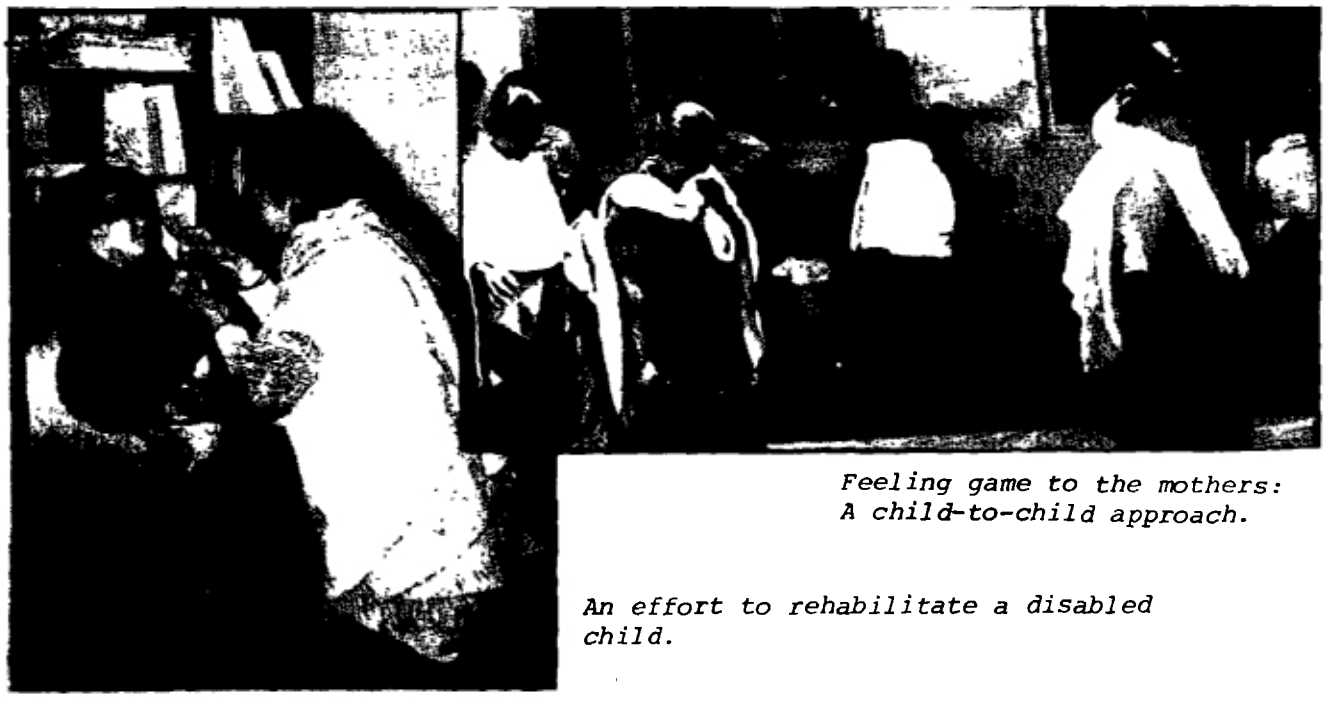
Nutrition:

Demonstration for the parents of disabled children.

Here: not a walk for health instead a walk for disabled children.

Nutrition Education.

Play group.



Feeling game to the mothers: A child-to-child approach.

An effort to rehabilitate a disabled child.

C H A P T E R V

RESULTS AND TRENDS

1. MEASURES OF EVALUATING HEALTH EDUCATION

Basic evaluation measures that can be used for evaluating health education efforts are summarised as follows:

1. Measures of Health Status:

   - Changes in morbidity,
   - Changes in mortality,
   - Authropometric measures,
   - Biochemical test results.

2. Measures of Behavioural Outcome:

   - Changes in knowledge,
   - Changes in attitude,
   - Changes in behaviour,
   - Level of participation.

3. Measures of Educational Outreach:

   - Number of target population reached,
   - Frequency of health education reached,
   - Number of educational activities held,
   - Number of educational materials distributed.

4. Measures of Community Participation:

   - Physical targets achieved,
   - Degree to which maintenance and repairs of physical targets are taken over by the people,
   - Physical changes in the environment due to the attitude/behaviour changes,
   - Improvement of health as a result of the combination of physical sanitary improvement and health education,
   - Degree to which the majority is involved when decisions are made,
   - Duration of decision making process,
   - Degree of opposition by the community to project proposal,
   - Degree to which women are actively involved in community programmes. Being the ones with most influence on hygiene, women will control the future health of the community and their involvement will have an immediate impact on prevention.
   - Degree to which people participate in educational activities.

Although it is very desirable to make use of all the criteria summarised above to measure the impact of health education, it is beyond the scope of this document. However, many indicators are directly or indirectly involved with the assessment of the programme in terms of the changes in health status, knowledge, attitude, behaviour, educational outreach and participation.

The relative effectiveness of some measures have already been discussed under the relevant chapter headings. This chapter gives further recorded examples of the effectiveness of the programme. Due to limitations of size, it is not possible to give all surveyed data and information in this document and, in some cases, data only is given without accompanying analysis.

2. EXAMPLES

2.1 Private and Public Toilets

2.1.1 Private Toilets

By August, 1982, BDP had assisted 1074 households in Bhaktapur to build private toilets. However, the evaluation survey of the private toilet and tap programme, carried out in 1982 indicated that 34% of private toilets were not used by all or several family members of those households. It is interesting to note that despite having toilets in their own houses, the people preferred open defecating places. The 66% of households whose members did use the private toilets did so, not for reasons of health and sanitation, but because of the greater convenience, privacy or other factors that they afforded.

Table 6

The Use of Private Toilets in Households with Private Toilets

1982 and 1988

Use	Households having private toilet			
	1982		1988	
	No.	%	No.	%
Used by all the family members	99	66 0	196	93.3
Not used by some or any family members	51	34 0	14	6.7
Total sample households 100.0	150	100.0	210	100.0

Source: Evaluation survey of private toilet and tap programme, BDP, 1982, and field survey, 1988.

By 1988 the situation had changed. The number of private toilets built with assistance from BDP and its follow-up activities through WSSC had increased from 1074 in 1975-82 to 3416 in 1983-88. The use of private toilets had also increased from 66% in 1982, to 93.3% in 1988. The increased level of use was due to the population's enhanced awareness of hygiene, reflected by the reduction in parasite infection and prevalence of communicable diseases.

Table 7

Cleanliness Conditions of Private Toilets 1982 and 1988

Condition	1982		1988	
	No	%	No	%
Clean	3	2 0	156	74.3
Satisfactory	95	63.3	47	22.4
Dirty	50	33.3	7	3.3
Very Dirty	2	1 4	-	-
Total Sample Households	150	100.0	210	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

Note: This data has been developed on the basis of the observation report of the survey interviewers. Toilets where excreta was totally flushed away and the toilet floor was kept clean were graded as clean; toilets where the excreta was flushed away but the toilet floor was not completely clean were graded as satisfactory; toilets where the excreta was not flushed away were graded as dirty; and toilets where faeces were found haphazardly on the toilet floor were graded as very dirty.

Table 8

Repair and Maintenance of Private Toilets by the Owners, 1982 and 1988

Description	1982		1988	
	No	%	No	%
Repairs carried out	9	6 0	24	11 4
No repairs needed	141	94.0	186	88.6
Total Sample Toilets	150	100.0	210	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

Table 9

Classification of Repairs carried out by the Owners of Private Toilets, 1982 and 1988

Type of Repair	1982		1988	
	No.	%	No.	%
House connection/sewer connection/blockage	9	100.0	16	66.7
Pan	-	-	2	8.3
Wall	-	-	2	8.3
Door	-	-	2	8.3
Other (plastering etc.)	-	-	2	8.3
Total no. of toilets repaired	9	100 0	24	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey 1988

2.1.2 Public Toilets

By August 1982, 24 public toilets had been built with BDP assistance. In addition, 3 modern public toilets and a new traditional toilet had been built without project assistance.

This document has already referred to the problems encountered in 1982 regarding the utilisation of public toilets under the heading "Physical Infrastructure and Behaviour". A further survey of the same toilets, together with a household survey, was carried out in 1988 to assess the situation at that time. Results are given below in brief.

Table 10

Distribution of Use of Public Toilets by Household, 1982 and 1988

Use	1982		1988	
	No	%	No	%
Households having all eligible family members using the toilet	53	35.3	58	64.4
Households having some family members not using the toilet	97	64.7	32	35.6
Total no. of sample households	150	100.0	90	100.0

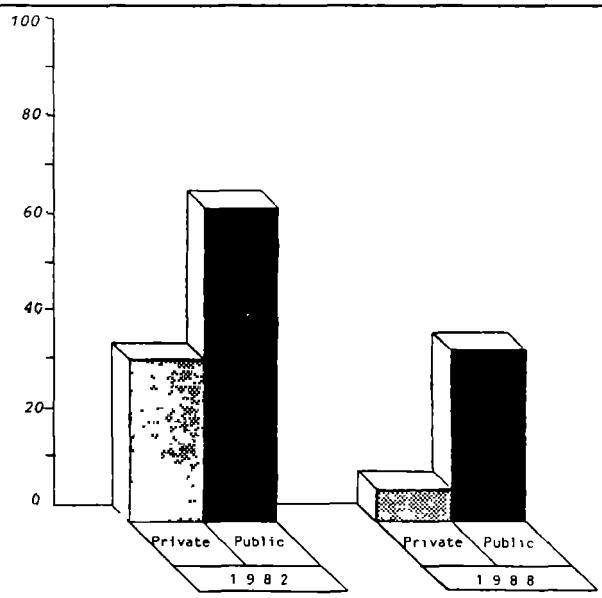


Fig.-1: Percentage of households with private and public toilet non-users

Table 11

Cleanliness of Public Toilets, 1982 and 1988

Condition	1982		1988	
	No.	%	No	%
Extremely dirty	6	23.1	3	115
Very dirty	9	34.6	4	154
Dirty	7	26 9	4	154
Clean	3	11 5	10	385
Very clean	1	3 9	5	192
Total no. of public toilets	26	100 0	26	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

Note: Toilets where the toilet floor was covered with excreta and faeces were found outside and around the toilet were graded as extremely dirty; toilets where defecation was carried out haphazardly on the floor were graded as very dirty; toilets where defecation was carried out on the pan but not flushed away were graded as dirty; toilets where the faeces were flushed away were graded as clean; toilets where faeces were flushed away and other types of garbage were not found were graded as very clean..

In 1982, 84.6% of public toilets were in an appallingly dirty condition; only 15.4% of the toilets were clean but, in 1988, the proportion of clean public toilets had increased to 46.2%. However, the improvement cannot be credited to users' behaviour alone. When visited frequently, the same toilet was observed sometimes clean and sometimes dirty. The Town Panchayat was undertaking the responsibility to maintain the cleanliness of the toilets. The overall improvement is therefore a result of the combination of users' behaviour and the effort of the town panchayat. The use, maintenance and cleanliness of a number of observed toilets was far from satisfactory and in these cases also, users alone cannot be blamed. Many factors were found contributing to the improper use and

dirty conditions. The toilets were badly designed. The toilet at the bus park, Dudh Pati, Ward No. 17, is an example: the toilet cubicle is too large and there is no ventilation and insufficient light; one has to be very careful to search and find the pan. Similarly, toilet pans in most of the toilets are not steep enough to let the faeces glide down easily. The toilet at Suryamadhi, Ward No. 1, do not have sufficient or proper slope at the sewer outlet, thus the sewers are always blocked. There are also cases where the design of the toilet is not acceptable to the users and inconvenient to use. The toilet at Indrayani Pith is an example. Sometimes, due to non-function and non-use, the people prefer to convert a toilet building for an alternative use. At Bhelukhel, Ward No. 11, one has been converted into a school building (there is another functioning toilet located nearby) and local people at Bekhal, Ward No. 4, converted another into a hall for indoor games. Many toilets were too small to cope with the large number of people who wish to defecate at the same time in the early morning thus forcing the people to defecate around the toilet during peak hours. In many cases, sewer connections are often blocked causing the accumulation of faeces on the the pan and the floor. The toilet pans and water-shield in most of the toilets require a large quantity of water to flush the faeces away. In many toilets, maintenance problems in the water supply system result in a lack of water which contributes considerably to an accumulation of faeces on the pan forcing the people to defecate on the floor. However, in many cases there is a need and demand for users' education and awareness.

Physical defects in public toilets in 1982 and 1988 are recorded in Table 12.

Table 12

Physical Defects in Public Toilets, 1982 and 1988

Physical Defects	1982	1988
Pans blocked	6	4
Sewer connection blocked	6	4
Common tap broken, leaking, missing or blocked	13	6
Tank overflowing	15	9
Roofing tiles missing/broken	8	5
Individual taps missing, broken or not functioning	6	3
Floor pavement sunken or missing	5	2
Sunken pavement under common tap	5	3
Sewer outlet open; evidence of wet composting at the outlet	4	3
Water drain damaged	1	1
No light	26	23
Footsteps not functioning	1	-
Taps not installed	1	-
No roof	1	-
Septic tank overflowing	2	-
Sewer line leaking	1	-
Partition walls dismantled	2	2
Stopcock missing	1	-
Total no. of toilets observed	26	26

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

The construction of public toilets was continued under the follow-up programme of BDP through the Town Panchayat. By 1988, 37 toilets were recorded. However, only 28 toilets were re-observed here and the condition of the new toilets is not recorded. Out of 28, two toilets were converted to other uses and therefore only 26 toilets are recorded in the above tables.

2.1.3 The Toilet Users

Table 13

Number and Percentage of Household Members, With and Without Private Toilets, Using a Toilet, 1982 and 1988

Use	People in Households without private toilets		People in Households with private toilets		Total Average	
	1982	1988	1982	1988	1982	1988
Using a toilet	457 (47.2)	492 (71.6)	1105 (87.6)	1654 (96.4)	1562 (70 0)	2146 (89.3)
Not using a toilet	512 (52.8)	195 (28.4)	157 (12 4)	62 (3 6)	669 (30.0)	257 (10.7)
Total Sample Population	969	687	1262	1716	2231	2403

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988.

Note: Numbers in parenthesis represent the percentage

An increase of 24.4% in the number of toilet users was recorded in the households without private toilets in 1988. Of the households with private toilets, only 3.6% of household members in 1988, as against 12.4% in 1982, were recorded as not using their private toilets. The percentage of people using a toilet increased by 19.3% and, to date, only 10.6% of the population do not use a toilet of any kind.

Table 14

Number and Percentage of Children (1-12) of the Households With and Without Private Toilets, Using a Toilet, 1982 and 1988

Use	Children in houses without private toilets		Children in houses with private toilets		Total Average	
	1982	1988	1982	1988	1982	1988
Using a toilet	61 (19 4)	99 (50 5)	306 (70 7)	412 (89 6)	367 (49 1)	511 (77.1)
Not using a toilet	254 (80 6)	97 (49.5)	127 (29 3)	48 (10 4)	381 (50 9)	45 (22.1)
Total Sample Population	315	196	433	460	748	656

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

Note: Numbers in parenthesis represent the percentage

Among the children of the households without private toilets, the public toilet users in 1988 were 50.5% as against 19.4% in 1982. Also of the households with private toilets, only 10.4% of children in 1988, as against 29.3% in 1982 were recorded as not using their private toilets. Of them, some had unavoidable reasons why they did not use the toilet i.e. the child too small and not able to use, etc.

Table 15

Number and Percentage of Adults (13 & above), in households with and without private toilets, using the toilet, 1982 and 1988

Use	Adults in houses without private toilets		Adults in houses with private toilets		Total Average	
	1982	1988	1982	1988	1982	1988
Using a toilet	396 (60.6)	393 (80 0)	799 (96.4)	1242 (98 9)	1195 (80.6)	1635 (93.6)
Not using a toilet	258 (39.4)	98 (10.0)	30 (3.6)	14 (1.1)	288 (19.4)	112 (6.4)
Total Sample Population	654	491	829	1256	1483	1747

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

Note: Numbers in parenthesis represent the percentage

With regard to the adults of the households without private toilets, the public toilet users were recorded as 80.0% in 1988 as against 60.6% in 1982. The non-toilet users in households with private toilets were also only 1.1% as against 3.6% in 1982.

Table 16

The Advantages of Private Toilets as Perceived by the Owners,1982 and 1988

Advantages	No. of Responses	
	1982	1988
Prevention of communicable disease caused by excreta; creation of a clean and healthy environment	-	162
Change the behaviour of children	-	6
Removes the need to go far from the house	133	48
Time saving as there is no need to go outside to defecate	N.A	44
Convenient during the night, when raining, when in a hurry or when sick	N A.	16
Privacy	N.A.	4
Removes need to use dirty public toilet	N.A	2
Convenient for disabled people	N A	1
Total Sample Households	150	210

Source. Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988.

(Note: N.A. = data not available.)

In 1982, respondents cited no health benefits amongst their perceived advantages, whereas in 1988, health benefits were seen as the major advantages of private toilets.

2.2 Water Supply : Use and Misuse

2.2.1 Private Tap

Table 17

Distribution of Private Taps in Sample Households, 1982 and 1988

Description	1982		1988	
	No.	%	No	%
With private taps	177	59.0	188	62.7
Without private taps	123	41.0	112	37.3
Total Sample Households	300	100.0	300	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

The exact number of private taps in Bhaktapur in 1982 and 1988 is not known. In 1986, 3552 private taps were recorded by WSSC. However, Table 16 indicates private taps as being available in 62.7% of households in urban Bhaktapur in 1988.

2.2.2 Amount of Water Consumed

Table 18

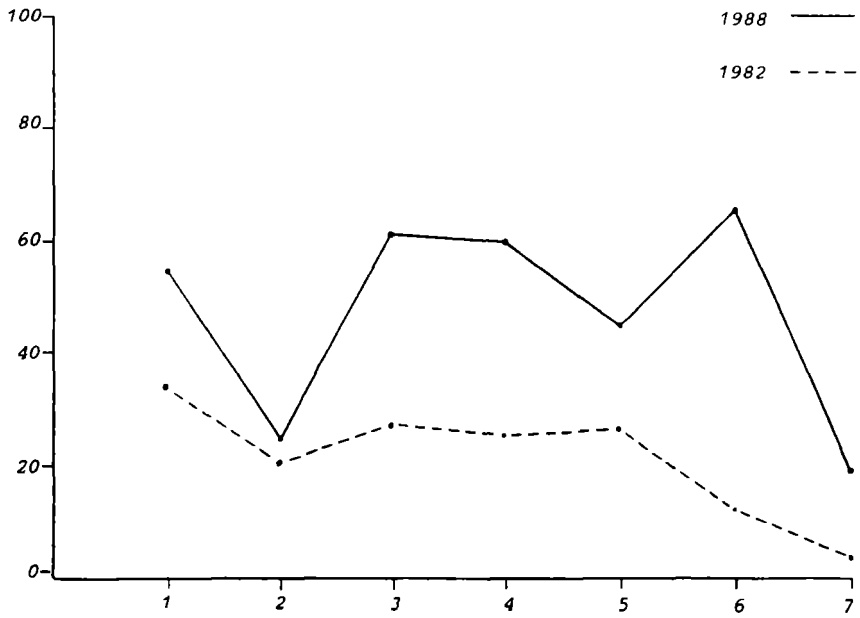
Average and Approximate Quantity of Daily Household Consumptionof Water per Household, With and Without Tap, for Various Purposes, 1982 and 1988

Purpose	Average & approx quantity per day per household (in litres)			
	Households with tap		Households without tap	
	1982	1988	1982	1988
Cooking	45	56	23	54
Drinking	23	26	18	24
Washing hands and household utensils	30	81	25	42
Washing clothes	36	52	15	68
Bathing	35	57	19	32
For use in the toilet	25	66	0 5	65
Others	3	21	5	18
Total	197	359	104.5	304

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

The calculation of the above table is based on the responses of the interviewees only. The measuring base was `gagro', as almost all the houses use it to store the water. As sizes of gagro differ from house to house, and the interviewee would often respond `a lot', the calculation is only approximate and cannot be taken as totally reliable. However, there was an increase in the water consumption of each household, with or without a private tap, for each purpose. This increase may be attibuted to :

- a sufficient supply of water made possible by the control of leakage and wastage of drinking water, and by the additional source of water



1. Cooking 2. Drinking 3. Washing hands & utensils
4. Washing clothes 5. Bathing 6. Toilet 7. Others.

Fig.-2: Daily mean consumption of water per household for different purposes, 1982 and 1988.

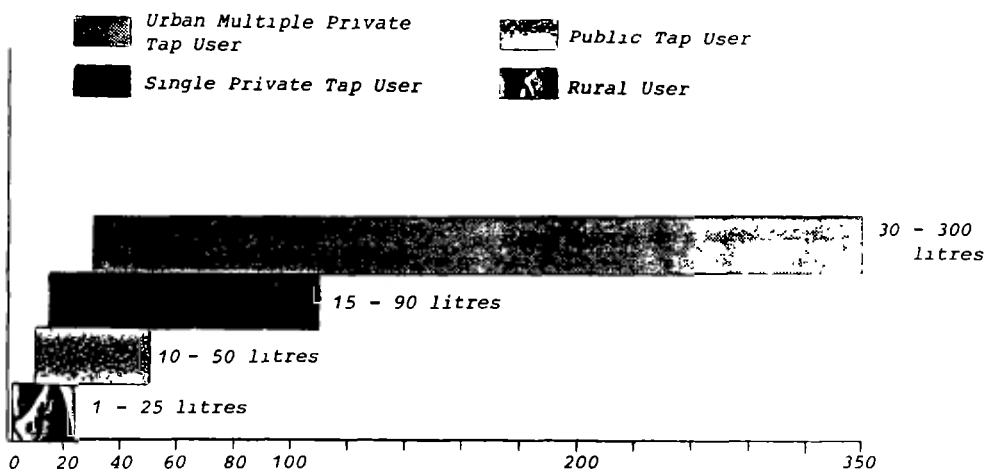


Fig.-3 Range of Daily Consumption per person in litres for major classes of water use in tropical developing countries [A.W. White].

- an increased use of water for personal and household health, hygiene and sanitation purposes.

2.2.3 Advantages of Private Taps

Table 19

People's Perception of the Advantages of Owning a Private Toilet, 1982 and 1988

Advantages	1982 Responses		1988 Responses	
	No	%	No.	%
Availability of potable water for all types of household use thus enabling more attention to be paid to health, hygiene and sanitation	10	5 6	78	415
No need to bring water from outside	75	42.4	57	303
Time saved	22	12 4	41	218
Can avoid unnecessary gossip or quarrels with others at the public tap	14	7 9	6	32
Convenient	-	-	58	309
No advantage	19	10 7	-	-
Don't know	1	0.7	-	-
No response	1	0 6	-	-
Others	6	3.4	13	69
Total Sample Households	177	100 0	188	100.0

Source: Evaluation of private toilet and tap programme, BDP, 1982 and field survey, 1988

2.2.4 Physical Condition of Private Taps in Terms of Leakage

No record of the condition of private taps in 1982 is available and any improvement by 1988 can therefore not be measured. However, out of 188 taps observed in 1988, 176 were in good condition.

2.2.5 Water Supply Hours : An Indicator of the Control of Leakage and Wastage

The paper, 'Urban Water Supply' presented by the Water Supply and Sewerage Corporation at the National Workshop on Water Quality in June 1988, states that the water supply hours in Bhaktapur have been greatly extended from 4 - 6 hours per day to 10 - 12 hours per day, mainly through control of leakage and wastage of drinking water. The household survey confirms the extension of water supply hours (Table 20). The quantitative increase in the use of water for household purposes also indicates that an increased supply of water is now available. However, the people complain that the supply in April, May, and June is still not satisfactory.

Table 20

Duration of Water Supply to Taps, 1988

Duration	No. of Responses
10 - 12 hours	83
8 - 9 hours	65
Uncertain	39

2.2.6 Control of Drinking Water Leakage and Wastage

The leakage and wastage of drinking water in Bhaktapur before 1982 was estimated as 70%. As a result, the supply hours were only 4 - 6 hours per day. The improvement in supply hours to 8 - 12 hours per day is a clear indication that leakage and wastage of drinking water is under control to a certain extent. It is believed that the Leak Detection and Repair Programme, carried out by BDP/GTZ through WSSC in 1985, as well as increased public awareness has contributed to this control.

Recently, Bhaktapur Town Panchayat formed a committee of representatives from concerned institutions; CDO, Police, WSSC, Plumbers and

Bhaktapur Town Panchayat, to control leakage and wastage of drinking water.

2.2.7 Water Quality

Water tests carried out before 1982 demonstrated that the drinking water at the reservoir and at the distribution entry point at Muladhoka was of acceptable quality, safe and potable. However, the drinking water became contaminated through leaks in the distribution pipelines which allowed shallow groundwater, and sometimes sewage, to intrude into the mains when the system was not under pressure.

Table 21

Bacteriological Test of Drinking Water From the Taps (1979)

Location	Coliforms MPN Index	E.Coli Count	Classification
WHO Standard	Should be absent or 1 - 10	Nil	
Indian Standard	1 - 10		
Muladhoka (eastern corner of town)	Nil	Nil	Excellent
Bholachhen	Nil	Nil	Excellent
Dattatraya	3	Nil	Satisfactory
Inaga	2	Nil	Satisfactory
Inacho	8	8	Unsatisfactory
Golmadhi	25	1	Unsatisfactory
Durbar Square	160	3	Unsatisfactory
Taulachhen	180	7	Unsatisfactory
Itachhen	180	7	Unsatisfactory
Taumadhi	180	180	Unsatisfactory
Bolachhen	180	180	Unsatisfactory
Dudhapati (western corner of town)	180	180	Unsatisfactory

Source: Statistical record, BDP Planning Section, 1979

Water quality deteriorated from the middle part of the town onwards to the western part of the town, indicating that drinking water was contaminated in the pipelines. The presence of E. Coli/Coliforms indicates faecal contamination in water. Bacteriological analysis of the drinking water for 1988 is not available and it is therefore not known how far the water quality has been improved by the control of leaks in pipelines.

With regard to the chemical analysis of water distributed at Bhaktapur from the Mahadev river, the majority of elements/parameters had a value within the WHO guidelines. However, the quality of ground water recently distributed at Bhaktapur is considered to be not as good as had been expected. The people have complained of a rusty brown colour and the presence of light particles of floc caused mainly from iron elements dissolved in the water. Present chemical analysis data is not available. However, the significant concentration of iron in the ground water is considered far beyond the WHO standard for potable water (highest desirable concentration is 0.3mg/l).

2.3 Sewerage System : Use and Misuse

A combined sewerage system with closed pipes was introduced in Bhaktapur to collect all the liquid waste, surface run-off and sewage together. Before this system was introduced, the local farmers made extensive use of freely running waste water to irrigate their fields and gardens. The installation of a combined sewerage system decreased the farmers' sources of irrigation water. To counteract this, the farmers blocked the main sewer pipe adjacent to the manholes and either directed the resulting overflow from the manholes to their fields or collected accumulated sewage in buckets. Alternatively, they blocked the manhole itself and the overflow coming directly from the sewer pipeline was used for irrigation purposes. These practices created the following problems:

- obstructions of the proper functioning of the sewerage system,

- infection of the town streets with raw sewage thereby creating health hazards to the population,

- the handling of raw sewage was a health hazard to the farmers themselves.

The absence of data on the sewerage situation (i.e. at how many places such practices took place) before 1982 prevents this document examining to what extent these practices have been controlled. However, general

observations indicate a great reduction in the number of blocked manholes.

Similarly, almost all of the clogged inlet chambers in the vicinity of schools have been cleaned during school to school clean-up campaigns organised by teachers and students.

2.4 Environmental Cleanliness

The responses to the household survey indicate that there has been a perceptible increase in cleanliness on the part of most family members. Observers generally note an improvement in environmental and personal hygiene practices but frequent visitors to Bhaktapur see the changes primarily in the main streets and courtyards. Courtyard rehabilitation and street pavement is continuing after the end of BDP. In some places, local households have taken the initiative by starting to pay a regular amount to sweepers assigned to maintain the cleanliness of the streets and other public areas. In this way, a start has been made in the taking of community initiatives for environmental cleanliness. The majority of respondents in the household survey also now link cleanliness with health benefits and aesthetic reasons. However, the cleanliness conditions of major parts of the town, although improved, are still not satisfactory. The people have only a restricted idea of how they, in their individual capacities, can cope with such a huge problem as daily waste creation. Many people are aware but they are still not able to take effective action. At this stage, the creation of waste could be greatly reduced if better ideas of reusing and recycling, together with a proper waste disposal system, could be promoted and provided to the people.

2.5 Cost Per Unit of Toilet, Tap and Water Tank

Prior to the school health education programme, the amount estimated by the project for assistance with toilet, tap and water tank facilities for a lower secondary and secondary school was Rs. 20,000/- each, and for a primary school Rs. 10,000/- each. Even with this provision, 18 and 16 out of 38 schools did not take any initiative to install toilets or water tap/tanks respectively. They preferred instead to extend their classrooms and school buildings.

During the programme, the participation of schools and the community was high and some groups completed both the installation of the tap and construction of the toilet (with two cubicles) with only Rs. 3,500/- support from the project.

It is therefore evident that increased awareness reduces the costs involved in development work.

Table 22

Number of Toilets, Taps and Water Tanks in Schools, 1982 and 1988

Facilities No.	1982		1988	
	No.	%.	No.	%
Toilet	20	52 6	36	947
Tap	22	67.9	35	921
Water Tank	18	47 4	33	968
Total no. of Schools	38		38	

3. DECLINING COMMUNICABLE DISEASES

The health status of Bhaktapur recorded in 1988 after the health education programme presents an interesting picture of decreasing, although still considerable, morbidity and mortality. The following data is given to clarify the situation with regard to health status in 1982 and 1988. The data is taken from various sources in order to give an overall view of the real situation; data from one source only may unreliable.

3.1 Record of Public Health Section of Bhaktapur Town Panchayat

Table 23 indicates a decline in the number of patients being treated for communicable diseases at the Public Health Section of Bhaktapur Town Panchayat and, if "home-based" treatment and hospital visits have not substantially increased, it can be assumed that the incidence of communicable diseases is decreasing.

Table 23

Annual Distribution of Patients Treated for Major Communicable Respiratory Diseases in the Public Health Centre of Bhaktapur Town Panchayat 85/86 - 87/88

Disease	Number of Patients by years		
	1985/86	1986/87	1987/88
Diarrhoea	4207	3451	1347
Dysentery	2278	3162	855
Hepatitis	47	3	8
Worm disease	2798	3140	1122
Abdominal pain	1909	4769	2075
Typhoid	8	17	4
Skin disease (Scabies etc)	623	501	488
Asthma	570	524	337
Tuberculosis	12	40	7
Bronchitis	108	77	18

Source: Bhaktapur Town Panchayat, 1988

3.2 Hospital Record

Hospital records (Table 24) also show a substantial decline in patients with communicable diseases as against no such improvements before 1982.

Table 24

Annual Distribution of Admitted Patients Treated for Major Diseases in Bhaktapur Hospital, 2040/41 -2044/45

Disease	Number of Patients by years			
	2040/41	2041/42	2042/43	2044/45
Abdominal pain	324	342	154	105
Anaemia	53	23	6	4
Poisoning Cases	117	186	73	N.A.
Bronchitis	N.A	154	211	115
Burn Cases	138	183	36	N.A
Tuberculosis	184	128	66	N A
Meningitis	418	18	11	21
P.U.O.	184	123	167	39
Gastro-enteritis	545	515	847	684
Typhoid	74	8	97	196
Measles	74	28	-	16
Malaria	20	3	-	3
U T I	94	186	36	45
Phyrengitis	74	-	-	-
Tooth Diseases	N.A	3163	2991	1553

Source: Bhaktapur Hospital, 1988

(Note: N.A. represents the non-availability of data)

A decline is recorded in almost all the cases of illness of the patients admitted to the hospital except typhoid. Gastro-enteritis also does not have an encouraging record. Causes are taken for granted as defects in the water supply system which still represent a great risk in the possibility of an epidemic of diarrhoeal and typhoid diseases in Bhaktapur.

3.3 Personal Observations of Doctors and Medical Shops

Personal observations from doctors and medical shops indicate a decline in communicable disease but no quantitative data is available. Calculation of each year's sales of medicines for communicable diseases at medical shops was beyond the scope of this document.

3.4 Household Survey

The household survey confirms the records of Bhaktapur Hospital and the Public Health Centre of Bhaktapur Town Panchayat.

Table 25

Yearly Distribution of Persons Infected by Selected Communicable Diseases, 1985 -1988

Disease	% of Infected People in Sample Population		
	1985/86	1986/87	1987/88
Gastro-enteritis (Diarrhoea, Dysentery)	27 4	25 3	24.9
Infective hepatitis	6 0	3 9	2.4
Abdominal pain	17.5	16.9	12.6
Roundworm	17.8	15.7	8.8
Typhoid	6 3	4.8	4.9
Skin disease (Scabies etc)	8 9	8.5	5.8
Measles	3 4	5.9	1 6
Tooth disease	10.7	9 8	8.0
Total no. of sample population			2603

An encouraging change has been noted in all types of communicable disease except typhoid.

3.5 Differences in Worm Infection

The difference in the level of worm infection in 1981 and 1988 is shown by the stool tests carried out in Bhaktapur the results of which are given in the following tables.

Table 26

Parasite Infection Rates, 1981 and 1988

Description	1981		1988	
	No	%	No	%
Positive Cases	3898	91 0	816	78 0
Total no. of stool tests	4295	100 0	1046	.100.0

Source: Integrated Family Planning and Parasite Control Project, (IFPPCP), 1981 and Field Study with the technical support of IFPPCP, 1988

Table 27

Distribution of Parasite Infection Rates by Years, 1981-1988

Description	Percentage				
	1981	1983	1985	1987	1988
Parasites positive	91%	97%	96%	86%	78%

Source: IFPPCP, 1987 and Field Study with the technical support of IFPPCP, 1988

It is not clear if parasite reduction in 1988 is significant or not. However, the following evidence indicates that it is.

a) The first stool tests were carried out in 1979-81. Extensive health education took place only in 1986-87. This time gap of 5 years is more than sufficient for re-infection to occur. Re-infection by worms usually takes place within 3 months if preventative measures are not practised.

b) At Bhelukhel, where the Alternative Sanitation Scheme was carried out, the reduction in worm infection was 13.8% in 1985.

c) In Kathmandu, where the economic conditions, urban infrastructure, literacy and living standards are better than in Bhaktapur, the worm infection rate was 89.9% in 1985.

Although the infection rate in Bhaktapur is still considerable, the reduction from 97% in 1983 to 78% in 1988 cannot be considered as insignificant either.

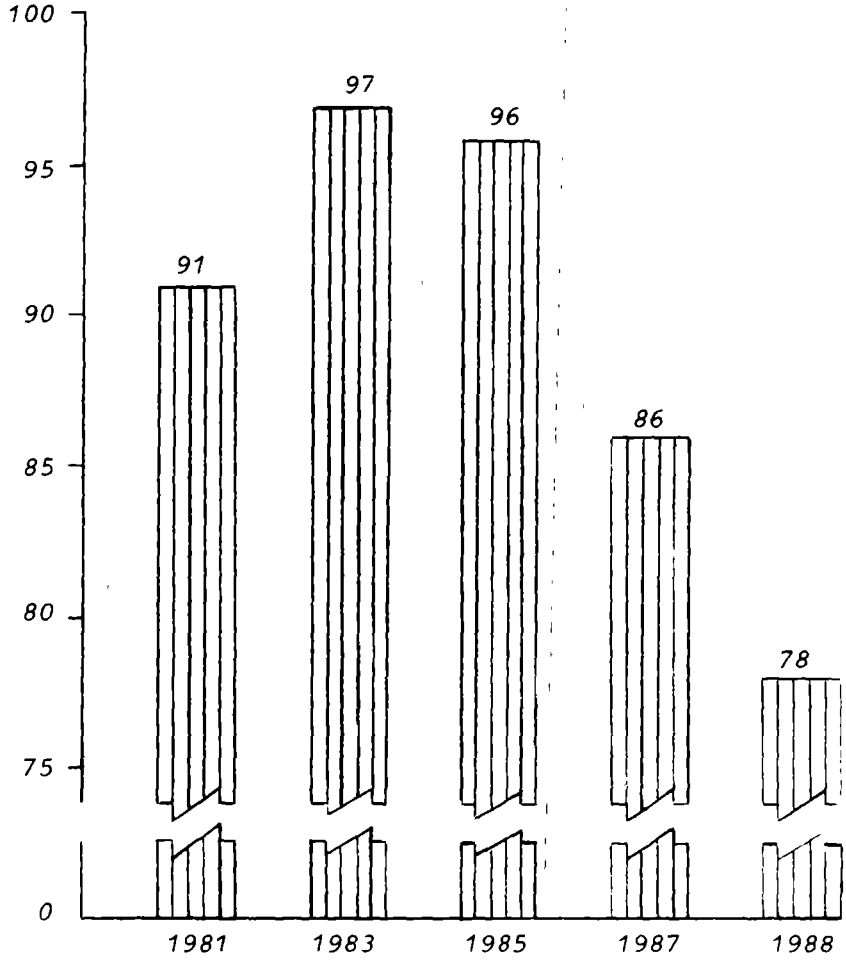


Fig.-4: Distribution of Prevalence Rate of Parasite Infection by years 1981-1988.

Table 28

Yearly Infection Rates of Helminthic Parasites, 1981 - 1988

Types of Helminthic Parasite	Infection Rate			
	1981	1986	1987	1988
Roundworm	75.8%	65 1%	66.5%	62 4%
Hookworm	7.1%	6.5%	2.5%	2.3%
Whipworm	40.6%	24.7%	19.3%	28 1%

Source: IFPPCP, 1981, 1986 and 1987, and Field Study with the technical support of IFPPCP, 1988.

There has been a substantial decline in all types of helminthic parasites. The rate of decline appears to have been most rapid in the cases of hookworm and whipworm from 7.1% and 40.6% to 2.3% and 28.1% respectively. However, in the case of roundworm, the decline rate is slow; from 75.8% to 62.4%.

Table 29

Age-group Infection Rate by Type of Parasite, 1981 and 1988

Types of Helminthic Parasites	Infection					
	1-12 yrs		13 yrs & above		Total	
	1981	1988	1981	1988	1981	1988
Roundworm	1544 (73 1)	221 (56 8)	1712 (78.4)	432 (65.7)	3256 (75.8)	653 (62 4)
Hookworm	97 (4 6)	5 (1 8)	209 (9 6)	19 (2.8)	306 (7 1)	25 (2 3)
Whipworm	853 (40 4)	62 (15.9)	890 (40 8)	134 (20 4)	1743 (40 6)	190 (18.1)
Total no.of stool tests	2112	389	2183	657	4295	1046

Source. IFPPCP, 1981 and Field Study with the technical support of IFPPCP, 1988

(Numbers in parenthesis represent percentages)

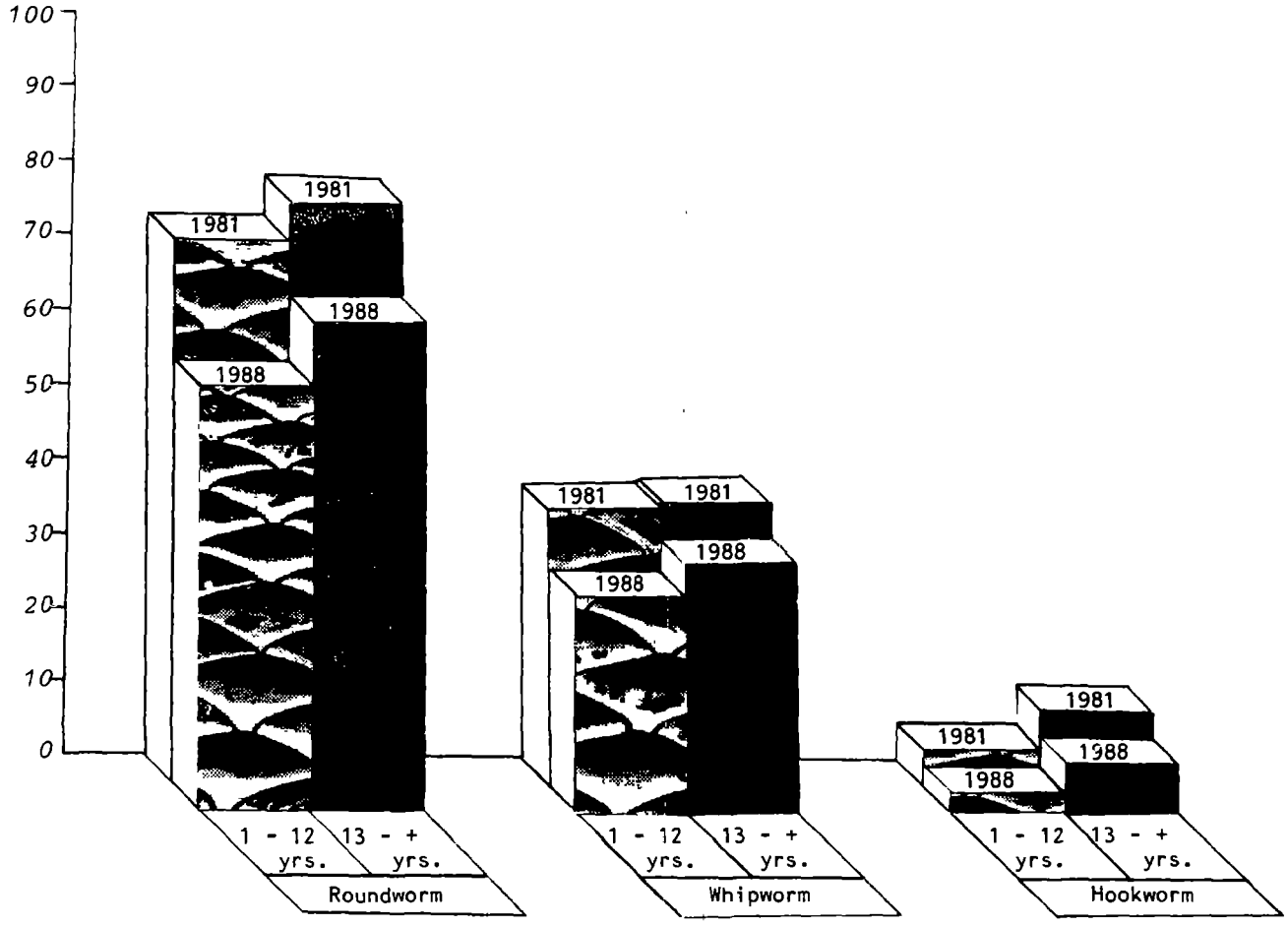


Fig.-5: Age-group Prevalence Rate of Parasite Infection by Type of Parasite - 1981 and 1988.

The reduction of roundworm is higher in children, the infection rate being 56.8% in 1988 against 73.1% in 1981. With regard to hookworm and whipworm the reduction is higher in adults (infection rates of 2.8% against 9.6% and 20.4% against 40.8% respectively) than in children (infection rates of 1.8% against 4.6% and 15.9% against 40.6% respectively).

Table 30

Selected Parasite Infection 1985 and 1988

Parasite	Infected Children					
	1985		1987		1988	
	No	%	No	%	No	%
Entamoeba histolytica	N A		N A.		45	4 3
Giardia Lamblia	102	6 2	271	12 2	59	5 6
Hyssenolepsis nana (Tapeworm)	21	1 3	0 17	0.8	7	0 7
Total no of stool tests	1654		2217		1046	

Source: Integrated Family Planning and Parasite Control Project, 1986-87 and Field Study with the technical support of IFPPCP, 1988

(Note: N.A. represents data not available)

4. CONCLUSION

Effective health education has proved to be both an essential and cost effective component of the total effort to achieve good health, participatory development by the local population and improved living conditions. Despite this, the health education component in many development projects is either neglected or given inadequate support. The initial three phases of Bhaktapur Development Project were equally guilty of this with the consequence of unexpected problems and negative feedback. It is believed that these might not have occurred if health education activities and a participatory approach had been started from the very beginning. Even the local people have started to realise that, if the software aspects, together with the hardware approach, had been given due consideration from the beginning of the project, far more people would have been benefited within a relatively short period for less investment by the project.

In its final phase, the project accepted on the basis of its own experience that:

- without individual and community actions facilitated by health education and a participatory approach, a major effect on the health, all-round development, and living conditions of the entire community cannot be achieved;

- assisting in the physical development and urban infrastructure has little effect if the user population or community do not understand their value or properly use and maintain them;

- community awareness of the existing problems is essential to generate long lasting community participation in local development.

There was still the problem of how to run a health education programme by involving the local community. There was no guarantee that the community would indentify health concerns as their primary problem. On the other hand, health education should be a participatory process with a practical approach through which people develop an understanding of:

- their serious health problems;

- the grave consequences of the problems;

- why the problems exist;

- how they can be solved and prevented;

- how to tap available resources and overcome barriers in order to solve the problems, improve their health and living conditions and expand local development.

Thus, from the very beginning of the programme, the project tried to concern itself with careful and time-consuming participatory planning, implementation and evaluation. The participatory process, providing information and a behavioural approach became part of the programme. Changing people's habits, and attitudes, and conditions that have been existing for a long period requires a sustained period of involvement and follow-up. The programme initially faced many difficulties in securing the actual participation necessary to implement change but the perseverance of everyone involved and the introduction of radical methods produced encouraging results in the end. However, there is still a long way to go before the desired goals are reached.

This document has been produced so that the experience can be used in a similar, modified or improved way elsewhere. Rather than presenting theory, this document has therefore examined the practical experience.

A P P E N D I C E S

RESEARCH APPROACH AND METHODOLOGY

The programme used a variety of approaches and methodologies in undertaking survey research work and collection of information within the programme period. They are described below in brief.

A. ALTERNATIVE SANITATION SCHEME

1. BASELINE INFORMATION

The question was put: should the project carry out an extensive household survey before starting the scheme? It was felt that the people has already been asked for a great deal of information with few apparent benefits as a result It was decided that a further household survey would be counter-productive and that emphasis should be placed on gaining the trust of the people and developing a system whereby they could participate in project activities The activities of the scheme were planned on the basis of information which was collected by various methods:

* Environmental Sanitation Walk

  The walk covered the whole project area, observers noted their observations using the specially prepared checklist as a guide.

* Key-Informant Interviewing

  In conjunction with observations made during the walk, interviews were carried out with key-informants. Youth club chairmen and members, locally respected elders and leaders, and hospital doctors were considered as useful sources of relevant information. The information collected through formal and informal interviews was pieced together to give an overview of the situation. However, it must be said that some of the information, excepting that from doctors, was subject to some bias

* Secondary Data

  A third source of information was the secondary data collected from existing BDP reports and records of concerned local institutions.

2. STOOL TEST

Stool tests played an important role in launching the scheme. Early on, a stool test was carried out on all the project area population with the exception of children less than one year old, sick people and pregnant or lactating women. 95% of people tested were found to have parasites When given medication, the people saw the large

number of roundworms excreted by themselves and their neighbours and consequently realised that they were not as healthy as they had imagined and that something was wrong. By arranging this graphic example of worm infestation the community workers stimulated the people to take action against health hazards.

Data obtained from stool tests was also used as a measuring tool to evaluate the impact of the scheme on the health status of the population.

3 SOIL TEST

Three locations were selected, based on observed soil type, for carrying out in-situ soil permeability tests to establish their suitability as sites for the construction of double pit sulabh latrines. Factors taken into consideration were soil type, voids in the soil mass and the resulting flow rate of water through the soil. The following steps were taken at each location

An auger borehole was made to a depth of 1.5m and a casing then inserted so that the bottom of the casing rested approximately 25 cm above the bottom of the borehole. The borehole was made perfectly clean and the casing was then filled to the brim with clean water. The water was allowed to flow into the soil surrounding the uncased portion of the borehole until the rate of flow became steady. The casing was again filled to the brim with clean water and the drop in water level was measured against a set period of time. The process was repeated many times and the last 4 observations were used to calculate the permeability of the soil

One location tested in this way was found to have poor permeability which resulted in the problem of water accumulating in the pits while the toilet was being built. As recommended, the walls and bottom of the pit were covered to with an approximately 15 cm thick layer of sand. This had the effect of improving the drainage of the pit.

4 COMPOSTING AND SURVEY

It was observed during the environmental sanitation walk that a great deal of wet composting was being indiscriminantly and hazardously carried out within the project area, particularly in the vicinity of the river It was assumed, wrongly as later became apparent that the wet composting was being carried out by the local inhabitants (composting is a traditional occupation in this area) A survey was carried out, through structured questionnaires, with the view of modifying wet composting practices in order to make them less hazardous. The survey revealed that the wet composting was being done by farmers of nearby locations and not by the local people Consequently, the planned campaign for 'safe wet

composting' was cancelled and campaigning restricted to other types of composting.

5. EVALUATION

Evaluation of the scheme was conducted at the end of the first phase simply to gain a clearer understanding of what should be retained and what should be changed in future programmes The evaluation was based on the following·

* Household Interview

A questionnaire was administered to 77 households. Each component of the programme was listed with accompanying 'open ended' questions; for example: 'What was good and what was bad about a particular component?', 'Why did they like or dislike a particular component?', 'How was a particular component carried out and how should it have been carried out?', 'What improvements or changes could be made?'

The purpose of the household interview was not to collect hard data but to encourage candid communication between the project and the local population. The results of the interviews were thus more of an anthology of case studies for each programme component.

* Brainstorming Session

A 5 hour brainstorming session took place with members of the user's committee Here again, emphasis was placed on encouraging frank communication between the project and the user's committee and not on the collection of specific data. In addition to the questionnaire used in the household interview, three other general questions were asked: 'What was right?', 'What was wrong?' and what suggestions could they make for the improvement of the future performance of the scheme? The session proved to be very lively and all comments were recorded and collated to produce the overall opinion of the group.

* Key-Informant Interviews

At this time key informants were community workers, volunteers and BDP members. The same three general questions as in the brainstorming session were asked

(Please see the evaluation result in 'Alternative Sanitation in Bhaktapur, Nepal An Exercise in Community Participation')

6. BASELINE HEALTH SURVEY

After the elapse of some time following the implementation of the scheme it was felt that it would have been interesting to evaluate its actual impact on the community It was at this stage therefore that the lack of pre-scheme data was felt Carrying out such a survey at this stage would involve much time and expense

However, there was another aspect to be considered. After the construction of toilets had been completed the people were asked what further sanitary improvements they would like to see carried out in Phase II. One thing they asked for was more health education, but what kind of health education and in what field? Child-care? Pre-natal - post-natal care? Nutrition? Safe water-handling? Hygiene? Sanitation? Behavioural health problems? etc. The question then was how to collect sufficient information so that further health education could be custom made to the local situation. At this stage a four-point survey was conducted.

All research methods have advantages and disadvantages and after considerable discussion it was decided to use a combination of approaches.

* Participant Observation

  The first approach was an abbreviated form of participant observation which involved the collection of qualitative information based on observations made by one of the authors in selected households This method is normally employed over longer periods of time than we were able to allow. Because of lack of time and the need to apply other methods as well, the researcher was resident with each selected household for one week only. She followed household members (mainly the women and children) through their daily routines from early morning rising to retiring at night, recording their behaviour and her observations.

  Criteria were established whereby it was ensured that the households visited were representative of all types of people living in the area.

* Open-Ended Questionnaire

  The second approach was a survey of all households in the area using an open-ended questionnaire Each household gave different types of responses which, although they helped to evaluate the effect of the scheme, made it difficult to obtain quantitative data. It should also be noted that it was necessary that the enumerator should be sufficiently skilled to keep the interviewee to the point.

* Closed Questionnaire

In order to gain specific hard data, a closed questionnaire was later added.

* Follow-up Stool Test

After the toilets had been in operation and the people practising preventive measures for one year a second series of stool tests was carried out on those people who were tested in the beginning The second set of stool tests was to determine the extent of re-infestation by parasites If preventive measures are not practised, re-infection is evident in stool tests three months after medication

The stool tests thus provided direct and effective measurement of how far the health education and sanitation measures had affected the health status of the community

* Environmental Pollution Test

In order to identify potential sources of parasite infestation outside the latrine, environmental pollution tests of various materials and locations such as kitchen dust, vegetable dust, latrine dust, playgound/street dust, childrens' nails, hand smears etc. were carried out. Samples were taken from 29 houses, (every fifth house was tested), while the selection of children for testing was made simply by calling whichever children were present in the street at the time.

B SCHOOL HEALTH EDUCATION

1 BASELINE INFORMATION

The baseline study as it was originally planned was not carried out due to lack of time. Instead, the required information was obtained by similar methods as those used in the Alternative Sanitation Scheme.

* School Environmental Sanitation Walk

Researchers visited all schools and their surrounding areas noting their observations and various information using a pre-prepared checklist as a guide

* Key-Informant Interviews

Key-informants were the District Education Officer, a representative of the Curriculum, Textbook and Supervision Development Centre, school health teachers and concerned specialists and officials.

* Secondary Information

Any relevant documents such as reports, papers and school records (including class schedules) were considered as sources of secondary information.

* Teaching Observation

The actual way in which teaching was being conducted was observed in a few schools.

C. EVALUATION OF TOILETS, TAPS AND HEALTH STATUS

This evaluation was carried out after health education had been in operation for two years to find out whether there had been any changes or not. No sophisticated statistical tools were used; the study was based on site inspections, interviews, secondary sources of data and stool tests. In some cases, primary information was also referred to in order to reveal how the situation had changed over a period of time. Precautions were taken to reduce any bias in the results as the responsibility for the evaluation, as well as the planning and implementation of the health education programme, rested largely with the authors.

1. SITE INSPECTION

* Public Toilet Inspection

Those public toilets which had been inspected in 1982 were inspected again at this time. A checklist based on the 1982 observations was developed so that the same components could be compared

* Private Toilet and Tap Inspection

This was carried out at the same time as the household interview. Once the interview was completed the enumerator would inspect the private toilet and tap and record his observations on a sheet attached to the questionnaire

* Environmental Walk

Observers walked thoughout the town recording the condition of street cleaning, courtyards, public taps, sewerage inlet chambers, sewerage house connections, sewerage manholes, stone taps, ponds, waste disposal etc However, the recorded conditions are not given in this document as it is not possible to compare the situation over time because pre-evaluation data is not available and a sophisticated survey was not carried out for the purpose

2. INTERVIEWS

* Household Survey

The evaluation of the toilet and tap programme was carried out by BDP in 1982. The evaluation tools used at that time were used as the basis for the evaluation now so that the two sets of results would be in comparable formats.

a. Questionnaire Development

Questionnaires were constructed in such a way that it was possible to control the information obtained It was vital that the information from each respondent should be directly comparable and could be tabulated accordingly This was done by using both open-ended and closed questions. Two types of questionnaire were developed; one for households with a private toilet and tap and the other for those households without

b. Training of Enumerators

Five enumerators were recruited so that the field operations could be completed within 14 days. They were provided with theoretical and practical training on the techniques to be applied during the field work with special emphasis being placed on the need for objectivity They were also briefed on the background of each question.

c. Pre-Testing

A trial run of the questionnaires was conducted in the presence of the authors. This enabled the questionnaires to be modified if questions did not elicit a meaningful response, and also to give the enumerators further instruction on questioning techniques where necessary.

d. Sampling

In 1982 sampling was carried out in only 7 wards (nos. 1, 3, 4, 5, 6, 7 and 8) from which 300 households were selected by stratified random sampling; 150 households with toilets and 150 households without toilets. However, in this case sampling was carried out differently. It was not stratified in any way and was done on a sequential basis throughout all 17 wards to select 300 households

3 SECONDARY INFORMATION

Secondary information and data from sources such as IFPPCP, Bhaktapur Hospital, Bhaktapur Town Panchayat, BDP and other relevant documents was used to support and supplement the evaluation.

4. FOLLOW-UP STOOL TEST

The Integrated Family Planning and Parasite Control Project (IFPPCP) had been conducting stool tests in Bhaktapur from 1979. Results (79% in 1979, 91% in 1981 and 97% in 1983) showed a definite upward trend despite the provision of sanitation facilites. This, combined with the ovewhelmingly high incidence of parasitic infection in Bhaktapur decided the authors to use stool tests as a tool to measure the effect of health education and sanitation measures on the status of health in the community.

Stool test data up to 1987 was available from IFPPCP. It was felt that data for 1988 was also necessary and, as far as was possible, the same population tested in previous years was tested again

The reason for testing people with a previous history of stool tests was that the likelihood of re-infection is greatly reduced if preventive measures are scrupulously adhered to

D. PRE-TESTING OF MATERIALS

The project produced many materials for use in the health education programme. A proto-type of each item was tested on the target population if at all possible or, failing that, on a group of similar people, to see if it was understood in the desired way before final production was carried out.

In pre-testing the following points were taken into consideration:

* Was the item well accepted by the target group?

* Did people get the message straight away or were they confused by details?

* Did people follow the sequence of subjects or messages?

* Did any part of the item cause embarrassment?

* Was the item interesting?

Appendix B-1

MAJOR PATHOGEN AGENTS EXCRETED IN FAECES
Causing Diseases or Major Sumptoms Preventable Through Sanitary Barriers and Health Education

A. MAJOR PATHOGENS EXRETED IN FAECES		
1. Viruses	1.1 Enteroviruses	1 1.1 Poliovirus
		1.1 2 Echovirus
		1 1.3 Coxsackiee Virus A&B
		1 1.4 New enteroviruses
	1.2 Hepatitis A Virus	
	1 3 Rotaviruses, Norwalk agent and other viruses	
2. Bacteria	2.1 Campylobacter fetus subspecies jejuni	
	2.2 Pathogenic Escherichia coli	
	2.3 Salmonella	2 3 1 Salmonella Typhi
		2.3 2 Salmonella Paratyphi
		2 3.3 Other Salmonellae
	2.4 Shigella species	
	2.5 Vibrio	2.5 1 V Cholerae
		2 5.2 Other Vibrios
	2.6 Yersinia enterocolitica, Y pseudotuberculosis	
3. Protozoa	3.1 Balantidium coli	
	3.2 Entamoebahystolytica	
	3.3 Giardia Lamblia	
4. Helminths	4 1 Hematodes	4 1 1 Ancyclostoma duedenale, Necator americanus (Hookworm)
		4.1 2 Ascaris lumbricordes (Roundworm)
		4.1.3 Enterobius vermicularis (Pinworm)
		4 1 4 Strongyloides stercoralis (Threadworm)
		4.1.5 Trichuris trichuria (Whipworm)
	4.2 Cestodes	4 2 1 Dyphyllobothrium latum (Broad tapeworm)

	4.2.2 Hymenolepsis nana (Dwarf tapeworm)
	4.2 3 Taenia saginata (Beef tapeworm)
	4.2.4 Taenia solium (Pork tapeworm)
4.3 Trematodes	4 3.1 Chlonorchis sinensis (Liver fluke)
	4.3.2 Opisthorchis
	4.3.3 Schistosome - s haematobium (excreted in urine) - s. japonicum - s. mansoni
	4.3.4 Paragonimus westermani (Lung fluke)
	4 3.5 Fasciolopsis buski (Intestinal fluke)

B MAJOR DISEASES OR SYPMTOMS CAUSED BY THE INFECTION OF ABOVE LISTED PATHOGEN AGENTS EXCRETED IN FAECES

1. Viruses	1.1	Poliomyelitis (paralysis, malaise, stiffness)
	1.2	Meningitis
	1 3	Fever
	1.4	Diarrhoea
	1 5	Respiratory disease
	1.6	Encephalitis
	1.7	Conjunctivitis
	1.8	Infectious Hepatitis
	1.9	Gastroenteritis (Diarrhoea, vomiting, etc)
2. Bacteria	2.1	Gastroenteritis (Diarrhoea, vomiting)
	2.2	Typhoid
	2 3	Paratyphoid
	2 4	Food poisoning (Diarrhoea, abdominal pain, nausea, vomiting, dehydration)
	2 5	Salmonelloses
	2 6	Shygellosis (bacillary dysentery including diarrhoea)
	2.7	Cholera
	2.8	Miscellaneous conditions
3. Protozoa	3 1	Diarrhoea
	3 2	Dysentery

	3.3 Colonic (part of large intestine) ulceration
	3.4 Amoebic dysentery
	3.5 Liver abscess
	3.6 Malabsorption
	3.7 Giardia (cramps, diarrhoea, bloating, fatigue, weight loss)
4 Helminths	4.1 Hookworm (anaemia, weakness, weight loss, nausea, constipation)
	4.2 Ascariasis (respiratory, digestive or abdominal disturbances, bowel obstruction, coughing, weakness
	4.3 Enterobiasis (anal itching, irritability, causes appendicitis)
	4.4 Strongyloidiasis - skin inflammation, - lung or abdominal disturbances - weakness, discomfort
	4.5 Trichuriasis - bloody stool - diarrhoea - abdominal pain - weight loss
	4.6 Diphyllobothriasis - anaemia - diarrhoea - obstruction
	4.7 Hymenolepiasis
	4 8 Taeniasis - digestive disturbances
	4 9 Cysticercosis - disturbances of * eye * heart * central nervous system
	4.10 Chlonorchiasis, Opisthorchiasis - diarrhoea, abdominal and liver disturbances
	4 11 Schistosomiasis, bilharziasis - blood urination - obstruction - bladder tumours - dysentery-like symptoms - liver cirrhosis
	4 12 Paragonimiasis - blood coughing - cerebral disturbances

Appendix B-4

Water-related diseases with their water associations and their pathogenic agents

S. No.	Water-related diseases	Category	Pathogenic agent
1.	Amoebic dysentery	Faecal-oral (water-borne or washed)	Protozoa
2.	Ascariasis	Faecal-oral	Helminth
3	Arboviral infections (some)	Water-related insect vector	Virus
4.	Bacillary dysentery	Faecal-oral	Bacteria
5	Balantidiasis	Faecal-oral	Protozoa
6	Cholera	Faecal-oral	Bacteria
7	Conjunctivitis	Water-washed	Miscellaneous
8	Clonorchiasis	Water-based	Helminth
9	Diarrhoeal disease	Faecal-oral	Miscellaneous
10	Diphyllobbothriasis	Water-based	Helminth
11.	Dengue	Water-related insect vector	Virus
12.	Enteroviruses (some)	Faecal-oral	Virus
13	Fasciolopsiasis	Water-based	Helminth
14.	Filariasis	Water-related insect vector	Helminth
15.	Flea-borne, louse-borne tick-borne, & mile-borne typhus	Water-washed	Rickettsiae
16.	Gastroenteritis	Faecal-oral	Miscellaneous
17	Giardiasis	Faecal-oral	Protozoa
18	Guinea worm	Water-based	Helminth
19	Hepatitis (infectious)	Faecal-oral	Virus
20	Leptospirosis	Faecal-oral	Spirochaete
21	Leprosy	Water-washed	Bacteria
22.	Louse-borne relapsing fevers	Water-washed	Spirochaete
23.	Malaria	Water-related insect vector	Protozoa
24.	Onchocerciasis	Water-related insect vector	Helminth
25.	Paratyphoid	Faecal-oral	Bacteria
26	Pargonimiasis	Water-based	Helminth
27	Scabies	Water-washed	Miscellaneous
28.	Skin sepsis & ulcers	Water-washed	Miscellaneous
29	Schistosomiasis	Water-based	Helminth
30	Tularaemia	Faecal-oral	Bacteria
31	Typhoid	Faecal-oral	Bacteria
32.	Tinea	Water-washed	Miscellaneous
33.	Trachoma	Water-washed	Virus
34	Trypanosomiasis	Water-related insect vector	Protozoa
35	Yaws	Water-washed	Spirochaete
36	Yellow fever	Water-related insect vector	Virus

Appendix C-1

LIST OF RESOURCE PERSONS IN TRAINING PROGRAMMES

A School Health Education

1. Dr. Kedar Nath Shrestha, Chief; Curriculum, Textbook and Supervision Development Centre; Ministry of Eduction.

2 Ms. Chandri Joshi, Under Secretary, Chief, Women Development Section, Ministry of Panchayat and Local Development.

3 Dr Rajendra Kumar Rongong, Director, Curriculum Development Centre, Tribhuvan University

4 Prof Gobinda N. Jyapoo, National Training Commissioner, Nepal Scout.

5 Dr. Devi Bahadur Shrestha, Ex. Asst Dean, Institute of Medicine, Tribhuvan University.

6 Dr. Yogendra P. Pradhananga, Institute of Medicine, Tribhuvan University.

7. Mr Bakhat Bdr. Chitrakar, Curriculum, Textbook & Supervision Development Centre, Ministry of Education

8 Ms Nupur Bhattacharya, Co-ordinator, Hate Malo Programme, Radio Nepal.

9 Mr Krishna Ram Khatri, Campus Chief, Bhaktapur Campus, Tribhuvan University

10. Mr Pushpa Shrestha, Ministry of Education and Culture, Keshar Mahal, Kathmandu

11 Ms Bina Rajbhandari, Curriculum, Textbook, & Supervision Development Centre.

12. Ms. Pushpa Shrestha, Community Development Unit, Bhaktapur Development Project

13. Mr. Kamal Bahadur Shrestha, Community Development Unit, Bhaktapur Development Project.

14 Dr Kokila Baidya, Superintendant, Bhaktapur Hospital.

15 Ms Bishnu Manandhar, Nursing Campus, Institute of Medicine

16 Mr Madhav Adhikary, Institute of Education

17 Mr Pushp B. Shrestha, Ministry of Education and Culture

B. **Alternative Sanitation**

1. Dr. Durga Dutta Joshi, Ministry of Health
2. Mr. Dattatraya Roy, UNICEF.
3. Mr. Prakash Chandra Joshi, East Consult.
4. Mr. Nanda Man Sthapit, Health Education Section/Ministry of Health.
5. Mr. Deep Bdr. Thapa
6 Mr. Rajendra Basnyet, Ministry of Health.
7 Mr Ratna M Bajracharya, Bhaktapur Development Project
8 Mr Dinesh, Integrated Family Planning & Parasite Control Project
9. Mr Chiranjibi Karmacharya, Ministry of Agriculture.
10. Mr. Mohan Poudyal, East Consult.
11. Mr. Balram Khyaju, Bhaktapur Development Project.
12. Mr. Kamal B. Shrestha, Bhaktapur Development Project.
13 Mr Mohan Shrestha, Health Education Section/Ministry of Health
14 Ms Pushpa Shrestha, Bhaktapur Development Project

Appendix D-1

HEALTH EDUCATION TEACHERS, COMMUNITY WORKERS, AND RESOURCE PARTICIPANTS

A. Lower Secondary/Secondary Teachers

1. Mr. Mahendra Gopal Karmacharya
   Shri Padma Secondary School

2. Mr. Ram Sikho
   Assistant Headmaster
   Shri Gyan Bijaya Lower Secondary School

3. Mr. Amogh Ratna Shakya
   Shri Suryodaya Secondary School

4. Mr. Rajendra Prasad Baidya
   Shri Bidyarthi Niketan Secondary School

5 Mr Jeevan Bhakta Pradhananga
   Shri Saraswati Secondary School

6. Mr. Sanu Lal Twanabasu
   Shri Sharada Secondary School

7. Mr. Gopal Das Basukala
   Shir Basu Lower Secondary School

8. Mr. Jaya Pal Harie Kayastha
   Shri Bal Sewak Lower Secondary School

9 Mr. Pratap Kaji Baria
   Shri Bhim Adarsha Lower Secondary School

10. Ms Pushpa Shrestha
    Shri Bal Bodh Shanti Lower Secondary School

11. Ms. Mangal Kumari Shakya
    Shri Bardayani Lower Secondary School

12. Ms. Chandra Kanta Prajapati
    Shri Shanti Niketan Lower Secondary School

13. Mr. Shivajee Bhuju
    Shri Jagriti Lower Secondary School

14. Mr. Bishnu Gopal Kusi
    Shri Bageswori Secondary School

15. Mr. Bal Krishna Karmacharya
    Shri Kanya Secondary School

16. Mr. Laxmi Narayan Rajlawat
Shri Bageswori Secondary School

17 Mr. Uttam Prasad Bhatta, Headmaster
Shri Chandeswori Lower Secondary School

B. **Primary Teachers**

1 Mr Shiva Ram Rajchal, Headmaster
Shri Branhacharini Primary School

2. Mr. Debendra Bahadur Joshi, Headmaster
Shri Udaya Primary School

3. Ms Durga Devi Khyaju, Headmaster
Shri Samaj Sewa Primary School

4. Ms. Pushpa Lal Sujakhu, Headmaster
Shri Tara Primary School

5 Ms Chandra Laxmi Raya
Shri Hansa Bahini Primary School

6. Mr. Sundar Bohaju
Shri Sawaj Sudhar Primary School

7. Mr. Syam Krishna Dhoubhadel, Headmaster
Shri Primary School

8 Mr. Jeevah Raj Rajopadhya, Headmaster
Shri Sidhi Sharada Primary School

9. Mr Bishnu Suwal
Shri Mahendra Primary School

10. Mr Keshav Ram Kayastha, Headmaster
Shri Sidhi Sharada Primary School

11. Mr. Mahendra Lal Kayastha
Shri Bharati Primary School

12. Ms. Shova Shrestha
Shri Nabin Primary School

13. Mr. Biswo Ram suwal
Shri Jana Sewa Primary School

14 Mr. Shri Ram Koju
Shri Bal Mandir

15 Mr. Ram Prasad Prajapati
Shri Kopila Primary School

16. Ms. Nhuchhe Maya Koju
Shri Twinkle Primary School

17 Ms. Chhal Keshari Bhomi
Shri Primary School, W. No. 3

18 Mr. Aas Kumar Koju
Shri Prabhat Primary School

19. Mr. Hari Krishna Bhaila
Shri Krishna Primary School

20. ..... (Non participatory training)
Shri Pre Primary and Primary School

C. Community Workers in Alternative Sanitation

1. Mr. Jaya Pratap Lakhe

2. Ms. Shanti Shrestha

3 Mr. Laxmi Prasad Dyola

4. Mr. Charan Prasad Dyola

5. Ms. Raj Devi Dyola

6 Mr. Ram Bhakta Koju

7. Mr. Nhuchhe B. Sainju

8 Ms. Maiya Mehator

9. Mr Sundar Bohaju

10 Mr. Sunil Matangi

11. Ms. Indra Kumari

D. Resource Participants in Teachers' Training

1. Ms. Bina Rajbhandari, CTSDC/MOEC

2. Mr. Bharat Nepal Pyakurael, DPS Education Section

3. Mr Jateswor P(Singh, DPS Education Section

LIST OF MATERIALS PRODUCED

1 Toilet Types - Excreta Disposal System Leaflet

2 Toilet Types: Posters

3 How to Build a Sulabh Toilet· Construction Guidelines

4 Sore Eyes: Flash Card

5 Prevention of Diarrhoea: Flash Card

6 Better Composting: Composting Guidelines

7 Health Education Drama· Video

8 Water Supply System: Slide

9 Toilet: Slide

10. Sewerage System: Slide

11 General Health Hazards: Slide

12 Misuse of Drinking Water at Tapstand Poster & Picture Card

13 Health Education Made Easy: Leaflet

14 Motivational Stories on Hygiene, Sanitation, Nutrition and Participatory Activites: Supplementary Reading Materials for Children (Reprinting)

15 Health Education Guidebook (Unpublished)

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