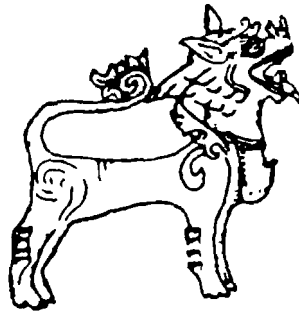


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UNICEF ASSISTED SEMI-URBAN SANITATION
PILOT PROGRAMME
AND THE EAST CONSULT'S SANITATION
ACTION PROGRAMME**



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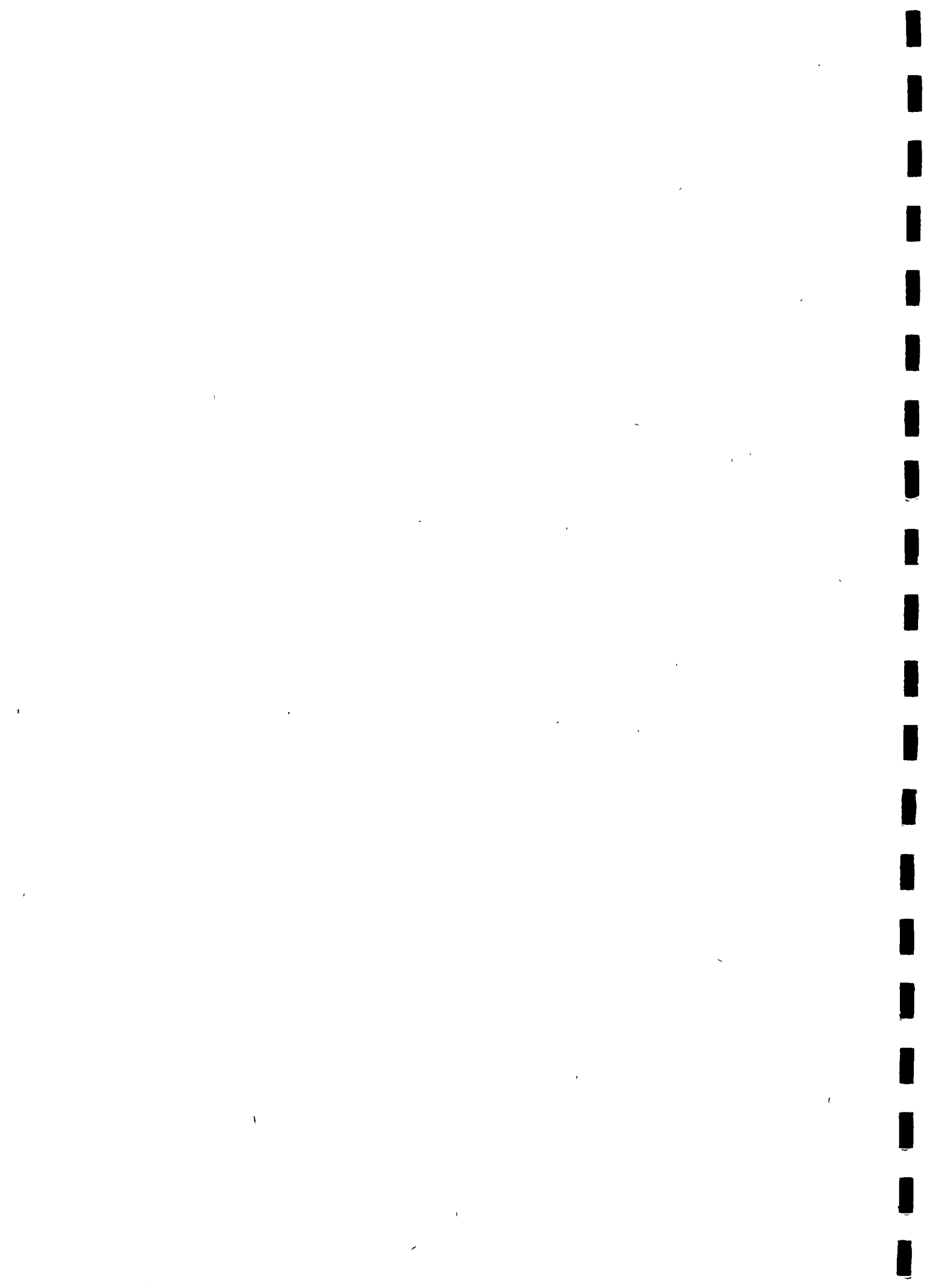
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Kathmandu, Nepal

August 1990

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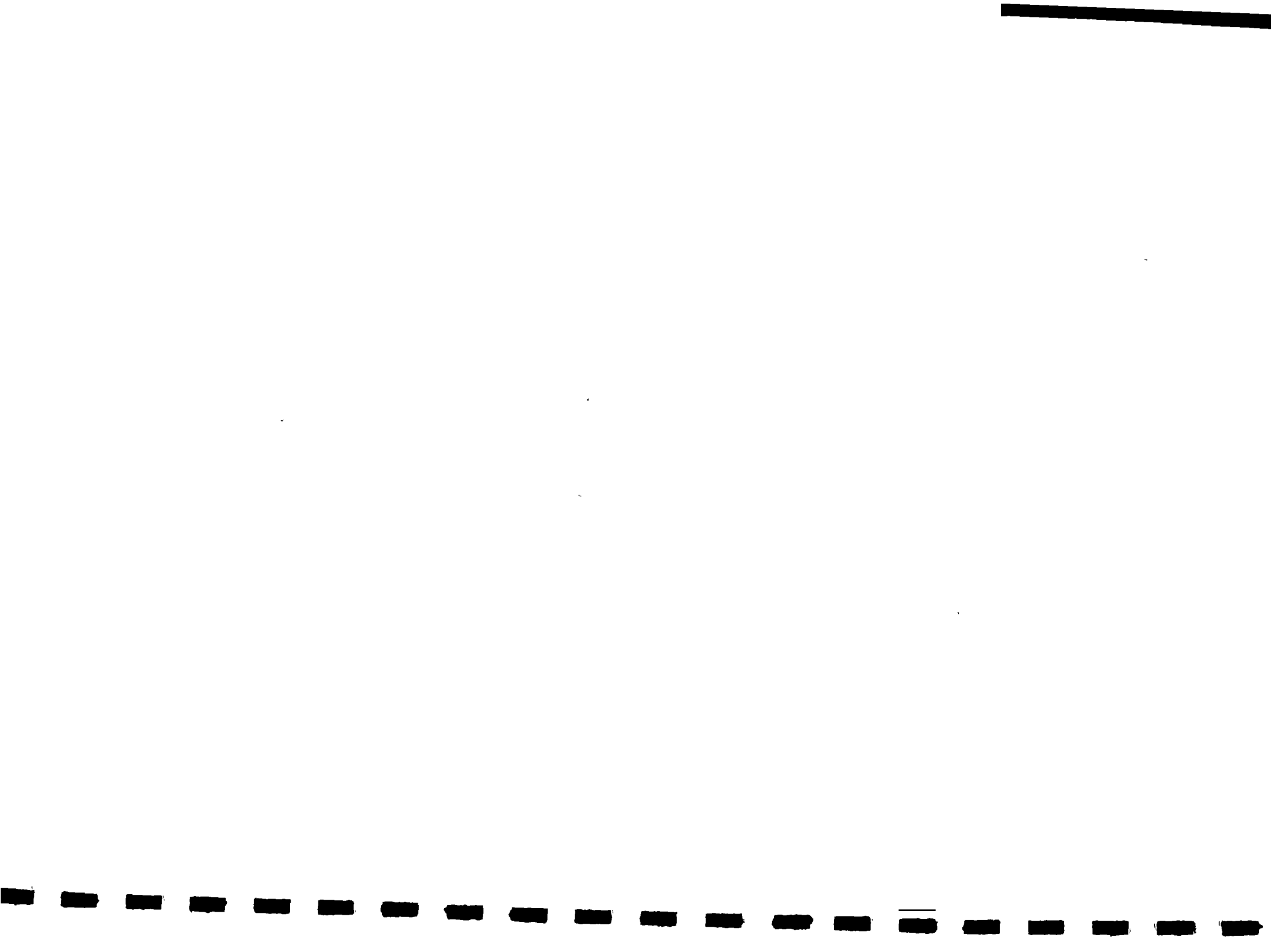
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Last but not the least the New ERA team members cordially extend their thanks to all the respondents who provided their valuable time for interview even during the peak harvesting season. We hope that the study truthfully reflects the problems and perceptions of these people.

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ACRONYMS

CHW	:	Community Health Worker
CWSS	:	Community Water Supply and Sanitation
DPHO	:	District Public Health Office
DWSS	:	Department of Water Supply and Sewerage
EASTAP	:	East Consult's Sanitation Action Programme
ESS	:	Environmental Sanitation Section
FPAN	:	Family Planning Association of Nepal
HES	:	Health Education Section
HMG/N	:	His Majesty's Government of Nepal
MHPP	:	Ministry of Housing and Physical Planning
MOH	:	Ministry of Health
MPLD	:	Ministry of (Panchayat and) Local Development
NRB	:	Nepal Rastra Bank
NRs.	:	Nepali Rupees
ORT	:	Oral Rehydration Therapy
PF	:	Poor-Flush
SC	:	Sanitation Committee
SCM	:	Sanitation Committee Member
SNV	:	Netherlands Development Organization (in Dutch)
SUSP	:	Semi-Urban Sanitation Pilot Project
TAG	:	Technology Advisory Group
UNDP	:	United Nations Development Programme
UNICEF	:	United Nations Children's Fund
VHW	:	Village Health Worker
WB	:	World Bank
WHO	:	World Health Organization



EXECUTIVE SUMMARY

Introduction to SUSP and EASTAP

1. SUSP was implemented through MPLD with UNICEF funding and was implemented in two semi-urban, Kathmandu Valley sites and two semi-urban Terai sites during 1982-1989.
2. EASTAP was implemented through EAST Consult (a private sector organization) with UNICEF funding and was implemented in 12 semi-urban Kathmandu Valley sites during 1983-1989 in three phases.
3. The objectives of SUSP were to improve environmental sanitation, to develop trained manpower and to implement integrated sanitation pilot project.
4. The objectives of EASTAP were to effect change in people's sanitation habits, to create employment through labor intensive technology, encourage composting, to raise sanitary awareness, to explore strategies like loan scheme and subsidy reduction, and to prove the efficiency and cost effectiveness of private sector approach.
5. SUSP had some health education, improvement of public tapstands and drainage. But EASTAP was focussed on private latrine construction. However, the education component of SUSP in practice was limited to initial health campaign for a couple of months while improvement of public tapstands was negligible.
6. The subsidy provided under SUSP was about 68 percent of total cost up to pan level (a weighted average based on the number of actual beneficiaries in Tokha and Khokana) which was given in the form of bricks, cements, squatting pan set and skilled labour. The subsidy amount is estimated as Rs. 1,700 per latrine at 1988/89 Kathmandu prices.
7. The subsidy provided under EASTAP was about 35 percent of cost up to pan level (a weighted average of 48 percent, 44 percent and 20 percent in the three phases of EASTAP). This was also given in the form of above mentioned materials and services and its monetary equivalent is Rs. 873 at 1988/89 prices.
8. Approximately 650 household latrines were completed in Tokha and Khokana under SUSP while 1,242 household latrines were constructed in the 12 EASTAP sites. Under SUSP about 50 percent of drains were also reconstructed.

Criteria for Comparison

A. Efficiency

1. EASTAP is much more efficient with respect to the input/output relation and subsidy distribution compared to SUSP.

2. Although project sites were not selected according to a fixed set of criteria, EASTAP sites are relatively more suitable for SULABH toilet distribution.
3. SUSP suffered from inefficiency and lags in implementation throughout the project because of bad timing of activities, transportation and supply problems, inadequate HMG budget, lack of construction follow ups and supervision, unnecessary expenditure in reworking on incomplete activities, and negative impacts of false promises. EASTAP's Phases I and II were relatively more efficiently implemented but Phase III suffered from confusion and bad timing aggravated by exogenous shocks like Indo-Nepal Trade and Transit impasse causing fuel crisis and sudden price rise of construction materials.
4. EASTAP was relatively more efficient in view of its much lower (and declining) subsidy levels but it also suffered from the problem of distributing subsidized latrines mostly to middle and rich income families with higher socio-political status. Majority of the non toilet households (especially in EASTAP) are much poorer than project beneficiaries, and are unable to build self-help latrines merely by demonstration effect.
5. EASTAP was devoid of any hygiene education programme except for some informal talks (during follow-ups) about parasitic diseases and need to clean latrines. SUSP too lacked a programme of continuing health and sanitation education but had sporadic sanitation campaigns with short-lived impacts.

B. Effectiveness

1. Both programmes have the elements of realism as well as over-optimism in their objectives. Some of the objectives are vague and some of them were completely ignored during formulation of targets and implementation. However, EASTAP's objectives of creating (some) employment by using labor based technology and validating the cost-effectiveness of a private sector approach for sanitation intervention were reasonable and largely fulfilled.
2. With respect to utilization and maintenance of toilets, EASTAP appears to be much more effective than SUSP.
3. Only one tenth of households in SUSP sites and slightly more than one-fifth in EASTAP sites replied that the programme has fully solved the main sanitary problem of the area. On the other hand about 15 percent in SUSP and 26 percent in EASTAP sites think that the programme has completely failed to attend to the main sanitary problem of the area.
4. Toilet ownership does not appear to significantly reduce the incidence of sanitation related diseases.
5. The two programmes do not have clear-cut dominance between one another in imparting knowledge about preventive measures for (or cause of)

sanitation related diseases and both programmes have been unable to generate sufficient awareness in this regard.

6. EASTAP has been relatively more successful in influencing the defecation habits of beneficiaries. But both programmes are weak in influencing children's defecation habits.

C. Sustainability

1. Despite the negative effect of lower household contribution on utilization rate, earlier toilet owners in EASTAP have significantly higher utilization rate indicating some habit formation and consequent sustainability of EASTAP. In case of SUSP no such clear cut trend is found.
2. Significantly larger proportion of households appear to be motivated for latrine installation in EASTAP compared to SUSP but many beneficiaries of EASTAP were in need not of subsidy but of proper motivation which would make latrine installation a felt need of people.
3. Most of the non-toilet households (in both programmes) are willing to install latrines but only with some subsidy reflecting both the gradual development of dependency syndrome and erosion of community self-reliance and the fact that the non-toilet households are much poorer (especially in EASTAP) compared to the project beneficiaries.
4. Most non-toilet households expressed the preference and need for subsidy rather than loans.
5. The demonstration effect in both programmes is much lower than the expectation of the concerned officials, although in EASTAP sites it is relatively stronger.
6. Although pit filling and emptying has been much more frequent in EASTAP sites, it is at least equally problematic in SUSP sites because majority of toilets are built indoors and composting of human excreta is much less prevalent.
7. Much larger percentage of beneficiaries in EASTAP sites acknowledge that they have learned useful things about sanitation and health through the use of project toilet, compared to SUSP.
8. In almost all sanitary practices EASTAP site population appears to be more knowledgeable than SUSP site population indicating higher sustainability of EASTAP. But this may be the result of selecting a population with relatively higher educational level on average by EASTAP.
9. More than 69 percent of EASTAP beneficiaries are fully satisfied while only 7 percent are quite dissatisfied with the project toilets. The corresponding percentages for SUSP are 57 percent and 17 percent respectively. The rest are only somewhat satisfied. Moreover, the

satisfaction level of beneficiaries is highly (statistically) correlated with utilization rate of toilets.

10. The most frequently cited reason for being dissatisfied in EASTAP sites is pit filled with water followed by small size of pits. In case of SUSP the most frequently cited reason is lack of drains attached to toilets followed by foul smell.
11. Much higher percentage of beneficiaries in EASTAP consider the materials provided by the project as insufficient, compared to the percentage for SUSP.

Other Findings and Major Recommendations

1. A majority of the beneficiaries in the sample sites (more so in SUSP sites) prefer sanitation intervention done by non-governmental organizations with the support of local committees because they think that local committees are more aware of local development needs and priorities.
2. In both programme sites, the largest percentage of households give top priority to drainage system followed by water supply improvement as a means to improve the sanitary situation of the community.
3. Education is an important determinant of frequency of utilization of constructed latrines.
4. Similarly, the level of contribution by households is an important determinant of utilization rate.
5. The SUSP and EASTAP are recommended to do the following:
 - a. Formulate realistic objectives compatible with community needs and priorities.
 - b. Conduct a baseline survey before formulating plan of action and use the results of the survey in formulating project plan of action and targets, and selecting beneficiaries.
 - c. Conduct hygiene education programme throughout the project period.
 - d. Conduct integrated and comprehensive sanitation programmes including water supply, drainage and solid waste disposal system along with latrine construction.
 - e. Provide regular follow-ups, motivation and supervision after project implementation.
 - f. Follow bottom to top approach by involving villagers from the very beginning of the project.

- g. Cautiously provide subsidies especially to poor households first by assessing their needs and priorities. Subsidy level should be kept to the minimum and households motivated through other means.
 - h. Provide institutional arrangement for soak pit latrine emptying at some reasonable rate.
6. SUSP and EASTAP should not do the following:
- a. A particular technology (however successful in other places) should not be forced on people without providing them with a choice between various technologies according to their household socio-economic status.
 - b. The programme should not be based on artificial demand created with the lure of heavy subsidies and/or other benefits such as water supply.
 - c. The procedure of applying for benefits of the programme should not be complicated, delayed and bureaucratic.
 - d. The programme should not be implemented with bad timing and poor plan of action.
 - e. Compost utilization should not be totally left to the people without proper demonstration and technical advice.
 - f. A pure loan programme is not recommended.



1.0 INTRODUCTION

1.1 The Sanitary Situation in Semi-Urban Areas of Nepal

One of the major problems of semi-urban and urban areas of Nepal is the extremely poor environmental sanitation. There is acute shortage of safe drinking water, waste-water disposal, sewerage systems and solid waste collection and disposal systems. In addition, the lack of latrines in most semi-urban houses and the traditional habits of semi-urban people to defecate on backyards, public defecation places, roadsides, the banks of ponds, rivers and streams, or indiscriminately on any available piece of land in the open, lead to contaminated water supply and widespread transmission of excreta related diseases such as diarrhoea, dysentery and various parasitic diseases. Apart from painful human sufferings and loss of lives, these poor environmental sanitation in general and unhygienic excreta disposal practices in particular cause unnecessary expenditure on medicines and health care in a country which has to import most of the medicines and has severe scarcity of hospitals, physicians and other medical attendants and facilities, low productivity of Nepalese people, and deplorable degradation of the beauty of this otherwise beautiful country.

According to a WHO report^{1/} the sanitation coverage in 1989/90 has not significantly changed from what it was at the start of the decade (16% urban population and negligible rural population). The high infant mortality (111.5/1000 live births) and high morbidity pattern in Nepal is mainly due to adverse environmental factors which is most severe in semi-urban areas because of lack of open fields unlike rural areas, lack of safe drinking water, clustered and unplanned settlements, lack of awareness among the community people and so on. As Tobin (1985) comments^{2/}, the semi-urban communities in Nepal are visibly much dirtier than the rural communities because of open defecation in alleys and lack of open fields. The felt need for sanitary improvement is, therefore, greater than in the rural areas and the people are often more receptive to sanitation programmes.

^{1/} World Health Organization (NEP CWS001), Mr. K.N. Gupta, Assignment Report, 2 Dec. 1988 - 1 Feb. 1989.

^{2/} Tobin, V.J., Evaluation for Sanitation Planning, Dissertation submitted to London School of Hygiene and Tropical Medicine. University of London, Sept., 1985.

1.2 Health Aspects of Various Sanitary Practices

1.2.1 Excreta Disposal Practices and Waste Water Management

More than fifty diseases can be transmitted from the human excreta through water, animals, flies and soil^{1/}. In 1978 a survey carried out in Surkhet district by the Institute of Medicine^{2/} found that the second major cause of death among children, after respiratory diseases, was diarrhoea and dysentery, resulting in 40 percent of deaths under the age of four. In 1979/80, data from Kanti Hospital, the only children's hospital in Nepal, found that 31 percent of the patients were suffering from infections and parasitic diseases. It is estimated that 50 percent of the population at any one time will be suffering from some form of worm infestation^{3/}.

Gastroenteritis is a common phenomenon in Nepal and available hospital records show that about 83 percent of all the sicknesses treated in the hospitals are related to water and sanitation^{4/}.

^{1/} Sanitation Workshop, 29-31, July 198, compiled by A.M. Tuladhar, SNV/Nepal.

^{2/} Sanitation why and how, Recommendations of the National Sanitation Seminar, Kathmandu, Nepal, 1-4 Sept, 1981.

^{3/} Ibid.

^{4/} HMG/N, DWSS and UN center for Human Settlements, "Low-cost Sanitation Training Programme", Dec. 1985.

This fact is clearly indicated by the following table.

Table 1.1 : Incidence of Environmentally Transmitted Diseases from Hospital Records

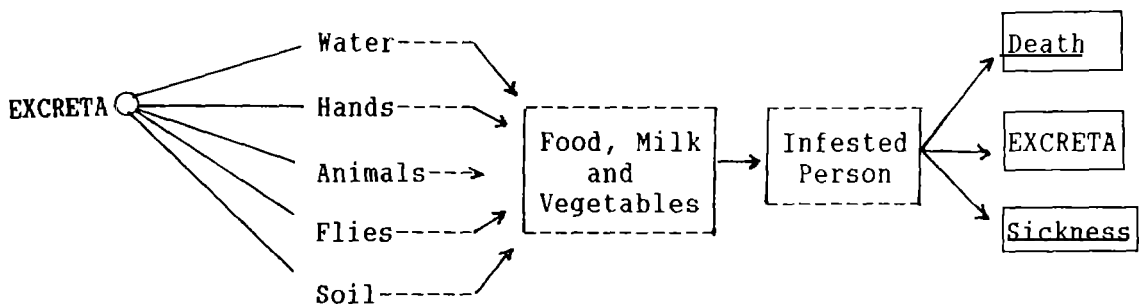
Environmentally Transmitted	1978	1979	1980
1. Gastroenteritis - Diarrhoea	3,306	3,552	2,275
2. Typhoid	356	308	541
3. Infections Hepatitis	99	133	134
4. Dysentery (bacterial)	309	122	123
5. Dysentery (amebic)	492	529	46
Sub-Total	4,562 (85)	4,644 (88)	3,549 (83)
Other	826 (15)	636 (12)	702 (17)
Total	5,388 (100)	5,280 (100)	4,251 (100)

Note : Other common diseases not included above and caused by fecal contamination are Hepatitis, Giardiasis, Polio, Roundworm, Hookworm, Threadworm, Pinworm, and Food poisoning. If these are included the percentage may rise up to 90 percent.

Source: From data in Annex 9 of "Master Plan Report on Low Cost Waterseas Latrine Programme in Eight Urban and Semi-urban Communities (DRAFT)" UNDP INT/81/04, New Delhi, Dec. 1983.

Thus, human excreta and contaminated water are the main source of transmission and spread of a wide range of communicable diseases through the fecal-oral route. As the following diagram shows, excreta is the source of infection and flies, water, food, animals, hands and soil are the agents in the spread of fecally based diseases.

Figure 1



The health impacts of excreta based diseases in Nepal is clearly shown in Figure 2.1/

To alleviate the unsanitary situation related to excreta disposal efforts are being placed by various governmental and non-governmental organizations in the country. The approaches or strategies to be adopted by these agencies are varied, efficient and sustainable approaches to sanitation problems. The successes that the various organizations have achieved are rather different. The EASTAP and SUSP programmes are two of the noteworthy ventures on the way to solve the challenges of sanitation problems, particularly that of excreta disposal, in the country.

1.2.2 Solid Waste Management and Other Practices

Indiscriminate collections of refuse lead to fly breeding, attract rats and dogs, are unsightly, and cause unpleasant odours. Moreover, lack of personal hygiene causes dirty skin which is likely to get infected with pimples, boils, sores, scabies, or ringworm. Similarly, eye infections are caused by use of dirty towels and handkerchiefs, exposure to dust and respiratory diseases are also transmitted through indiscriminate coughing, sneezing and spitting.

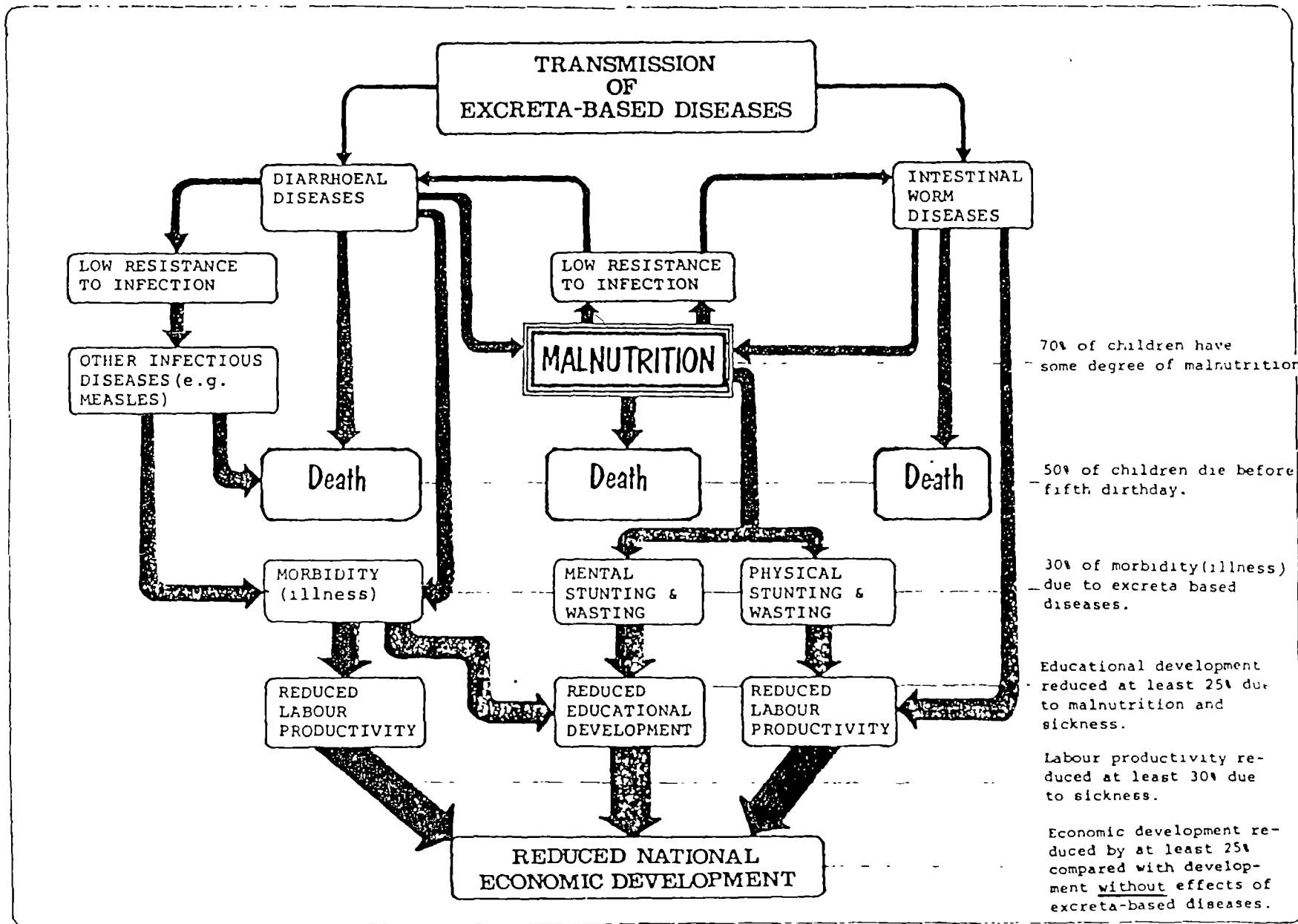
1.3 Objectives of the Evaluation Study

The present evaluation study has the general objective of careful and comparative evaluation of the wealth of experiences gained in the UNICEF assisted Semi-urban Sanitation Pilot Project (SUSP) in order to come up with useful findings for the proper planning and implementation of future sanitation programmes in Nepal such as the proposed Urban Basic Services (UBS) programme of UNICEF with sanitation component. The specific objectives of this study as mentioned in the TOR are as follows.

- i. To assess the efficiency of the interventions undertaken in both projects and to compare them by examining the impediments to efficiency and the role of subsidies.
- ii. To assess and compare the effectiveness of the interventions in the two projects by (a) examining the knowledge and attitudes of latrine users, latrine owners but non-users, and latrine non-owners, and (b) by examining the contribution of the interventions towards overall improved sanitation.
- iii. To assess and compare the sustainability of the interventions in the two projects by (a) studying peoples perception in the project areas after the projects and their willingness to improve the situation on their own, and (b) by investigating the use of compost with respect to the time, crops and persons employed in handling them.

1/ Sanitation why and how, Ibid. p. 10.

Figure 2



1.4 Scope of the Study

- A. The efficiency aspect will be examined and compared by studying the following.
- i. Quantity and quality of inputs (manpower, materials and money) provided and outputs (e.g. number of installed/completed latrines and number of persons served) achieved in the two projects.
 - ii. The implementation rate as per the schedule and reasons of delays.
 - iii. Role of health education/training and subsidies for motivation.
- B. The effectiveness of the two projects will be examined by studying the following topics.
- i. Scrutiny of the objectives as regards their clarity, relevance and sufficiency in relation to the sanitary situation (or problem) of the project sites.
 - ii. The degree of achievements of the objectives and the reasons for less than maximum achievement.
 - iii. The characteristics of households who were reached by the project and of those who were not reached, and the reasons for both.
 - iv. The degree of latrine utilization and maintenance.
 - v. The spill over effects of latrine distribution.
 - vi. The contribution of health education toward improvement of programme effectiveness.
- C. The sustainability aspect of the two projects will be assessed by studying the following long-run impacts.
- i. The proportion of latrines still in use in relation to projects' age.
 - ii. The willingness of people to improve the sanitary situation on their own because of the knowledge and awareness generated by the project in the project areas.
 - iii. The demonstration effect as reflected by the number of latrines built by individuals on their own after the project and because of the observed or heard benefits enjoyed by latrine owners.
 - iv. The extent and purpose of the use of Sulabh compost.
 - v. The persons and procedures employed in pit emptying and composting, and the need for institutionalizing the pit emptying activity in urban areas.

- vi. Change in peoples habits, attitudes and perceptions due to the project.
- D. Finally, this study will provide recommendations to improve efficiency, effectiveness, and sustainability of future sanitation programmes based on the primary and secondary sources data and other information gathered during this study.

1.5 Methodology of the Study

1.5.1 Data Sources

The information required for the comparative impact evaluation have been obtained from the following five sources.

- i. Secondary data collection and literature review was done during the extended desk study period of about three weeks. During the desk study numerous files and reports were collected and studied so as to depict a clear picture of the two projects and their achievements. The major findings of the desk study were presented in the "Desk Study Report" submitted to UNICEF in the first week of May, 1990. The desk study report contained critical appraisal of the objectives, targets, activities and achievements of the EASTAP and SUSP programmes. Moreover, the experiences, problems, shortcomings and lessons learned during the two programmes were highlighted based on various completion reports, files and mid-term evaluation report of the programmes.
- ii. Interviews through household survey questionnaire of 1002 households divided into three categories: project toilet households, non-toilet households, and non-project-toilet households. The questionnaires were designed to provide information about household characteristics, housing characteristics, water supply sources and uses, household waste disposal, economic background, sanitary practices, health information, awareness and attitudes, status of latrines, reasons for installing (or not installing) latrines, role of subsidies, user satisfaction, willingness to build self-help latrines, and household priorities related to environmental improvement. The survey was completed in a period of five weeks.
- iii. Observation by field staffs and supervisors using check lists during the five weeks survey of sample sites including information about settlement pattern, livestock, conditions of drains, water supply situation, solid waste disposal system, public defecation places, cleanliness of streets and houses, conditions of electricity, educational and health facilities, method of composting, and usual village practices about prevention from and cure of common diseases such as diarrhoea, dysentery, vomiting, fever, eye/ear infections and worms.
- iv. Information collected through rapid appraisal interviews of five local key informants from each sample site (e.g. leaders, school teachers, sanitation committee members, members of local NGOs etc.)

were related to incidence of epidemics (cholera, malaria, etc.), changes in environmental sanitation brought about by the project, general change in people's sanitary habits, attitudes toward the efficiency effectiveness and sustainability of the project, distribution of subsidy, suitability of latrine design, problems during project implementation, compost utilization in the community, and suggestions about future such programmes.

- v. Informal interviews of those officials at East Consult, UNICEF and the line ministries who were involved in the programmes in some way provided some useful insights about the programmes, which were helpful in providing recommendations.

1.5.2 Sample Selection

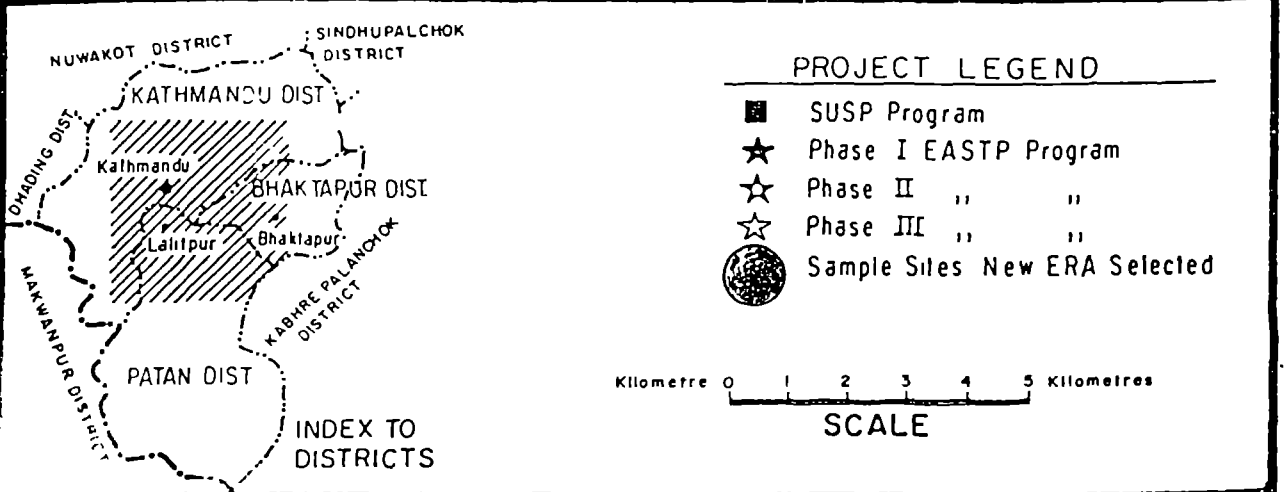
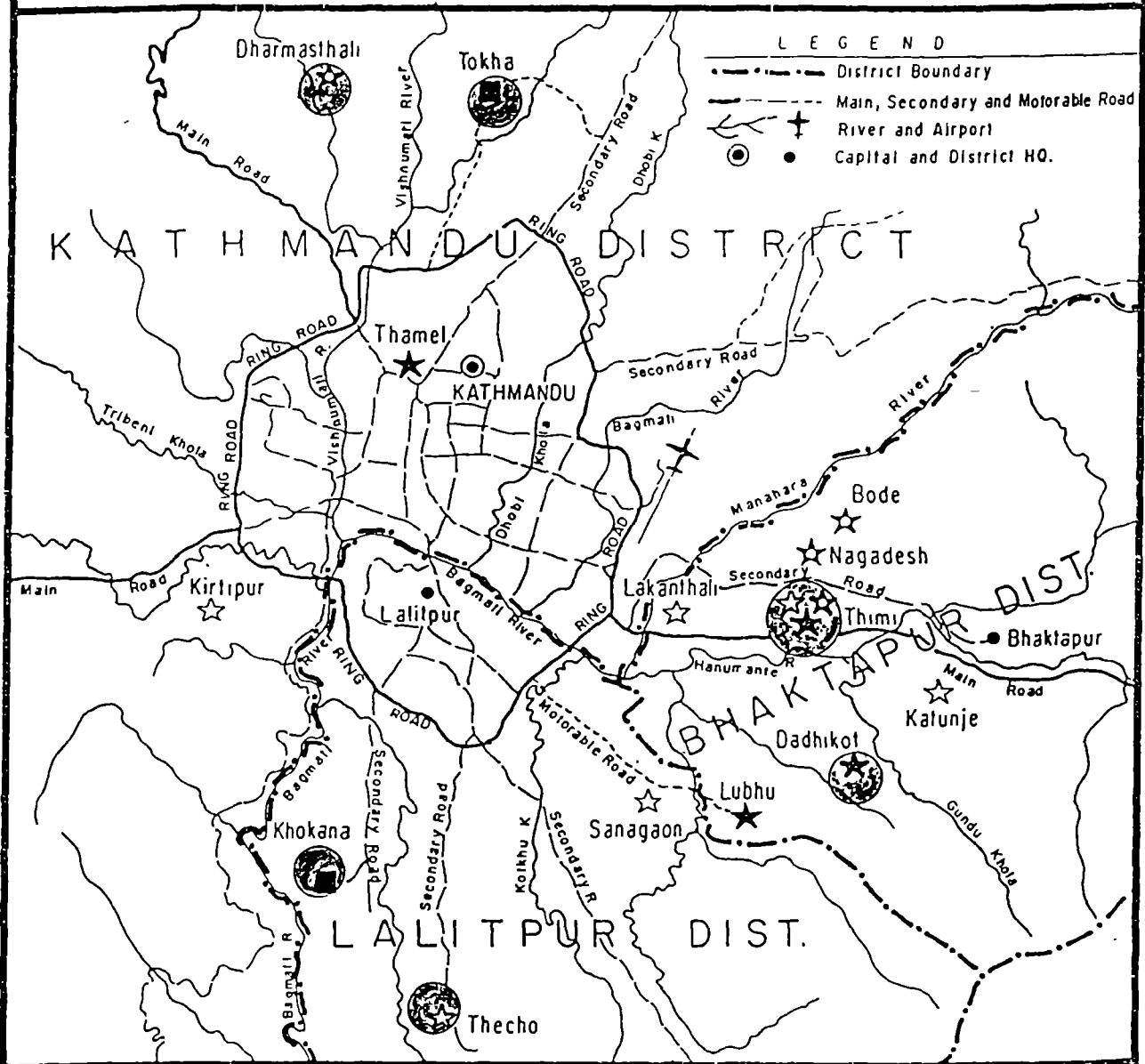
1.5.2.1 Sample Sites

Two SUSP sites, namely, Tokha and Khokana (out of four SUSP sites) and four EASTAP sites, namely, Thimi, Dadhikot, Dharmasthali and Thecho (out of 12 EASTAP sites) were selected for household survey as shown in Map 1.

The criteria used in the selection of the sites are as follows:

- i. All sites are from Kathmandu Valley. In fact this criterion eliminates only two terai SUSP sites, namely, Urlabari and Bhadrapur. This criterion is adopted for the comparability of the two programmes.
- ii. Approximately equal number of beneficiaries from both projects. The total number of actual beneficiaries in selected SUSP sites is estimated as 641 although the official list provided by the ministry has about 150 more beneficiaries. The discrepancy arises because many households in Tokha and some in Khokana did not build any latrine at all but used the bricks and cement received for other purposes such as paving their door steps. The total number of beneficiaries in the selected EASTAP sites comes as 639 (Table 1.2).
- iii. At least one site with a strong health education input (e.g. Tokha and Khokana) and at least one without any health education input (e.g. Thecho and Thimi).
- iv. At least two sites where projects started in the same year. This criterion is fulfilled because Thimi (Chapacho and Balkumari) was covered in all the three phases of EASTAP, and Dadhikot was covered in 1983/84, Dharmasthali in 1985/86 and Thecho in 1987/88.
- v. Thimi was selected also because it provides the best example of the effectiveness of local initiative. In the two village panchayats of Thimi, 8 type A toilets were built mainly by the initiative of a local school headmaster in less than 45 days.

SAMPLE SITES SELECTED FROM SUSP & EASTAP SITES IN KATHMANDU VALLEY



- vi. Thecho was selected so that the problems and prospects in the installation of Type C latrines designed for "poor families" could be carefully studied.
- vii. Dadhikot provides the only example of large number of non-project toilets, and
- viii. Dharmasthali was selected because it is the only Phase II site in the proximity of Tokha.

1.5.2.2 Sample Households

After a selection of sample sites, the allocation of sample sizes to different sites was done as shown in Table 1.2. A total of 512 households with project toilets (256 households for each programme) were selected by systematic random sampling procedure from the lists of households provided by EASTAP and the Local Development Ministry. This represents a 40 percent sampling fraction of total beneficiaries in those sites.

Table 1.2 : Sample Size Allocation of EASTAP and SUSP Sample Sites

Site	Program	No. of Beneficiaries	Non			Total
			Project Toilet	Project Toilet	Non-Toilet	
Khokana	SUSP	391	156	7	123	286
Tokha	SUSP	250	100	3	78	181
Total		641	256	10	201	467
Thimi Chapacho	EASTAP	269	107	20	84	211
Thimi Balkumari	EASTAP	104	42	10	33	85
Dadhikot	EASTAP	80	33	30	25	88
Dharmasthali	EASTAP	75	30	10	23	63
Thecho	EASTAP	111	44	8	36	88
Total		639	256	78	201	525
Grand Total		1280	512	88	402	1002

The total number of non-toilet households selected for interview is 402 (201 households in each programme) which is over 8 percent the sample size for project-toilet households. In this case the sampling fraction is not known since the list of all households (toilet or non-toilet) was not available for any site. In the case of non-project toilet households the target was to interview about 100 households but only 88 households

could be interviewed because of fewer number of such households in some sites than expected.

The allocation of the sample sizes of the first two types of households namely, project-toilet and non-toilet, was done in proportion to the number of beneficiaries for each samples site. This proportional allocation procedure according to number of beneficiaries was followed even up to the ward level in each selected site.

1.5.3 Data Coding and Analysis

Open questions were closed after examining the frequencies and open answers were translated from Nepali into English and coded. Data entry was done using dBASE III+. Most of the tabulations and statistical analyses were performed using SPSS. Association between different attributes and categories were studied using Chi-square test.

1.6 Organization of the Study

Chapter II reviews some related studies and reports about sanitation programmes in Nepal and develops a set of criteria for evaluation of Sanitation Action Programs (especially latrine distribution programmes) as suggested by various authors. Most of these criteria are later applied in this evaluation study. Chapter III describes the objectives, targets and achievements of SUSP and EASTAP in detail and also lists some practically useful experiences gained during EASTAP activities (in case of SUSP such list could not be prepared because of lack of annual or completion reports similar to EASTAP). Chapter IV is based on field survey and describes the sample sites as well as the characteristics of the sample households according to the socio-economic indicators relevant for the evaluation study. Most of this survey data and findings are directly, used in later chapters. In other words, Chapter IV provides the quantitative basis for the conclusions drawn in Chapters V, VI and VII. Chapters V, VI and VII provide the comparative evaluation of the two programmes respectively in terms of efficiency, effectiveness and sustainability. Finally, chapter VIII summarizes the major findings of this study and lists the recommendations for future sanitation programmes in semi-urban areas of Nepal.



2.0 REVIEW OF LITERATURE AND EVALUATION CRITERIA FOR SANITATION PROGRAMMES

This chapter summarizes the major findings of selected sanitation related studies and seminars done in Nepal and also provides a theoretical framework for the evaluation of sanitation programmes (with special focus on latrine distribution programmes). Thus, this chapter is based on review of literature and is one of the outcome of the "Desk Study" done in the course of this evaluation study.

2.1 Findings of Various Sanitation Programmes in Nepal

2.1.1 Sanitation Workshop (1987) 1/

This workshop was held at SNV/Nepal during 29-31 July 1987. There were 15 participants and 4 observers from various organizations and projects.

The major findings of the sanitation workshop separately for each project are listed below.

1. Sanitation component of Community Water Supply and Sanitation (CWSS) is limited to latrine construction and is given second priority relative to water supply systems.
2. The problem with simple pit latrines built under Redd Barna in Palpa district is that the people do not use these latrines because they give human waste to the pigs.
3. The Action Aid project adopted the approach of asking the people first to build latrines before the water supply system was to be constructed. However, soon it was found that the latrine construction was not the felt need of the people. Only people with relatively higher level of education took some interest, whereas many people showed interest more to please the project.
4. The emphasis of the sanitation programme in Dooley foundation is on the 'behavioral change' especially of the Hospital/Health Post staff with the hypothesis that there is need to educate from the lowest level (peons and sweepers) to the medium level (nurses) through workable/practical manuals and to the higher level employees through seminars. The recommendation of this project is that it is the responsibility of the government to provide model sanitation standard in the hospitals for which a minimum 24 hour water supply and sufficient working latrines are necessary.
5. In the PCRW (Production Credit for Rural Women)/Dhading Project the approach to sanitation and hygiene has been through a "Women Health

1/ Sanitation workshop (29-31 July 1987), compiled by Adarsh M. Tuladher, SNV/Nepal,

Volunteers Programme" with emphasis on simple methods like washing hands so as to avoid skin diseases and drinking clean water to avoid water borne diseases. One important lesson learnt from this programme is that educating women on health and sanitation is far more effective than educating men because even though more knowledgeable men hardly communicate to others whereas women will at least communicate the message to other women and their own children.

5. SCF (Save The Children Fund)/UK: the focus of the project is on the "Health Education" in primary schools to teachers and students and on building school latrines. With respect to community participation, this project finds it relatively easier among Brahmin caste as compared to Tamang and Danuwar castes from the area. Also, it has been found that the use of latrines is directly related to the level of literacy among the people.
 6. DTO (District Technical Office)/Tanahun has been carrying sanitation and health education programme, on a small scale in Damauli through DPHO (District Public Health Office). The focus is on explaining the population at large about water born diseases. The lesson learned from this activity is that for any programme stimulated by a foreigner to succeed, there needs to be good support at all levels, starting from the villagers to the officials at the district. The recommendation of this project is that we need sanitation workshop also for officers every year and that for sanitation promotion we should rely on more educated and interested local people for support.
 7. SATA (Swiss Association for Technical Assistance) at Pokhara broadened its approach from latrine construction to the inclusion of disease prevention and control and health education. Moreover two selected women from each village were given training about communicable disease, handling of water, and use of latrines. An important statement of this project is that women are usually uneducated and left out in planning and decision making although they share large burden of physical labour during construction of community water supply and sanitation project. Another statement is that building awareness is one of the important steps in a sanitation programme. Finally, it is stated that dirty latrines and inadequate drainage lead to increased health risks.
 8. Other findings of the workshop are:
 - a. People build and use latrines more for comfort and social prestige.
 - b. It has been difficult to institutionalize sanitation programme in Nepal at local level because sanitation is usually related to community water supply projects which are implemented by purely technical institutions and health education has to come from a different agency (and inter-agency coordination is often very difficult to achieve). Moreover, a firm commitment from HMG/Nepal on sanitation is lacking on one hand and sanitation is not necessarily a felt need of the people, on the other.
-

- c. More than 50 diseases can be transmitted from the human excreta through water, animals, flies and soil.
- d. The sanitary latrines, pit for animals' waste, and separate ponds for the livestock can be very effective in the control of communicable diseases.
- e. Sanitation programmes may take 15 years or half a generation to take effect. Therefore, we should not be discouraged by apparent lack of progress in the short run.
- f. Hygiene education is essential for the long-run and sustainable impact of sanitation programmes, but in the progress report this cannot be shown as easy as the number of constructed latrines.
- g. Social problems are more difficult but important in the context of successful sanitation programmes, relative to technical problems.
- h. Caste, Custom and Culture play a great role in village sanitation.
- i. Unless there is a very good follow-up about the why and how of keeping latrines clean, in some cases it might be better not to have people build latrines, especially where houses are scattered and people can defecate at a long distance from the houses.

2.1.2 Sanitation Workshop (1989) 1/

The major findings and recommendations of this workshop are:

1. The programme should follow a bottom to top approach. It is the implementer's responsibility to foster the feeling in the community that it is their own programme. The community should also be made prepared to absorb the programme after the termination of the outside assistance.
2. Points in favour of subsidy for private latrines are: low priority given to latrines by households in Nepal (hence subsidy is required to lower the price to match the priority), expensive non-indigenous materials required for the suitable technical design at many places, and the relatively fast response and speedy coverage induced by subsidies.
3. Possible drawbacks of subsidy programmes are: heavy reliance of project staffs on subsidy alone at the cost of neglecting other more important motivational activities (thus reducing sustainability); erosion of self-reliance of a community, and development dependency syndrome; introduction of expensive technology based on subsidies which lack sustainability, replicability (without subsidy) and demonstration effect; and unfair distribution of subsidies to middle

1/ Sanitation Workshop (27-29 August 1989), compiled by Heinz Boeni, UNICEF, Kathmandu Nepal.

and high income groups who are influential in local politics and have higher awareness.

4. Subsidies may continuously be provided when a durable and hygienic latrine cannot be built with indigenous materials; when a demand already exists (rather than for artificially creating demand); when close follow-ups after implementation will be done to monitor installation, proper use and maintenance of the subsidized latrines; when the technology promoted is replicable in the long-run in terms of affordability and practicality even without subsidy; and only in kind rather than in cash. However, there should be enough flexibility with regard to the items to be subsidized according to the local choice and need.
5. Health education is an inseparable part of sanitation and should be the basis of any sanitation programme. Moreover, the health education should have the following elements:
 - a. It should be able to convince the people of the priority need for latrine and personal and domestic hygiene.
 - b. It should cover personal hygiene, domestic hygiene (food and water), environmental hygiene (latrines, drainage and solid waste disposal), and Oral Rehydration Therapy (ORT).
 - c. It should have special focus on women and children.
 - d. The teaching methods should always have participatory elements.
 - e. The media selected should be compatible with local preferences and educational level.
 - f. It should be followed by evaluation and post tests.
6. There are two general guidelines for latrine design: (a) The proper isolation of excreta from the environment, and (b) The local appropriateness in terms of prevailing habits and practices, local site conditions (soil, water label etc.), affordability and selection of construction materials. Moreover, various types of latrine should be advocated in any area to incorporate different levels of affordability and individual habits.

2.1.3 Low-Cost Water-Seal Latrine Programme in Eight Urban and Semi-Urban and Areas of Nepal (1987) 1/

Evaluation "Low-Cost Water-Seal Latrine Programme in Eight Urban and Semi-Urban and Areas of Nepal" undertaken by Department of Water Supply and Sewerage (DWSS) jointly with United Nation's Centre for Human

1/ Rai, N.K., Socio-cultural Perspective on Sanitation in Nepal: A Survey Report, DWSS/HMG/Nepal and UNCHS.

Settlements (UNCHS/HABITAT), Nairobi. The important conclusions of this evaluation study are:

1. Neither ethnicity nor religion is a determining factor for household and community sanitation.
2. Education and socio-political status positively correlate with household sanitation.
3. The problems in sanitation programme are basically financial, bureaucratic, or organizational in nature rather than socio-cultural.
4. Majority of households report that they have installed toilets mainly for reasons of comfort, privacy, health, and social prestige.
5. The human excreta is not generally used as soil conditioner because of strong socio-psychological stigma against the human excreta-raw as well as compost.
6. Most households think that the sanitation programme could not be effectively implemented through a governmental institution.
7. While the households with toilets (project or non-project) are commonly found in linear and clustered settlements, the non-toilet households are most commonly found in scattered settlements. Thus, settlement pattern is also important.
8. Even among toilet households children and elderly continue to use open places for defecation and urination, partly because of tradition and partly because there is still little cultural/psychological objection to the practice.
9. For many non-toilet households, the preference of the decision making family members (usually adult males) for open air defecation is the main reason for non-installation. Other reasons are: other expenditure priorities and long bureaucratic process of getting the programme subsidy.
10. The project seems to have retarded the construction of septic tank toilets. The households which could have built septic tank toilet are either the beneficiaries or are waiting for the subsidy from the programme.
11. Informal channels of information dissemination (neighbour, friends and relatives) are more effective, and men, in the patriarchal Nepalese society, are the initiators for programme participation.
12. Non-project toilets are kept cleaner in general than project toilet perhaps because the former were built totally at the expense of the household concerned, an investment on which they would like to get the maximum return.

13. Majority of the project toilet households show dependency syndrome as they claim that the subsidy was "less than required".
14. Based on the survey results, Mr. Rai recommends that future projects should focus on the socio-politically sub-ordinate and economically poorer households, and should simplify and shorten the bureaucratic and technical procedures of applying for subsidized latrines. Moreover, the subsidy level should be clearly worked out considering the affordability of the poorer households in such a way as to avoid the dependency syndrome. Finally, non-governmental or private organizations in the country should be looked into as lead institutions and sanitation programmes must be closely integrated with other public and social service programmes.

2.1.4 Assignment Report, WHO (NEP CES 001) (1989) 1/

This report comes up with the following findings and recommendations about sanitation in Nepal.

1. Although a basic component of the Basic Minimum Needs Programme (BNP), Sanitation has neither been spelt out clearly nor policy guidelines given or targets set in the BNP document (1986).
2. Sanitation is lagging far behind the progress in water supply subsector. Sanitation coverage in 1989-90 is almost the same as in 1979/80.
3. The data on government expenditures during the Sixth and the Seventh Five Year Plans indicate that sanitation received a very low priority.
4. The people in the north hill region in Nepal do not use water for anal cleaning and water is scarce there. Hence the most appropriate technology for that areas is Ventilated Improved Pit Latrine (VIP), with twin pits. In midlands and the Terai, where people use water for ablution, Pour Flush (PF) latrines with twin pits is the best option.
5. No particular technology should be forced on the people but the relative costs, merits and demerits should be explained and the choice decision be left to the people. Moreover, people should have some choice flexibility of making some necessary changes (e.g., super-structure, elevation, location and size etc.) without significantly affecting the basic design.
6. Sanitation should be integrated with water supply project and rural multi-sectoral development programmes.
7. There should be a lead department at the national level for coordination, and there should be uniformity (as far as practicable) in financial assistance (based on affordability) in all projects and among all implementing agencies.

1/ Gupta, K.N. (2 Dec. 1988 - 1 Feb. 1989).

8. In order to ensure post-implementation use and maintenance (or sustainability) the programme should be need based and not forced on the people through creating artificial demand with the lure of heavy subsidies and/or other benefits such as water supply.
9. Instead of spreading thinly over the country the programme should initially concentrate on those areas where the acceptance is likely to be high.
10. The community should be involved in all stages of the programme (planning, technology selection, financing and training) and local social workers, teachers, senior students, community and religious leaders, and especially women should be fully utilized to act as promoters and facilitators between the community and planners.
11. The benefits of latrines should first be highlighted in terms of privacy, convenience, modesty of women and physical safety followed by health benefits.
12. A clear and simple manual on design, use and maintenance of latrines should be distributed.
13. Till the social taboo and barrier in cleaning pits is broken, the local bodies should provide cleaning service at a fixed rate.

2.1.5 Behavioral and Health Aspects of Sanitary Intervention in Nepal
(1987) 1/

The acceptability and health effects of sanitary intervention among rural population in the Terai area of Nepal and comes up with the following findings.

1. Costumes and habits of water use is tailored by availability of water.
2. Rural Terai community in Nepal are not much interested in having latrines thus requiring much more motivational inputs to increase acceptance.
3. People are more willing to contribute voluntary labour to improve their sanitation facilities that to pay even a very small amount of cash.
4. People like the idea of being a member of water supply and tubewell maintenance committee.
5. Motivational and educational inputs are not given due attention in sanitation programmes which concentrate on design, production and supply aspects.

1/ Acharya, S.

6. It took two lady motivators two years for convincing 30 percent of the 2,000 population to take the slab, construct the latrine and use it, and to make another 26 percent willing to take the slab.
7. Because of improved water supply and sanitation and also because of the presence of health workers in the village, a reduction in morbidity due to diarrhoea and worm infections was observed.
8. As there was inadequate drainage around the tubewell, the water collected around the tubewell have been contaminated with human excreta.

2.1.6 Baseline Study of Khokana

In September 1982 New ERA^{1/} conducted a baseline survey of Khokana to establish baseline indicators and to identify sanitation and health related problems. The baseline survey was conducted to elicit data on socio-economic status, sanitation practices, perceptions and attitudes towards sanitation and health, and the contemporary health status of the inhabitants of Khokana. Moreover, all water sources in Khokana were observed using an observation form for taps, wells, and ponds. The major findings of the baseline survey were as follows:

1. At the time of survey sanitation facility was minimum in Khokana. Very few people had private latrines and most of them defecated in the streets and alleys. About 55 percent of observed houses had feces in front.
2. Majority of the people used to heap animal dung in front of their houses until used as fertilizer in their farms.
3. The traditional system of disposing household waste included Nauga (dug under the stair) for accumulating ash and urinals, and Saaga (bigger than Nauga and often located at the back of the house) for throwing all types of liquid household wastes.
4. At the time of survey Khokana had piped water supply distributed by ten public standpipes some of which were attached to cement tanks. Water from the tap was used for drinking while well and pond water was used for washing clothes, making alcoholic beverages, bathing, and other household purposes.
5. At the time of survey the impact of poor sanitation was clearly visible, most people (94%) were found to be infested with worms, skin disease was prevalent and outbreak of cholera and eye infection had occurred frequently in the past.
6. Most people in Khokana showed their preference for a flush type toilet because of the absence of "pore" (sweepers by caste) required to empty pit-type latrines.

^{1/} New ERA, 1983 Sanitation Education in Khokana: A Report on the Baseline Survey, UNICEF/New ERA, Nepal.

2.1.7 Report on Health and Sanitation Campaign in Tokha/

A baseline study^{1/} of existing sanitation conditions and practices of the Tokha Community was done in 1985 and the major findings and recommendations are as follows;

1. Few households in Tokha have built latrines. People generally defecate in the field and children on road sides.
2. Being an agricultural community people utilize animal and agricultural wastes for manure.
3. Traditional method of solid waste disposal and composting is prevalent in which Nauga, Saaga, Cheapaga, and dungheaps are used.
4. The unhygienic practices include occasional bathing, seldom use of boiled water, non-cleaning of utensils after every meal, infrequent laundering, no proper ablution after defecation and lack of chimneys in kitchen.
5. Cholera, diarrhoea, worm infections, skin diseases and frequent fevers are common in the village.
6. The women folk who are responsible for their home sanitation and family health are illiterate, and unaware of the relation between sanitation and health.
7. Various superstitious beliefs are associated with health and diseases. When someone becomes ill the local people first approach a "Baidya" (a traditional healer) who recommends a "puja" (rituals of worship) to Gods and Goddesses.

2.1.8 Findings of the Mid-Term Evaluation (1986)^{2/}

Chris Wolz evaluated the technical aspects of SUSP in 1986 with the objective of evaluating the status, quality, and appropriateness of design of physical works constructed in the SUSP, namely PF twin pit composting latrines, street drains, and project workshop. The major findings of this study are summarized below.

2.1.8.1 Status of the Sulabh Latrines (August, 1986)

1. In Khokana, out of the 391 latrines constructed, only 52 percent were found in use, while 7 percent were incomplete to pan level and 41 percent had incomplete superstructure (and therefore not in use).

^{1/} UNICEF, File H. 32.17.

^{2/} Wolz, Chris, SSA, 1986. Evaluation of the Technologies and Implementation of the UNICEF Semi-Urban Sanitation Pilot Project, Final Report.

2. In Tokha, out of the 250 latrines built, only 35 percent were in use, while 74 percent were incomplete to pan level and 11 percent had incomplete superstructure. The main reasons for this low percentage of complete and used latrines were the shortages of funds and materials.
3. In both places, all of the Sulabh soak pits were found to be of good quality built in close accordance with the standard dimensions. However, in Khokana 90 percent of the soak pits were set so deeply into the ground that the top of the cover slab were at or below the ground elevation, making them susceptible to flooding.
4. In Khokana 75 percent of the latrines were found to function well while the other 25 percent were rendered temporarily inoperable during the monsoon due to flooding. Moreover, the scarcity of water in Khokana had lead many people to use less flush water than they should (2 litres), and thus fresh faces in the pan were generally found which would accumulate, dry, and block the gooseneck or channel.
5. While as much as 50 percent of the Khokana latrines had their pits filled with water, or flooded during the monsoon, only 25 percent were rendered inoperable for the 3-4 months of rainy season. These 25 percent latrines were filled with run-off drainage or "perched precipitation", due to the limited infiltration capacity of the clay-like Khokana soil.
6. In Khokana and Tokha mosaic cement pans manufactured by East consult Sulabh Toilet and Action program (EASTAP) were used. The EASTAP pans, waterseals and foot-rests used are all smooth and of consistent good quality. They flush well with one litre of water and totally with two, and seem to always function well.
7. At the two Kathmandu sites the most common type of SS was found to be of brick-mud masonry walls with a tile roof. Of all completed SS 60 percent were of good quality, 20 percent fair, and 20 percent poor. Homeowners typically built the SSs by themselves, and spent an average of Rs. 500.00. Other building materials, such as wood or bamboo are not readily available, nor much cheaper than brick-mud masonry. In Khokana all of the homeowners with incomplete SS blamed it on their financial problem and the other half on lack of enough time.
8. In Khokana and Tokha new workshop/storeroom facilities were constructed under the SUSP. All slabs were cast in the workshops and the quality of those slabs were very good. However, the construction of workshop is a costly affair. For example, the workshop in Tokha cost Rs. 40,000.

2.1.8.2 Latrine Utilization

1. In Khokana utilization of completed latrines was found to be irregular. Of those families with completed latrines, only 80 percent of the people over 5 years of age used the latrine at all (85% of the adult men and 75% of the adult women). Even among the latrine users,

50 percent did not use the latrine all of the time, preferring to use it only if it was raining, dark outside, or if they were sick. This may be because there were few pre-SUSP latrines in Khokana.

2. In Khokana, the stated reasons for not using latrines were: "Not their habit" and fear of filling up quickly and becoming odorous. Very few children under the age of 5 used latrines, and people were still believing that children's feces do not pose a health hazard.
3. As mentioned above, in Tokha only 35 percent of the latrines were in use, and therefore the mid-term evaluation did not assess the latrine utilization there.

2.1.8.3 Maintenance and Cleaning

1. At Khokana it was found that flushing was not done regularly and cleaning of the pan and floor appeared to have been done only when they had been badly fouled. The main reason for this may be the scarcity of water in Khokana.
2. In Khokana the interiors of the SSs. and edge of the pan were found to be generally clean of stray fecal matter, yet half of the latrines always had fresh fecal matter in the neck of the pan. About 35 percent of the latrine pans were found to be scummy and stained. Home owners responded that latrines are generally cleaned once a week with a brush, or dump of grass, and water, and 60 percent of the time by the women of the house.
3. Sulabh latrines built by EASTAP in Thimi and Bode were also inspected and found to be generally cleaner than SUSP latrines. Nearly all of the EASTAP latrine recipients visited reported using wood-ash from their kitchen as an abrasive to clean the latrine pan. The use of ash and chappel-stick has been strongly promoted at these sites by EASTAP, and readily accepted. Ash is a cheap locally available abrasive and may also help improve the quality of the compost (M. Dorfman, 1986 Report, EASTAP).

2.1.8.4 Pit Emptying and Compost Utilization

1. Only in Khokana any pits had filled and been changed, and then only a few. The simple operation of plastering the brick into the channel opening with mud plaster was rarely done properly there. The brick was usually just placed over the channel opening without mud, thus not properly sealing off the channel, resulting in simultaneous filling and contamination of both pits. All homeowners in Khokana said they had/or would change the channel by themselves (unlike terai where many would hire sweepers).
2. Few pits had been emptied at the time of survey, and only in Khokana. Those highly motivated homeowners had performed the emptying themselves, while 55 percent of other latrine owners would hire a sweeper to do it, costing about Rs. 200 per pit (which is much higher than the reported cost for terai as only Rs. 40-90 per pit during the survey

time). In Khokana the high cost of hiring a sweeper was mentioned by several latrine owners as a reason for not using the latrine all the time.

3. Little Sulabh compost utilization was found at the time of the mid-term evaluation survey, perhaps because few pits had been filled and emptied. In the Kathmandu sites 80 percent of the respondents were found to be willing to mix the Sulabh sludge with other organic material, dry it in the sun if it is wet and apply it before planting to grain crops as well as vegetables. Only 20 percent were unwilling to use the Sulabh compost. It should be noted that applying the compost to crops before planting is advisable, yet not to low-laying vegetables, or vegetables eaten raw (M. Dorfman, 1986).

2.1.8.5 Water-Supply, Drainage and Solid Waste Disposal

1. The original project document sets improvement of existing water supply as a priority, yet other than in Khokana no work in water supply has been done under the SUSP. At the Khokana site the SUSP gave the towns people several bags of cement to repair each of the town's taps. This activity, however, has not at all solved the severe water shortage problem of Khokana.
2. The two Kathmandu sites were found to have drainage problems. Tokha has the most serious drainage problem among all the SUSP sites.
3. The drains so far built by the SUSP (up to the time of mid-term evaluation) have been in Tokha and Khokana and all covered brick-masonry channels, of good design, and most good-fair quality. A large SUSP subsidy was used for all drains, however, without any topographical mapping, assessment of the degree of the drainage problems, and planning to serve the worst drained areas first.
4. Under the SUSP 440 meters of brick-masonry drains were built in Khokana of which 300 meters cover first priority sectors. It was found that a total of 1250 meters additional improved drainage is needed in Khokana.
5. The drainage in the dense town of Tokha is very poor and a serious health hazard. Under the SUSP drainage 50 percent of the town's 2000 meters of roadways were to be covered (of which 615 meters were built by 1986 but only 20 percent of the 615 meters were totally completed). The slow progress in building drainage was due to a shortage of gravel (supplied by the MPLD) for cover slabs, and sand (village voluntary contribution). These incomplete drains were full of dirt, making it difficult to clean before final plastering. According to the project overseer, however, all of the 615 meters of drains had been completed by July 1986.
6. Under the SUSP no work has been done to improve solid waste collection and disposal, except for "clean-up" campaigns at the beginning of implementation. But these campaigns have proven to give only temporary relief.

7. Many people in Khokana expressed the view that the streets are much cleaner after the SUSP due to an increased awareness of sanitation. The streets of Tokha were found to be much dirtier than of Khokana, and the traditional system of regular collection and composting of waste seemed to be declining. Half of the courtyards in between the houses were found extremely dirty with human feces scattered around the other refuse.

2.2 Evaluation Criteria for Sanitation Programmes

In 1983 a suitable methodology for the evaluation of water and sanitation programmes, the Minimum Evaluation Procedure MEP (1983)^{1/} was developed field tested by WHO, which is currently being used in many countries for the assessment of the utilization and functioning of facilities. The current consensus is that the evaluation process should be continuous and integrated at different stages of the programme itself, rather than appended at the end.^{2/} On the other hand, evaluation can be more useful if built into the programme, rather than being performed by an outside team or agency according to some authors.^{3/} A serious drawback of most evaluation studies of sanitation programmes is their focus on technical issues at the cost of neglecting the utilization and community acceptance aspects. Only the input/output or cost considerations and timely completion of projects are considered ignoring the real impact on the sanitation situation by the project.^{4/}

2.2.1 The MEP Evaluation Approach

The MEP developed by WHO argues that the ultimate objectives of investments in these fields are to improve the health, welfare and economic status of the users of these facilities for which the proper functioning and utilization is required. Therefore, MEP is designed to evaluate these two aspects.

1/ MEP, 1983, Minimum Evaluation Procedure for Water Supply and Sanitation Projects, WHO, Geneva.

2/ Psharoti, K.A., 1975, Guide to the Integration of Health Education in Environmental Health Programmes. WHI, Geneva, and Schultzberg, G., 1982. Evaluation of Water Supply and Sanitation Projects, M.Sc. CHDC theme.

3/ Steurt, G.W. 1969 Planning and Evaluation in Health Education 13(1).

4/ VanWijk-Sijbesma, F., 1979. Participation and Education in Community Water Supply and Sanitation Programmes. Vol. 12 and 13. IRC Technical Papers Series No. 12., International Reference Center for Community Water Supply, Hague.

1. Functioning: Here the technical aspects of the facilities in relation to the local conditions have to be examined. In case of latrine distribution programmes, latrine designs have to be evaluated with respect to local defecation habits, availability of water, and ground conditions. For example, VIP latrines (ventilated improved pit) were found unpopular in Bangladesh due to smells, even though they are supposed to eliminate these.^{1/}

The VIP can be a problem in areas of high water table and actually become a breeding place for mosquitoes.^{2/} Similarly Sulabh latrines can be a problem due to "perched precipitation" which keeps the soil saturated up to the ground elevation in places like Khokana with clay like soil.^{3/} In addition to technology, the problem may be with inadequate training of local masons who inadvertently change the design, or with inadequate explanation to the local villagers of the type of latrine to be constructed and the reasons for selection.

2. Utilization: It may be the case that many latrine owners continue to defecate on open land after the latrine construction programme had been completed.^{4/} Usually, a significant problem in this regard is the underutilization by children, despite the fact that children are the main carriers of diarrhoeal and other intestinal pathogens.^{5/} In order to evaluate the utilization by family members a combination of observation technique and household questionnaire is to be adopted.

2.2.2 Other Evaluation criteria

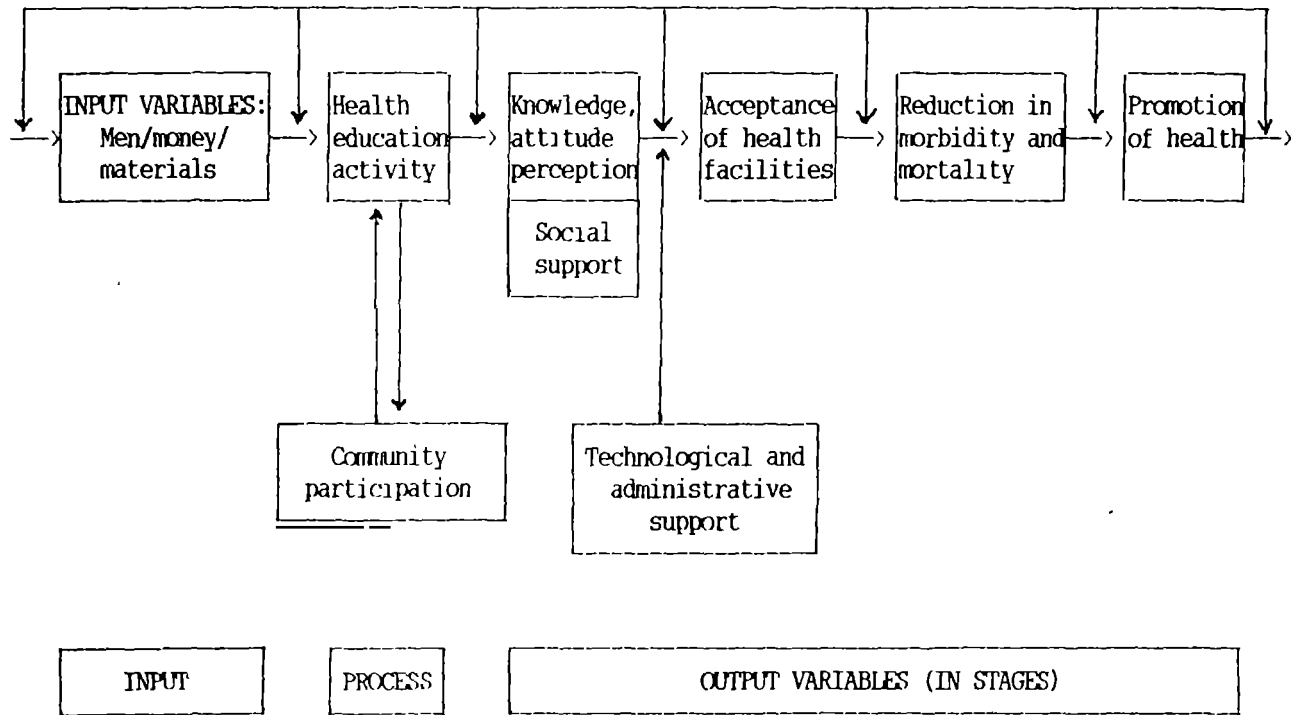
In addition to functioning and utilization of facilities the following aspects should also be investigated.

1. Maintenance : If latrines are badly maintained and dirty, they may provide ideal breeding places for flies and hookworms and actually increase health hazard. Hence, the frequency and method of maintaining and cleaning latrines have to be investigated by questionnaire and observation methods.

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- ^{1/} Gibbs, K., 1984. Privacy and the pit privy - technology or technique., Waterlines, 3 (1)
 - ^{2/} Curtis, F.F. and Feachem, R.G. 1981. "Sanitation and Culex pipiens mosquitoes: a brief review". Journal of Tropical Medicine and Hygiene, 17-25.
 - ^{3/} Wolz, Chris, 1986. Evaluation of the Technologies and Implementation of the UNICEF Semi-Urban Sanitation Pilot Project. Final Report
 - ^{4/} Handa, B.K. et al., 1978. "the Impact of Sanitation in Ten Indian Villages", in Sanitation in Developing Countries (A Pacey Ed Chichester, John Wiley and Sons, pp. 34-42.
 - ^{5/} UNICEF, 1983. Assisted Integrated Water and Sanitation Programme Azad Jammu and Kashmir. UNICEF, Islamabad.

future?" Similarly, in a latrine promotion programme where the initial motivation was based on status/comfort/privacy/convenience concept, it should be determined whether after the installation of the latrines, people gradually became aware of the health impact aspect or not. For example, it may be the case that many households installed a subsidized latrine for the status among their peers but they keep the latrine unutilized except on rare occasions of social gathering at their houses. This would not happen if their motive for installation were reduction of health hazard. Similarly, a household head may have installed the toilet because the promoter convinced him/her of the convenience during rains and dark. In this case the family members will most likely use the latrine mainly during rains or dark and would defecate outside at other times. Finally, the proper maintenance and cleaning of the toilets cannot be expected from a family whose members are unaware of the direct relation between human excreta and various transmissible diseases. In that case the household latrine would be useless with respect to sanitation and health but would only be a medium of saving time spent in defecation.

Figure 3 : Conceptual Model for Evaluation of Health Education



3.0 INTRODUCTION TO SUSP AND EASTAP

This chapter provides the detailed description of objectives, targets and achievements of the two programmes based on files and reports of the Ministry of Local Development and EASTAP and the baseline surveys and related reports for Khokana and Tokha prepared during the Health and Sanitation Education Campaigns in 1982/83 and 1985 respectively in the two sites. Moreover, a list of some useful practical experiences and findings during the programme implementation is provided for EASTAP. For SUSP such practical experiences are not reported in the files and reports. Table 3.1 shows the main characteristics of the two programmes.

Table 3.1 : Main Characteristics of the Two Projects (SUSP and EASTAP)

Characteristics	Projects	
	SUSP	EASTAP
Programme Sites	Semi-urban (Hills and Terai)	Semi-urban (Hills)
Duration	7 years (1982-1989)	6 years (1983-1989)
Project execution	Through Government (MPLD)	Private sector
Financial and technical support	UNICEF	UNICEF
Objectives	<ul style="list-style-type: none"> --To improve mothers' and children's health through improvement of environmental sanitation conditions --To develop trained manpower --To implement integrated sanitation pilot project 	<ul style="list-style-type: none"> --To affect change in people's habit regarding sanitation --To create employment through labour intensive technology --To involve people in the reuse of pit manure for composting --To support private sector approach in order to gain experience in the practicability and cost effectiveness of private sector intervention

Cont'd...Table 3.1

Characteristics	Projects	
	SUSP	EASTAP
		--To raise sanitation awareness in the communities
		--To explore strategies for effective implementation of sanitation in particular experimenting with loan scheme and subsidy reduction
Programme components (planned)	--Health education campaign in the initial stage of the programme	--Major emphasis on private latrine building
	--Health education materials distribution	--Training of local masons
	--Improvement of health education curricula	
	--Health training (technical staff)	
	--Latrine building (school/private house)	
	--Water storing and drain construction	
	--Refuse disposal area construction	
	--Improvement of public tapstands	
	Activities not included in project plans	

Cont'd...Table 3.1

Characteristics	Projects				
	SUSP		EASTAP		
Participation:					
UNICEF	Weighted average of subsidy for Tokha and Khokana is 68% of cost up to pan level. In the form of bricks, cements. Squatting pan and slab, skilled labour equivalent to Rs. 1,700 per latrine at 1988/89 Kathmandu prices (of this 80% contribution by UNICEF)		Weighted average of subsidy for all EASTAP sites is 35% of total cost up to pan level in terms of materials and labour which was funded by UNICEF but channeled through the private sector organization. The monetary equivalent is Rs. 873 at 1988/89 Kathmandu prices.		
HMG	Bricks, cements. Squatting pan and slab, skilled labour equivalent to Rs. 1,700 per latrine at 1988/89 Kathmandu prices (of this 20% contribution by HMG)		-		
People	Voluntary work, materials for superstructure and sand equivalent to Rs. 800 up to pan level. Cost of superstructures are highly variable		Voluntary work, materials for superstructure and sand equivalent to Rs. 800 up to pan level. Cost of superstructures are highly variable		
Private sector	None		On average 65% of up to pan level (Rs. 1,627 at 1988/89 Kathmandu price and cost of superstructures equivalent to Rs. 873 per latrine.		
		SUSP		EASTAP	
Targets	Target Activity	Achievements	Target Activity	Achievements	
Baseline Survey		Done			
Latrine building	2,000 (in four sites)	Approx. 650 toilets in two hill sites	1,200 household toilets	1,242 household toilets	

Cont'd...Table 3.1

Targets	SUSP		EASTAP	
	Target Activity	Achievements	Target Activity	Achievements
Tapstand	100	Negligible	Not applicable	
Waste disposal facilities for households	2,000 (beneficiaries)	None		
Training:				
Overseer	2	Data not available		
Sanitation Tech. Workmen	4			
Workmen	100			
Health education campaign	2 months		Not applicable	
Reconstruction of drain	50%	Achievement according to target		

3.1 Objectives and Targets of SUSP

UNICEF has been involved in the Semi-urban Sanitation Pilot Project (SUSP) since 1982 which started in Khokana (Lalitpur) and was later extended to Tokha in Kathmandu and two Terai sites, namely, Bhadrapur (Jhapa) and Urlabari (Morang). However, for the purpose of comparison with the EASTAP project in several Kathmandu valley sites, a detailed discussion of objectives, targets, activities, achievements, and shortcomings in the SUSP programmes only at Tokha and Khokana will be presented in this section. The project was implemented through MPLD and after the reorganization of the ministries through MHPP, with the financial assistance and technical support of UNICEF. The project had latrine (Sulabh type) building component as well as stormwater drains building and more importantly, a health and training component which included training of technical staff (HMG and local) and of Community Health Motivators. The health education component was involved prior and during the construction of latrines. A mid-term evaluation of the technological aspects was done by Chris Wolz in 1986, which is also one of the main sources of information available to the present evaluation team about the SUSP programme.

3.1.1 Objectives of SUSP

1. To alleviate the poor state of health of children and mothers in Nepal by improving environmental sanitary conditions.

2. To implement four integrated sanitation pilot projects in four small semi-urban communities (mentioned above) over a period of four years.
3. To develop and establish the procedures necessary for implementation of the programme on a larger scale.
4. To develop and establish trained manpower for expansion of the programme.

3.1.2 Planned Activities

1. A baseline survey will be conducted to collect information on present water supply, sanitary and drainage facilities and health conditions (particularly stool, urine and blood tests).
2. Four community workers will be chosen for each site. These people will be given training in health education and communication, with emphasis on the local situation as determined by the baseline survey. They will visit every house to discuss sanitation and to explain about the project.
3. After the training, a village campaign will be launched, consisting of health education, talks, posters and leaflet distribution. This campaign will continue for two months. During the campaign several demonstration latrines and refuse disposal areas will be constructed.
4. Appropriate latrines will be constructed at local schools and most of the private homes. To construct latrines HMG will provide squatting slabs and cement. The local people will provide voluntary work and other local materials required for the superstructure.
5. Refuse disposal areas will be constructed and used for composting.
6. Public tapstands will be improved.
7. If there is an existing drainage system, this will be repaired and expanded to handle waste water from the taps. If there are no drainage facilities then a simple system will be constructed using labor intensive methods to reduce cost. Wasteponds which can be diverted from use on the fields will be constructed.
8. Health education materials will be given to the local school and health post. The health education curricula in the schools will be improved and the children will learn about and become involved in the project.
9. An evaluative survey will be carried out for the assessment of each project.
10. The results of the project in the four sites will be used in the planning of a more extensive semi-urban sanitation programme.

3.1.3 Targets

The physical targets were changed annually throughout the implementation of SUSP. However, from the various files of MPLD (now Ministry of Local Development) and notes for record of UNICEF the following information about the annual physical targets for Tokha and Khokana could be collected.

1. Original Targets (1982/83) was to build 2,000 household VIP latrines, 100 hygienic public tapstands, provide solid waste disposal facilities for 2,000 households, training of two overseers, four water and sanitation technicians, and 100 local skilled workmen for latrine construction.
2. For 1982/83 the targets for Khokana (the first project site) were:
 - a. Intensive two month health education campaign (for 4,000 people);
 - b. Construction of 4 school latrines;
 - c. Construction of 10 public tap stands;
 - d. Reconstruction of 50 percent of existing drains; and
 - e. Planning and organization of waste disposal facilities.
3. For 1983/84 (second year for Khokana) the targets were:
 - a. Construction of a further 350 household latrines;
 - b. Construction of 4 VIP latrines for local school; and
 - c. Reconstruction of existing drainage system.
4. In 1984/85 the annual targets for Khokana were:
 - a. Construction of 100 household latrines;
 - b. 3,437 ft. surface drain; and
 - c. Improvement of public tap stands.
5. In 1984/85 (first year) for Tokha the targets were:
 - a. One month long health education campaign; and
 - b. Construction of 300 household latrines.
6. In 1985/86 (second year) for Tokha the physical targets were:
 - a. 400 household and institutional Sulabhs;
 - b. 3,000 ft. of surface drain;
 - c. The draining and cleaning of traditional ponds; and
 - d. The training of health and sanitation workers.

Similarly for Khokana the targets were 300 latrines and 3,000 ft. drains.

7. In 1986/87 the physical targets for Khokana were:

- a. Essential drains 78 m
- b. Additional drains 110 m
- c. Carry-over latrines 30

8. For Tokha the yearly target in 1986/87 were:

- a. Carry-over essential drains 750 ft.
- b. New essential drains 1,150 ft.
- c. Carry-over latrines 162
- d. Additional proposed 88
- e. Institutional 7

9. Proposal for 1987/88 for Tokha:

- a. Building 88 new latrines;
- b. 500 m essential drains;
- c. Tap stand platform for 12 tap stands; and
- d. Carry-over drains.

3.2 Objectives and Targets of EASTAP

In 1981, EAST consult - a private sector organization formulated its own action programme: EAST's Sanitation Action Programme (EASTAP), in order to test the practicability and the usefulness of such private initiative. EASTAP selected the "Power Flush low-volume-water-seal-twin-composting-pits latrine" design known as "Sulabh Latrines". During 1982, EASTAP was able to mobilize some funds from German Embassy in Kathmandu to subsidize (50% of cost) 35 and 50 demonstration latrines in Kirtipur and Dadhikot respectively. This work was completed during Mid 1983. In 1983 UNICEF-Nepal was also interested in the sanitation action programme with the objective of gaining experience in the practicability and cost-effectiveness of utilizing the private sector alternative in promoting and implementing suitable sanitation systems for semi-urban areas in Nepal. The UNICEF assisted EASTAP programme of latrine building has completed three phases, namely, The Demonstration Phase (1983-1984) covering Lubhu, Dadhikot, Thimi and Lainchour), The Extended Demonstration Phase (1985-1986, covering Bode, Thimi, Dharmasthali and Nagadesh), and The Approach Development Phase (198-1989, covering Lokanthali, Katunje, Sanagaon, Thecho, Thimi, and Kirtipur). The total target was to build 1,200 latrines in the Kathmandu Valley sites mentioned above whereas the actual construction was of 1242 latrines. The objectives and targets of EASTAP are discussed below.

3.2.1 Objectives of EASTAP

3.2.1.1 Phase 1 (May 1983-Nov. 1984, 18 months) - The Demonstration Phase

1. To effect change in people's chronic habit of open defecation by providing latrine alternative and to ensure better public health and environmental sanitation,

2. To create employment by using more labour based methods of construction,
3. To involve individual households in the reuse of pit manure,
4. To support a private sector approach to promote, propagate and construct "Sulabh Types" latrines in many (four) toiletless semi-urban settlement, and
5. The implicit objective of UNICEF was also to gain experience in the practicality and cost-effectiveness of utilising the private sector alternative in promoting and implementing suitable sanitation system for semi-urban areas in Nepal, and to compare and correlate such experiences with programmes run by usual government channels (in particular, the SUSP programme through MPLD/MHPP) so that a more effective approach to tackle the problem (of sanitation) could be developed.

3.2.1.2 Phase II (Jan 1985-June 1986; The Extended Demonstration Phase):

1. To allow EASTAP to continue its efforts in developing a proper private sector approach,
2. Demonstration latrine building programmes aiming at a change in the defecation habits of the communities, and
3. To continue to support the efforts of a private sector initiative, so that the promotion and implementation of "Sulabh" latrines in other similar areas of Nepal could be taken up through private sectors in future.

3.2.1.3 Phase III (April 1987 - June 1989): Exploration of Strategies

1. To raise sanitation awareness in communities residing in semi-urban or village level settlement inside Kathmandu Valley by introducing "Sulabh" type household latrines as demonstration units,
2. Share experiences and ideas between EASTAP and other UNICEF-supported sanitation programmes in Nepal and to develop strategies, approaches and technologies to be made accessible to other interested parties for general promotion and advocacy in Nepal,
3. To explore the possibility to involve financing agencies like development banks and Nepal Rastra Bank to loan out money to families who want to build latrines, and
4. To reduce the prevailing subsidy to such a low level that loans become attractive to people.

3.2.2 Targets of EASTAP

The targets of EASTAP under Phase I (Pilot Phase) were to build 200 Sulabh toilets in a period of 12 months between July 1983 to June 1984

with a subsidy of 66 percent of cost up to pan level (estimated as Rs. 1250.00 per latrine) at the four Kathmandu Valley sites mentioned above. The targets under Phase II (Extended Pilot Phase) were to build 500 Sulabh toilets in a period of 18 months between January 1985 to June 1986 with a subsidy of 44 percent of cost up to pan level (total cost estimated as Rs. 1,710.00 per latrine) at the four Kathmandu Valley sites mentioned above. Finally, the targets under Phase III (Approach Development Phase) were to build 500 latrines in a period of 18 months between April 1988 to Sept. 1988 with a subsidy of only 40 percent of cost up to pan level (total cost estimated as Rs. 2,070.00 per latrine) at the six Kathmandu Valley sites mentioned above. It was also planned during Phase III to explore and develop ideas on how to go about for an extended loan-programme in future. Moreover, experimentation with Type C sulabh latrines exclusively designed for poor families was also one of the planned activities under Phase III.

3.3 Activities Under SUSP at Khokana and Tokha

3.3.1 Health and Sanitation Education

Although health and sanitation education is indispensable for a successful and sustainable sanitation programme^{1/} the SUSP has failed so far to design and implement a programme of continuing health and sanitation activities.

3.3.1.1 Khokana Sanitation Education Campaign

This campaign was conducted in 1982-83 as a joint effort of the sanitation unit of Environmental Sanitation Section of Ministry of Local Development, Health Education Section of Ministry of Health, UNICEF/Nepal, and New ERA team. Immediately following the baseline survey in September 1982, a workshop actively participated by community members and concerned officials was held at Khokana to discuss and finalize the training programme and campaign. The outcomes of the two-day workshop (25-26, November 1983) were as follows.

1. The realization that the poor sanitation situation in Khokana causes many health problems.
2. A detailed job description of the Sanitation Committee and Community Health Workers.
3. A detailed description of the training needs for the Sanitation Committee and Health Workers.
4. A detailed plan of the Scheduled Campaign Activities, and
5. A Training Schedule for Sanitation Campaign (SC) and Community Health Workers (CHW).

^{1/} Sanitation Workshop, 1989, Ibid, p.11.

The training programme (5-12, Dec. 1982) in Khokana was conducted for six days for CHWs, and three days for Sanitation Campaign Members (SCMs). Educational materials used during training included blackboards, flowcharts, posters, booklets, drawings, charts, and figures.

An intensive Health Campaign was planned for two months (end of Dec. to end of Feb. 1983) in Khokana after which a less intensive campaign was supposed to continue throughout the construction phase of the project.

The objectives of the campaign were to construct 45 demonstration latrines (5 in each ward) and 90 compost pits (10 in each ward), to collect application forms for subsidised latrines from 400 households, and to reach every household with sanitation/health messages.

3.3.1.2 Health and Sanitation Campaign in Tokha

This campaign was conducted during January 1985 to April 1985. The tasks of this campaign were accomplished in three phases.

Phase I

1. Observation and evaluation of existing sanitation conditions, practices and beliefs of the Tokha community.
2. Co-ordinations with FPAN's activities in Tokha.

Phase II

1. Survey work on sanitation practices in Tokha.
2. Schedule activities for community awareness and motivation.
3. Preparations for campaign week.

Phase III

Workshop and physical cleaning activities in Tokha.

Activities Done in Tokha

1. Sanitation Committee Formed

A sanitation committee including the representatives of the youth group, women group, teachers and social workers is formed to plan the campaign activities and to initiate community participation in the programme.

2. Observation Visit to Khokana Village

The sanitation committee members were taken to the Khokana village to help them understand the SUSP programme and the community commitment to the programme.

3. Home Visits

Some families were interviewed to know their socio-cultural norms of hygiene and sanitation. Their personal and home hygiene practices are related with religion rather than with healthy living.

4. Meetings and Discussion Sessions

Formal and informal meetings were held with the local panchayat leaders, the youth group and the women's group to discuss the objectives of SUSP programme and to mobilize their resources for the campaign purposes.

5. A brochure of 'Sulabh' latrine was printed and distributed in the community.

6. Film Shows

Once in a week film shows related with health and sanitation were scheduled to create awareness among the community and it was found the most effective media of mass communication in Tokha.

7. Slogans of Health and Sanitation

Slogans of personal, home and environmental hygiene were prepared and distributed in the schools of each panchayat.

8. Posters

Special posters were drawn for the campaign to convey the messages of health and sanitation keeping in view the peculiarities of the Tokha Community.

9. Model Latrine Construction

One Sulabh latrine in each panchayat office was built as a model to the householders.

10. Workshop and Health Teaching

The workshop - opening day of the campaign week was inaugurated by the Minister of Panchayat and Local Development. The discussion sessions on Health and Hygiene and community participation were initiated by the resource persons from the Health Department and Social Service Organizations.

11. Tokha Cleaning Activities

One group in each panchayat did the cleaning activities in their respective panchayat for 2 days. Wards, ponds and drainage were cleaned. More women and children than men had actively participated in the campaign.

12. Exhibition and distribution of health and sanitation reading materials. Booklets, flyers, posters about nutritious food, diseases, carriers, common diseases, health and hygiene, etc. were collected from various sources for exhibition and distribution in the community during the campaign days.
13. A sanitation survey was done in Tokha as the result of the baseline survey report was not made available.

3.3.2 Critical Appraisal of Other SUSP Activities

1. There are no records or documentation of the site selection procedures and criteria used in choosing the four pilot project sites. The wide variation in the way the sites were selected and the characteristics of the four sites has on one hand, led to a wide variety of situations and experiences, but, on the other, it has also made it difficult to apply cumulative experience, and in standarding project "software" and procedures. Moreover, the implementation in such varied sites has involved greater administrative and supervisory efforts and costs.
2. Baseline surveys were carried out at all four site, yet the results of these surveys were not effectively utilised in project planning. In Khokana the baseline survey by New ERA followed the formulation of project plans and targets rather than proceeding the latter. Similarly the baseline survey of Tokha (performed by a consultant) does not appear to have been utilised in the selection of beneficiaries, because it was done only in 1985.
3. Under the SUSP only the expensive (type A) sulabhs were distributed, though the SUSP project document envisioned the construction of 2000 household VIP (Ventilated Improved Pit) latrines in 4 pilot project towns with a total of 2000 households: 100 percent coverage. However, the actual coverage during implementation ranged from 30-40 percent to 45-80 percent, and the households were not given options about latrine types. Moreover, the number of latrines distributed in the four sites were not based on the local conditions or the size of the population.
4. Most of the subsidised latrines appear to have been installed by the relatively richer households which involves an element of inequity and has far lower demonstration effect than the case when poorer households are the target group.
5. Post implementation follow-up was poor resulting in poor maintenance, low utilization rate, low demonstration effect, and low sustainability of the programme.
6. Both in Khokana and Tokha, the latrine distribution has been done very inefficiently and carelessly as indicated by the much smaller number of actual beneficiaries (about 250 in Tokha and 391 in Khokana) as compared to the lists prepared by the ministerial staffs (which exceeds 400 beneficiaries in both sits). This is because many households only received bricks and cement which they utilized for other purposes than latrine construction.

3.4 Activities Under EASTAP

3.4.1 Phase I Activities

During June 1983 to November 1984 (18 months) a total of 234 Sulabh latrines were built in four sites which was 34 latrines more than the initial target but there was a delay of about six months according to the initial target (Table 3.2). However, compared to the revised proposal of EASTAP the number of latrines built were exactly as proposed and also six months ahead of the extended deadline (May 26, 1985).

The programme has been able to raise household contribution to an upper most level of 70 percent of the cost of a latrine, minimising the subsidy to level of 30 percent only. Whereas the target was only 34 percent contribution by households up to pan level, the programme was able to solicit on average 52 percent of cost contribution per latrine up to pan level from the households. Moreover, the programme's running cost was reduced from 59 percent to 39 percent and the net saving was utilised in constructing 34 more latrines (in 5 more months).

Training of local masons were achieved to construct Sulabh toilets during the construction by involving local masons (also fulfilling the objective of creating local employment). Ten masons in Dadhikot, 2 in Thimi and 3 in Lubhu have been fully trained.

During the follow-up measures by EASTAP team members it was found that majority of households where toilets were built have relatively cleaner surroundings than before reflecting a positive and voluntary (attitudinal) change in people to some extent and the sustainability of the programme.

Apart from the communities where toilets were built, promotional activities were carried out in Satungal V.P., Bande V.P. Thaiba V. P. and Dhapasi V.P. In Dhapasi a school toilet was built by the local people with EASTAP's supervision for demonstration and contribution of pan and water seal.

Revised drawings of Sulabh Toilets, information leaflets having use and maintenance instructions, and simple cost estimate sheets showing materials and labour requirements with toilet photographs were prepared for free distribution. One set each of pan and water-seal with above propagation materials were distributed free to several Nagar and Village panchayats.

For wider publicity and for educational purpose, EASTAP arranged two educational tour programmes. On March 30, 1984 twenty final year engineering students from Pulchowk campus of T.U. were taken around to familiarize them with the construction methods and actual functioning of the Sulabh Toilets. Next on May 25, 1984 twenty primary school headmasters and school inspectors took part in a two-hour field trip to Lubhu and Lainchour. However, it is clear that such occasional and brief tour programmes do not have long lasting impacts even on the participants.

Table 3.2 : Salient Features of UNICEF Financed Programmes (Phase I, II and III)

LATRINE BUILDING PROGRAMS FINANCED BY UNICEF Between 1983 - 1989 YEARS	PHASE I		PHASE II		PHASE III	
	PILOT PHASE		EXTENDED PILOT PHASE		APPROACH DEVELOPMENT PHASE	
	Estimated	Actual	Estimated	Actual	Estimated	Actual
	July 1983 - June 1984	July 1983 - November 1984	January 1985 - June 1985	January 1985 - June 1986	April 1987 - September 1988	April 1987 - June 1989
TIME SPAN (MONTHS)	12	17	18	18	18	27
TOTAL OF LATRINES	200	234	500	500	500	508
TOTAL UNICEF FUNDING (HRs)	290,000.00	290,000.00	525,000.00	525,000.00	595,000.00	522,000.00
UNICEF Contribution Per Latrine in 'HRs'	Upto 825.00 (66%)	Upto 680.00 (48%)	Upto 750.00 (44%)	Upto 750.00 (44%)	Upto 830.00 (40%)	Upto 448.00 (20%)
Household Contribution Per Latrine in 'HRs'	Upto 425.00 (34%)	Upto 750.00 (52%)	Upto 980.00 (55%)	Upto 980.00 (56%)	Upto 1240.00 (60%)	Upto 1835.00 (80%)
Cost of Latrine in HRs	Upto 1250.00 (100%)	Upto 1430.00 (100%)	Upto 1710.00 (100%)	Upto 1710.00 (100%)	Upto 2070.00 (100%)	Upto 2283.00 (100%)
UNICEF Contribution to EASTAP Per Latrine in 'HRs'	Upto 625.00 (50%)	Upto 560.00 (39%)	Upto 300.00 (17%)	Upto 300.00 (17%)	Upto 360.00 (17%)	Upto 580.00 (25%)
LOCATIONS	Locations (A)	Locations (A)	Locations (A)	Locations (A)	Locations (B)	Locations (C)
TYPE OF LATRINES	1) Lubhu (65)	1) Bode (130)	1) Lokanthali (67)	2) Fatunje (102)	-	-
NO. OF LATRINES	2) Dadhikot (60)	2) Thimi (225)	3) Saranathali (75)	3) Saragaon (64)	-	-
	3) Thimi (70)	3) Daransihali (75)	4) Thecho (30)	4) Thimi (78)	-	(81)
	4) Thami/ Latachaur (19)	4) Hajdeeh (70)	5) Kirtipur (4)	-	-	(85)
	Total 234	Total 500	Total 341	+ 167	-	508

During the one-year guarantee period when EASTAP field workers inspected the toilets, the houseworkers were taught the changing pits operation by actually doing it and were motivated to keep their toilets neat and clean by using kitchen and locally made broom.

In Dhadhikot a deworming campaign was organised to show the people what sort of parasites they carry in them. The people were approached for latrine construction at a time when it was most uncomfortable for them to go to the bushes at any time of the day or night. Moreover, the people were made aware of the latrines built by other people (mostly political rivals, people of same status) in the village to dwell on the "social Prestige" element.

3.4.2 Phase II Activities

During Phase II the target of building 500 latrines in four sites was exactly achieved in time and the household contribution was also as per the target (56%).

Besides latrine constructions some practical trainings on low cost sanitation for government technicians, and one-day field exposure trips for engineering students, teachers, and journalists were also arranged during Phase II (as in Phase I).

During implementation (especially follow-ups) exchange of ideas with the local people also helped in gathering experiences and useful practical suggestions (e.g. the use of ash and broom for cleaning).

3.4.3 Phase III Activities

During Phase III a total of 508 latrines (8 more than the initial target) were built in six sites. However, there was a delay of about 9 months in the completion of latrine constructions due to various reasons described in Chapter 5 of this study.

The amount of subsidy was drastically reduced from 40 to 20 percent even when the total cost of latrine construction was sharply increasing.

The low cost type (Type C) latrines were first introduced in Thecho (81 latrines of Type C) and with the experience gained there, these latrines (86 in number) were successfully constructed in Kirtipur. These latrines were exclusively designed for poorer families who enjoyed higher percentage of subsidy (although the absolute amount of subsidy was the same as for type A latrines).

Phase III programme also attempted to explore the possibilities for a loan programme which could not be successful, however, due to the unwillingness of the concerned development banks (and Nepal Rastra Bank) despite the offer by UNICEF of assuming the collateral risk on behalf of the communities. Nevertheless this experiment helped formulate a loan scheme based on the discussions between EASTAP and UNICEF on one hand and EASTAP and the community people on the other. The proposed loan scheme is presented in Appendix C.

3.4.4 Problems and Shortcomings in EASTAP Activities

1. Although the programme created some awareness among the local people to have toilets at least for comfort and convenience if not for hygiene, the total number of toilets built (only 1242 latrines in 14 sites during six years of the project) in each of the communities is quite insufficient for the purpose of affecting people's health and habits of open defecation.
2. People in those sites do not strongly feel the need for toilets. Open defecation is a chronic and stubborn habit of the people and they see nothing wrong in open defecation except some indecency and inconvenience. Although women are more concerned about toilets, the decision makers are old males who resist the idea of having a toilet. Similarly, youngsters are more aware of sanitation facts but the old generations with their financial control do not usually listen to the advices of these youngsters.
3. In Nepal there has been continuous erosion of community self-reliance (the dependency syndrome) resulting from excessive charity type "social projects and programmes" being undertaken by different groups, especially during the last 10 years. The communities, therefore, expect major share of contemporary development investment to come from outside.
4. There is lack of a sense of responsibility and priority at the National Level to frame clear, long-term policies and effective implementing strategies in the sanitation sector.
5. By and large people are unaware of the direct relationship between health and sanitation.
6. Many self proclaimed NGOs (such as Youth Club, women's club) are not at all active in this regard. Rather they seem to have done more harm than good because of infightings among themselves.
7. Lack of effective local institutions which are really trusted by the people, is one of the main hurdles for launching successful local development projects.
8. Almost all demands for "Sulabh Latrines" (Type A) came from relatively higher income families which produces little demonstration effect on the poorer households.
9. The task of subsidy reduction causing higher household share in the (rising) cost was not only very difficult but also time consuming. It was also risky and complicated because of higher subsidies provided during earlier phases. This happened during phase III when subsidies were reduce from Rs. 830 to Rs. 425 in the face of rising costs of material and labour.

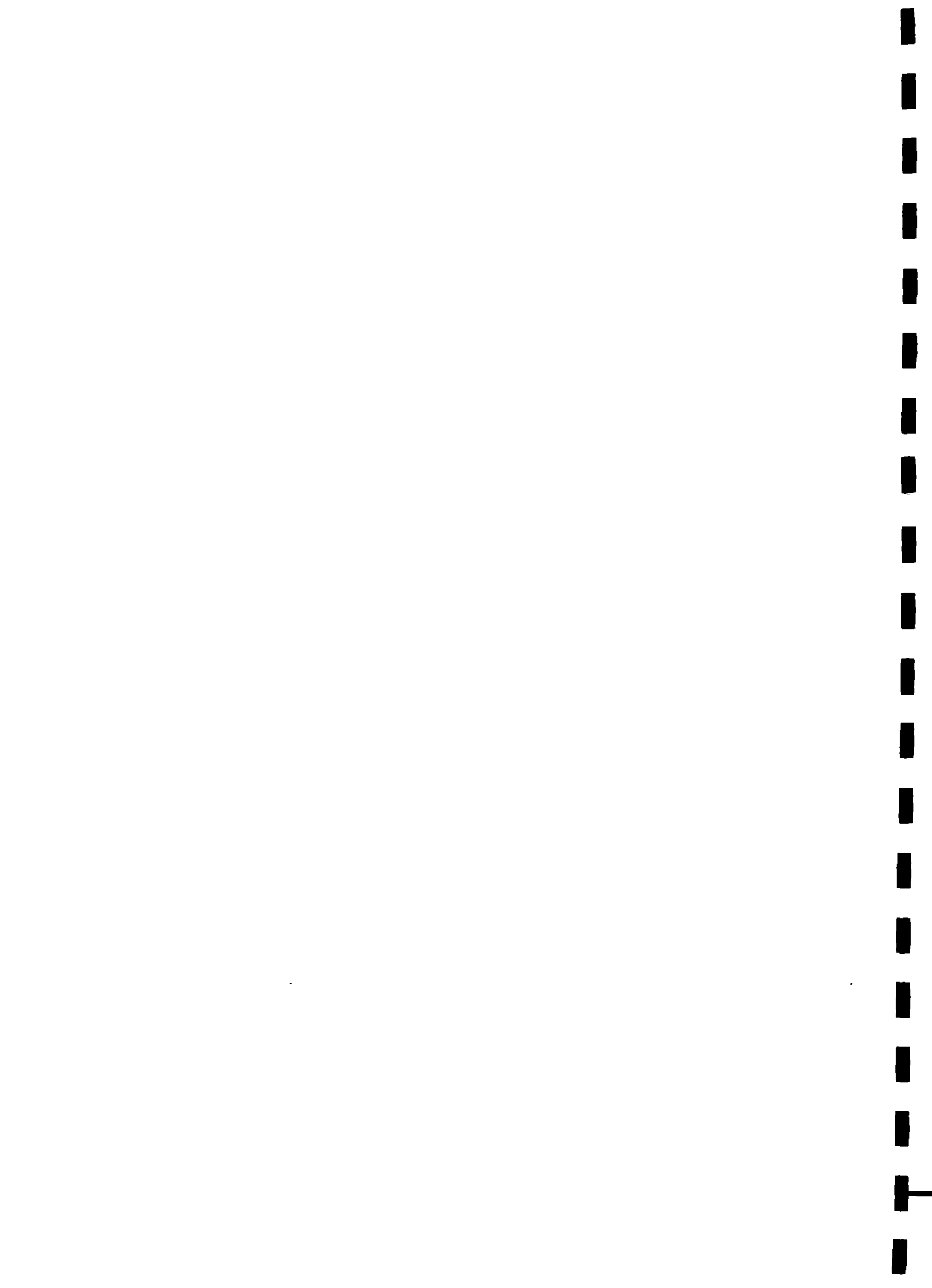
10. During phase III, there was a long delay (of many months) due to monsoon during which people started preparing themselves for agricultural activities.
11. During initial period of phase III suspicions and rumours floated around concerning the issue of reduction in subsidy.
12. People in Katunje heard about the loan programme (phase III) and decided to wait for the loans which not only hampered the on-going programme there, but also brought it to a halt.
13. By the time the loan programme was suspended for the time being (phase III) and attention was redirected toward speeding up the physical progress (mainly because of pressure from UNICEF which was concerned about rising costs), the prices of bricks rose suddenly during April 1988 and monsoon had also started, thus virtually stopping latrine construction.
14. As EASTAP was not fully confident of the long term usefulness of the unlined pits, it purposely slowed down their construction despite the pressing demands from the community.
15. There was only one steel frame available with EASTAP (costing Rs. 3,500) so that only one site could be covered by type C latrine at a time. On the other hand the concrete rings (required for Type C) had to be constructed at the sites because their transport from one site to another involved very high breakage rate.
16. The local NGO (Adult Women Village Development Committee [AWVDC]) in Thetcho was unable to handle properly the delicate ring casting job due to the breakage problem during transportation (phase III).
17. Due to the expiry of Indo-Nepal trade and transit treaty on March 23, 1989, Kathmandu experienced an unprecedented fuel oil crisis during April and May 1989, virtually stopping the latrine construction. Therefore, only 10 more latrines could be built between mid April to mid May 1989 which was far short of the expected number of 150 Type A latrines.
18. EASTAP seemed to be confused about the priority between the physical progress on one hand (the hardware) and the development of strategies and approaches on the other (the software). Moreover, there was a conflict of emphasis between UNICEF and EASTAP in this regard because the former was more concerned about the escalating cost if delays occurred while the latter was (initially) more interested in the development of right strategies for future programmes.
19. The EASTAP programme was virtually devoid of any health and sanitation education programmes, although EASTAP field staff spent some time in discussing excreta related health problems during the follow-up period when latrine maintenance problems were discussed with the communities.

20. Most of the latrines (Type A) were actually built by relatively higher income and socio-politically dominate families and it is EASTAP's view that it would be unwise for sanitation programme to focus only on poorer section as a target group. Unfortunately, EASTAP fails to realize that as long as the local power structure remains in the hands of the higher income families, the subsidies of such indiscriminating programmes will more likely flow toward the relatively richer section of the population who are actually in less need of the subsidy. Thus, there seems to be an element of inequity in the distribution of subsidized latrines. Moreover, a widespread demonstration effect could be realized only if the poor families were targetted because the rich households would be more willing (due to sense of status and prestige) and able to build latrines on their own when they see their neighboring poor families enjoying the comfort and privacy of private latrines. Hence, for the sustainability and demonstration effect the EASTAP argument that both rich and poor households should be indiscriminately subsidized, does not seem to be a sound argument.
21. EASTAP claims that by keeping the absolute amount of subsidy same for the high and the low cost latrines, it is possible without entering into the complexities of local politics, to benefit the poor families more. But the relative popularity and attractiveness of Type A latrines and the various problems faced in installing Type C latrines clearly show the superficiality of this claim. In fact, in view of the changed political environment of the country, it is to be recommended that future sanitation programmes should emphasize on the poorer sections and preferably increase the subsidy and/or provide loans on lenient terms.
22. Although EASTAP claims to have considered different factors like existing sanitation conditions, settlement patterns, ethnic composition, locational aspects, and people's sanitation perception and priorities, the selection of project sites is not explicitly explained anywhere in the reports. From the personal interview with the EASTAP's officials, the selection of sites seems to have been solely determined by the degree of local response and density of population.

3.4.5 Practical Experiences and Findings During EASTAP Activities

1. The idea of building half open toilet house for kids worked wonderfully in Lubhu (phase I). This idea was first suggested by the school founder in Lubhu.
2. Disadvantages of outside construction of toilet are higher cost (as additional walls and roof are needed), difficult access during rains and night, and more likely to be used by outsiders (hence locks on the doors required).
3. A compromise between indoors and outdoors is a latrine outside but attached to one wall.

4. Although some grant or subsidy helps in the beginning, it is not a right approach for involving a sustainable sanitation improvement scheme.
5. Local people want the subsidy to continue and that loans be provided for the rest at low interest without collateral.
6. Sanitation awareness building activities take along time to have effect. Hence, self-help latrines (without subsidy) are not practicable in a short-run demonstration project.
7. Loan programmes cannot be attractive (e.g. during phase III) as long as subsidies are high.
8. Loan programmes cannot be implemented as long as the financial authorities (Nepal Rastra Bank and Development Banks) do not give high priority to sanitation improvement as a basic need of the communities.
9. Very low cost latrines (Type C) are spared by the greed of the rich households.
10. Among the poorer households the single pit low cost latrine with a water seal squatting pan (Type C) was found to be the local choice. The advantages were low cost and affordability, higher subsidy percentage, free from small nuisance due to water-seal, the mosaic pan gives the appearance of modern latrines, and the possibility of future improvements such as making it a double pit latrine with concrete rings.
11. The effectiveness of local initiative by educated persons was clearly demonstrated by the effort of a school headmaster in Thimi which was instrumental in building 78 Sulabh Latrines (Type A) in Chopacho and Balkumari (Thimi).
12. The experience from Thetcho and Kirtipur showed that although absolute amount of subsidy for different types of latrines were kept same, there was a need to maintain enough flexibility on which items to be subsidized which usually depends on local conditions as well as the type of latrine.
13. The experiment with low-cost pit lining showed that even with richer concrete ratios the rings would not be made strong enough to transport even small local distances.
14. The pit is hardly half filled after 8 months use by 5 people/day. Some toilets have pit filled in 9 months when used by 8-10 people/day.
15. If a toilet does not function during rains because of high ground water level, the pit should be raised.
16. No household opted for a low-cost (Type B) latrine which could save N. Rs. 385/- per latrine because of the perceived weakness of the cover slabs and lower status value of such latrines.



4.0 DESCRIPTION OF SAMPLE SITES AND ANALYSIS OF DATA

This chapter briefly describes the main sanitary situation of each sample site based on field surveys and interviews of key informants. Then the two programmes are compared with respect to several important socio-economic characteristics of sample households by toilet ownership, namely, non-toilet, project toilet and non-project toilet households. Moreover, the water supply situation, sanitary practices and knowledge, utilization and maintenance of project toilets and other important findings about project toilet households are also presented in this chapter so as to provide the quantitative basis for the examination of efficiency, effectiveness and sustainability in the following chapters.

4.1 Description of Sample Sites Based on Observation and Interviews of Key Informants

4.1.1 Tokha

Location and Setting: Tokha is a Newar community with clustered houses only 15 km away from Kathmandu. The two panchayats Saraswati and Chandeswari are physically annexed to each other. Most houses have no compound area. There is electricity supply in the main settlement but not in houses outside the main settlement near the farms.

Most houses have domestic animals kept in the ground floor but washed in ponds and stream. Most houses have Nauga and Saaga. Nauga is used for depositing ash and urinating while Saaga is used for kitchen waste and animal waste.

Streets and Drains: About 80 percent of Saraswati and 30 percent of Chandeswari streets are of bricks but are broken at many places with ditches. Household animal and agricultural wastes are dumped on streets. Old drains are open, blocked and used for defecation by children. Many areas have no drains at all. SUSP built drains are generally in good conditions.

Composting: Although the main occupation is agriculture (along with masonry work), there is no scientific procedure for making compost. Most houses use deposits of Nauga and Saaga which are dried in streets after mixing with animal waste.

Defecation Places: The north side of main settlement of Chandeswari and south side of Saraswati used as open defecation places by adults. Some courtyards and streets too are used for this purpose.

Drinking Water and Ponds: The main source is piped water taps and the old piped water system is not working. The taps are mostly below ground level and surrounded with mud and refuse. Water supply seems quite inadequate and water is not purified before drinking although it is quite unsafe. The only two ponds are dried up and muddy used by ducks, pigs

and buffaloes for bathing. These ponds are real health hazards and breeding grounds for mosquitoes.

Other Facilities: Most of the toilets are located indoors and dark. The toilets are generally dirty and smelling. There is one primary school in Chandeswori (1-3 classes) with 65 students. In Saraswati there is one secondary school (1-10 classes) with 600 students and one Primary English Boarding School (nursery to class 5) with 250 students. There is no health post or hospital in Tokha. Only one medical shop in Saraswati provides ordinary treatment and medicines. However, the major sanitation problem in the village is the conspicuous absence of solid waste disposal system and inadequate water supply.

Health/Sanitary Practices and Knowledge: A few educated families use preventive methods to avoid diarrhoea, dysentery etc. Most people visit a doctor only after being seriously ill but usually apply homemade medicines, such as, wine treat with ghee for dysentery, seeds of Bakaino for worms, witchcraft for vomiting and fever, plantain juice and sheep urine for earache, and boiled egg for eye problem etc. The people seem to be confused about the different roles of SUSP and FPAN programmes. Some recognized the role of UNICEF but no one understood the word Sulabh toilet. They think it is an ordinary septic tank with water seal. Even though many non-toilet people seem to have demand for subsidized toilets, the community as a whole has very poor knowledge of personal, household, and environmental sanitation. It is also observed that Tokha villagers generally prefer drains and water supply improvement to latrines.

4.1.2 Khokana

Location and Setting: Khokana is a Newar community with clustered houses about 25 km from Kathmandu. It is predominantly agricultural society. Almost all houses have electricity. Most houses have domestic animals kept in ground floor. Almost all houses have Nauga and Saaga used for and throwing ash and other household/kitchen wastes.

Streets and Drains: The drains start from ward number 3 and reach ward numbers 4, 6 and 7. The approximate length is 170 meter. Although covered, the covering slabs are used by children for defecation. Some houses have joined their toilets to the drains. Most streets are made of bricks or only earth and have ditches every where. These ditches are full of animal and children's wastes washed by rains.

Composting: People use animal dungs as manure either directly or by mixing with other wastes and composting in the streets. A few households use human excreta by depositing them at separate composting pits and mixing with other wastes. This composting process takes about four weeks.

Defecation Places: There are defecation places in school compound behind Rudrayani Temple and near the road to Sano Khokana. Males and females sit at separate places and there are heaps of human wastes in those places.

Drinking Water and Ponds: Most houses use public stand pipe for drinking and other kitchen use. For washing clothes and bath taking wells and the river are also used. Only a very few houses have private water supply connection. Water is visibly impure and inadequate in quantity. Ponds are very dirty and muddy but are used by women for anal cleaning washing clothes, washing hands, and washing animals too.

Other Facilities: Most toilets are inside houses. Because of lack of spaces people are forced to dump all kinds of wastes in streets. Some people who tried environmental sanitation programmes were harassed by local people. There are only two schools with a total of about 335 students and 9 teachers. One school has classes up to five and another up to two. Nepal Japan Human Development Association has established a health post where the local people come for ordinary and First Aid treatment. In ward number 3 there is a medical shop.

Health/Sanitary Knowledge and Practices : Most of the people use witchcraft and worship rituals (Jharphook) and how to "Sacrifice" before the god. People also wash their faces in the dirty water of the pond before worship. Initially people use home-made medicines and traditional herbs and go to the hospital doctor only when seriously ill. Only a few educated people use prescribed medicines (but the prescription is not necessarily by a certified doctor).

4.1.3 Dharmasthali

Location and Setting: Dharmasthali is situated about 17 km from Kathmandu with mixed settlement pattern (some areas with clustered houses and some with scattered houses). The composition of population is also mixed including Brahmin, Chhetri and Newars. There is electricity in every ward.

Streets and Drains: In ward numbers 1,2, and 3, brick and stone paved streets are found which are broken, have ditches and are dirty. In ward numbers 4,5,6, 7 and 9, narrow streets (with earth only) are found but are relatively cleaner. About 15 percent area is covered by drains which are however, blocked, brockness, and frequently used for defecation.

Composting: There is no systematic or scientific method of composting in the village. People just dump household waste and animal dungs at one place and apply before cropping whether the compost is properly formed or not.

Defecation Places: In wards 1,2,3 and 4 there are public defecation places. Moreover, fields/farms are also used for this purpose. In rest of the wards people usually go to river banks for defecation.

Drinking Water and Ponds: Main sources of water are public and private piped water and wells. At some places drinking water is obtained even from rivers and streams. Ponds are very dirty and used by households animals.

Other Facilities: Household wastes are usually thrown in house compounds, courtyards and streets. In Newar communities, solid wastes are found in heaps around the houses (ward numbers 1,2,8 and 3). There is a secondary school (1-10 classes in ward no. 3) with 800 students, a primary school (1-3 classes in ward no. 9) with 250 students, and a private English Boarding School (Nursery to 2 classes in Ward no. 3) with 150 students. In ward no. 2, a health post provides ordinary treatments, and health examinations but the employees close it after 2 O'Clock everyday.

Health/Sanitary Practices and Knowledge: Some educated families observe sanitary rules and visit health post for treatment. But the majority (uneducated) of families do nothing for prevention and apply strange domestic medicines for treatment. Examples are, mothers' milk on eyes, sheep's urine into ears, juice of banana trees into ears, sitting on heated bricks for treating dysentery, etc. People visit health posts only after all traditional methods have failed.

4.1.4 Thimi (Balkumari and Chapacho)

Location and Setting: It is the closest sample site to Kathmandu about 10 km. with clustered houses. The majority of population is Newar. Some houses have compound area, and all houses have electricity.

Streets and Drains: The outside roads are metalled, but the inside streets are fair weather, with ditches and water holes. The drain system is very poor and inadequate. Most drains are uncovered which are used for defecation and urination (especially by children).

Composting: Few households have animals and only a few use compost manure. Most households use chemical fertilizers, and only a few use wastes of Saaga as manure.

Defecation Places: All open spaces are used for defecation and human excreta is scattered on all street sides. But the public defecation place near a school has become a small hill of human excreta and other refuse.

Drinking Water and Ponds: There are many sources of water namely, stone tap (Dhunge Dhara), public stand pipe, and wells. All sources are used for drinking but most people prefer water of wells for this purpose. The stone taps provide relatively cleaner water. Ponds are few and dried up.

Other Facilities: Some houses have Saaga and Nauga used for waste disposal. Generally people throw wastes in public dumping places. There are two secondary schools and one morning primary school in Thimi with a total of about 3000 students. These are two places for medical treatment. Chapacho health post and Balkumari T.B. hospital.

Health/Sanitary Knowledge and Practices: Some people do follow preventive measures for diarrhoea, dysentery and fever, but most people do only curative treatment after catching these diseases by visiting the health posts and hospitals.

4.1.5 Dadhikot

Location and Setting: Dadhikot is about 15 km from Kathmandu with mixed settlement pattern. Majority of people are Brahmin/Chhetri followed by Newars. Except a few poor households, all have electricity.

Streets and Drains: The roads are wide and earthen with ditches. There is also a minibus for transporting and materials. Most places have uncovered drains. Only a few areas are devoid of drains.

Composting: Two types of compost manure are prepared in this village from animal dung and from human excreta. The human excreta is extracted from the pit and deposited in a separate composting pit where rice bran (husks), ashes, hay and bushes are mixed and covered for some months. After the formation of compost it is used in growing different vegetables such as potato, garlic, onion, cauliflower etc.

Defecation Places: There are no special public defecation places but people defecate in nearby pits and ditches and in backyards.

Drinking Water and Ponds: The water supply is very inadequate. People have to carry water from outside the village from or public stand pipe in water pots (gagros). The wells are dried up. The water supply from Ashapuri Mahadev place is inadequate but clean. There are no ponds. People wash animals in river and stream.

Other Facilities: Most of the households use wastes for composting. Hence solid waste disposal is not a big problem. Moreover, people are conscious about cleaning their neighborhood. Hence the environmental sanitation is relatively better. However, in densely populated areas the streets have scattered feces of children. The educational facilities are good relative to the population of the village. There is a secondary school with 700 students and three primary and preprimary schools (with 500 students). There is a health post where the health worker does not come regularly. In emergency, people go to Bhaktapur Hospital. During the field survey a group of nurses visited the village for their research work and gave some health education and other services to the villagers, although the main purpose of the visit was research.

Health/Sanitary Practices and Knowledge: People do not follow any preventive measures for transmissible diseases. But they usually visit the health post or hospitals and consult Baidyas (Homeopathic Doctors). On the whole, people here are more aware of sanitation and health aspects and more receptive to sanitation activities.

4.1.6 Thecho

Location and Setting: Thecho is about 27 km from Kathmandu with mixed settlement pattern. Majority of population is Newars but in two wards there is heavy concentration of Chhetries. There is good electricity supply in the village.

Streets and Drains: In wards 8 and 9 the streets are of dust and earth, with mud during rains. At other places the streets are paved with bricks and stones and the main road is metalled. But the metalled road is broken at places with water hols. There are chauks and public waste dumps along streets, and animal wastes are heaped on the side of streets. The major road and streets have drains which are partially covered. Children usually defecate on the open drains.

Composting: The people dry human and animal wastes in sun and mix with ashes and other wastes to make compost.

Defecation Places: There is a community latrine for women which is very dirty. Similarly two public toilets for men are also dirty and smelling from a distance. There are no public defecation places but the chauks and streets are used for this purpose.

Drinking Water and Ponds: Some localities have public stand pipe with tanks, and some localities have stone taps. Private water supply connection is available only for few houses. Ponds and wells are used for washing clothes, washing animals and cleaning utensils. The public water supply is relatively cleaner. But water in wells and ponds are dirty.

Other Facilities: Household wastes are deposited in chauks and Saagas. Agricultural wastes are dumped in Saagas and beside houses. There are mud and waterholes everywhere. There is a secondary school with 765 students. Private schools are three with about 44 students. In the Balmandir there are 318 students in Nursery to first grade. There is a health post for ordinary treatment.

Health/Sanitary Knowledge and Practices: People are careless about environmental sanitation. People usually go to the treatment center established by Adult Female Village Development Committee and the health post for treatment. But few people follow preventive measures for transmissible diseases. Some people also use traditional methods such as eating special flowers for eye/ear infection and drinking (boiled) cumin soup for fever. Some people also use witchcrafts and worship rituals especially for fever, vomiting and stomach ache.

4.2 Household Characteristics

4.2.1 Educational Status

As the following table shows the percentage of illiterate among respondents in SUSP sites (Tokha+Khokana) is 47.1 percent which far exceeds that in EASTAP sites (Thimi+Dadhikot+Thecho+Dharmasthali) equal to 27.1 percent. On the other hand the percentage of respondents with higher education in SUSP sites is less than one-third of that in EASTAP sites. Thus, the educational level of respondents in SUSP sites is significantly below than in EASTAP sites. The same is true about the educational level of other family members in the two sites, as illustrated for 13-59 years' group in Table 4.1.

Table 4.1 : Comparison of Educational Level in the Two Programme Sites

Education Level of Respondents	SUSP (%) N=467	EASTAP (%) N=535
Illiterate	47.1	27.1
Read and write only	13.1	16.1
Schooling up to SLC	35.1	40.2
Higher Education	4.7	16.6

It is found (byx2 test on the data) that the relation of educational level with toilet ownership is highly significant for both sites. This fact is illustrated for family members 13-59 years in Table 4.2.

Table 4.2 : Highest Educational Level of Family Members (13-59 years) and Toilet Ownership by Programme

Educational Level	SUSP (N=461)			EASTAP (N=517)		
	Non-Toilet (%)	Toilet (%)	Total (%)	Non-Toilet (%)	Toilet (%)	Total (%)
Illiterate	71 (62.3)	43 (37.7)	114(24.7)	21 (65.6)	11 (34.4)	32 (6.2)
Read & write	22 (59.5)	15 (40.5)	37 (8.0)	7 (53.8)	6 (46.2)	13 (2.5)
1-5 class	46 (51.1)	44 (48.9)	90(19.5)	27 (56.3)	21 (43.8)	48 (9.3)
5-10 class	56 (32.0)	119(68.0)	175(38.0)	105(40.1)	157(59.9)	262(50.7)
I.A. and above	4 (8.9)	41 (91.1)	45 (9.8)	32 (19.8)	130(80.2)	161(31.3)
Chi-square Test	Chi-square=53.742, D.F.=4 Significance=.000			Chi-square=42.130 D.F.=4 Significance=.000		
Conclusion	Relation highly significant			Relation highly significant		

Note: Missing observation excluded for the answers, "No family member in this group". Moreover, project and non-project toilet columns combined to avoid very low frequencies in some cells.

This table shows that the likelihood of owning a toilet (project or non-project) significantly increases with educational level. Therefore, it is also clear that EASTAP sites were better selected than SUSP sites because the people in the former place have significantly higher educational level, and are more aware of and receptive to the sanitation programmes.

4.2.2 Ethnicity and Religion

It is interesting to note that the SUSP sites are populated almost exclusively by Newars (because only two households among 467 were non Newars). In the case EASTAP sites the Newar population is estimated as 75 percent followed by Brahmin/Chhetri (especially in Dadhikot and Dharmasthali) as 23.9 percent and others only 1.1 percent. Even with respect to religion the two sites are different since Hindus comprise 70.1 percent of population in EASTAP sites while they comprise as much as 85.2 percent in SUSP sites. However, the impact of ethnicity and religion on toilet ownership is found to be significant in EASTAP sites only, and not at all in SUSP sites as shown in the following Table table. However, it should be noted that predominantly, of Newar population, so the (chi-square test for SUSP is not meaningful)

Table 4.3 : Ethnicity/Religion and Toilet Ownership by Programmes

	SUSP (N=467)				EASTAP (N=535)			
	Non-Toilet	Project Toilet	Non-Project Toilet	Total	Non-Toilet	Project Toilet	Non-Project Toilet	Total
	%	%	%	%	%	%	%	%
1. <u>Ethnicity</u>								
Newar	201 (43.2)	254 (54.6)	10 (2.2)	465 (99.6)	157 (39.2)	199 (49.6)	45 (11.2)	401 (75.0)
Brahmin/ Chhetri	-	-	-	-	42 (32.8)	57 (44.5)	29 (22.7)	128 (23.9)
Others	2 (100)	-	-	2 (0.4)	2 (33.3)	-	4 (66.7)	6 (1.1)
Chi-square test	Chi-square=1.656 D.F.=2 Significance=.4370				Chi-square=24.49 D.F.=4 Significance=.0001			
Conclusion	Relation insignificant				Relation highly significant			
2. <u>Religion</u>								
Hindu	137 (43.5)	216 (54.3)	9 (2.3)	398 (85.2)	128 (34.1)	187 (49.9)	60 (16.0)	375 (70.1)
Non-hindu	28 (40.6)	40 (58.0)	1 (1.4)	69 (14.8)	73 (45.6)	69 (43.1)	18 (11.3)	160 (29.9)
Chi-square test	Chi-square=0.44 D.F.=2 Significant=.802				Chi-square=6.43 D.F.=2 Significant=0.0343			
	Relation quite insignificant				Relation significant at 5%			

4.2.3 Family Type and Family Size

As regards the family type, there is not much difference in the two sites. The percentages for couple only, nuclear family and joint/extended family at SUSP sites are 3.9, 36.2 and 60.0 respectively, whereas at EASTAP sites the respective percentages are 2.6, 31.4 and 66.0. It is also found by chi-square test that the relation between type of family and toilet ownership is highly significant for SUSP and the likelihood of a joint/extended family owning a toilet is the highest, followed by nuclear family, surprisingly in the case of EASTAP sites this relation is not significant at all. However, the more interesting and more meaningful result is the association between family size and toilet ownership. It is found, that there is much difference in the distribution of families according to family size in the two programme sites. For example, the percentage of large size families (more than seven members) is as high as 42.1 percent at EASTAP sites while it is only 29.1 percent at SUSP sites. Again we find the surprising result that the relation between family size and toilet ownership is highly significant in SUSP sites while it is quite insignificant in EASTAP sites this fact is shown in Table 4.4.

Table 4.4 : Family Size and Toilet Ownership by Programme

Family Size	Non-toilet (Row %)	Project Toilet (Row %)	Non- Project Toilet (Row %)	Row Total (Column %)
<u>SUSP Sites</u> N=467				
1-3 members	44 (77.2)	12 (21.1)	1 (1.8)	57 (12.2)
4-7 members	128 (46.7)	141 (51.5)	5 (1.8)	274 (58.7)
> 8 members	29 (21.3)	103 (75.7)	4 (2.9)	136 (29.1)
Chi-square test	Chi-square=55.05, D.F=4 Significance=.0000, Very highly significant			
<u>EASTAP Sites</u> N=535				
1-3 members	12 (35.3)	17 (50.0)	5 (14.7)	34 (6.4)
4-7 members	112 (40.6)	126 (45.7)	38 (13.8)	276 (51.6)
> 8 members	77 (34.3)	113 (50.2)	35 (15.6)	225 (42.1)
Chi-square test	Chi-square=2.232, D.F=4 Significance=.6932, Quite insignificant			

4.2.4 House Compound Area

The households in SUSP sites have less compound area as compared to EASTAP sites. For example, the percentage of houses with no compound is 37.7 in SUSP sites but only 23.3 in EASTAP sites, and the percentages of households with compound area larger than four areas are 10.3 and 28.9 respectively for the two programme sites. However, it is found by chi-square test that house compound area significantly affects toilet ownership only in EASTAP sites. This may be because most toilets in SUSP sites are built inside the houses. Since, the preference of most households is found to be for outdoor toilets, it can be concluded that EASTAP sites are relatively more suitable for toilet distribution programme. The distribution of houses by compound area is shown in Table 4.5 below.

Table 4.5 : House Compound and Toilet Ownership by Programme

Area	SUSP (N=467)			EASTAP (N=533)		
	Non-toilet (Row %)	Toilet (Row %)	Row Total (Col.%)	Non-toilet (Row %)	Toilet (Row %)	Row Total (Col. %)
No compound	81 (46.0)	95 (54.0)	176 (37.7)	64 (51.6)	60 (48.4)	124 (23.3)
Up to 1 ana	64 (43.0)	85 (57.0)	149 (31.9)	53 (35.8)	95 (64.2)	148 (27.8)
1-4 ana	34 (36.2)	60 (63.8)	94 (20.1)	29 (27.1)	78 (72.9)	107 (20.1)
> 4 ana	22 (45.8)	26 (54.3)	48 (10.3)	55 (35.7)	99 (64.3)	154 (28.9)
Chi-square test	Chi-square=2.601 D.F.=3 Significance=.4572 Quite insignificant			Chi-square=15.817 D.F.=3 Significance=.0012 very highly significant		

Note : Project and non-project toilets combined for statistical reason.

4.2.5 Per Capita Income

Per capita annual income was obtained from the ratio of total household income to total family size, and the households were categorized as follows:

Small Income = 0 - Rs. 5,000
 Middle Income = Rs. 5,001 - 12,000
 High Income = Above Rs. 12,000

According to this classification the SUSP site families appear to be relatively poorer than EASTAP site families. For example, 71.6 percent families in SUSP sites belong to small income group while 60.9 percent families in EASTAP sites belong to this group. A very important finding in this regard is that income category and toilet ownership are highly significantly related in EASTAP sites while the relation is statistically insignificant in SUSP sites (Table 4.6). Thus, EASTAP latrine distribution seems to be highly biased in favour of middle income and rich families while SUSP latrine distribution seems to be quite egalitarian on the basis of per capita income. This seems to be a serious drawback of EASTAP latrine distribution programme.

Table 4.6 : Per Capita Annual Income and Toilet Ownership by Programme

Programme/Income Group	Non-toilet		Project Toilet		Non-Project Toilet		Row Total	
	(Row %)		(Row %)		(Row %)		(Column %)	
1. SUSP: Small (N=465)	142	(42.6)	185	(55.6)	6	(1.8)	333	(71.6)
Middle	54	(43.9)	66	(53.7)	3	(2.4)	123	(26.5)
High	4	(44.4)	4	(44.4)	1	(11.1)	9	(1.9)

Chi-square test	Chi-square=3.873,		D.F=4		Significance=.423, Quite insignificant			

2. EASTAP: Small (N=399)	106	(43.6)	98	(40.3)	39	(16.0)	243	(60.9)
Middle	31	(21.2)	90	(61.6)	25	(17.1)	146	(36.6)
High	1	(10.0)	5	(50.0)	4	(40.0)	10	(2.5)

Chi-square test	Chi-square=26.816,		D.F=4		Significance=.0000, Very highly significant			

Note: Missing observations deleted.

4.2.6 Land Ownership

The conclusion derived above about the egalitarian nature of latrine distribution in SUSP sites is contradicted by the relation between landownership and toilet ownership. In this respect, both programmes appear to be biased toward well-to-do families. As Table 4.7 shows project toilets are more likely distributed to big landowners (especially those falling in the category of 10.1-20 ropani land). Other important points note are:

- i. Big landowners are more likely to a toilet either project toilet or a toilet built entirely on own expenses.

ii. EASTAP sites have much larger percentage of small to marginal landowners relative to SUSP sites. This fact on its face seems to contradict the finding above that EASTAP site population is relatively better economically. However, this can easily be explained by another finding (discussed later) that agriculture is far more important main occupation in SUSP sites as compared to EASTAP sites.

iii. In Nepal, family size is monotonically increasing with total household income. Therefore, the result based on per capita income is more meaningful than that based on total household landownership.^{1/}

Table 4.7 : Land Ownership and Toilet Ownership by Programme

Programme/Area	Non-toilet		Project Toilet		Non-Project Toilet		Row Total (Column %)
	(Row %)		(Row %)		(Row %)		
1. SUSP: N=467							
<=4 Ropani	86	(58.1)	61	(41.2)	1	(.8)	148 (31.7)
4.01-10 Ropani	92	(43.4)	116	(54.7)	4	(1.9)	212 (45.4)
10.01-20 Ropani	19	(20.9)	69	(75.8)	3	(3.3)	91 (19.5)
> 20 Ropani	4	(25.0)	10	(62.5)	2	(12.5)	16 (3.4)

Chi-square test	Chi-square=42.033		D.F=4				
	Significance=.0000,		Very highly significant				

2. EASTAP: N=535							
<=4 Ropani	128	(46.6)	117	(42.4)	31	(11.2)	276 (51.6)
4.01-10 Ropani	57	(30.0)	98	(51.6)	35	(18.4)	190 (35.5)
10.01-20 Ropani	10	(18.9)	36	(67.9)	4	(13.2)	53 (9.9)
>20 Ropani	6	(37.5)	5	(31.3)	5	(31.3)	16 (3.0)

Chi-square test	Chi-square=28.34,		D.F=6				
	Significance=.0001,		Very highly significant				

4.2.7 Main Occupation

The main occupation of 94 percent of people in SUSP sites is agriculture but only 51.6 percent households in EASTAP sites report agriculture as their main occupation. Many people in EASTAP sites earn from cottage industries, small businesses and service. This may be the reason for the relative higher income status of people at EASTAP sites. The chi-square

^{1/} Nepal Rastra Bank, Multipurpose Household Budget Survey Report, p. XI and Table XIII, p. 104

test of data from EASTAP site shows a highly significant relation between main occupation and toilet ownership. It is clearly seen that people engaged in service and business have been relatively favoured in latrine distribution. Since the SUSP site population is predominantly agricultural, a similar test for this site would not make much sense because of very low frequencies of non-agricultural occupation. Therefore, only the result for EASTAP sites is shown in Table 4.8.

Table 4.8 : Main Occupation and Toilet Ownership, EASTAP

Main Occupation N=535	Non-toilet (Row %)	Project Toilet (Row %)	Non- Project Toilet (Row %)	Row Total (Column %)
Agriculture	99 (35.9)	134 (48.6)	43 (15.6)	276 (51.6)
Service	15 (30.0)	28 (56.0)	7 (14.0)	50 (9.3)
Cottage Industry	28 (46.7)	26 (43.3)	6 (10.0)	60 (11.2)
Business	38 (36.9)	57 (55.3)	8 (7.8)	103 (19.3)
Others	21 (45.7)	11 (23.9)	14 (30.4)	46 (8.6)
Chi-square test	Chi-square=23.077 Significance=.0033,	D.F=8 Highly significant relation		

4.3 Water Supply Situation and Drinking Water Practice

The water supply is not sufficient for household needs according to the response of 50.1 percent respondents in SUSP sites while the percentage for EASTAP sites is only 25.2. Thus the water supply situation in SUSP sites is far worse than in EASTAP sites. This clearly indicates a serious problem with SUSP. Without adequate water supply the Pour Flush type latrine does not function well, nor can it be adequately cleaned. Furthermore, the general household hygiene is also negatively affected by water shortage which cannot be improved by more latrine distribution. It is also likely that latrine is not the main priority item of the SUSP sites (this point is studied later) and that water supply improvement should have been at least equally emphasized in SUSP sites rather than the distribution of toilets only. A chi-square test showed that there is no significant relation between sufficiency of water for household need and the ownership of toilet. However, a chi-square test run on the cross-classification by programme and sufficiency of water clearly shows that the degree of sufficiency is significantly higher for EASTAP sites, as shown in Table 4.9.

Table 4.9 : Sufficiency of Water By Programme

Is the Drinking Water Sufficient	SUSP N=467	EASTAP N=535	Total N=1,002
Yes	233 (49.9)	400 (74.8)	633 (63.2)
No	234 (50.1)	135 (25.2)	369 (36.8)

Chi-square	D.F.	Significance	
65.245	1	.0000	With Yates Correction
66.310	1	.0000	Without " "

Conclusion : Very Highly Significant Difference by Programme.

As regards the practice of purifying water before drinking, 96.8 percent of respondents in SUSP sites report that they drink water as is available from the source, whereas 78.7 percent of respondents in EASTAP sites do so. Thus, the percentage of those who purify water before drinking is much higher in EASTAP sites. This may be because the EASTAP has improved sanitary awareness much more than SUSP, or because of the relative higher educational status of EASTAP site people. A chi-square test clearly shows the effectiveness of owning a toilet in this regard because a much higher percentage of toilet owners purify drinking water as compared to non-toilet households. Thus, we can say that it is because higher percentage of people in EASTAP sites purify drinking water. This fact becomes even more important when it is noted that the drinking water in SUSP sites is relatively more contaminated than that in EASTAP sites.

Table 4.10 : Toilet Ownership and Drinking Water Purification Practice

Do you Purify Drinking Water	SUSP N=467			EASTAP N=535		
	Non-Toilet	Toilet	Row-Total	Non-Toilet	Toilet	Raw-Toilet
No, drink as it is	197(98.0)	255(95.9)	452(96.8)	171(85.1)	250(74.9)	421(78.7)
Yes, purify	4 (2.0)	11 (4.1)	15 (3.2)	30(14.9)	84(25.1)	114(21.3)
Chi-square Test	Chi-square = 1.695 D.F. = 1 Significance = .193 Not significant			Chi-square = 7.823 D.F. = 1 Significance = .0052 Highly significant		

Note : Figure inside parentheses are all column percentage.

The above statement about the relatively higher sanitary awareness in EASTAP sites is also confirmed by another related finding. The respondents were asked whether it was necessary to purify water before drinking. In answer to this question 80.9 percent of respondents in EASTAP sites said yes (and the rest said no or do not know), while only 50.1 percent of SUSP site respondents said yes. This difference is highly significant statistically as shown in Table 4.11 below.

Table 4.11 : Knowledge about the Necessity to Purify Drinking Water by Programme

Is it Necessary to Purify Water Before Drinking	SUSP N=467	EASTAP N=535	Total N=1,002
Yes	234 (50.1)	433 (80.9)	667 (66.6)
No or do not know	233 (49.9)	102 (19.1)	335 (33.4)

<u>Chi-square</u>	<u>D.F.</u>	<u>Significance</u>	
105.094	1	.0000	With Yates Correction
106.474	1	.0000	Without " "

Conclusion : Knowledge significant deference between sites

4.4 Other Sanitary Practices and Facilities

4.4.1 Defecation Habits

The percentage of adult males who go to toilet for defecation is 52 percent in EASTAP sites while it is only 36.4 percent in SUSP sites. It is also found that ownership of toilet has very significant impact on defecation habits of adult males. In this respect, the ownership of non-project toilet seems to be most important because 94.9 percent of adult males in non-project toilet households of EASTAP site use toilet for defecation while the corresponding percentage for SUSP is 100. However, in case of project toilets the percentage is 79.1 in EASTAP sites and only 59.2 in SUSP sites. This lower percentage for project toilet households compared to non-project toilet households can be explained by the fact that the households who build latrine entirely on their own expense are more likely to use it because of the following reasons:

- a. They are more aware of sanitation and health relation,
- b. Toilet has high household priority,
- c. They want to maximize the returns from their investment, and
- d. The toilets are built according to the household preferences and defecation habits.

The lower percentage for SUSP sites clearly shows that the EASTAP has been relatively more effective in influencing defecation habits. It is interesting to note that a few non-toilet adult males too use toilets (of

others, of course) for defecation. All these points are clearly exhibited in Table 4.12 below. A similar picture is depicted by the distribution of adult females as shown in Table 4.12.

Table 4.12 : Toilet Ownership and Defecation Habits of Adults Males

Programme/ Defecation	Non- Toilet	Project Toilet	Non- Project Toilet	Row-Total	Chi-square Test
1. <u>SUSP</u> : N=464					Chi-square=164.893 D.F. = 2
Toilet	8 (4.0)	151(59.2)	10(100.0)	169(36.4)	Significance=.0000
Outside toilet	191(96.0)	104(40.8)	0	295(63.6)	Very highly significant
2. <u>EASTAP</u> : N=533					Chi-square=341.840 D.F. = 2
Toilet	2 (1.0)	20(79.1)	74(94.9)	277(52.0)	Significance=.0000
Outside toilet	199(99.0)	53(20.9)	4 (5.1)	256(48.0)	Very highly significant

Note : Figure inside parentheses are column percentages.

In case of children under 5 years of age only 22.1 percent households in SUSP sites report that they go to toilet for defecation, while the percentage for EASTAP sites is 34.0. Although, toilet ownership has very significant effect on children's defecation habits (as found by a chi-square test similar to above), it is unfortunate that even among project toilet households only 34.2 percent in SUSP and 57.9 percent in EASTAP sites go to toilet. The percentages for non-project toilet households are slightly higher. Thus, it is clear that the two programmes have not been able to convince most of the households that children's feces are at least as hazardous as adult's feces and that toilet habits should be formed from early childhood.

Table 4.13 : Toilet Ownership and Defecation Habits of Adults Females

Programme/ Defecation	Non- Toilet	Project Toilet	Non- Project Toilet	Row-Total	Chi-square Test
1. <u>SUSP</u> : N=458					Chi-square=170.051 D.F. = 2
Toilet	7 (3.6)	156 (60.9)	10 (100.0)	173 (37.8)	Significance=.0000
Outside toilet	185 (96.4)	100 (39.1)	0	285 (62.2)	Very highly significant
2. <u>EASTAP</u> : N=532					Chi-square=351.188 D.F. = 2
Toilet	2 (1.0)	205 (80.4)	74 (96.1)	281 (52.8)	Significance=.0000
Outside toilet	198 (99.0)	50 (19.6)	3 (3.9)	251 (47.2)	Very highly significant

Note : Figure in parentheses are column percentages.

In case of bigger children (5-12 years) a slightly higher percentage of toilet users is found, but the overall picture is quite similar to that of small children and, therefore, the details are not given here. Finally, sick and old people are reported to mainly use Urine Pans called "Kopara". The corresponding percentage is as high as 91.0 in SUSP sites while it is 34.6 in EASTAP sites. In this case too, EASTAP sites appear to be better (larger percentage using toilets) than SUSP sites and the effect of toilet ownership is highly significant.

4.4.2 After Defecation Cleaning

It is found that 77.3 percent of adults in SUSP sites (as per the respondents) clean with water after defecation while others use paper/grass/stone etc. The corresponding percentage in EASTAP sites is quite high (98.7% for water). Thus, the Sulabh type latrines seem to be relatively more appropriate for EASTAP sites. This fact is confirmed by the finding that even among the Project Toilet households 15.2 percent adults are reported to practice non-water cleaning in SUSP sites. In case of Non-Toilet households exactly one-third respondents in SUSP sites report that their adult family members use other things than water for anal cleaning. Thus the distribution of Sulabh toilets only may not be suitable for all households in SUSP sites.

4.4.3 Solid Waste Disposal

The percentage distribution of households according to the places where they usually throw solid waste is shown in Table 4.14. The table shows that a large majority in SUSP sites usually throw household solid waste into Nauga or Saaga (60.2%) and only a negligible percentage use compost pit for this purpose. In case of EASTAP sites 42.4 percent households use Nauga and Saaga for throwing solid waste and about one fifth use compost pit for this purpose. In both sides there is an insignificant relation between toilet ownership and solid waste disposal (as indicated by Chi-square test not shown in the table below). An indication of relatively higher sanitary awareness is again provided by the lower percentage of households in EASTAP sites who carelessly throw household wastes just outside their houses.

Table 4.14 : Solid Waste Disposal by Programme

(Column percentage)

Places Use for Solid Waste Disposal	SUSP (N=467) Number	EASTAP (N=535) Number
Outside the house	67 (14.3)	35 (6.5)
Compost pit	11 (2.4)	108 (20.2)
Nauga and Saaga	281 (60.2)	227 (42.4)
Others places	108 (23.1)	165 (30.8)

From the respondents' answers it is estimated that in SUSP sites 74.7 houses have Nauga and only 40.9 percent houses have Saaga. The corresponding percentages for EASTAP sites are 26.7 and 54.4 respectively. In other words for more SUSP site houses have Nauga and for less have Saaga compared to EASTAP sites. Since wastes of Saaga are relatively more important (quantity wise) for composting, it can be indirectly inferred that composting is more prevalent in EASTAP sites.

4.4.4 Waste Water and Liquid Waste Disposal

The problem of liquid waste disposal (drains) is far more serious in SUSP sites compared to EASTAP sites as evidenced by the fact that 60.2 percent of respondents in SUSP sites reply that there is no arrangement for liquid waste disposal while only 26.5 percent respondents in EASTAP sites say so. Moreover, only 34.5 percent households report of drain facilities (covered and open) in SUSP sites while 52.2 percent EASTAP site household report to have drains facilities for liquid waste disposal. It is also found that relatively larger percentage of Project-toilet households have drain facilities in both programme sites. The chi-square test too confirms this, as shown in Table 4.15. This finding is similar to that of N.K. Rai (19) which finds that Project-Toilet households are usually those which are also favoured by public utility services.

Table 4.15 : Liquid Waste Disposal Arrangement by Toilet Ownership and Programme

Arrangement	SUSP				EASTAP			
	Non-Toilet N=201	Project-Toilet N=256	Non-Project N=10	Row Total N=467	Non-Toilet N=201	Project-Toilet N=256	Non-Project N=78	Row Total N=535
No arrangement	140(69.7)	139(54.3)	2(20.0)	281(60.2)	58(28.9)	56(21.9)	28(35.9)	142(26.5)
Covered drain	28(13.9)	59(23.0)	6(60.0)	93(19.9)	51(25.4)	73(28.5)	16(20.5)	140(26.2)
Open drain	27(13.4)	41(16.0)	-	68(14.6)	61(30.3)	64(25.0)	14(17.9)	139(26.0)
Others	6(3.0)	17(6.6)	2(20.0)	25(5.4)	31(15.4)	63(24.6)	20(25.6)	114(21.3)
Chi-square test	Chi-square = 29.006, D.F. = 6 Significance = .0001 Very highly significant				Chi-square = 15.390, D.F. = 6 Significance = .0174 Significance			

The respondents were also asked where they usually throw dirty water. In SUSP sites the highest percentage was for Saaga (30.2) followed by courtyards (23.3). In case of EASTAP sites the highest percentage again corresponds to Saaga (40.7) followed, however, by Drains (22.6). Again we find that the sanitary practices in SUSP are relatively worse than those in EASTAP sites, because a much higher percentage of households in the former sites are found to throw dirty water on roadside and courtyard, whereas in the latter sites the percentage of near by pits is relatively much larger. Since the dirty water deposited in pits can be used for irrigating and soil conditioner for kitchen garden, this is a better practice than throwing dirty water on roadside and courtyard. A chi-square test shows that the dirty water disposal practices in the two programme sites are statistically quite different.

Table 4.16 : Disposal of Dirty Water by Programme

(Column percentage)

Places of Disposal	SUSP N=467	EASTAP N=535	Total N=1,002
Courtyard	109 (23.3)	23 (4.3)	132 (13.2)
Road	60 (12.8)	18 (3.4)	8 (7.8)
Drainage	90 (19.3)	121 (22.6)	211 (21.1)
Nearby pit	20 (4.3)	102 (19.1)	122 (12.2)
Saaga	141 (30.2)	218 (40.7)	359 (35.8)
Other places	47 (10.1)	53 (9.9)	100 (10.0)

Chi-square = 152.169, D.F. = 5, Significance - .0000

Comment : Very Highly Significant

4.4.5 Food Sanitation Habits

When asked whether they eat fruits and raw vegetables as obtained from the shops and other sources, a large majority of respondents at both programme sites responded that they wash before eating. However, the extremely high percentage (above 90) of such responses is somewhat unreliable if we notice the carelessness about other sanitary practices in the above sites. In fact observation of food handling practices revealed that most people eat raw fruits as available or only by wiping. Moreover, when raw vegetables are washed, the water in which they are washed is itself not very clean (or purified). Hence, the fruits and vegetables (e.g. Radish and Carrots) which are eaten uncooked, are usually flies infested and contaminated with soil/excreta/water.

Another important food habit is that of eating raw meat which is more prevalent in SUSP sites which are predominantly Newar communities (about 80%) than in EASTAP sites (about 68%). This food habit is also a possible health hazard because of the very unhygienic handling of meat by butchers and households and because of the worm infestation of the animals eaten.

When asked whether food is kept covered or not, 85.0 percent of respondents said 'yes always' in SUSP sites while 91.7 percent said so in EASTAP sites. A chi-square test showed that there is a significant difference between the two programme sites in this regard. Thus, the food handling practice in EASTAP sites seems significantly better in this respect. Similarly, only 46.6 percent respondents in SUSP sites told that they washed hands before touching food while the percentage for EASTAP sites was much higher (53.4%). Finally, a significantly higher percentage of respondents told that their family members always wash hands before eating in EASTAP sites compared to SUSP sites (54.1% and 45.9% respectively). But the relation between toilet ownership and food handling practices mentioned above was found to be statistically insignificant.

4.5 Use of Human Excreta

In the SUSP sites only 10.5 percent respondents said that they have used human excreta for composting and manure, while in EASTAP sites the percentage is slightly higher (17.6%). It is also observed that ownership of toilet has very significant impact in this regard as shown in SUSP sites the percentage of Project-Toilet households using human excreta is 16.4 while that in EASTAP is 21.9. Interestingly, the non-project toilet households are less likely to use human excreta in SUSP sites (10.0%) while they are more likely to use human excreta in EASTAP sites (33.3%) as compared to Project-Toilet households. As expected, the non-toilet households are least likely to use human excreta in both programmes. For all type of households the percentage of human excreta users for composting is higher in EASTAP sites as shown in Table 4.1, thus showing that the distribution of compost forming Sulabh Toilets is relatively more suitable in EASTAP sites.

Table 4.17 : Use of Human Excreta for Composting by Programmes and Toilet Ownership

(Column percentages)

Do you use Human Excreta for Compost	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=201	N=256	N=10	N=467	Chi-square = 21.598 D.F. = 2
Yes	6 (3.0)	42(16.4)	1(10.0)	49(10.5)	Significance = .0000
No	195(97.0)	214(83.6)	9(90.0)	418(89.5)	Very highly Significant
1. <u>EASTAP</u>	N=201	N=256	N=78	N=535	Chi-square = 35.332 D.F. = 2
Yes	12 (6.0)	56(21.9)	26(33.3)	94(17.6)	Significance = .0000
No	189(94.0)	200(78.1)	52(66.7)	441(82.4)	Very highly Significant

The table clearly shows that the likelihood of using human excreta significantly increases with toilet ownership for both programme sites. When asked what was the most important reason for not using human excreta the most important reason (according to frequency) in SUSP sites is found to be lack of toilet or not using the toilet (34.8%) followed by the reason that pit has not filled (18.0%). In case of EASTAP sites the frequently cited reason is "No tradition", followed by "No toilet or toilet not used".

Table 4.18 : Reasons for Not Using Human Excreta by Programme

Reason for Not Using	SUSP	EASTAP	Total
1. No toilet/toilet not used	145 (34.8)	79 (18.1)	224 (26.2)
2. No tradition	44 (10.6)	157 (36.0)	201 (23.6)
3. Pit not filled	75 (18.0)	35 (8.0)	110 (12.9)
4. Lack of equipment	50 (12.0)	25 (5.7)	75 (8.8)
5. Stigma fear of diseases	32 (7.7)	36 (7.8)	68 (7.9)
6. No knowledge	21 (5.0)	45 (10.3)	66 (7.7)
7. No need or use	13 (3.1)	39 (8.9)	52 (6.1)
8. Not converted into compost	8 (1.9)	8 (1.8)	16 (1.9)
9. Lack of personnel	4 (1.0)	3 (0.7)	7 (0.8)
10. Others	25 (6.0)	9 (2.1)	34 (4.0)
Total	417 (100)	436 (100)	853 (100)

Chi-square = 148.859, D.F. = 11, Significance = .0000

The difference between programmes highly significant.

The table above shows that the three most important reasons for not using toilet in aggregate are lack of toilet (or non use of toilet) with 26.2 percent, followed by No Tradition (23.6%) and "Pit Not Filled" (12.9%). Surprisingly, the lack of personnel is cited by very few respondents as a reason. It should also be noted that stigma or fear of catching diseases is not as important as some authors claim (see for example, N.K. Rai, 1987). "No tradition" is relatively more important in EASTAP sites perhaps because it includes Brahmin/Chhetri population who are relatively more conscious about tradition and social status.

4.6 Incidence of Sanitation Related Diseases

4.6.1 Incidence of Diarrhoea

In order to assess the impact of owning a toilet on the incidence of diarrhoea, the respondents were asked how frequently their family members, suffered from diarrhoea during last year. It was found that the percentage of households not suffering from diarrhoea was slightly higher (50.1%) for SUSP sites than for EASTAP sites (44.6%). Similarly, the

frequency of diarrhoea occurring several times was much lower for SUSP sites (3.6%) than for EASTAP sites (16.1%). Thus the SUSP sites appear to be better than EASTAP sites in this respect. However, it is also found that in SUSP sites the ownership of toilet (project or non-project) has no significant impact on reducing diarrhoea (as indicated by the very low chi-square in Table 4.19). In EASTAP sites, on the other hand, the ownership of project toilet appears to significantly reduce the likelihood of suffering from diarrhoea. Thus, EASTAP site latrine distribution seems to have significant health impact in this respect.

Table 4.19 : Incidence of Diarrhoea by Toilet Ownership and Programme
(During Last Year)

(Column percentages)

Family Members Suffering from Diarrhoea	Non- Toilet	Project- Toilet	Non- Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=201	N=256	N=10	N=467	Chi-square = 2.088 D.F. = 4
Never	98(48.8)	131(51.2)	5(50.0)	234(50.1)	Significance = .720
1-2 times	93(46.3)	118(46.1)	5(50.0)	216(46.3)	Not Significant
Several times	10 (5.0)	7 (2.7)	0	17 (3.6)	
2. <u>EASTAP</u>	N=200	N=256	N=78	N=534	Chi-square = 11.631 D.F. = 4
Never	72(36.0)	131(51.2)	35(44.9)	238(44.6)	Significance = .0203
1.2 times	94(47.0)	88(34.4)	28(35.9)	210(39.3)	Significant at 5%
Several times	34(17.0)	37(14.5)	15(19.2)	86(16.1)	

4.6.2 Incidence of Dysentery

In this case the two programme sites are not different statistically. Moreover, the impact of toilet ownership is statistically negligible in both programme sites as shown in Table 4.20, although the impact in EASTAP sites is relatively stronger.

Table 4.20 : Incidence of Dysentery by Toilet Ownership and Programme

(Column percentages)

Frequency During Last Year	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=201	N=256	N=10	N=467	Chi-square = 3.833 D.F. = 4
Never	99(49.3)	131(51.2)	8(80.0)	238(51.0)	Significance = .4290
1-2 times	96(47.8)	116(45.3)	2(20.0)	214(45.8)	Not Significant
Several times	6 (3.0)	9 (3.5)	0	15 (3.2)	
2. <u>EASTAP</u>	N=201	N=255	N=78	N=534	Chi-square = 6.948 D.F. = 4
Never	99(49.3)	142(55.7)	38(48.7)	279(52.2)	Significance = .1386
1.2 times	88(43.8)	100(39.2)	30(38.5)	218(40.8)	Not much Significant
Several times	14 (7.0)	13 (5.1)	10(12.8)	37 (6.9)	

4.6.3 Incidence of Typhoid

In this case, too, the two programme sites are almost identical and there is negligible impact of toilet ownership as shown in Table 4.21.

Table 4.21 : Incidence of Typhoid by Toilet Ownership and Programme

Frequency During Last Year	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=200	N=256	N=10	N=466	Chi-square = 1.003 D.F. = 4
Never	173(86.5)	217(84.8)	8(80.0)	398(85.4)	Significance = .9093
1-2 times	24(12.0)	36(14.1)	2(20.0)	62(13.3)	Quite Insignificant
Several times	3 (1.5)	3 (1.2)	0	6 (1.3)	
2. <u>EASTAP</u>					Chi-square = 5.345 D.F. = 4
Never	175(87.5)	212(82.8)	70(89.7)	457(85.6)	Significance = .2537
1.2 times	25(12.5)	42(16.4)	7 (9.0)	74(13.9)	Not Significant
Several times	-	-	2 (0.8)	1 (1.3)	

4.6.4 Incidence of Worms

In this case SUSP sites are relatively worse than EASTAP sites in frequency of occurrence because only 35.7 percent households deny having suffered from worms in SUSP sites while 45.6 percent in EASTAP say so. Similarly the percentage of occasional occurrence of worms in SUSP sites is 59.3 percent which is much higher than that for EASTAP sites (47.3%).

Table 4.22 : Incidence of Worms by Toilet Ownership and Programme

Frequency During Last Year	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=200	N=252	N=10	N=462	Chi-square = 6.096 D.F. = 4
Never	79(39.5)	83(32.9)	3 30.0	165(35.7)	Significance = .1921
1-2 times	116(58.0)	152(60.3)	6(60.0)	274(59.3)	Not Significant
Several times	5 (2.5)	17 (6.7)	1 (10.0)	23 (5.0)	
2. <u>EASTAP</u>	N=199	N=252	N=78	N=529	Chi-square = 2.717 D.F. = 4
Never	83(41.7)	122(48.4)	36(46.2)	241(45.6)	Significance = .6063
1.2 times	103(51.8)	111(44.0)	36(64.2)	250(47.3)	Quite Insignificant
Several times	13 (6.5)	19 (7.5)	6 (7.7)	38 (7.2)	

4.7 Knowledge of Preventive Measures

4.7.1 Preventive Measures for Diarrhoea

The responses for the question "How to prevent diarrhoea?" were categorized as correct and incorrect according to the rules prescribed by public health experts. It was found that the percentages of correct and incorrect answers in the two programme sites were almost identical. In case of EASTAP sites, the percentages were not statistically different according to toilet ownership. However, in SUSP sites there seems to be a significant relation between toilet ownership and correct knowledge of preventive measures for diarrhoea. This may be an indication of the impact of toilet ownership or it may be the case that those households who have correct knowledge of such preventive measures are more interested in installing a toilet. It should also be noted that in SUSP sites the highest percentage of correct answers belongs to Non-project toilet group (88.9%) while in EASTAP sites it belongs to the Project-Toilet groups (83.2%). Finally, among toilet owners, the percentage of correct answers is significantly higher in SUSP sites (85.1 and 88.9%) as compared to EASTAP sites (83.2 and 76.7%).

Table 4.23 : Correct Responses About Preventive Measures for Diarrhoea by Toilet Ownership and Programme

(Column percentages)

Response	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
<hr/>					
1. <u>SUSP</u>	N=142	N=194	N=9	N=345	Chi-square = 7.660 D.F. = 2
Correct	104(73.2)	165(85.1)	8(88.9)	277(80.3)	Significance = .0217
Incorrect	38(26.8)	29(14.9)	1(11.1)	68(19.7)	Significant at 5%
<hr/>					
2. <u>EASTAP</u>	N=186	N=244	N=73	N=503	Chi-square = 2.055 D.F. = 2
Correct	147(79.0)	203(83.2)	56(76.7)	406(80.7)	Significance = .3579
Incorrect	39(21.0)	41(16.8)	17(23.3)	97(19.3)	Not Significant

4.7.2 Preventive Measures for Worms

In this case the correct responses were low in both programme sites. Nevertheless, the percentage of correct responses was much higher for EASTAP sites than for SUSP sites (29.9% and 20.2% respectively). It is

also important to note that the percentages of correct answers were significantly higher for toilet owners in both programme sites. Even toilet owners, the group non-project toilet owners have much higher percentages of correct answers (50.0 and 42.6 for SUSP and EASTAP respectively). If project toilet households are considered, the percentage of correct answers is much higher for EASTAP sites than for SUSP sites (33.3% and 22.8% respectively) showing a relatively higher effectiveness for EASTAP sites.

Table 4.24 : Responses About Preventive Measures for Worms by Toilet Ownership and Programme

(Column percentages)

Response	Non-Toilet	Project-Toilet	Non-Project Toilet	Row Total	Chi-square Test
1. <u>SUSP</u>	N=122	N=167	N=8	N=297	Chi-square = 7.327 D.F. = 2
Correct	18(14.8)	38(22.8)	4(50.0)	60(20.2)	Significance = .0256
Incorrect	104(85.2)	129(77.2)	4(50.0)	237(79.8)	Significant Relation
2. <u>EASTAP</u>	N=151	N=216	N=78	N=435	Chi-square =14.730 D.F. = 2
Correct	29(19.2)	72(33.3)	29(42.6)	130(29.9)	Significance = .0006
Incorrect	122(80.8)	144(66.7)	39(57.4)	305(70.1)	Very Highly Significant

4.8 General Information About Project Toilets

4.8.1 Information Channel

In SUSP sites the most frequently cited source of first information about the project toilet is Panchayat leaders (51.6%) followed by friends and neighbours (32.0%). In case of EASTAP sites the highest percentage is for friends and neighbours followed by panchayat leaders (40.6% and 33.2% respectively). Other sources such as relatives and project staff are quite unimportant in both programme sites.

4.8.2 Initiator for Project Toilet Installation

In all sample sites male members of family are overwhelmingly the initiator for toilet installation (91.4% for all sites). However, the share of female members is relatively larger for EASTAP sites than for SUSP sites (12.5% and 4.7% respectively). A chi-square test shows highly significant difference in the two programme sites in this regard. This

relatively larger role of females may be because of higher educational status or population including Brahmin and Chhetri in EASTAP sites.

Table 4.25 : Initiator Family Member for Toilet Installation by Sex

Sex	SUSP	EASTAP	Total
Male	244 (95.3)	224 (87.5)	468 (91.4)
Female	12 (4.7)	32 (12.5)	44 (8.6)
Total	256	256	512

Chi-square 8.976, D.F. = 1, Significance = .0027, Very Highly Significant

4.8.3 Location of Project Toilets

Majority of the toilets in SUSP sites (57.0%) are located inside house (clearly because of lack of space) but in EASTAP sites most toilets are located outdoors (71.1%). A chi-square test shows the difference to be very highly significant. Clearly the preference of households is to build toilets outdoors if space is available.

Table 4.26 : Location of Project Toilets by Programme

Location	SUSP N=256	EASTAP N=256	Total N=512
Indoors	146 (57.0)	74 (28.9)	220 (43.0)
Outdoors	110 (43.0)	182 (71.1)	292 (57.0)

Chi-square = 40.177, D.F. = 1, Very Highly Significant

4.8.4 Most Important Reason for Installation

For all sample sites by far the most important reason for toilet installation is convenience, comfort and time saving (80.9% and 90.6% respectively for SUSP and EASTAP). This is followed at a long distance by Family Health consideration (10.9% and 8.2% respectively for SUSP and EASTAP). In case of SUSP 5.1 percent respondents reported that they were interested after observing the convenience enjoyed by other project toilet houses. In EASTAP sites no respondent cited this reason. Thus, demonstration effect seems relatively larger in SUSP sites among the beneficiaries.

Table 4.27 : Most Important Reason for Project Toilet Installation

Reason	SUSP N=256	EASTAP N=256	Total N=512
1. Convenience/comfort/privacy	207 (80.9)	232 (90.6)	439 (85.7)
2. Family health	28 (10.9)	21 (8.2)	49 (9.6)
3. Observing other project-toilets	13 (5.1)	0	13 (2.5)
4. Subsidized package	1 (0.4)	2 (0.8)	3 (0.6)
5. Prestige	2 (0.8)	-	2 (0.4)
6. Others	5 (2.0)	1	(0.4)

Note : A chi-square test combining low frequency rows shows that SUSP percentage for convenience/comfort/privacy is significantly lower but those for health and observing other's toilet are significantly higher.

4.8.5 Incomplete Latrines

In both programmes only a few project toilets are reported as being incomplete up to pan level (2.7% in SUSP and 3.5% in EASTAP sites). This is because the households in Tokha and Khokana who were not distributed any other material except cement and brick were excluded from the list of beneficiaries in sample selection. If those households were included, then the number of incomplete toilets in SUSP sites would appear much higher. The major reason in SUSP site for the incomplete latrines is that of insufficient supply of bricks and problem of transportation. In EASTAP sites the major problem cited is financial problem.

However, 29 latrines (out of 256) in EASTAP sites and 73 latrines (out of 256) in SUSP sites have incomplete superstructure. The most important reason for this in all sites is lack of money followed by lack of materials. Other reasons cited were lack of time and incomplete work up to pan level.

4.8.6 Household Expense in Toilet Construction

Fifty percent of project toilet households in SUSP sites spent between Rs. 100 to Rs. 500 for toilet construction (including toilet house) and 28.9 percent spent below Rs. 100. On the other hand, in EASTAP sites 40.6 percent households spent above Rs. 1,500, while one third households spent between Rs. 1,000 to Rs. 1,500. Thus, it is clear that SUSP latrine distribution was far more heavily subsidized in comparison to EASTAP. A very high chi-square value was obtained showing extremely different frequency distribution in the two programmes according

different levels of expenditure by households for installation of project toilets. This clearly speaks for the relative efficiency of EASTAP latrine distribution. It is interesting to note that the SUSP frequencies monotonically fall as expenditure exceeds Rs. 100, while EASTAP frequencies (almost) monotonically rise with expenditure level.

Table 4.28 : Household Expenditure in Toilet Installation

Expenditure Level	SUSP N=256	EASTAP N=256	Total N=512
Below Rs. 100	74 (28.9)	0	74 (14.5)
Rs. 100- 500	128 (50.0)	39 (15.2)	167 (32.6)
Rs. 500-1000	28 (10.9)	30 (11.7)	58 (11.3)
Rs.1001-1500	17 (6.7)	83 (32.5)	100 (19.5)
Above Rs.1500	9 (3.5)	104 (40.6)	103 (22.1)

Chi-square = 244.927, D.F. = 4, Significance = .0000,
Very Highly Significant

4.8.7 Problems Faced During Toilet Installation

In both programme sites about 21 percent respondents admit that they faced some problems during toilet installation while the rest denied of any problem. The most important problem in SUSP sites seems to be unavailability of materials while in EASTAP sites lack of money is the most frequently cited problem (which is but natural considering the very high household expenditure on toilets as discussed above). Lack of technical advice and transportation problem are also cited in all sites.

4.8.8 Subsidies Received

In Khokana subsidy included all skilled labor and all 800 bricks in addition to cement (4 bags) and other construction materials up to pan level. The monetary value comes as Rs. 1,285.05 per latrine or 76.7 percent of cost up to pan level. In Tokha, however, the subsidy included only 400 bricks, 4 cement bags, 1 set pan and seal and 7 kg rod etc. The monetary value comes as 54.4 percent of cost up to pan level. The village contribution for Tokha was 400 bricks, 4.5 days of skilled labor, 23 cft. of sand, and 11.5 unskilled labour. For drain construction the village contribution was digging of trenches and sand collection while HMG/UNICEF contributed 718 bags cement and 117,250 bricks. In case of EASTAP the actual subsidies were 48 percent, 44 percent, and 20 percent of costs up to pan level in Phases I, II, and III respectively, although the initially estimated subsidies were 66, 44 and 40 percent respectively. Thus, Lubhu, Dadhikot and Thamel had highest

subsidies (on average per latrine of Rs. 680 in 1983/84) while Phase III sites like Thetcho had lowest subsidies (Rs. 448 on average per latrine in 1987/88).

4.9 Utilization and Maintenance of Project Toilets

The frequency of latrine use by adult males of EASTAP sites is much higher than that of SUSP sites. For example 69.5 percent households report that their adult males always use project toilets in EASTAP sites while the corresponding percentage for SUSP sites is only 47.5. Moreover, the percentages of adult males never using project toilets are 17.2 and 32.9 for EASTAP and SUSP sites respectively. As Table 4.29 shows the difference in the frequency of utilization by adult males is very significantly different for the two programmes.

Table 4.29 : Frequency of Latrine Utilization by Adult Males

Frequency	SUSP N=255	EASTAP N=256	Total N=511
Always	121 (47.5)	178 (69.5)	299 (58.5)
Sometimes	50 (19.6)	34 (13.3)	84 (16.4)
Never	84 (32.9)	44 (17.2)	128 (25.0)

Chi-square = 26.412,
Significant=.0000,

D.F.=2,
Very Highly Significant

In case of adult females, an almost identical picture is depicted and is therefore not repeated here.

The relatively higher utilization rate in EASTAP sites is seen even more strikingly in case of elder children, as shown in Table 4.30. For example, the percentage of elder children always using the project toilet is almost 70 percent in EASTAP sites while it is below 32 percent in SUSP sites.

Table 4.30 : Frequency of Latrine Utilization by Elder Children

Frequency	SUSP N=206	EASTAP N=239	Total N=445
Always	65 (31.6)	167 (69.9)	232 (52.1)
Sometimes	60 (29.1)	29 (12.1)	89 (20.0)
Never	81 (39.3)	43 (18.0)	124 (27.9)

Chi-square = 65.199
Significant=.0000

D.F.=2
Very Highly Significant

Although the utilization rate of younger children is lower in both sites (e.g. percentages of exclusive users are 15.3 and 63.8 in SUSP and EASTAP sites respectively), the comparative picture between SUSP and EASTAP is the same as in Table 4.30 (with chi-square even higher). However, it should be mentioned that 48.7 percent households in SUSP and 20.5 percent in EASTAP report that the younger children never use project toilet. This fact is the reflection of the general belief that young children's feces are harmless. Besides, the indoor toilets (especially in SUSP sites) are dark and therefore not attractive to young children.

Relation Between Utilization and Household Educational Level

Table 4.31 shows that formal educational level of household members is significantly associated with the frequency of utilization. The percentage of always utilizing households is much higher for those who have schooling above primary level relative to those who have lower education. The educational level of members 13-59 years is considered because this group includes the economically active members and utilization rate of only adult males is shown in the table because that for adult females is quite similar.

Table 4.31 : Highest Educational Level in 13-59 Years Group and Frequency of Utilization by Adult Males
(Row Percentages)

Education	SUSP			EASTAP		
	Always	Sometimes	Never	Always	Sometimes	Never
Upto 5 class	43 (43.4)	17 (17.2)	39 (39.4)	19 (59.4)	3 (9.4)	10 (31.3)
6-10 class	50 (43.1)	27 (23.3)	39 (33.6)	79 (68.1)	19 (16.4)	18 (15.5)
IA and Above	25 (69.4)	6 (16.7)	5 (13.9)	76 (76.8)	9 (9.1)	14 (14.1)

The table clearly shows that the lower the educational level the higher is the percentage of households who never use toilets and conversely.

Relation Between Utilization and Household Share

It was hypothesized that those households who spend larger amount in toilet installation are more likely to use it more frequently. The data very strongly confirms this hypothesis as shown in Table 4.32. As the table shows the percentage of exclusive users of project toilet monotonically increases with expenditure level for both programmes, for adult males.

Table 4.32 : Expenditure by Household on Latrines and Latrine Utilization Rate by Adult Males

Expenditure Level	(Row Percentages)					
	SUSP (N=255) Utilization			EASTAP (N=256) Utilization		
	Always	Sometimes	Never	Always	Sometimes	Never
Less than Rs. 100	20 (27.0)	14 (18.9)	40 (54.1)	-	-	-
Rs. 100-500	64 (50.4)	27 (21.3)	36 (28.3)	23 (59.7)	2 (5.1)	14 (35.9)
Rs. 500-1000	15 (53.6)	8 (28.6)	5 (17.9)	20 (66.7)	3 (10.0)	7 (23.3)
Rs. 1000-1500	13 (76.5)	1 (5.9)	3 (17.6)	57 (68.7)	12 (14.5)	14 (16.9)
More than Rs. 1500	9 (100)	-	-	78 (75.0)	17 (16.3)	9 (8.7)
Total	121 (47.5)	50 (19.6)	84 (32.9)	178 (69.5)	34 (13.3)	44 (17.2)
Chi-square Test	Chi-square=36.886, D.F.=8 Significance=0.000 Very highly significant			Chi-square=1.148, D.F.=6 Significance=.0088 Highly significant		

An identically strong relation is observed for adult females and children and, therefore, the results are not shown here.

Reasons for Not Always Using Latrines

The most frequently cited reasons for not always using toilets in both programme sites were "not habit" and "pit filled or will fill soon". Another important reason (especially for SUSP sites) is bad smell. Those who gave the reason "pit filled" were asked why they did not empty it and the most frequently cited reason was lack of personnel especially in EASTAP sites (53.3% in SUSP and 75.0% in EASTAP sites), followed by "high cost of emptying" (20.0% in SUSP and 12.5% in EASTAP sites).

Maintenance

It is found that EASTAP site latrines are generally better maintained than those at SUSP sites. Also the frequency of cleaning the toilet is higher at EASTAP sites. For example the percentage of those who reported

NEP/H.32.67 (561)

11 Oct. 1990

Man Heijnen
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P. O. Box 9.3190
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Dear Sir/Madam,

01900000 53576

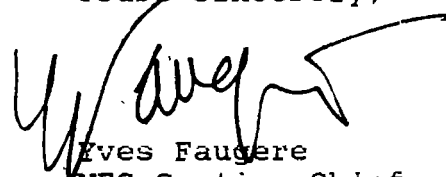
Hej

I am pleased to send you herewith one copy of a comparative evaluation study on two UNICEF assisted semi-urban sanitation projects in Nepal prepared by a local consultancy. The first project was implemented through a governmental ministry between 1982 and 1989 and the second one was carried out by the private sector from 1983 to 1989. The criteria of comparison include efficiency, effectiveness and sustainability of the interventions. The study also gives some general recommendations for sanitation projects in semi-urban areas and judges the role and effects of subsidies for household latrine construction.

I hope you will find the report interesting and informative.

With best regards,

Yours sincerely,



Yves Faugere
WES Section Chief
UNICEF Nepal

Attachment: Report

cleaning every time after use or daily is 71.8 in EASTAP sites while it is only 56.6 in SUSP sites. Besides 11.4 percent households in SUSP sites never clean the toilets while the corresponding percentage for EASTAP sites is only 1.4. There seems to be significant difference in frequency of cleaning in the two programmes.

Table 4.33 : Frequency of Cleaning by Programme

(Column Percentage)

Frequency	SUSP	EASTAP	Total
Each time after use	74 (42.3)	65 (30.5)	139 (35.8)
Everyday	25 (14.3)	88 (41.3)	113 (29.1)
Occasionally	31 (17.7)	27 (12.7)	58 (15.0)
When very dirty	25 (14.3)	30 (14.1)	55 (14.2)
Never	20 (11.4)	3 (1.4)	23 (5.9)
Total	175 (100)	213 (100)	388 (100)

Note : Missing observations = 124 (toilet non-users)

Chi-square = 50.665

D.F.=4

Significant=.0000

Very Highly Significant Difference

It was also found that all households (except two in EASTAP sites) clean with the help of family members only.

Pit Changing

The percentage of households reporting that no pit has yet filled is only 7.7 in SUSP sites and 3.3 in EASTAP sites. Those who report filling of pit only once are 62.8 percent in SUSP and 3.4 percent in EASTAP sites. On the other hand, those who report pit filling 3 or more times are 35 percent in EASTAP sites but only 14.1 percent in SUSP sites. Thus, in EASTAP sites pit filling is far more frequent than in SUSP sites. This may be because of more frequent use, or because of non absorption of water in EASTAP sites.

Similarly, with respect to the frequency of pit changing, Table 4.34 shows that SUSP sites have significantly lower frequency of pit changing.

Table 4.34 : Frequency of Pit Changing by Programme

(Column Percentage)

Frequency	SUSP N=175	EASTAP N=213	Total N=388
Not at all	97 (55.4)	90 (42.3)	187 (48.2)
One time	56 (32.0)	49 (23.0)	105 (27.1)
Two times	9 (5.1)	24 (11.3)	33 (8.5)
Three times	4 (2.3)	14 (6.6)	18 (4.6)
More than 3 times	9 (5.1)	36 (16.9)	45 (11.6)

Note : Missing observations=124

Chi-square = 25.829
Significant=.0000

D.F.=4
Very Highly Significant Difference

The above results show that EASTAP sites have more frequent pit filling and emptying. As regards the personnel for pit changing, 91 percent in SUSP sites used family members only, while 34.1 percent in EASTAP sites used hired persons. Very few (only 1 in SUSP and 3 in EASTAP) households reported using both pits simultaneously. In SUSP sites 28.6 percent of toilet users report that water leaks into pits while the percentage for EASTAP is 26.8 percent.

Compost Utilization

Only 17.7 percent households project toilet users in SUSP sites responded that they have used compost from the pit, and the corresponding percentage for EASTAP is slightly higher (23.9%). On the other hand 57.6 percent of households in SUSP replied that they are planning to use compost in future while only 29 percent in EASTAP said so. The highest percentage of households mainly use compost for vegetables growing (58.2% in SUSP and 59% in EASTAP) followed by paddy (17.6% and 11.7% respectively). In SUSP sites 32.3 percent used hired hands for taking out compost and in EASTAP sites 29.4 percent did so. Among those who used compost, 7.4 percent in SUSP sites report if to be fully prepared while the corresponding percentage in EASTAP sites is 70.6 percent.

5.0 EFFICIENCY OF THE INTERVENTIONS IN THE TWO PROGRAMMES

This chapter provides a comparison of SUSP and EASTAP with respect to their respective efficiency in implementation. The criteria selected for this comparison are : Input/Output Relations and Suitability of Sulabhs in the two Programme Sites, Suitability of Selection of Sites, Lags and Problems in Implementation, Role of Health Education and Training, and Role of Subsidies in the two Programmes.

5.1 Input/Output Relations and Suitability of Sulabhs

The files of Ministry of Local Development (NFP H 32.17) show that the estimated construction cost per latrine up to pan level was Rs. 1,676.12 in 1983 in Tokha and Khokana. Of this UNICEF and HMG contribution was Rs. 1,285.05 per latrine in Khokana (76.7%) and Rs. 945.05 per latrine in Tokha (54.4%). A weighted average of the two percentages according to the actual number of beneficiaries in the two sites comes as 68 percent. Thus, on average the contribution of SUSP per latrine comes as Rs. 1,700 at the 1989 prices of Kathmandu according to which the total cost of production of Type A latrines up to pan level is estimated as Rs. 2,500.00.^{1/}

Similarly, the subsidies provided by EASTAP in Phases I, II and III were 48 percent, 44 percent, and 20 percent respectively (of the cost up to pan level). The weighted average according to number of latrines built in the three phases comes as 34.9 percent. Thus, at 1989 Kathmandu prices the contribution per latrine is only Rs. 873. This, clearly shows that SUSP is far more dependent on subsidy for latrine distribution. Therefore, in this respect, EASTAP is much more efficient relative to SUSP.

However, both programmes are very costly in view of the poor economic status of the people in semi-urban areas of Nepal. In fact Sulabh is a very costly technology if used only to produce hygiene compost which is discarded.^{2/} Since we have seen (in Chapter IV) that very few households have used the compost of the distributed Sulabh toilets, it can be safely said that the funds used in the two programmes could be more efficiently used if less expensive toilet designs (e.g. the type C latrines distributed in the last phase of EASTAP) were promoted instead of the expensive Sulabh Toilets. Furthermore, as recommended in Workshop^{3/} of 1989 "Pour-flush latrines are only appropriate where enough water is available nearby the toilet. Due to the relatively sophisticated technology of the pour-flush latrine, this type should only be promoted

^{1/} EASTAP, June 1989, Experiences of Building Demonstration Latrines; A Contribution Towards Better Environmental Sanitation, Annex 1.

^{2/} Wolz, Chris (1986), Ibid, p. 113

^{3/} Sanitation, Workshop (1989), Ibid, p.13

in areas where latrine-use is a common practice". Since the SUSP and EASTAP sites (especially the SUSP sites) hardly fulfill this criterion, the exclusive focus on Sulabhs (Type A) in the two programmes casts doubt about their efficiency. Wolz^{1/} correctly remarks "...Sulabh is... affordable to only 10-50 percent of the population..... Sanitation is already a low priority in Nepal without the complications of high cost, and UNICEF should not promote an excreta disposal technology that the majority of semi-urban households cannot effort". In this respect the experiment in EASTAP at Thetcho and Kirtipur with Type C Sulabh designed for poor households seems to be a promising alternative. Unfortunately, EASTAP tried it only in the last Phase of the programme.

Another aspect of efficiency pertaining to input/output relations is the large discrepancy between listed and actual beneficiaries. More than one third of the listed beneficiaries in SUSP sites never built a toilet, but used the cement and bricks for something else (according to the field reports of field staffs). In case of EASTAP sites such discrepancy is less than 5 percent. This is because the EASTAP officials were also involved during the actual construction of the latrines, while the ministerial staffs were involved only up to the distribution of bricks, cement and other materials. The local sanitation committees in SUSP sites did not bother to see that all the households which received the materials did build the toilets.

Thus, a significant amount of money and materials were used in some other purposes rather than latrine building in SUSP sites. Hence, the efficiency of SUSP has been significantly lower relative to EASTAP.

5.2 Suitability of Selection of Sites

It is said that "Well begun is half done". Hence careful site selection significantly enhances the efficiency of an Action programme. As shown in Table 4.1 above, the educational status of EASTAP site population is relatively much higher than that of SUSP site population. Furthermore, Table 4.2 showed that educational status is highly (Positively) correlated with toilet ownership. Hence, EASTAP site population was relatively more receptive of the Sanitation Programme. So, in this respect the site selection by EASTAP can be said to be relatively more suitable. Besides, larger percentage of EASTAP site houses have compound area as compared to SUSP sites (Table 4.5 above). Since, it is found from field reports that most households would prefer to build outdoor toilets (if space were available) it can again be concluded that EASTAP sites were relatively more suitable for toilet distribution. The survey results shows that 30.8 percent of Non-toilet households in SUSP sites give lack of space as the main reason for not installing a toilet while only 21.4 percent in EASTAP say so.

However, it was also found that SUSP sites have predominantly agricultural population (94%) while only 51.6 percent households in EASTAP have agriculture as the main occupation. Since one proclaimed

^{1/} Wolz, Chris (1986), p.114

advantage of Sulabh is the compost formation, this would imply relatively better suitability of SUSP sites for "Sulabh Toilet" distribution. Yet, this advantage was not realized to a significant degree as seen above by the compost utilization rates for the two programmes. So, this criterion was not important in practice.

Another site specific criterion is the adequate supply of water. In this respect, too, the EASTAP sites appear to be better relative to SUSP sites for Pour-flush toilet distribution because 50.1 percent households in SUSP sites complain about inadequate water supply, while the corresponding percentage for EASTAP sites is only 25.2 (see Table 4.9 above). Since some authors recommend (e.g. Chris Wolz, 1986) that there must be at least a water supply coverage of 60 percent before Pour-flush latrines are promoted, it is clear that SUSP sites are quite unsuitable for Sulabh toilets. Similarly, the "After Defecation Cleaning" habits in the two programme sites also indicates the relatively higher suitability of EASTAP sites for Sulabhs because 22.7 percent households in SUSP sites do not clean with water while the corresponding percentage for EASTAP is only 1.3 (see section 4.4 above).

5.3 Lags and Problems in Implementation

5.3.1 SUSP Programme : Lags and Problems

In SUSP the baseline surveys were done only after the formulation of project plans and targets and were, therefore, not utilized in the implementation of the programme. In EASTAP sites no such baseline surveys were done. In SUSP although the original target for the four SUSP sites was to build 2,000 household VIP type latrines, the focus during implementation was exclusively on expensive Sulabh Type A latrines. Furthermore the coverage in Tokha and Khokana seems to be even less than 50 percent while the original target was 100 percent coverage. Instead of improving 100 hygienic public tapstands the programme achieved the repair of about a dozen tapstands at Khokana. Similarly, the solid waste disposal facility for 2,000 households became a false promise.

By the end of 1985/86 only 100 household latrines were completed in Tokha (with 2 demonstration latrines). A workshop cum storage shed was completed next to a rehabilitated school building in Saraswati Village Panchayat. In August 1986 it was found (Chris Wolz, 1986) that in Khokana out of 391 household latrines 27 (7%) were incomplete up to pan level and 158 (41%) had incomplete superstructure. Thus, only 206 (52%) of the 391 latrines were in use. Similarly, in Tokha out of 250 latrines 158 (74%) were incomplete up to pan level, 4 (2%) had incomplete superstructure and therefore, only 88 (35%) were in use. Thus, the major problem in Khokana was that of incomplete superstructure and in Tokha that of incomplete HMG/UNICEF work.

It was also found that 20 percent of Khokana and Tokha latrines were inoperational during monsoon due to water blockage. Several homeowners had actually dug open drains to drain liquid sewage away from the pits.

The achievement was far below targets (especially in case of latrine construction) in Tokha and Khokana as shown in Table 5.1 below.

It should be noted that the construction of latrines and drains were done in a hurry at the end of the fiscal year because a report of April 1987, says that in Tokha only 219 ft. of carry-over essential drains, 500 ft. of new drains, only 20 household latrines, and none of the institutional latrines were built by April 1987. One of the major problems in SUSP sites was the supply of bricks. For instance, in May 1987 the bricks from Jor Ganesh Chimnivata were rejected and returned because they were found not up to the standard of the sample supplied. Another major problem was the inadequate HMG budget. For instance, in 1987/88 the budget from HMG allocated for Tokha Sanitation Programme was only Rs. 20,000 which was far below the proposed budget of Rs. 143,000.

Table 5.1 : Targets for 1986/87 and Achievements up to July 1987 (SUSP Sites)

Site and Activity	Target	Achievement (Percentage)	Remarks
<u>1. Tokha</u>			
Carryover essential drains	750 ft	660 ft (88.0)	Drains incomplete mainly due to lack of HMG budget
New " "	1,150 ft	1150 ft (100.0)	Latrine construction hampered by
Carryover latrines	162	106 (65.4)	local panchayat election and
Additional proposed latrines	88	0 (0)	supply problems of bricks
Institutional proposed latrines	7	4 (57.1)	
<u>2. Khokana</u>			
Essential drains	256 ft	118 ft (46.1)	Problem of supply of bricks and cement
Additional drains	361 ft	0 ft (0)	
Carryover latrines	30	8 (26.7)	

Source : Various files of ministry of local development. Note that the achievement rates given at different places in the files do not exactly tally.

According to a file report of January 1988 the achievement rates as per targets for Tokha were as in Table 5.2 (In Khokana SUSP ended by Nov. 1987) :

Even in April 1988, 33 latrines were carried over from the last fiscal year and out of the 88 new latrines only 70 were built according to a report of July 1989 due to lack of bricks and cement. Finally, it is also reported that a local sanitation committee was formed in Tokha only in December 1987 (toward the end of the SUSP programme).

Table 5.2 : Targets and Achievements up to January 1988 for Tokha

Activity	Target	Achievement (Percentage)		Remarks
New latrines	88	0	(0)	Bricks and cement
Carryover latrines	36	9	(25.0)	not available
Carryover drains	528 ft	456 ft	(86.4)
New drains	656 ft	164 ft	(25.0)
Tapstand repair	12	0	(0)

The general picture which emerges from the detailed description of targets and activities at different points in time during the implementation of SUSP, is that delays and time lags were regular features of the programme. The principal causes for these inefficiencies in the implementation of SUSP were:

- a. Bad timing of activities : Example of this are: baseline survey following the formulation of project plans and targets, formation of local sanitation committee towards the end of the programme, starting construction activities during monsoon and election, proposal of new construction without completing the large carryover activities of previous period, and so on.
- b. Transportation and Supply Problems : Throughout the programme there were complaints of unavailability of cement and bricks. Sometimes cement bags were sent to another region (e.g. in Dec. 1986, 800 cement bags went to central region instead of SUSP sites by mistake. This involved retransporting time and cost). The transport of bricks to Khokana and Tokha was difficult also due to the treacherous roads leading to these sites. As mentioned above, sometimes the supplied bricks were not up to standard and were rejected. Moreover, the local villagers in Tokha faced great difficulty in obtaining the bricks to be contributed by them. The situation turned from bad to worse during the last phase of SUSP because of fuel crisis in Kathmandu in the aftermath of Indo-Nepal Trade and Transit deadlock.
- c. Inadequate HMG Budget : Frequently the construction of drains was hampered by the lack of HMG budget.
- d. Lack of Construction Follow Up : Many houses were distributed only bricks and cement and they did not build a latrine at all. Some households refilled the pit after waiting for some time for other materials. Thus, it was not attempted to make sure that those households who received any material from SUSP did actually use it in latrine construction.
- e. Unnecessary Expenditure in Reworking on Incomplete Activities : Drains were not completely built at one time. For example in May

1986, 80 percent of the 2,000 ft drains in Tokha were left only half complete due to shortage of gravel (to be supplied by the ministry) for cover slabs, and sand (village voluntary contribution). These incomplete drains were full of dirt, used as refuse dump and open defecation place. Hence it must have involved a lot of time and money to clean them before final plastering. This is an important example of inefficiency in the implementation of SUSP.

- f. Negative Impacts of False Promises : Many promises made in the proposal and some also made to the villagers were not fulfilled, which must have had negative impact on the villagers participation in other activities. For example, nothing was done toward solid waste disposal despite the promises in the proposal and negligible effort was made toward water supply (tapstands) improvement despite the promises made in this regard. Cleaning of ponds is another false promise made during SUSP programme. Since in SUSP sites (especially Tokha), water supply problem is very serious, the efficiency and effectiveness of any sanitation programme is severely constrained by the inadequacy of water supply.

5.3.2 EASTAP Programme: Lags and Problems

In Phase I of EASTAP there was a delay of six months as per the initial target. Instead of completing the latrine distribution activities between July 1983 and June 1984 as originally proposed, the construction activities were completed only by November 1984. However, there were 34 more latrines built than the original target of only 200 latrines, and the completion was six months before the revised deadline of May 26, 1985. Furthermore, EASTAP was able to reduce the subsidy level from 66 percent (initial proposal) to only 48 percent (actual) of the cost up to pan level. Thus, it can be said, that, Phase I of EASTAP was a success despite the initial delay.

One of the main reasons for this successful completion (as per the revised schedule) was the timely advances received from UNICEF. Another reason for this was that the action oriented private organization (EAST Consult) had already gained some experience in successful promotion, propagation, and construction of Sulabhs in Nepal since 1981. The EASTAP thus, successfully demonstrated the cost effectiveness of private sector approach in implementing and maintaining sanitation system leading to further investment in similar projects by various private and government agencies.

Furthermore, labor-based methods of construction of toilets and their components led to the development of local small enterprises which in turn created more employments.

During Phase II there was no delay in building the 500 latrines in four sites. Both the estimated and actual schedule were January 1985 to June 1986, and the household contribution was also exactly as proposed.

Some of the main reasons for the above successes were :

- a. Motivational work had already been carried out in Bode and Thimi during Phase I.
- b. Programme was launched at the beginning of the working season (December) which allowed the construction work to start immediately. Moreover, two full working seasons were available during the 18 months of the programme, and
- c. No efforts were made to reduce subsidy during this programme in contrast to Phases III in which considerable confusion was created due to subsidy reduction resulting in complete stoppage of construction work for a long time in the initial period.

Although eight more latrine were built in Phase III than the initial target (of 500 latrines), there was a long delay of nine months in the completion of latrine construction. The various reasons cited for this delay in EASTAP reports (as discussed in detail in Chapter III) are :

- a. Drastic cut in subsidy from 44 percent in Phase II (and 40 percent initial proposal for Phase III) to only 20 percent of costs up to pan level was tried even in face of the sharply rising cost of construction. This created widespread confusion among the local people and it took some time for EASTAP to convince the people about their honesty in subsidy reduction.
- b. There was an apparent conflict of emphasis between UNICEF and EASTAP. While UNICEF emphasized physical progress and target achievement (due to fear of rising costs caused by delay), EASTAP was interested mainly in exploring, experimenting and developing suitable strategies for increasing the effectiveness and popularity of sanitation programmes.
- c. EASTAP also experimented with a loan programme which could not however, be implemented because of lack of interest from Nepal Rastra Bank and other commercial and development banks of Nepal.
- d. The programme also suffered from bad timing because the construction activities coincided with the start of monsoon during which the villagers become very busy in farming activities.
- e. There was also a sudden rise in the price of construction materials which created financial problems both for EASTAP and the villagers.
- f. EASTAP itself started doubting over the effectiveness of the highly demanded low cost unlined pit latrines (Type C-1 designed for poor families) and, therefore, their construction was halted.
- g. Lack of steel frames required to build Type C-2 and C-3 latrines (for poor households) was also a problem.

- h. Inability of local NGOs to properly handle the delicate ring casting job, was also a reason for the delay.
- i. The Indo-Nepal Trade and Transit deadlock which resulted in fuel crisis, created transportation problems.
- j. People in Katunje heard about the loan programme and decided to wait for the loans which hampered the on-going programme there.

In conclusion, we can say that EASTAP's implementation was relatively more efficient with respect to time lags and problems in implementation except for Phase III which was hampered by confusion and bad timing in addition to the exogenous shock like Indo-Nepal Trade and Transit crisis. While SUSP programme had delay and mismanagement problems throughout the programme, EASTAP's Phase I and II were relatively far more smooth and successful.

5.4 Role of Health Education and Training

5.4.1 Health Education Component in EASTAP

We have already seen above that EASTAP was almost completely devoid of Health Education and Training component except for the informal discussions about worms and importance of keeping latrines clean during the follow up period by the field staffs. This may be because of EASTAP's somewhat mistaken view that health and sanitation education packages generally attached to any sanitation improvement programmes have not been able to produce desired long-term effect. In contrast, many studies about sanitation projects in Nepal (see Chapter II) have concluded just the opposite to this view. For example, Rai (1987) finds that all households from all categories (by toilet ownership) believe that direct sanitation education should be used to encourage wider participation in sanitation programmes (especially, through audio-visual medium). Mr. Rai, therefore, claims that intensive sanitation programmes without schools, health and other social service programmes have short lived success. It is EASTAP's view that health education should follow sanitation programme, but there is little emphasis on health education in EASTAP's programme. In fact for the popular acceptance and success of sanitation programmes, it is essential to have continuous health and sanitation education programmes in the project sites before, during and after the implementation of sanitation programmes. The fact is that education takes a long-time (10-15 years) to have full visible effect, hence many projects emphasize on building latrines. (Sanitation Workshop 29-31, July 1987). However, health education is an inseparable part of sanitation and should be the basis of any sanitation programme (Sanitation Workshop, 27-29 August 1989).

The field survey results show that in EASTAP sites more than one third (37%) of households cite health education as one of the three most important environmental sanitation improvement activity for the village (for SUSP sites, however, this is only about 15%). Similarly, for the two programmes together, about one fourth of the households suggest that

health/sanitation education is the best means of making the sanitation programme more popular.

5.4.2 Health Education Component in SUSP

Although SUSP had health and sanitation education component in the initial years of implementation, it lacked a programme of continuing health and sanitation activities to complement the latrine construction activity of the programme. The health activities in Khokana and Tokha have been sporadic and in Bhadrapur nonexistent according to Chris Wolz (1986). Only in Urlabari the health programme has been relatively promising, yet planned and run by off-site staff.

The intensive Health Campaign for two months in Khokana is claimed to have accomplished the following :

1. It made people think about the need for proper and hygienic disposal of human waste.
2. It established an excellent rapport between local people and project staff.
3. The pre-campaign activities (e.g. workshop and training) helped increase people's participation.
4. The preparatory meeting for the wards mobilized people for cleaning, opening and repairing common utilities such as drains, taps, water tanks and defecating alleys.
5. Drains in Khokana were significantly improved during the campaign.
6. People were convinced of the need to clean the heap dungs in front of their houses and to use them in their fields.
7. The ""Deo-Pukhu" pond, which is centrally located and has religious significance, was cleaned during the campaign for the first time after 1962.
8. Many people were motivated to build latrines
9. Compost pits were dug in each ward and dust bins were installed too.
10. The massive distribution of deworming drugs and the results of taking it had dramatic impact on people's attitude toward open defecation.
11. During the ward activities, sanitation education was especially imparted to women.

However, the main problems with the sanitation campaign were as follows:

1. Unavailability of teaching materials during kick-off and ward activities,

2. Transportation difficulties faced by campaign team,
3. Lack of active participation from concerned line agencies (HES^{1/} and MPLD),
4. Inability of the campaign to complete demonstration latrines (except two) partly because of the poor participation by MPLD,
5. Not all SCMs^{2/} were equally enthusiastic and the CHWs^{3/} were not devoted to the project,
6. The "Pode" (traditional sweeper caste) demanded high wages for cleaning public defecating places, and
7. Last, but perhaps the most important problem is that the campaign had only a short lived impact because it was not followed up by similar activities during the SUSP programme.

Similarly, the Tokha Health and Sanitation Campaign (as described in detail in Chapter III) had limited and short lived impact on the villagers. Besides, there were the following problems even during the campaign.

1. Although transportation was arranged on contracts it was not available when it was needed,
2. Lack of money to meet the immediate expenses severely restricted the efficiency of the campaign group,
3. The campaign activities scheduled for one week were squeezed to 3 days due to the administrative constraints in MPLD and the feast days of the Tokha community,
4. Political differences among the local leaders posed the problems of confusions and misunderstanding and this obviously discouraged the community participation in the programme,
5. Siting of the two villages was proposed but the technical support was not made available,
6. Installment of a drinking water tank in each panchayat was proposed but the budget could not effort it, and
7. The campaign had to (unnecessarily) spend some time and money for sanitation survey because the results of the baseline survey were not made available.

^{1/} Health Education Section
^{2/} Sanitation Committee Members
^{3/} Community Health Worker

To conclude this section let us consider the health/sanitation education activities in SUSP in the light of the five step Adoption or Diffusion Process as suggested by some authors.

Step I : Awareness

Due to a health education campaign the people in rural and semi-urban areas become aware of the direct link between sanitary practices and various sanitation related diseases. They also become aware of the health benefits of using a toilet. This step seems to be achieved in Tokha and Khokana health Campaigns.

Step II : Interest

The awareness created in Step I when reinforced by other promotional activities (such as brochures or pamphlets about Sulabh Toilets their design, use and maintenance) generates interest in the sanitation (e.g. toilet distribution) programme. In this stage people start seeking more information about the sanitation programme. This stage too seems to have been achieved in Tokha and Khokana.

Step III: Evaluation

After being interested people start calculating the costs and benefits or advantages and disadvantages of the sanitation activity being promoted. The health education can now reinforce people's knowledge and awareness by teaching the health benefits of adopting the sanitation item (e.g. toilet) by talk programme, film/documentary and other activities. This stage does not seem to have been successfully achieved in Tokha and Khokana. Instead of reinforcing people's awareness and knowledge about toilet use and health benefits, the SUSP emphasized comfort/convenience/privacy aspects of the heavily subsidized toilets. This created a kind of artificial demand among local people who were not fully aware of the health benefits of using toilets for defecation. The result was that the utilization rate of latrines built was very very low although the physical target set for latrine distribution was somehow met (by extending the time span of the project). In fact most households utilize the latrines infrequently and only when outside defecation is not convenient in rains or dark. Besides, the children were not forced to use toilets because the people were still unaware (generally) of the (at least) equally hazardous nature of children's feces, because children did not care for privacy, and because it was more convenient for them to defecate in the streets and open drains than inside a dark toilet. Thus, the very concepts of convenience, comfort and privacy (instead of health benefits) any have become the prime causes for very low utilization rate. Moreover, the households did not care for keeping the toilets always clean as they were not fully aware of the health hazards of a dirty toilet. Thus, those who stipulate that continuing health education is not necessary for sanitation programme forget about utilization, maintenance and long-term sustainability but only care about rate of physical target achievement. The survey results show that among those Non-toilet households who want to build toilets about 90 percent in SUSP sites mention convenience/comfort/privacy as one of the main reasons

while only about 25 percent mention health or environmental sanitation. For EASTAP sites the percentages are about 80 and 50 respectively. These facts show that people generally are still unaware of the health benefits of toilets.

Step IV : Trial

After reinforcement during evaluation stage people try to follow the sanitary practices being taught by the health education programme.

Step V : Adoption

Once the people realize the health impacts (e.g. reduced incidence of diarrhoea, dysentery, typhoid and worms) in their own family and the community, they fully adopt the new sanitation practice and their behavior, attitude and perception is changed for ever.

These last stages were not reached in Tokha and Khokana through health education process but through heavily subsidized toilet distribution and artificial demand creation. Thus, we can conclude that SUSP had health campaign while EASTAP did not but the role of health and sanitation education was nil in both programmes. This is why, the utilization rate is so low (paradoxically more so in SUSP), awareness about other sanitation practices is negligible and there has been negligible change in the sanitary practices of the community or the environmental sanitation situation. If a comprehensive health education programme were run throughout the two projects, we would certainly find that the overall sanitary practices (not only defecation but also drinking water purification, solid waste disposal and food handling practices etc.) of the communities have significantly changed.

5.5 The Role of Subsidies

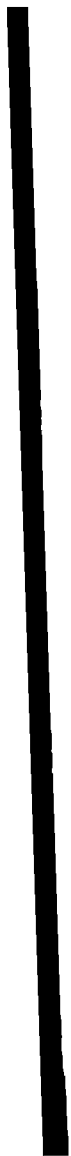
We have already seen above that SUSP was heavily subsidized especially in Khokana while EASTAP was very careful about subsidies from the very beginning. EASTAP reduced its subsidies from 66 percent (proposed) to 48 percent (actual) per latrine cost up to pan level even in Phase I. It may be the indirect pressure put on the ministry due to EASTAP's lower subsidies which resulted in a significantly lower subsidy in Tokha (54.4 percent) as compared to (76.7 percent in) Khokana. EASTAP gradually reduced its subsidy to 44 percent and finally to 20 percent (although the subsidy reduction process was not easy as discussed above). Thus, EASTAP correctly understood that latrine promotion based on artificial demand created through heavy subsidies is not a process of ensuring long term sustainability of the programme. Moreover, it also reduced the efficiency of the programme because the input/output ratio in SUSP is much higher than in EASTAP. It was seen in Table 4.31 that higher the subsidy level (or lower the household contribution) lower is the utilization rate of all family members. Thus, if subsidies can be reduced and toilets still distributed, then it is always more efficient to do so (provided it does not create widespread confusion and long delay as in Phase III of EASTAP). However, if an expensive toilet design like Sulabh type A is promoted, then some subsidy is essential in order to

effectively lower the price of a toilet and make it affordable to a large mass of poor people. An alternative would be to devise a low cost toilet which is almost equally efficient in functioning, and to promote it merely by motivating people through other means (e.g. health and sanitation education) with subsidy only as sugar coating (to a minimal level, say five percent), that too in the form of technical supervision or supply of an essential item not locally available at a subsidized rate).

Although EASTAP was relatively more efficient in view of its lower (and decreasing) subsidy level, it was not fully efficient because the subsidies went to relatively richer families who were in need not of subsidies but of proper motivation. The reason for such unfair distribution, according to EASTAP, is the concern to avoid the complexities of local politics. However, modern approach to project evaluation, thanks to authors like Squire and Tak (1975) also includes the distributional aspects. Although equity is not a major concern of sanitation programme, it is not desirable to aggravate the inequality already existing in the society. Since no donor agency can be expected to subsidize all latrines in the country, there is no alternative to reducing subsidy to a minimal level directed specially toward poor households who cannot really afford to build latrines entirely on their own. If richer families get any amount of subsidy, it is unrealistic as well as unfair to hope that poorer households will build self help latrines merely by demonstration effect. Unfortunately, this is what the EASTAP officials are expecting in their hope for demonstration effect of the so called "Demonstration" and "Extended Demonstration" Phases. The survey data show that about one third of the Non-Toilet households in SUSP and about 42 percent such households in EASTAP sites mentioned unaffordability as the main reason for non-installation of toilet. This is the direct result of the fact that most of those households who were left out in EASTAP were poorer households.

It is also interesting to note that about 58 percent of Non-toilet households in SUSP and 74 percent in EASTAP sites consider the subsidies provided by the programme as insufficient. This may be because of the "Dependency Syndrome" developed by subsidized latrine distribution, and/or it may be because most of the Non-toilet households in both programmes are poorer households who are more need of subsidies than the current beneficiaries.

The gist of the above facts and figures is that subsidy should be minimized and directed toward poorer households as a target group. But subsidies should follow proper motivation by other means (especially, health and sanitation education) and should be used to slightly lower the price of toilets to make them affordable to the target group. A richer household will be more likely to build a toilet merely by demonstration effect and social prestige when a poorer neighbor installs a toilet. The question of local politics and the influence of socio-politico-economically higher families is difficult, it is to be admitted, but in the changed political system of the country it is a viable and worthwhile endeavor.



6.0 EFFECTIVENESS OF THE INTERVENTIONS IN THE TWO PROJECTS

In this chapter the second important aspect of evaluation, namely, effectiveness is studied on a comparative basis for SUSP and EASTAP. This is accomplished by critically examining the objectives (with respect to their viability), by comparing the utilization rates for the two programmes, by examining the extent to which the programmes have solved the main sanitary problem of the project sites, and by comparing the various effects (especially health and awareness generation) of the two programmes.

6.1 Critical Appraisal of the Objectives

6.1.1 Appraisal of SUSP Objectives

1. The objective of alleviating the poor state of health of children and mothers in Nepal is clearly over-optimistic and unrealistic for a pilot programme concentrating on latrine distribution. The problem of inadequate and unsafe (for drinking) water supply is even more serious in the SUSP sites. Since there was virtually no programme toward solving this problem it is too much to expect that the latrine distribution (with some drainage facilities) would have significant impact on the health of mothers and children. It was found from survey data (Tables 4.19, 4.20, 4.21 and 4.22 above) that toilet ownership does not have significant impact on the incidence of diarrhoea, dysentery, typhoid, and worms in SUSP sites. Thus the sanitation programme would have to expand its activity (in coverage of latrine distribution and other sanitation activities like water supply) significantly and complement it with health and sanitation education if it were really serious about its first objective.
2. Other objectives of SUSP are more or less realistic except that manpower development was done on a very limited scale and the programme was unable to develop and establish the procedures necessary for implementation on a larger scale as promised in the beginning. Moreover, the term "integrated sanitation" is not clear in SUSP objectives, because it could imply the solid waste disposal as well as water supply improvement which were non-existent in the programme.

6.1.2 Appraisal of EASTAP Objectives

1. The objective of Phase I to bring about change in the chronic open defecation habits of the majority and thus to improve environmental sanitation and community health was over optimistic for a short-run demonstration programme without complementary health and sanitation education activities. Therefore, this objective was discarded during later phases. It was realized that such objective was not realistic in view of the problems like : age-old stubborn habits, chronic breach of laws of sanitation; apathy and erosion of community self-reliance due to habitual dependence on outside help for any community activity;

absence of effective local institutions or NGOs; and lack of awareness of direct link between environmental sanitation and community health among local people.

2. Sanitation awareness cannot be raised simply by constructing subsidized demonstration latrines and by motivating people by talking about comfort, convince and privacy of a private latrine (instead of health and sanitation considerations). Therefore, this objective of Phase III was also not practicable because it was not supported by a continuously going on sanitation education and awareness building programme in the project sites.
3. The objective of involving individual households in the reuse of pit manure was also neglected during the implementation of the programme because it was not supported by sufficient follow-up and practical demonstration of using the compost manure. It was left entirely to the people to do so as if they were already knowledgeable and habituated of using compost manure. Since the use of such manure requires some technical know-how and the service of hired personnel (sweeper caste people to empty pits), it is unlikely that this objective be realized to a significant degree. The survey data about compost utilization (Chapter IV) also confirms this statement.
4. The implicit objective (of UNICEF) of validating the cost effectiveness of a comprehensive and participatory private sector approach in developing a process of implementation and maintenance of "Sanitation System" is the only important objective which seems to be practical and largely fulfilled by EASTAP.
5. The objective of sharing ideas between EASTAP and other UNICEF supported sanitation programme in Nepal, although theoretically appealing, seems to have been neglected during implementation of the programme. In fact, it is not easy in case of Nepal to have a close coordination between an action oriented private sector organization and the departments of the line ministries as there is a general lack of coordination even among the various ministerial departments (resulting in information gap, duplication of activities and inefficiency).
6. The creation of employment by using more labor based methods of construction was a worthy objective and was also largely fulfilled during implementation.
7. The objective of exploring the possibility to involve financing agencies like development banks and the Nepal Rastra Bank to loan out money to families interested in latrine building, was seriously pursued by EASTAP during Phase III but the outcome was only the development of a tentative loan scheme (Appendix C) to be used in future programmes. It was later realized (after many months of negotiations with UNICEF and the banks) that loan programmes cannot be implemented until the financial authorities (Nepal Rastra Bank and Development banks) do give high priority to sanitation improvement as a basic need of the communities.

To conclude this section, it can be said that both programmes have the elements of realism as well as overoptimism in their objectives.

6.2 Utilization of Latrines

Since the major focus of the two programmes was on latrine distribution, their relative effectiveness can be compared (among other things) by comparing the degree of utilization of constructed latrines in the two programmes.

As Tables 4.29 and 4.30 above show, the degree of utilization by family members in SUSP sites is much lower than in EASTAP sites. While about 70 percent of project toilet owners in EASTAP sites are exclusive toilet users (except young children for whom percentage of exclusive toilet users is 64), the percentage of exclusive toilet users for SUSP is only between 15 to 50 percent for different family members (highest for adult females equal to 50,0%). On the other hand, the percentage of project toilet households never using toilets in EASTAP sites is only between 17 and 20 percent (highest for young children while it ranges between 33 and 49 percent for SUSP sites (highest for young children). Thus, with respect to the degree of utilization, EASTAP appears to be far more effective than SUSP.

Table 6.1 : Utilization Rates by Family Members of Non Project Toilet Households

(Row Percentage)

Member/Programme	Always	Sometimes	Never
1. Adult Males : SUSP	9 (90.0)	1 (10.0)	0 (0)
EASTAP	69 (92.0)	6 (8.0)	0 (0)
2. Adult Females: SUSP	10 (100.0)	0 (0)	0 (0)
EASTAP	70 (93.3)	4 (5.3)	1 (1.3)
3. Children : SUSP	7 (100.0)	0 (0)	0 (0)
EASTAP	39 (95.1)	2 (4.9)	0 (0)

Note : Missing observations excluded

One reason for this may be the much lower subsidy provided by EASTAP compared to SUSP. We have already seen in Table 4.31 above that the household expenditure on toilet installation is highly significantly correlated with the degree of utilization. Thus, a very strong point in favor of lowering the subsidy level is that, the lower the subsidy level other things remaining the same, the higher is the programme effectiveness in term of degree of utilization. However, it was found in Tables 4.12 and 4.13 above show that in both programmes the utilization rates (defecation in toilets) is much higher for Non-Project Toilet households, than for Project Toilet households. This fact is reconfirmed by Table 6.1 above, which shows that the percentage of exclusive toilet

users (for all family members) is significantly higher for Non-Project Toilet compared to Project Toilets. What this means is that both the programmes are not as effective as they could be in motivating the toilet owners to utilize the toilets. Apart from the expenditure shared by the households, they should be convinced about the health benefits and environmental sanitation of exclusively using the toilets. If only the economic consideration is the determining factor for utilization, then the programmes cannot be considered effective in raising the knowledge and awareness level of the beneficiaries.

6.3 The Projects and the Main Sanitary Problems of the Project Sites

A programme can be effective only if is compatible with the community priority of the project site.

The survey data show (Table 6.2 below) that for both programmes the largest percentage of households give top priority to Drainage system followed by water supply improvement (quantitatively and qualitatively) as a means to improve the sanitary situation of the community. Therefore, the focus of EASTAP exclusively on latrine distribution does not match with the priority of the communities. This is also true for SUSP to some extent. However, SUSP also had a component of drainage construction which was compatible with the community priority. Thus, relatively speaking, SUSP seems more effective in attending to the main sanitary problem of the project sites as reflected in the community priority. However, the programme effectiveness could be greatly enhanced if the two programmes had water supply improvement as a complementary activity to latrine distribution and drainage construction. The table shows that toilet distribution ranks only fifth in SUSP sites and third in EASTAP sites according to community priority.

Table 6.2 : Top Priority Village Sanitation Improvement Activity

(Column Percentage)

Top Priority Activity	SUSP N=467	EASTAP N=535	Total N=1,002
Drainage	145 (31.0)	275 (51.4)	420 (41.9)
Water supply	112 (24.0)	105 (19.6)	217 (21.7)
Toilet distribution	53 (11.3)	75 (14.0)	128 (12.8)
Education	60 (12.8)	45 (8.4)	105 (10.5)
Health post/hospital	61 (13.1)	17 (3.2)	78 (7.8)
Solid waste disposal	32 (6.9)	11 (2.1)	43 (4.3)
Road construction	4 (0.9)	7 (1.3)	11 (1.1)

For the two programmes to be more effective, Water Supply, Health Post and Education should have complemented the Toilet distribution programme. This statement is also verified by the responses of the households and key informants about the questions "What remains to be done to improve the environmental sanitation and how can it be improved?". The largest percentage of response were in favor of drainage construction and water supply improvement followed by Toilet distribution to cover remaining households, education (general and health education) and better provision of health posts and/or hospitals.

When asked to what extent the latrine distribution has solved the main sanitary problem in the area only about 10 percent of households in SUSP and 22.9 percent in EASTAP sites replied that the programme has fully solved the main sanitary problem of the area (Table 6.3). On the other hand about 75 percent in SUSP and only 52 percent in EASTAP replied that the programme has partially solved the main sanitary problem of the area. Thus, 15 percent in SUSP and 26 percent in EASTAP think that the programme has completely failed to solve the main sanitary problem of the area.

There is, thus, no clear cut dominance of one programme over another in the effectiveness with respect to solving the main sanitary problem of the project site. SUSP seems better in solving the main sanitary problem to some degree while EASTAP seems better in fully solving the main sanitary problem according to percentage of responses. As a matter of fact, both programmes are unsuccessful as a very large majority of households think that the main sanitary problem is left either untouched or solved only partially (90% in SUSP and 78% in EASTAP).

Table 6.3 : How Far has the Programme Solved the Main Sanitary Problems of the Project Site?

(Column Percentages)

Response	SUSP	EASTAP	Total
Fully solved	46 (9.8)	117 (21.9)	163 (16.3)
Part solved	353 (75.6)	277 (51.8)	630 (62.9)
Not solved at all	68 (14.6)	141 (26.3)	209 (20.9)
Total	467 (100)	535 (100)	1002 (100)

Chi-square = 31.336, D.F. = 2, Significance = .0000
 Very Highly Significant Difference in the Programmes.

6.4 Various Effects of the Programmes

6.4.1 Health Impacts

Although health impact is (perhaps) the most important aspect of effectiveness of a sanitation programme, it is also the most difficult and statistically unreliable aspect. The reason is that a household may be always using its toilet, yet its members may suffer from all excreta related diseases transmitted through other media such as dirty water, dirty streets and dirty food. Thus, a toilet distribution programme may be very effective as far as toilet distribution and utilization are concerned, still the other mediums of transmission of sanitation related diseases may be responsible for the prevalence of those diseases. Nevertheless, the incidence of various sanitation related diseases are considered here as one aspect of effectiveness of the two programmes.

Table 4.19 above shows that the impact of project toilet ownership in case of Diarrhoea is significant only for EASTAP sites where project toilet households have significantly lower incidence of diarrhoea as compared to other type of households. Moreover, the non-toilet households are relatively the worst (with highest percentage of households suffering from diarrhoea in the last year). This is a clear indication of the programme effectiveness. On the other hand, in SUSP sites, although Project Toilet households have relatively the least incidence of diarrhoea, the relationship between incidence of diarrhoea and toilet ownership is statistically quite insignificant. However, if we compare the current incidence of diarrhoea with that reported in Baseline Survey of Khokana (New ERA, 1983) we do not find any improvement in this regard in Khokana. In 1982 only 24.1 percent households reported illness during the past year of which only 9.5 percent were diarrhoeal cases. It is, however, obvious that the baseline survey highly underestimated the incidence of sanitation related diseases.

Table 4.20 above shows that project toilet households have least incidence of dysentery in EASTAP sites, while in SUSP sites Non-Project Toilet households have least incidence. Comparing the two programmes with respect to the percentage of Project-Toilet households reporting incidence of dysentery during past year, EASTAP appears slightly better. However, the table also shows that toilet ownership has statistically insignificant impact on the incidence of dysentery in both programmes. Thus, it cannot be inferred from the survey data that the two programmes had any appreciable effect on incidence of dysentery.

Similar is the case of Typhoid. It should be noted, however, that many households may not be aware of the type of illness they have unless diagnosed by a medical practitioner. This statement is easily verified by the baseline study of Khokana (New ERA, 1983), which reports that a stool test revealed that over 82 percent of sample members of households were infested with parasites, but almost all respondents were totally unaware of it. It may also be the case that the people in these places think it as a natural occurrence and not as a disease.

The field survey during the present evaluation study shows that SUSP sites are relatively worse than EASTAP sites in the frequency of occurrence of worms because 46.6 percent in EASTAP sites deny having suffered from worms while only 35.7 percent in SUSP sites do so (Table 4.22). But toilet ownership does not seem to have made any significant difference, perhaps because many households still defecate outside and the water supply is infested with eggs of parasites which together nullify any positive effect of toilet ownership.

A comparison of the above percentages with the result of the baseline survey would be misleading because no stool test was carried out during the present study.

It is perhaps because of the lack of high correlation between toilet ownership and health impacts, that many people involved in sanitation programmes are reluctant to mention health benefits to households as a motivational factor and try instead to motivate by convenience/comfort/privacy concepts.

6.4.2 Other Effects

Among other effects of the programmes, increased awareness and knowledge about health and sanitation is particularly important in order to measure the effectiveness of a project. In this study this effect is considered in detail later when sustainability of the two programmes are compared. As regards the knowledge about preventive measures for Diarrhoea (which is equivalent to the knowledge about causes of Diarrhoea) Table 4.23 above shows that SUSP appears to be relatively more effective. On the other hand the knowledge about preventive measures for parasites is significantly higher among EASTAP Project-Toilet households as compared to SUSP Project-Toilet households (Table 4.24). Thus, the two programmes do not have clear-cut dominance between one another with respect to imparting knowledge about sanitation related diseases. Furthermore, both programmes seem to be weak in generating knowledge about sanitation related diseases because the percentages of correct responses are quite low in both programmes (especially about preventive measures for parasites).

Another important measure of effectiveness is the extent to which the two programmes brought about changes in sanitary practices of the people. Due to lack of baseline survey data for EASTAP (and also the absence of many important socio-economic indicators in SUSP baseline surveys), it is only possible to compare between project toilet households and other type of households on hand, and on the other to compare the change in sanitary practices as perceived by the local people.

Table 4.12 and 4.13 above show that EASTAP has been relatively more effective in influencing defecation habits of the adult family members, relative to SUSP. In case of defecation of children, although EASTAP is more effective, both the programmes are unable to convince most of the households that children's feces are at least as hazardous as adult feces and that toilet habits should be formed from early childhood.

As shown in Chapter IV in case of other sanitary practices too EASTAP seems better than SUSP showing its higher effectiveness. For example Table 4.10 shows higher percentage of population at EASTAP sites purifying the drinking water. Yet the percentage of households doing this is quite low in both sites (25.1% and 4.1% of project toilet households in SUSP and EASTAP respectively).

In conclusion it can be said that EASTAP appears better than SUSP in most criteria for evaluating effectiveness, but both programmes are not very high in the degree of effectiveness.

7.0 SUSTAINABILITY OF THE TWO PROGRAMMES

One of the three important aspects to be evaluated in this study is the sustainability of the interventions undertaken in both projects. It is compared by investigating (a) the utilization and maintenance patterns of latrines with respect to projects' age, (b) willingness of people to build self-help latrines (c) the demonstration and spillover effects, (d) use of compost from the latrine (e) pit emptying process and problems, and (f) the extent of change in people's perceptions and habits related to excreta disposal in particular and sanitary practices in general.

7.1 The Utilization and Maintenance of Project Toilets with Respect to Project's Age

7.1.1 Utilization

It was found from survey data that the current utilization rate by all family members is much higher for EASTAP sites as compared to SUSP sites (Tables 4.29, and 4.30 above). It was also found comparing the utilization rates for project-toilet and non-project toilet households (Table 6.1) that both programmes have been unable to motivate the beneficiaries to utilize their toilets as much as non-project toilet households do on their own. Furthermore, Table 4.31 also confirmed that expenditure on toilet construction contributed by the households is a major determining factor of utilization rates.

Now, let us reconsider utilization with respect to the year of installation of toilets. The premise here is that for sustainability, there should be a positive relation between duration of toilet use and utilization rate. That is, the households should be more and more motivated toward using the toilet as years go by and they become habituated as well as become more and more aware of the benefits of toilet installation. On the other hand, if the utilization rate is found to decline with duration of toilet installation, then the sustainability of the programmes becomes less likely. This would imply that there were many problems arising in the functioning and maintenance of toilets as they become older.

Table 7.1 below shows that for EASTAP sites there is a significant positive relation between age of toilets and utilization rate, while for SUSP sites the relation is not statistically significant. For EASTAP sites there is a clear trend of increasing percentage of exclusive users with the age of toilets, and also a decreasing trend of absolute non-users with the age of toilets except for few cases. One important exception is year 1986/87 during which there was a nine months delay and very few toilets were built. Apart from the high chi-square value, the above tendency can be illustrated by considering the first and last years of toilet installation. The percentage of exclusive users for the earliest years (1982/84) is the highest and for the last year it is lowest (ignoring year 1986/87). Similarly, the percentage of absolute

non-users is lowest for 1982/84 and second highest for 1988/89. Among EASTAP sites the highest utilization rates were found for Dadhikot and Dharmasthali and lowest for Thecho. In case of Thimi too, earlier toilet owners were found to be more frequently utilizing their toilets compared to newer toilet owners. This fact is even more important if the decreasing level of subsidy is considered. Despite the negative effect of higher subsidy level on utilization rate, the higher rate of utilization by earlier toilet owners is a clear indication of habit forming and consequent sustainability of the EASTAP programme. In the case of SUSP sites too the highest utilization rate corresponds to earliest toilet owners and lowest utilization rate belongs to the latest toilet owners. However, there are two limitations to this trend which imply lower sustainability of SUSP. First the utilization rate for all years is much lower for SUSP compared to EASTAP. Second, the relation between toilets' age and utilization rate is not strong.

Table 7.1 : Frequency of Latrine Use by Adult Males by Year of Installation and Programme
(Row percentages)

Year of Installation	SUSP (N=255)			EASTAP (N=256)		
	Always	Sometimes	Never	Always	Sometimes	Never
1982/84	52 (53.1)	19 (19.4)	27 (27.6)	27 (77.1)	5 (14.3)	3 (8.6)
1984/85	37 (45.1)	13 (15.9)	32 (39.0)	70 (72.2)	11 (11.3)	16 (16.5)
1985/86	16 (47.1)	8 (23.5)	10 (29.4)	29 (74.4)	6 (15.4)	4 (10.3)
1986/87	11 (42.3)	8 (30.8)	7 (26.9)	6 (85.7)	1 (14.3)	0 (0)
1987/88	4 (36.4)	2 (18.2)	5 (45.5)	22 (59.5)	9 (24.3)	6 (16.2)
1988/89	1 (25.0)	0 (0)	3 (75.0)	24 (58.5)	2 (4.9)	15 (36.6)
Total	121 (47.5)	50 (19.6)	84 (32.9)	178 (69.5)	34 (13.3)	44 (17.2)
Chi-square Test	Chi-square = 9.777 D.F. = 10 Significance = .4603 Quite insignificant			Chi-square = 20.878 D.F. = 10, Significance = .0220 Quite significant		

If the current utilization rate is compared with that of 1986 (Chris Wolz, 1986) then we find that for adult males the percentage of those who ever use toilets has declined from from 85 percent (for Khokana) to only 67.1 percent, while the percentage of exclusive toilet users has only slightly increased. Thus we find a declining trend of utilization with time in SUSP.

The data about the utilization by adult females are quite similar to those in Table 7.1, however, with slightly higher rate of utilization and higher chi-square values (showing stronger relation between toilets' age and utilization rate for EASTAP). In this case too the percentage of households ever using the toilet has declined from 75 percent in 1986 for Khokana (Chris Wolz, 1986) to 67.6 percent currently for SUSP sites. Note, however, that the present survey findings show higher utilization rate for women than for men while Chris Wolz (1986) finds just the opposite. Similar picture about comparative sustainability of EASTAP and SUSP is depicted by data about children's utilization. The conclusion is that, EASTAP has higher sustainability with respect to utilization of latrine.

7.1.2 Maintenance

As Table 4.32 above shows, EASTAP site latrines are much more frequently cleaned compared to SUSP latrines. This fact is also confirmed by the field reports of field staffs which show that the cleanliness condition of EASTAP site latrines is generally better than those of SUSP sites. The data concerning the age of toilets and frequency of cleaning do not show any clear cut trend. Nevertheless, from the current status of latrines and the respective frequencies of cleaning it can be said that EASTAP site latrines are relatively better maintained than SUSP site latrines indicating relatively higher sustainability of the former programme. A comparison with mid term evaluation report (Chris Wolz, 1986) of current findings shows that EASTAP sites had better maintenance of latrines throughout the programmes and that SUSP sites have not at all improved with respect to maintenance and cleaning of latrines.

7.2 Willingness to Build Self-help Latrines

Sustainability of the programme is often indicated by the willingness of the community to carry over the programme activities through people's own initiatives and use of their own resources after the termination of the project. Such a willingness could be assumed to be the result of the motivation created among the people through the exposure to the latrine programme activities. This study tries to examine the willingness to build self-help latrines of two different populations—one who have already been the beneficiary of the latrine programmes and one who have not been the beneficiary yet.

7.2.1 Willingness of Beneficiaries

Among 506 beneficiaries from both the EASTAP as well as the SUSP areas about one-third (N=176) expressed that they would have installed the latrine from their own expenses even if the projects did not provide the subsidy. The proportion of people who had expressed such a willingness was much higher in the EASTAP (53.6%) areas than in the SUSP areas (16.1%). This is also confirmed by the high chi-square value in Table 7.2.

Table 7.2 : Willingness to Build Latrine without Project Support

Willingness	Frequency by Programme		
	SUSP	EASTAP	Total
Yes	41 (16.1)	135 (53.6)	176 (34.8)
No	213 (83.9)	114 (45.2)	327 (64.6)
Don't know	0 (0)	3 (1.2)	3 (0.6)
Total	254 (100)	252 (100)	506 (100)

Chi-square = 83.170 D.F. = 2, Significance = .0000
Very high significance.

Note: Missing observations excluded.

This information indicates that a highly significant proportion of people were motivated in the EASTAP areas to build self-help latrine than in the SUSP areas perhaps because of the motivation provided by the project and the habit developed through years of using latrine. Thus, EASTAP seems significantly better than SUSP in this respect. On the other hand, it also shows that many beneficiaries in EASTAP sites were in need not of subsidy but rather of proper motivation which would make latrine installation a felt need of the households.

7.2.2 Willingness of Non-Toilet Households

The willingness of those who have not built latrine yet, to build one can be considered as one of the indicators of sustainability of community latrine programme. The underlying premise is that if the programme is perceived as sustainable at the community level more people will express this willingness to build toilets and favour the services or resources supporting the toilet building efforts.

Of the 402 non-toilet households included in this study from both the EASTAP as well as SUSP project areas an overwhelming majority (92.8%) have been found to be aware of the latrine distribution programmes (Table 7.3).

Table 7.3 : Knowledge Regarding Project Toilet Distribution by Programme
(Column percentage)

Knowledge Regarding Project Toilet	Frequency by Programme		
	SUSP N=201	EASTAP N=202	Total N=402
Yes	198 (98.5)	175 (87.1)	373 (92.8)
No	3 (1.5)	26 (12.9)	29 (7.2)
Total	201 (100)	201 (100)	402 (100)

As Table 7.3 shows higher proportion of households from SUSP areas were aware of the latrine distribution programme than the households from EASTAP area. In general, the latrine programmes had been well publicized in both the project areas.

Despite such publicity, not all residents had tried to become beneficiaries of the programme. The reported reasons were : lack of space to build toilet, untimely information about the project, lack of money, lack of drainage, lengthy bureaucratic process, lack of knowledge about the application procedures etc. (Table 7.4).

Table 7.4 : Reasons for not Trying to Get the Project Toilet

Reasons	SUSP (N=198)	EASTAP (N=175)	Total (N=273)
No space	61 (30.8)	2 (12.0)	82 (22.0)
Not known in time	7 (3.5)	48 (27.4)	55 (14.7)
Lack of money	2 (1.0)	27 (15.4)	29 (7.8)
Application rejected	11 (5.6)	16 (9.1)	27 (7.2)
No drainage	6 (3.0)	21 (12.0)	27 (7.2)
Others	11 (5.6)	42 (24.0)	153 (56.0)

Note : Others include "bureaucratic process", "application in process" and "don't know how to apply".

More proportion of households in EASTAP area did not try to get the project latrine because of untimely information about the project and lack of money where as the lack of space was the most frequently reported reason for not attempting to get the latrine built in SUSP areas.

Surprisingly, on an average, more than 95 percent of the non-toilet sample households were willing to build toilet (Table 7.5). The reasons were : comfort, health, environmental sanitation, prestige and privacy (Table 7.6). Comparatively, a slightly more proportion of households from EASTAP areas than from SUSP areas were willing to build toilet.

Table 7.5 : Willingness to Build Toilet by Non-Toilet Households

(Column Percentage)

Willingness	SUSP (N=201)	EASTAP (N=201)	Total (N=402)
Yes	187 (93.0)	196 (97.5)	383 (95.3)
No	14 (7.0)	5 (2.5)	19 (4.7)

The proportion of households in SUSP areas which expressed willingness to build latrine for comfort and prestige/privacy reasons is slightly higher than such proportion in EASTAP areas. In contrast, the proportion of households in EASTAP areas reporting health and sanitation as the main reason for the willingness to build toilet is more than in SUSP areas (Table 7.6).

Table 7.6 : Reasons for Willingness to Install a Toilet

Reasons	SUSP (N=187)	EASTAP (N=196)	Total (N=383)
Comfort	170 (90.9)	155 (79.1)	325 (84.9)
Health	32 (17.1)	50 (25.5)	82 (21.4)
Environmental/sanitation	13 (7.0)	88 (44.9)	101 (26.4)
Prestige/privacy	20 (10.7)	9 (4.6)	29 (7.6)
Others	12 (6.4)	14 (7.1)	26 (6.8)

Note: Due to multiple responses total may add up to more than 100.

Tables 7.5 and 7.6 also indicate that in EASTAP sites the motivation of people has been relatively more than in SUSP sites, and relatively more people understand the relationship between toilet use and health benefits. These facts show relatively higher sustainability of EASTAP compared to SUSP.

But these higher percentages are not so encouraging because almost all the non-toilet households from both the EASTAP (98.5%) and SUSP (99.5%) areas feel the need for external assistance to install the type of latrine they prefer (Table 7.7).

Table 7.7 : Support Sought for Latrine Construction

Support	SUSP (N=187)	EASTAP (N=196)	Total (N=383)
Yes	186 (99.5)	193 (98.5)	379 (99.0)
No	1 (0.5)	3 (1.5)	4 (1.0)

Thus, the proportion of Non-Toilet households who are willing to build self-help latrines is quite low in both programmes. This may be partly because of the gradual erosion of community self reliance as mentioned by EASTAP reports and also because of the fact that most of the Non-Toilet households are relatively poorer than the current beneficiaries. Hence, neither of the two programmes seems to be very sustainable with respect to the willingness generated in the community to build self-help latrines after the termination of the project.

With regard to the type of assistance to build latrines most of the Non-Toilet households in the two programmes expressed the need and preference for subsidy (99.5% in SUSP and 93.8% in EASTAP). Some households expressed preference for a combination of both subsidy and loans and very few preferred loans only.

7.3 Demonstration and Spillover Effects

The demonstration effect in both programmes is far below the expectation of officials involved in the programmes. One simple indicator would be the number of non-project toilets built after the projects in the project sites. Since only 10 non project toilets were found by the field staffs in the two SUSP sites it is clear that the demonstration effect there was minimal. Even among those ten toilets only seven were built after distribution. In case of EASTAP sites only 78 non-project toilets could be located in the sample sites (except Dadhikot where there were many toilets built by other projects). Even among these non-project toilets more than half were built before the households knew about the project toilet distribution. Thus, in EASTAP too, the demonstration effect cannot be considered very strong although compared to SUSP it appears to be stronger. An indication of higher demonstration effect in EASTAP sites is the finding that about 42.3 percent of non-project toilet households report that they got the idea of building a toilet by talking to or observing other toilet owners, while the corresponding percentage for SUSP is only 20 percent.

It has repeatedly been emphasized in this study that the process of latrine distribution in both programmes reduces the likelihood of any demonstration effect. The reason for this is that most of the

beneficiaries belong to upper socio-economic class in the project sites. Naturally, the poor households who were left out by the programmes are not able to build self-help latrines merely by demonstration effect. In fact, there may have been negative demonstration effect in that many not-so-poor households who would otherwise have built their own latrines are now waiting for some outside help.

It should be noted that Table 4.27 above shows that among the Project-Toilet households only 5.1 percent in SUSP sites mentioned demonstration effect (observing other project toilets) as the main reason for installing the project toilet, while in case of EASTAP no project toilet household mentioned this reason. Thus, among the project toilet households SUSP seems to have some demonstration effect (although quite low) while EASTAP has none.

The spill-over effects of the sanitation programmes can be analyzed by studying their other sanitary practices apart from defecation. It was found from the data in Table 4.10 above that purification of drinking water is much more prevalent in EASTAP sites compared to SUSP sites despite the fact that SUSP site drinking water is relatively more contaminated (according to observation and interviews not a laboratory test). Moreover, a significant relationship between toilet ownership and prevalence of purification of drinking water is also shown by Table 4.10. Thus it is likely that EASTAP has been more effective in generating this side effect. However, it must be admitted that such relatively higher awareness in EASTAP sites could be the result of the comparatively higher educational status in EASTAP sites. Similarly, the practice of throwing liquid waste in an unhygienic way is more prevalent in SUSP sites compared to EASTAP sites (Table 4.16). This may be the result of lower spillover effects in SUSP sites or the result of lack of better arrangement for liquid waste disposal (Table 4.15) in SUSP sites compared to EASTAP sites. Furthermore, the better food handling practices in EASTAP sites compared to SUSP sites (Chapter IV) may be the result of spillover effects or of higher educational status. Unfortunately, baseline survey data are not available to determine whether these sanitary practices have really improved, remained same or even deteriorated in the two programme sites.

Thus, a categorical conclusion cannot be derived from the present survey data about the relative strengths of the two programmes with respect demonstration and spillover effects. Nevertheless, EASTAP seems consistently better in the demonstration effect on Non-Toilet households and the possible spillover effects on other sanitary practices.

7.4 Pit Emptying and Compost Use: Process and Problems

The survey data show that pit filling has been far more frequent in EASTAP sites than in SUSP sites which may be because of of higher utilization rate or less water absorption in EASTAP sites (Chapter IV). It is also found that that 72 percent of respondents in SUSP and less than 48 percent in EASTAP have never emptied the pit. On the other hand, the percentage of pit emptying for more than three times is only 5.1 percent in SUSP and 15.5 percent in EASTAP. Since, most of the emptying

is done by hired personnel (who are getting more and more scarce in supply in both sites), it should imply that pit filling and emptying is relatively more a problem in EASTAP sites. But the problem of indoors toilets and less utilization of compost in SUSP sites makes pit filling at least equally problematic there (as discussed in further detail below). Therefore, both programmes suffer from this problem and require either institutional pit emptying or regular supply of sweeper caste people at reasonable prices.

As regards compost utilization, it was found from survey data that compost utilization is much more prevalent in EASTAP sites (23.9%) than in SUSP sites (17.7%). In contrast, among those who have not yet used the compost, a very large proportion (57.6%) are planning to use it in the future in SUSP sites as compared to EASTAP sites (29%). Thus, the relative prevalence of compost utilization may change in future between EASTAP and SUSP. As discussed in Chapter IV, most of the households in the two programme sites use compost for vegetables growing followed by paddy and maize. In some of the EASTAP sites (e.g. Thimi) people wanted to use compost but it never formed as the pits were always filled with water. In such places people were generally unwilling to use the toilet for fear of filling up soon which would require pit emptying, a big problem due to scarcity of personnel. In contrast, in some EASTAP sites such as Dadhkot and Dharmasthali many people were using compost and some of them even invited their neighbors to use the toilet to fill up the pit soon (based on field reports). In case of SUSP sites pit filling is a more serious problem because most of the toilets are indoors. In fact many households have stopped using the toilet after the pits were filled up or they have connected the pits to the drains to let out the sewage from the the pits. It should also be noted that many project toilet households have recommended the construction of toilets with drain when asked about their suggestion for improving the design of the toilet and making the toilet distribution programme more popular. In SUSP 71.3 percent responses were in favor of toilets with attached drains, while in EASTAP sites this percentage is 51.3. Thus, it is clear that compost utilization is less important in the minds of SUSP site population and pit filling is of more concern. In this respect too EASTAP appears to have relatively higher sustainability.

7.5. Change in People's Knowledge, Attitudes and Practices

It can be argued that the long run viability and sustainability of a sanitation action programme mainly depends on its impact on the community's knowledge about sanitation related diseases and environmental sanitation, the community's attitude toward the interventions in the programme and the change in community's behavior related to defecation, solid and liquid waste disposal, drinking water, and food sanitation.

7.5.1 Knowledge

As regards the knowledge generated by the two programmes among the direct beneficiaries, it was found that a significantly larger proportion (60.5%) in EASTAP sites acknowledge that they learned a) not to defecate indiscriminately, b) toilet use reduces diarrhoea and other transmissible

diseases, c) private toilets keep environment clean, and d) felt the need for environmental sanitation. In case of SUSP sites the corresponding percentage was much lower (46.5%). In contrast, those who did not know what they learned or said that they learned nothing useful from toilet use through the years constitute 41.8 percent of beneficiaries in SUSP sites and only 14.5 percent in EASTAP sites. The rest of the beneficiaries (11.7% in SUSP and 25.0% in EASTAP sites) learned other things such as saving of time and convenience provided by private toilets. Hence, in this respect EASTAP seems to have enhanced the knowledge of beneficiaries more than SUSP.

Table 4.11 above showed that EASTAP site households (all types of households in the sample) are more aware of the need to purify drinking water (80.9%) as compared to SUSP site households (50.1%). On the other hand, Table 4.23 showed that the percentage of correct responses about preventive measures for diarrhoea was almost the same (slightly above 80%) for both programmes. But Table 4.24 showed that in the case of preventive measures for worms, significantly higher percentage of correct answers corresponds EASTAP (29.9%) compared to SUSP (20.2%). Thus, there seems to be relatively more sanitation knowledge in EASTAP sites which may be because of the comparatively higher socio-economic status of the people. Whatever the reason, higher level of sanitary awareness implies higher sustainability of the programme.

7.5.2 Attitude

The project toilet households were asked to rank their satisfaction level and it was found that significantly larger proportion of beneficiaries in EASTAP sites were fully satisfied with the project toilet (69.1%) compared to SUSP sites (57.0%) as shown in Table 7.8 below. The table also shows that the percentage of dissatisfied beneficiaries is much higher for SUSP (16.8%) than for EASTAP (7.4%).

Table 7.8 : Level of Satisfaction of Beneficiaries by Programme
(Column percentage)

Satisfaction Level	SUSP	EASTAP	Total
Highly satisfied	146 (57.0)	177 (69.1)	323 (63.1)
Somewhat satisfied	67 (26.2)	60 (23.4)	127 (24.8)
Dissatisfied	43 (16.8)	19 (7.4)	62 (12.1)
Total	256 (100)	256 (100)	512 (100)

Chi-square = 12.651, D.F. = 2, Significance = .0018
Very highly significant difference.

The satisfaction level of beneficiaries is a very important aspect of sustainability as can be confirmed from Table 7.9 below which shows that the degree of utilization by adult males is highly positively correlated with the satisfaction level for both programmes.

Table 7.9 : Level of Satisfaction and Utilization Rate by Programme
(for Adult Members)

(Row percentage)

Satisfaction Level	SUSP (N=256) Frequency of Use				EASTAP (N=256) Frequency of Use			
	Always	Some- times	Never	Total (Colu- mn %)	Always	Some- times	Never	Total (Colu- mn %)
1. <u>Adult Males</u>	<u>121</u>	<u>50</u>	<u>84</u>	<u>255</u>	<u>178</u>	<u>34</u>	<u>44</u>	<u>256</u>
Highly satisfied	91 (62.8)	30 (20.7)	24 (16.6)	145 (56.9)	137 (77.4)	19 (10.7)	21 (11.9)	177 (69.1)
Some satisfied	25 (37.3)	16 (23.9)	26 (38.8)	67 (26.3)	37 (61.7)	12 (20.0)	11 (18.3)	60 (23.4)
Not satisfied	5 (11.6)	4 (9.3)	34 (79.1)	43 (16.9)	4 (21.1)	3 (15.8)	12 (63.2)	19 (7.4)
2. <u>Adult Females</u>	<u>128</u>	<u>45</u>	<u>83</u>	<u>256</u>	<u>182</u>	<u>29</u>	<u>45</u>	<u>256</u>
Highly satisfied	95 (65.1)	27 (18.5)	24 (16.4)	146 (57.0)	139 (78.5)	16 (9.0)	22 (12.4)	177 (69.1)
Some satisfied	28 (41.8)	14 (20.9)	25 (37.3)	67 (26.2)	39 (65.0)	10 (16.7)	11 (18.3)	60 (23.4)
Not satisfied	5 (11.6)	4 (9.3)	34 (79.1)	43 (16.8)	4 (21.1)	3 (15.8)	12 (63.2)	19 (7.4)

Note : Chi-square values 37.851 and 36.189 for EASTAP and 63.580 and 63.219 for SUSP for males and females. All chi-square values very highly significant.

As the table shows, the percentage of exclusive toilet users is the highest among those who are fully satisfied for both sexes and both programmes. Moreover, the percentage of absolute non-users is the lowest among those who are fully satisfied for both sexes and both programmes. On the other hand, the percentage of exclusive users is the lowest and that of non-users is the highest among dissatisfied toilet owners in both programmes for both sexes. Thus, beyond any doubt, satisfaction level seems to be a major determinant of degree of utilization. Therefore,

EASTAP appears to be far more sustainable in this respect because of its much higher percentage of satisfied beneficiaries.

Among the reasons cited for being dissatisfied or not fully satisfied, the four most important reasons for SUSP sites were lack of drains attached to the toilet, foul smell, lack of proper supervision by the project and pit filled with water in the order of percentage of response. In case of EASTAP sites the four most important reasons were pit filled with water, too small pit, lack of drain, and lack of proper supervision by the project, in the order of percentage of response. Thus, for sustainability of the sanitation programme emphasizing latrine distribution solving the problem of pit filling with water, increase in the size of pits and attaching the pits to drains are suggested along with sufficient follow ups and supervision.

As regards the attitude toward the adequacy of materials provided by the projects, it was found that much higher percentage of beneficiaries in EASTAP sites (55.5%) consider the materials provided as insufficient compared to SUSP sites (42.2%). This may be because of the much lower subsidy provided in EASTAP compared to SUSP.

Another aspect of people's perception relevant for the present evaluation is the attitude of the local people towards sanitation intervention by governmental versus non-governmental organizations. It was found that in SUSP sites only one third of the beneficiaries consider governmental organizations more effective for sanitation intervention. Ironically, in EASTAP sites almost 42 percent of the beneficiaries consider governmental organization as more effective. A majority of the beneficiaries in the two programmes, however, prefer sanitation interventions done by non-governmental organizations supported by local committees because they think that local committees are more aware of local development needs and priorities.

Since neither of the two programmes effectively formed and mobilized local leaders' or users' groups and local committees, there seems to be much scope for improving the sustainability of the two programmes by doing so.

7.5.3 Sanitary Practices

Due to lack of baseline survey data for EASTAP and absence of many important socio-economic and sanitation practice related variables in Khokana and Tokha baseline survey reports, it is not possible to comparatively examine the change in people's sanitary practices in general and excreta disposal practices in particular brought about by the two programmes. The current status of sanitary practices in the sample sites of the two programmes has already been presented in Chapter IV of this study. It was found (Tables 4.12 and 4.13) that much higher percentage of households in EASTAP sites use toilets for defecation (52% for adult males) compared to SUSP sites (36.4%). On the other hand, it was also found that the percentage of beneficiaries using toilets was far below that of non-project toilet owners for both programmes. Besides, it was also found that children in both programme sites usually go outside

for defecation. Thus, both programmes have failed to significantly change the defecation habits even of beneficiaries, and have not convinced people that children's feces are at least equally hazardous. Nevertheless, EASTAP site population seems to have relatively better habits of all family members (adults and children).

Similarly, Tables 4.14 and 4.16 above showed that EASTAP sites are better (relatively speaking) with respect to solid waste and liquid waste disposal practices, because higher percentage of households in EASTAP sites use compost pits, drains and Saaga rather than streets and courtyards for waste disposal. Furthermore, drinking water and food handling practices too were found to be comparatively better in EASTAP sites. Thus even if some difference is allowed for the higher educational and socio-economic status of EASTAP population, it is consistently shown by various data that EASTAP appears to have changed the overall sanitary practices of the population more than SUSP.



8.0 SUMMARY OF MAJOR FINDINGS AND RECOMMENDATIONS

This chapter lists the major findings of each previous chapter based on the survey results and review of literature. Based on the major findings especially about the problems related to efficiency, effectiveness, and sustainability aspects of the two programmes, this chapter also provides a list of recommendations for the government and the non-governmental organizations already involved in sanitation development in Nepal, or interested in getting involved in the future.

8.1 Summary of Major Findings

8.1.1 Sanitation Situation in Nepal

1. Poor sanitation situation is one of the major problems of semi-urban areas in Nepal and the situation has not appreciably improved from what it was a decade ago.
2. Sanitation related diseases, namely, diarrhoea, dysentery, typhoid, and parasitic diseases are among the major causes (in addition to respiratory diseases) for high infant mortality and child morbidity in Nepal.

8.1.2 Findings of Other Studies

1. The approaches of various sanitation related programmes are quite different, some emphasize women's involvement in health programmes, some emphasize behavioral change of health staffs, some emphasize health/sanitation education and awareness. But most programmes generally concentrate on latrine construction, and motivational and educational inputs are not given due attention.
2. Educating women on health and sanitation is more effective than educating men because of wider communication and dissemination through women. But in Nepal, the women folk who are responsible for household sanitation and family health are illiterate and unaware of relation between sanitation and health.
3. People build and use latrines more for comfort and social prestige than for health benefits.
4. Sanitation programmes may take about half a generation to take effect and hygiene education is essential for the long-run and sustainable impact of sanitation programmes.
5. Social problems are relatively more difficult but also more important than technical problems because caste, custom, and culture play a great role in village sanitation.
6. Dirty latrines and inadequate drainage lead to increased health risks.

7. Points in favour of subsidy for household latrines are: low priority given to latrines in Nepal (hence subsidy required to lower the price to match the priority); expensive non-indigenous materials required for the suitable technical design at many places; and the relatively fast response and speedy coverage induced by subsidies.
8. Possible drawbacks of a subsidy programme are: heavy reliance of project staffs on subsidy alone rather than other more important motivational activities (thus reducing sustainability); development of dependency syndrome; introduction of expensive and non-replicable (without subsidy) technology; and unfair distribution of subsidies.
9. Education and socio-political status rather than ethnicity and religion are the determining factor for household (and community) sanitation.
10. Most households think that the sanitation programme could not be effectively implemented through a governmental institution.
11. Many toilet owners (especially children and elderly) continue using open defecation because of tradition and lack of cultural/psychological objection to the practice.
12. A sanitation project may retard the construction of self help latrines (negative demonstration effect) because many households who could have built their own latrines (e.g., septic tanks) may become the beneficiaries (of subsidized latrine distribution/or may be waiting for the subsidy from future programmes.
13. Informal channels of information dissemination (mainly neighbours and friends) are more effective.
14. Non-project toilets are kept cleaner than project toilets.
15. Sanitation is lagging far behind the progress in water supply sector (which itself has only a modest progress), and sanitation has received very low priority in the development plans of Nepal.
16. Customs and habits of water use are constrained by the availability of water.
17. Many semi-urban people have preference for a flush type latrines because of the scarcity of sweeper caste people required to empty pit-type latrines.
18. In places where people generally go for open defecation, a latrine distribution programme may suffer from very low utilization only during rains and dark.
19. Most people in Nepal (especially in villages) consider children's feces as harmless.

20. Scarcity of water results poor cleaning of latrines and ultimately less and less use because of dirty and smelling latrines.
21. Ash is a cheap locally available abrasive in Nepal which can be used to clean latrines and also to improve composting.
22. Applying the compost to crops before planting is advisable, yet not to low-laying vegetables, or vegetables eaten raw.
23. In villages of Nepal, various superstitions beliefs are associated with health and diseases. When someone becomes ill, the local people first approach a "Baidya" (a traditional healer) or a "Dhami/Jhankri" (who practices witchcraft), and seek medical help only when all these traditional methods have failed.

8.1.3 Objectives, Targets and Practical Experiences of SUSP and EASTAP

1. The major objectives of SUSP were to help improve women's and children's health, and to develop and establish procedures and trained manpower for sanitation programmes on larger scale.
2. The targets of SUSP included the construction of 2,000 household latrines, 100 hygienic tapstands, and drainage facilities for 2,000 households in addition to health and sanitation education programmes (or campaigns) in the four SUSP sites.
3. The objectives of EASTAP included change in people's defecation habits, creating more employment (during the interventions), popularize use of human excreta for composting, prove the cost effectiveness of private sector sanitation programme and to explore and develop strategies, approaches and technologies for sanitation programmes in Nepal.
4. The targets of EASTAP included a total of 1,200 household (Sulabh) latrines in three phases at 12 Kathmandu Valley sites in a period of about five years from July 1983.
5. The SUSP lacked a programme of continuing health and sanitation education activities although it had sporadic sanitation campaigns (for a couple of months) in the beginning. On the other hand, EASTAP was completely devoid of any health/sanitation education element.
6. No set of criteria was used in selecting project sites either in SUSP or in EASTAP. Hence the sites have a wide variety of situations making it difficult to apply cumulative experience and in standardizing project "software" and procedures. Moreover, the implementation in such varied sites has involved greater administrative and supervisory efforts and costs.
7. In EASTAP no baseline survey was carried out while in SUSP the results of the baseline survey were not used in the formulation of project plans and targets, or the selection of beneficiaries.

8. Most of the toilets distributed in the two programmes were expensive Sulabh toilets except for a few (Type C) toilets designed for poorer households in the last years of EASTAP.
9. In SUSP a significant number of households who received bricks and cement did not build latrines at all but used them for some other purpose. There was poor follow up (especially in SUSP) resulting in poor maintenance and low utilization rate.
10. The highest subsidy level was provided in Khokana followed by Tokha, but EASTAP reduced subsidy from initially proposed level (66% of costs up to pan level) to only 20 percent in the last phase.
11. The idea of building half open toilet house for kids works wonderfully.
12. Sanitation awareness building activities take a very long time to have effect so that self-help latrines without subsidy are not practicable in Nepal in a short-run demonstration project.
13. Loan programmes cannot be attractive as long as subsidies are high. Besides, loan programme cannot be implemented in a situation where banks (including Nepal Rastra Bank) give low priority to sanitation improvement compared to other development activities.
14. Very low cost latrines (e.g., Type C Sulabhs) are spared from the greed of the rich households.

8.1.4 Main Findings of Survey

1. The traditional medicines in villages of Nepal (like the project sites) are quite strange. Examples are: wine treated with ghee (home-made butter) for dysentery, witchcraft for vomiting and fever, plantain juice and sheep's urine for earache, boiled eggs for eye trouble, washing faces in the dirty water of the ponds near the temples, women's milk on eyes, sitting on heated bricks for dysentery, and seeds of Bakaina for worms, etc. Only a few educated families follow preventive measures while the large majority seek curative measure, only after catching the diseases and becoming seriously ill. Even the medicines used are usually not prescribed by certified medical practitioners, but suggested by relatives, friends and medical shop-keepers.
2. The method of composting and use of organic manure in project sites are not scientific and unhygienic. Few people use human excreta for composting, while majority use animal dungs and agricultural wastes.
3. The project sites where people are generally well educated and where there are sufficient educational facilities (schools and teachers), the sanitary practices are also better and people are more receptive of sanitation programmes.

4. Most of the traditional sources of water including ponds have become dried up and dirty but modern (piped water supply) facilities have not adequately compensated for these losses.
5. The educational level of people in EASTAP sites is relatively far above that in SUSP sites and family educational level in both sites is highly positively correlated with toilet ownership.
6. Brahmins/Chhetris are more likely to be toilet owners (especially non-project toilet owners) compared to Newars, according to survey data.
7. Family type (Couple only, Nuclear family or Joint/Extended family) and family size are significantly correlated with toilet ownership only in SUSP sites but not in EASTAP sites. In other words, in SUSP sites large and joint/extended families are far more likely to be the beneficiaries of project toilet distribution than smaller families. Combined with the finding that family size in SUSP sites are usually much smaller than EASTAP sites, it implies that project toilet distribution is more difficult in SUSP sites because smaller families are less receptive.
8. Relatively speaking SUSP sites have smaller house compound area than EASTAP sites. But toilet ownership is positively correlated with house compound area only in EASTAP sites because most SUSP site toilets are built indoors. In case of EASTAP sites most toilets are built outdoors.
9. SUSP site families are relatively poorer than EASTAP site families according to per capita household income. Also income category and toilet ownership are highly correlated in EASTAP sites (but not in SUSP sites). Thus, EASTAP latrine distribution is highly biased in favour of relatively richer families, while SUSP latrine distribution is quite egalitarian.
10. Agriculture is predominantly the main occupation of SUSP site population while business, cottage industry and services together occupy equally important position in EASTAP sites. Moreover, people engaged in services and business are relatively more favoured in toilet distribution in EASTAP sites.
11. Big landowners (in both programmes) are found to be more likely to own a toilet (project or non-project).
12. The water supply situation in SUSP sites is far worse than EASTAP sites and also the percentage of those who purify drinking water is much lower in SUSP sites. Moreover, a much higher percentage of people in EASTAP sites have knowledge about the necessity of purifying drinking water. It was also found, that toilet ownership is significantly positively correlated with the practice of purifying drinking water.

13. Educational level of family members is an important determinant of frequency of utilization.
14. Households who build self help latrines are more likely to use it than project beneficiaries. Moreover, utilization rate is highly positively correlated with the level of expenditure by households on toilet installation.
15. EASTAP site project toilets have significantly higher utilization rate by all family members (adults and children) compared to SUSP toilets. But both of the programmes have failed to convince most of the beneficiaries that children's feces are at least as hazardous as adult's feces and that toilet habits should be formed from early childhood. The most frequently cited reasons for infrequent utilization of toilets were not habit and pit filled or will fill soon. In SUSP sites bad smell, dark (indoor) toilets are also important reasons for infrequent toilet use.
16. A significant percentage of adult population in SUSP sites use non-water means of after defecation cleaning (e.g., grass, stone, paper, straw, etc.). For EASTAP site population this percentage is negligible.
17. Composting is relatively more prevalent in EASTAP sites and the percentage of human excreta users for composting is also higher in EASTAP sites. The three most important reasons for not using human excreta in aggregate (for the two programmes) are lack of toilet (or toilet not used) followed by no tradition and pit not filled.
18. The problem of liquid waste disposal (drains) is far more serious in SUSP sites. Besides, beneficiaries of project toilets are relatively more favoured than non-beneficiaries by drain facilities in both programme sites.
19. Food sanitation habits are relatively better (less unhygienic) in EASTAP sites but the ownership of toilets seems to have no effect on food handling practices.
20. Incidence of diarrhoea is less in SUSP sites if all households are considered, but among beneficiaries the incidence of diarrhoea is much lower in EASTAP sites. Also, toilet ownership seems to have significant impact on incidence of diarrhoea in EASTAP sites only.
21. Incidence of dysentery and typhoid is similar in both programme sites, and toilet ownership has insignificant impact in this respect.
22. Incidence of worms seems much more serious in SUSP sites but toilet ownership has negligible impact in this respect too.
23. In SUSP sites non-project toilet owners are more aware of preventive measures for diarrhoea than beneficiaries and non-toilet owners, while in EASTAP sites beneficiaries are more aware of preventive measures.

24. The percentages of correct response about preventive measures for worms are quite low in both programmes but for EASTAP this percentage was relatively higher.
25. In SUSP sites the most frequently cited source of first information about the project toilets is panchayat leaders followed by friends and neighbours while in EASTAP sites friends and neighbours are the most frequently cited source of first information followed by panchayat leaders.
26. In all sample sites male family members are predominantly the initiator for toilet installation. However, the role of female members is relatively more important in EASTAP sites.
27. For all sample sites, by far the most important reasons for toilet installation are convenience, comfort and privacy followed at a long distance by family health consideration.
28. If the lists of beneficiaries prepared by the ministerial staffs are considered then more than one-third of the latrines in SUSP are incomplete up to pan level, while this percentage is below five in EASTAP sites. However, about 12 percent of latrines completed up to pan level have incomplete superstructure in EASTAP (mainly because of lack of money and material), while this percentage is about 29 for SUSP sites (mainly because of transportation problem of bricks and other construction materials).
29. SUSP latrine distribution was far more heavily subsidized in comparison to EASTAP. More than three-fourths of beneficiaries of SUSP spent below Rs. 500 for toilet installation, while about the same proportion of beneficiaries of EASTAP spent above Rs. 1,000. In Khokana the monetary value of materials and services provided as subsidy was Rs. 1,285.05 or 76.7 percent of cost up to pan level. In Tokha it was only 54.4 percent of the cost. In EASTAP the subsidies were 48 percent, 44 percent and 20 percent in phase I, II and III respectively.
30. In both programmes slightly more than one-fifth of respondents replied that they faced some problems during toilet installation. The most frequently cited problem in SUSP sites is unavailability of construction materials while in EASTAP sites it is lack of money, perhaps because of higher household share in expenditure. Lack of proper technical supervision and advice and transportation problems were also cited in all sites.
31. The frequency of toilet cleaning is relatively higher in EASTAP sites and the toilets are also better maintained than SUSP sites. Almost all sample households clean toilets with the help of family members (without hired personnel).
32. In EASTAP sites pit filling is much more frequent and one-third of the households seek help of hired personnel for pit changing. In

SUSP sites pit filling is less frequent and pit changing is mostly done by family members.

Very few households in the sample sites have used both pits simultaneously. Slightly more than one-fourth (26.8% for EASTAP and 28.6% for SUSP) project toilet households report that water leaks into the pits.

33. Only about 18 percent of project toilet households in SUSP sites report that they have used compost from the pit, while the corresponding percentage in EASTAP sites is about 24 percent. On the other hand, about 58 percent beneficiaries in SUSP sites replied that they are planning to use compost in future while only 29 percent in EASTAP sites said so. Majority of households use compost mainly for vegetables growing (in all sample sites) followed by paddy and maize. Slightly less than one-third of those who have used compost, used hired hands for taking out compost in all sample sites.

8.1.5 Comparison of Efficiency

1. EASTAP is much more efficient with respect to the input/output relation and subsidy distribution compared to SUSP. Moreover, many of the listed beneficiaries of SUSP never built a latrine but used the bricks and cement for some other household purpose.
2. The selection of project site was not done by any set of fixed criteria but the EASTAP sites appear to be comparatively more suitable for distribution of Sulabh toilets considering the higher economic and educational status of people, larger compound areas available for outdoor toilet installation (as generally preferred by households), relatively more adequate water supply, and the use of water by most people for after defecation cleaning in EASTAP sites.
3. The lags and problems in SUSP implementation included baseline survey only after the formulation of project plans and targets, change in focus from VIP type latrines to Sulabh latrines only, less than 50 percent coverage (while originally 100% coverage was proposed), neglect of the proposal to improve and repair 100 hygienic public tapstands, and completely ignoring the solid waste disposal improvement target. Moreover, the achievements were always far below the annual targets (especially in latrine construction) and physical targets were tried to be met in a hurry at the end of the fiscal year. The major problems causing all these delays and lags were transportation and supply of bricks and lower HMG budget than proposed. Other causes of inefficiency in SUSP implementation were bad timing of activities, lack of toilet construction supervision and follow-ups, unnecessary expenditure in reworking on incomplete activities and carry-over, and negative impact of many false promises made in the original objectives and planned activities.
4. EASTAP too suffered from many problems during implementation such as, lack of any baseline survey to help formulate project plans and targets, six months delay in Phase I (as per original schedule) and

nine months delay in Phase III due to the following reasons : (a) confusion created by drastic cut in subsidies, (b) conflict of emphasis between UNICEF (concerned more about delays in physical target achievement and consequent cost increase) and EASTAP (interested more in exploring and experimenting new strategies), (c) experiment with a loan programme which could not be implemented because of unwillingness of banks, (d) bad timing of activities during monsoon, (e) sudden rise in price of construction materials, (f) lack of steel frames required to build Type-C Sulabhs, (g) inability of local NGOs to handle delicate ring casting job, (h) halting of construction in Katunje because people wanted to wait for loans, and (i) last (but not the least) Indo-Nepal Trade and Transit deadlock causing fuel crisis.

5. On the whole, EASTAP's implementation was relatively more efficient with respect to time lags and problems in implementation (except for Phase III which was hampered by confusion, bad timing and exogenous shocks like fuel crisis). While SUSP had delay and mismanagement problems throughout the programme, EASTAP's Phase I and II were relatively more smooth and successful.
6. In EASTAP sites more than one third (37%) of households mention hygiene education as one of the three most important environmental sanitation improvement activity for the village but EASTAP was almost completely devoid of any hygiene education activity except for the informal discussions about parasitic diseases and need to keep latrines clean during the follow-up. It is EASTAP's (somewhat mistaken) view that health and sanitation education packages generally attached to any sanitation improvement programme have not been able to produce desired long-term effect. Although EASTAP claims that health education should follow (rather than precede) sanitation programme, there is little (or no) emphasis on health/sanitation education in EASTAP. This seems to be a serious short coming of EASTAP which would otherwise have achieved far more efficiency and long-term impact.
7. Although SUSP had health and sanitation education for a couple of months in the beginning, it lacked a programme of continuing health and sanitation education activities. The health/sanitation campaigns in Khokana and Tokha were sporadic and had only short lived impacts. This is why the utilization rate is so low, awareness about household sanitary practices is negligible, and there has been negligible change in the sanitary practices or in the environmental sanitation of the community.
8. Although EASTAP was more efficient compared to SUSP in view of its lower (and declining) subsidy level, it too was not fully efficient because the subsidies went mostly to relatively richer families who were in need not of subsidies but of proper motivation. The reason for such unfair distribution, according to EASTAP, is the concern of avoiding the complexities of local politics. The survey data show that about 42 percent of non-toilet households in EASTAP (and one third in SUSP) mentioned unaffordability as the main reason for not

installing a toilet. Moreover, about three fourths of non-toilet households in EASTAP (and 58% in SUSP) consider the subsidies provided by the programme as insufficient partly because of dependency syndrome and partly because most of the non-toilet households are poorer (especially in EASTAP sites) than the current beneficiaries.

8.1.6 Comparison of Effectiveness

1. Both programmes have the elements of realism as well as overoptimism in their objectives. In SUSP the objective of alleviating the poor state of health of mothers and children in Nepal is overoptimistic. The objectives of developing manpower and procedures necessary for expansion of the programme were also not realistic for a pilot project and therefore, these objectives were fulfilled (if at all) only on a very limited scale. Furthermore, the term "integrated sanitation" in SUSP objectives is not clear because it could imply the inclusion of water supply improvement and solid waste disposal systems which were non-existent in the programme.
2. In case of EASTAP the objectives of bringing about change in the chronic open defecation habits of the majority (and thus to improve environmental sanitation and community health) was over optimistic for a short run demonstration programme devoid of supporting activities like health and sanitation education. Sanitation awareness raising objective is also unrealistic for a subsidized latrine distribution programme which motivates people by talking about comfort, convenience and privacy of a private latrine instead of health and sanitation considerations.
3. The EASTAP objective of involving individual households in the reuse of pit manure was also neglected during the implementation as it was not supported by sufficient follow-up and practical demonstration.
4. The objective of sharing ideas between EASTAP and other UNICEF supported sanitation programme in Nepal, although high sounding, seems to be merely philosophical because it is not easy in Nepal to have a close coordination between an action oriented private sector organization and the departments of the line ministries.
5. The EASTAP objective of exploring the possibility of involving banks to loan out money for latrine building was not compatible with the low priority given to sanitation development by banks (including Nepal Rastra Bank).
6. The EASTAP objectives of creating (some) employment by using labor based methods of construction and validating the cost effectiveness of a private sector approach for sanitation intervention were reasonable and largely fulfilled.
7. With respect to the degree of utilization of project toilets EASTAP appears to be far more effective than SUSP, perhaps because of higher households contribution in toilet installation in EASTAP sites.

8. In both programme sites the largest percentage of households give top priority to Drainage System followed by water supply improvement as a means to improve the sanitary situation of the community. Therefore, the focus of EASTAP exclusively on latrine distribution does not match with the priority of the community. SUSP had a component of drainage construction thus enhancing its effectiveness to some extent. However, the two programmes could have much larger effectiveness if they were complemented by water supply and extensive drainage improvement activities.
9. Only one tenth of households in SUSP sites and slightly more than one fifth in EASTAP sites replied that the programme has fully solved the main sanitary problem of the area. On the other hand, about half in EASTAP replied that the programme has partially solved the sanitary problem of the community. Thus, 15 percent in SUSP and 26 percent EASTAP think that the programme has completely failed to attend to the main sanitary problem of the area.
10. Toilet ownership seems to have some impact only on diarrhoea and not on other sanitation related diseases. This may be because the streets, surroundings and water supply are still dirty and contaminated in all sites.
11. It is perhaps because of the lack of strong correlation between toilet ownership and reduction of frequency of sanitation related diseases (especially when the community is still dirty) that many people involved in sanitation programmes are reluctant to mention health benefits to households as a motivational factor.
12. The two programmes do not have clear cut dominance between one another in imparting knowledge about causes of sanitation related diseases and both have been unable to generate sufficient awareness (especially about preventive measures for parasites).
13. EASTAP has been relatively more effective in influencing defecation habits of adult family members compared to SUSP. In case of children's defecation both programmes are weak but SUSP is much weaker.
14. Although both programmes leave much to be desired for in effectiveness, EASTAP seems to be relatively more effective with respect of almost all evaluation criteria.

8.1.7 Comparison of Sustainability

1. In EASTAP sites there is a significant positive correlation between age of toilets and utilization rate, while in SUSP sites the relation is weak. This fact is even more striking for EASTAP if the decreasing subsidy level is considered. Despite the negative effect of lower household contribution, earlier toilet owners have significantly higher utilization rate indicating habit forming and consequent sustainability of EASTAP. In case of SUSP, the present utilization rate is not only much lower than EASTAP, but also lower than that

reported in mid term evaluation of 1986, showing lack of sustainability. Similarly, EASTAP appears better than SUSP with respect to maintenance.

2. The proportion of beneficiaries who replied that they would have built toilets even without project subsidy is much higher in the EASTAP areas (54%) than in the SUSP areas (16%). This implies two things that significantly larger proportion of households were motivated in EASTAP compared to SUSP and that many beneficiaries of EASTAP were in need not of subsidy but rather of proper motivation which would make latrine installation a felt need of the households.
3. Although about 93 percent of non-toilet households in the sample sites know about the programmes (showing that they have been well publicized in the project areas) and about 95 percent are willing to build a private latrine, it is not so encouraging because most of them are intered in comfort and convenience aspects (rather than health and environmental sanitation) and almost all of them (99%) feel the need for external assistance to install a latrine. This shows a gradual erosion of community self-reliance as mentioned in EASTAP reports and also reflects the fact that most of the non-toilet households are poorer than the current beneficiaries.
4. With regard to the type of assistance to build latrines, most of the households expressed the need and preference for subsidy rather than loan programme.
5. The demonstration effect in both programmes is far below the expectation of the officials involved in the programmes, although in EASTAP sites it is relatively stronger as indicated by the larger number of non-project toilets built after the project. About 42 percent of non-project toilet households in EASTAP sites (and only 20% in SUSP sites) report that they got the idea of building a toilet by talking to or observing other toilet owners. Among the beneficiaries of the programmes very few in SUSP (and none in EASTAP) report such demonstration effect as the main reason for installing a toilet.
6. Although pit filling and emptying has been much more frequent in EASTAP sites, this is at least equally problematic in SUSP sites because majority of toilets are built indoors and composting of human excreta is less prevalent. In some of the EASTAP sites (e.g. Thimi) people wanted to use compost but it never formed as the pits were always filled with water. In such places people are reluctant to use the toilet frequently for fear of filling up soon, which would require pit emptying, a big problem due to scarcity of personnel. In contrast, in some other EASTAP sites (e.g. Dadhikot and Dharmasthali) many people are using compost and some of them even invite their non-toilet neighbours to use the toilet in order to fill up the pit soon. In SUSP sites many beneficiaries stopped using the toilets after the pits were filled up and some households have connected the pits to the drains to let out the sewage. Compost utilization is less important in the minds of SUSP site population and pit filling is of more concern.

7. About 61 percent of beneficiaries in EASTAP sites (and only 47% in SUSP sites) mention the following useful learning from the use of the project toilets : (a) not to defecate indiscriminately, (b) toilet use reduces diarrhoea and other transmissible diseases, (c) private toilets keep the environment clean, and (d) there is need for environmental sanitation. In contrast about 42 percent of beneficiaries in SUSP (and only 15% in EASTAP) report that they learned nothing useful from owning and using the project toilet. The rest of respondents mentioned other things such as comfort, convenience and saving of time due to toilet use.
8. In almost all sanitary practices (e.g. purification of drinking water, waste disposal and food handling) EASTAP site population appears more knowledgeable than SUSP site population, showing relatively higher sustainability of EASTAP.
9. More than 69 percent of beneficiaries of EASTAP (and only 57% of SUSP) are fully satisfied, while only about 7 percent of EASTAP beneficiaries (and 17% of SUSP beneficiaries) are quite dissatisfied with the project toilet.
10. The satisfaction level of beneficiaries is highly positively correlated with the utilization rate of toilets. Therefore, EASTAP appears to be far more sustainable in this respect because of its much higher percentage of satisfied beneficiaries.
11. Among the reasons cited for not being fully satisfied, the four most important reasons for SUSP sites were lack of proper supervision by the project, and pit filled with water (in decreasing order of percentage of response). In case of EASTAP sites the four most important reasons were pit filled with water, too small pit, lack of drain, and lack of proper supervision by the project (in order of frequency of response).
12. Much higher percentage of beneficiaries in EASTAP sites (56%) consider the materials provided by the project as insufficient compared to SUSP sites (42%). This may be because of the much lower subsidy provided in EASTAP compared to SUSP.
13. In SUSP sites one third of the beneficiaries consider governmental organizations as more effective for sanitation intervention. Ironically in EASTAP sites almost 42 percent of the beneficiaries consider governmental organization as more effective. A majority of the beneficiaries in the two programmes, however, prefer sanitation intervention done by non-governmental organizations with the support of local committees because they think that local committees are more aware of local development needs and priorities.

8.2 Recommendations

1. The objectives of sanitation programmes should be realistic and compatible with the development priorities of the community.

2. A baseline KAP survey designed to collect the data about demographic and socio-economic parameters including health and sanitation knowledge, habits and perceptions of the project site population should precede the formulation of project plan of action and targets and should be utilized in the selection of beneficiaries. Such a base-line survey will not only provide necessary information for formulation and implementation of a realistic, acceptable and affordable sanitation package (avoiding false promises) but also provide a bench mark for post-project evaluation. Besides, the project sites should be carefully selected according to some reasonable set of criteria.
3. Since educational level and hygiene knowledge and awareness have significant relation with the sanitary habits of the people, a programme should complement other interventions of the sanitation programme. These knowledge and awareness building activities should not be a once for all campaigns, but should be prolonged throughout the project period. If these activities are conducted by a separate agency, then a close coordination between these agencies and the one implementing sanitation improvement programme should be established.
4. Sanitation programmes are better implemented by non-governmental organizations (such as EASTAP), but the local people should be actively involved from plan formulation to project implementation and the programme should be supported by a local committee of users and leaders (formed in the initial stage) which should involve women as much as possible. These committee members should be provided with proper training and even some remuneration if necessary.
5. The government should provide a model sanitation standard in the hospitals and health posts for which adequate water supply and sufficiently working latrines are necessary along with environmental sanitation training of all staffs (including even the sweepers and peons).
6. Sanitation programmes should be really integrated and comprehensive including drainage, water supply, solid waste disposal, and latrine construction. Moreover, maximum coverage (preferably 100%) should be the target for which sufficient time and cost should be devoted. Without such integrated and comprehensive programme the project site people will not realize the benefit of improved environmental sanitation and the community sanitary practices will not change significantly. Since such a comprehensive programme cannot be implemented at many places by a single agency, many agencies (national and international) should be involved in a joint venture sharing the costs and responsibilities of the total programme. Unbalanced efforts and lopsided (such as latrine construction only) cannot solve the main sanitary problems of the community. Instead of spreading thinly over the country the programme should initially concentrate on those areas where the acceptance is likely to be high.
7. Locally suitable and affordable technologies should be promoted (for which the local people can be active partners) rather than imposing

technologies which are found successful elsewhere. No particular technology should be forced on the people but the relative merits, demerits and costs should be clearly explained and the choice decision be left to the people according to their sanitary habits and economic status. Moreover, people should have some choice of flexibility of making some necessary changes without significantly affecting the basic design of the sanitation item (e.g. latrines).

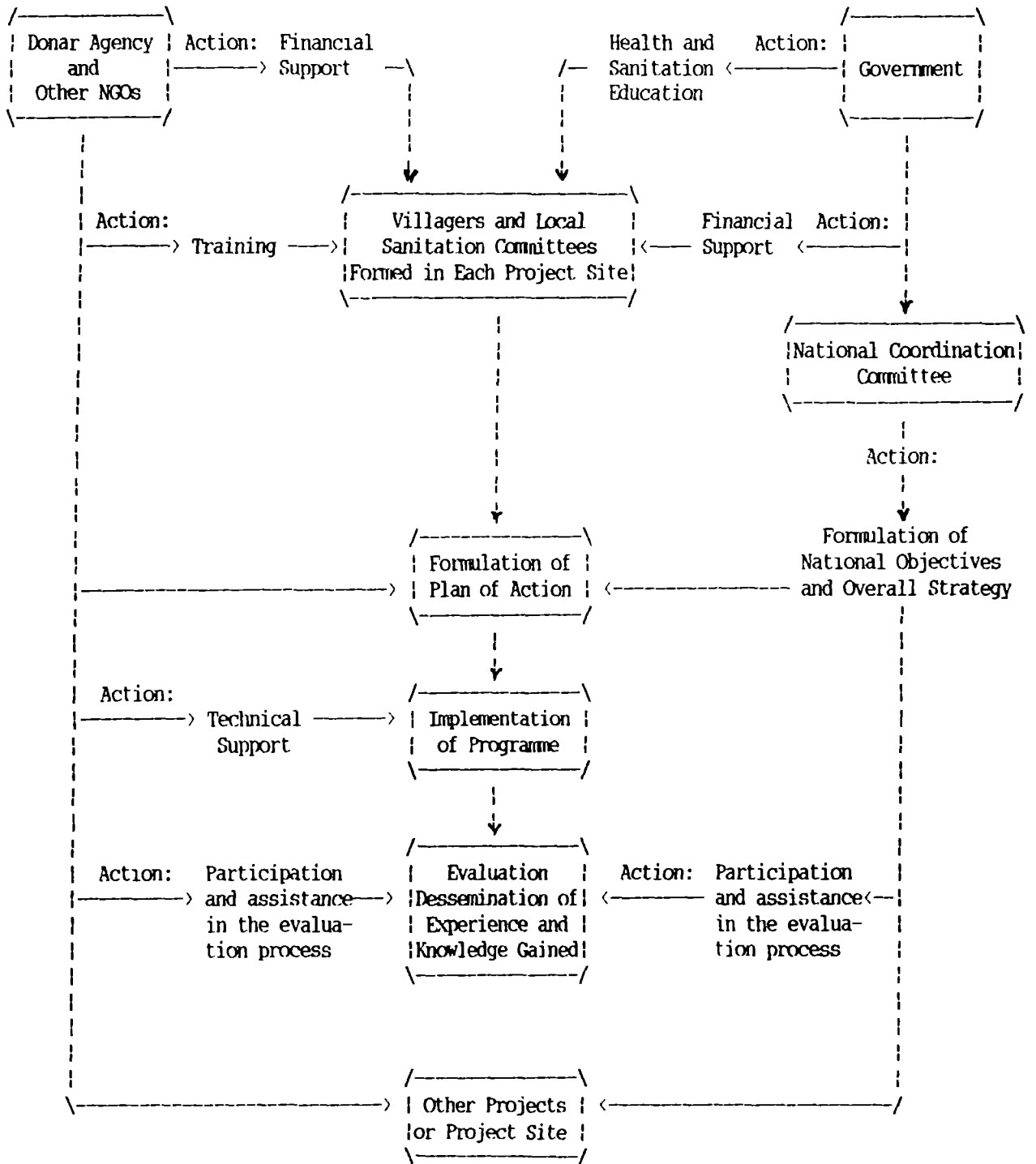
8. There should be a lead department at the national level for coordination, and there should be as much uniformity as is practicable in financial assistance (based on affordability) in all projects and among all implementing agencies. In case of UNICEF's sanitation interventions a formal as well as functional level mechanism need to be developed and used to share experiences among EASTAP and other UNICEF supported sanitation programmes. A "Sanitation Programme Coordination Committee" can be formed for this purpose.
9. In order to ensure post implementation use and maintenance (or sustainability), the programme should be need based and not forced on the people through creation of artificial demand with the lure of heavy subsidies and/or other benefits such as water supply.
10. The beneficiaries should be continuously motivated to properly maintain and utilize the sanitary facilities created by the project. For this regular follow ups, motivation and supervision is required. In case of latrine distribution, for instance, it might be better in some cases not to have people build latrines unless there is a very good follow up about the why and how of keeping latrines clean and regularly utilizing them.
11. The programme should follow a bottom to top approach by fostering the feeling in the community that it is their own programme. The community should also be prepared to absorb and continue the sanitary activities even after the termination of the outside assistance. For this a conscious effort during the programme implementation is required rather than the mere hope that sanitary habits fostered by the programme will guarantee such continuation.
12. Subsidies should be cautiously provided when a durable and hygienic sanitation facility (e.g. latrine) cannot be built with indigenous materials, when a demand already exists or is properly generated through education and motivation (rather than through the lure of subsidy itself); when close follow-ups will be done to monitor installation, proper use and maintenance of the subsidized units; when the technology that is promoted is replicable in the long run in terms of affordability and practicality even without the subsidy. But subsidies should preferably be provided in kind rather than cash and there should be enough flexibility with regard to the items to be subsidized according to the local choice and need. Finally, the subsidies should be especially directed toward the needy and poor households.

13. Health/sanitation education should be made an integral part of a sanitation programme and it should incorporate the following elements:
 - (a) It should be able to convince the people of the priority need for personal, households and community sanitation.
 - (b) It should cover personal hygiene, domestic hygiene (including food and water), environmental hygiene (latrines, drainage and solid waste disposal), and Oral Rehydration Therapy (ORT).
 - (c) It should have special focus on women and children.
 - (d) The teaching methods should always have participatory elements.
 - (e) The media selected should be compatible with local preferences (e.g. film/documentary) and educational level (non-technical locally spoken language).
 - (f) It should be followed by evaluation and post tests.
14. The sanitation projects should emphasize (rather than ignore) the socio-politically sub-ordinate and economically poorer households, and should simplify and shorten the bureaucratic and technical procedures of applying for subsidized sanitation facilities (e.g. household latrines).
15. In case of latrines not connected to drains, the project or the local bodies should provide cleaning and pit emptying service at a fixed rate till the socio-cultural taboo and barrier in clearing pits is broken.
16. The projects should be careful about timing of activities (e.g. not starting construction during the monsoon). The problem of transportation of construction materials (even if the households have to pay for it) should be solved by the project itself or local bodies rather than leaving it for the poor individual households.
17. Drainage should always be of covered type, completed at one time (to avoid the costs of cleaning and reworking on the incomplete works at later date), should be based on topographical mapping and assessment of the degree of the drainage problems, and should be planned to serve the worst drained areas first.
18. In case of compost forming latrines, the project should make sure during follow-up that the compost is actually formed as promised. The beneficiaries should also be well informed and trained (mainly by demonstration) about the proper composting process and proper utilization of compost in various crops. If left as an entire responsibility of the beneficiaries to explore and learn on their own about composting and compost utilization (as done during SUSP and EASTAP) the compost utilization will be quite low and also done in unhygienic way.

19. A pure loan programme is not recommended. A mixed package of low subsidy and easy loan can be attempted and there can be a trade off offered between the current subsidy and the cost of loans if a practical loan scheme can be worked out and banks (especially development banks and the Nepal Rastra Bank) can be persuaded for such ventures.
20. According to the preference of majority of semi-urban households, latrines attached to drains are recommended and people should be advised to build light inexpensive superstructures with ample lighting and ventilation. If latrines with soak pits are constructed, the pit size should be adequately large, there should be proper elevation according to ground water table, and the problem of pit emptying should be solved by institutional arrangement.

A schematic diagram of the recommended roles of Donar Agency, NGO, Government and the villagers in a national level sanitation programme is shown in Figure 4.

Figure 4 : A Schematic Presentation of the Roles of Villagers, NGOs and the Government in a Nationwide Sanitation Programme



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APPENDIX A

Sulabh Latrines: A Introduction

1. "Sulabh Latrine" is an ordinary low volume waterseal connected to two offset equal sized composting pits technically known as "pour flush" latrines. This twin-soak pit composting latrines design was developed in India more than 20 year ago.
2. The sulabh functions very well on a low quantity of flush water, and only a few problems have occurred so far due to inadequate flushing and monsoon flooding.
3. It has no gas vent, is thus odorless and can be built indoors or outdoors, and in densely populated areas such as Kathmandu valley.
4. This latrine design is compatible with the local habits of Kathmandu valley people of using water for anal cleansing and with the insufficient water supply situation of the valley as only 2 litres of water are required to flush. It is also suitable to the tradition of valley farmers of applying excreta (not properly composted) as manure and soil conditioner.
5. Sulabh is simple in design and allows replication through prefabricated components that can be locally manufactured (creating local employment).
6. Sulabh (Type A) satisfies the desire of higher income families to have a "modern toilet" and can be installed even in upper floors of low-rise buildings like attached toilets.
7. The estimated costs of materials and services based on prevailing market prices at Kathmandu during June 1989 for the different types of sulabh toilets* up to pan level are shown below.
8. The Sulabh latrines may not be appropriate in all places. For example, in the Terai housing density is low (except for main market areas), most homeowners have plenty of land on which to build the latrine outdoors, and compost utilization is not widely practiced. Therefore, insisting on Sulabh only may not be appropriate for the Terai areas.
9. As shown above, Sulabh latrines cost between NRS. 1850 to NRS. 2500 for double pit and about N.Rs. 1340 even for (lined) single pit, only up to the pan level. The preferred superstructure will cost another NRS. 1500-2000 at current prices (the brick-masonry). Therefore most

*: Type B (two pits with brick lining and bamboo + cement cover slab) is not shown because it was not accepted by any household in the EASTAP sites.

households cannot afford to build Sulabh without subsidy. Considering the low priority given to private latrines by semi-urban and rural families in Nepal, the promotion of Sulabh's only does not seem to be a sound approach if wide coverage is the objective and minimal subsidy is the strategy. Hence cheaper latrine technologies need to be tested, evaluated, and promoted.

Table 1 : Costs (in Rs.) of Different Sulabh Types (June 1989 Prices)

Items (Up to Pan Level)	Type A	Type C-3	Type C-2	Type C-1
	Two pits with brick lining and R.C. cover slab	Two pits with concrete rings lining and bamboo/cement slab	One pit with concrete rings lining and bamboo/Cement slab	One pit with no lining and bamboo/cement slab
1. Materials and finished components	1920	1475	1005	705
2. Supervisor	55	55	55	55
3. Mason	245	140	140	140
4. Unskilled labour	240	160	120	80
5. Transport	40	20	20	20
Total	2500	1850	1340	1000

Source: P.C. Joshi, Experience of Building Demonstration Latrines, EASTAP, June 1989. Annex 1.

APPENDIX B

Locations and Number of Sulabhs Constructed/EASTAP

Table 2 : Demonstration Latrines Constructed Between July 1983 and June 1989 Under EASTAP/UNICEF

S.No.	Phase	Duration	Site	Number of Latrines	Similar SUSP Site
1	I	June 1983	Lainhour/Thamel	19	-
2		to	Lubhu	65	Khokana
3		November 1984	Dadhikot	80	Tokha
4			Thimi	70	Khokana
Total				234	
5	II	January 1985	Bode	130	Khokana
6		to	Thimi	225	Khokana
7		June 1986	Dharmsthali	75	Tokha
8			Nagadesh	70	Khokana
Total				500	
9	III	April 1987	Lokanthali	63	Tokha
10		to	Thetcho	30+81=111*	Tokha
11		June 1989	Sanagaon	64	Khokana
12			Katunje	102	Tokha
13			Thimi	78	Khokana
14			Kirtipur	4+86= 90*	Tokha
Total				508	
Grand Total				1242	

* Type C latrines



APPENDIX C

Proposed Loan Scheme

Proposed Scheme for a Loan Programme*

1. EASTAP discusses the details of the proposal with the willing village panchayat.
2. Village panchayat puts up a notice giving details about the loan and asks individual households to apply in the 'Sulabh Household Latrine Loan Programme (SHLLP).
3. Interested householders apply to village panchayat for SHLLP.
4. After 50 applications are collected, village panchayat examines all the applications and forward it to the bank for necessary action.
5. After proper scrutiny of the applications, the Bank releases the total loan amount as loan advancement for 50 latrines to EASTAP on behalf of applicator households.
6. Construction starts and EASTAP collects completion certificates (after 10 latrines are completed) from the householders.
7. Village panchayat countersigns the completion certificates and EASTAP submits the collected certificates to the bank. Then bank writes off the loan advancement from EASTAP's account and the loan is written in the names of the householders. The householder pays back the loans to the bank according the terms and conditions laid down between the village panchayat and the bank. However, it is bank's responsibility to recover the loans from each householders.

* EASTAP Proposal, discussed with UNICEF, in March 1988.



Terms of Reference for a combined evaluation of the UNICEF
assisted
Semi-Urban Sanitation Pilot Programme (SUSP)
and the
East Consult's Sanitation Action Programme (EASTAP)



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I. BACKGROUND

Since 1982 UNICEF has been involved in two semi-urban sanitation projects, which both ended by July 1989.

1. The Semi-Urban Sanitation Pilot Project (SUSP) started 1982 in Khokana (Lalitpur District) and was later extended to Bhadrapur (Jhapa District), Thoka (Kathmandu District) and Urlabari (Morang District). The project was implemented through MPLD and after the reorganisation of the ministries through MHPP. UNICEF provided financial assistance and technical support. Altogether about 2000 Sulabh type latrines have been built and about 2000 meters of stormwater drains. The project also had a training component, which included training of technical staff (HMG and local) and of Community Health Motivators. Prior and during to construction health education was conducted. A mid-term evaluation of this project was done in 1986 with a strong emphasis on technical aspects (Chris Wolz, 1986: "Evaluation of the technologies and implementation of the UNICEF assisted Semi-Urban Sanitation Project").
2. The support from UNICEF to the East Consult's Sanitation Action Programme started in July 1983. In a pilot phase (Phase I+II) 734 Sulabh latrines were built in seven semi-urban to urban sites in the Kathmandu Valley: Lubhu, Dadhikot, Thimi, Thamel, Bode, Dharamthali and Nagdesh. Phase III was the approach development phase during which 508 latrines were constructed in six semi-urban sites in the Kathmandu Valley: Lokanthali, Katunje, Sanagaon, Thecho, Thimi and Kirtipur. There was only little health education along with latrine construction in this project, nevertheless the approach chosen seemed to be quite successful in terms of latrine promotion. This project has never been systematically evaluated, but the experiences were summarized in two reports: "Experiences of building demonstration latrines" (June 1989) and the "Completion report" (June 1989).

Since 1989 UNICEF is involved in the Urban Basic Services (UBS) Programme, which has a strong emphasis on sanitation. This programme will be implemented in selected pocket areas of the five towns Lalitpur, Pokhara, Biratnagar, Nepalgunj and Dhangadi thereby relying much on community participation and contribution. The sanitation component of UBS can be seen as an application of the previously gained experience in the EASTAP and SUSP programmes.

II. JUSTIFICATION FOR THE EVALUATION

Sanitary improvements in semi-urban and urban areas still remain an important and huge task for HMG. In these areas the need for proper sanitation is especially acute, since there are no open fields for defaecation. Transmission of excreta related diseases under those circumstances is very easy and the unsanitary environment contributes significantly to the high child and infant mortality rates in towns.

The change of population patterns in Nepal with a high urban growth rate and the limited absorption capacity of the town areas require well planned sanitary interventions with utmost sustainability. Due to the high cost and the operational problems of sewerage systems in Nepal, on-site sanitation will continue to play an important role in sanitation programmes for urban and semi-urban areas.

UNICEF's involvement in the sanitation sector in semi-urban and urban areas requires a review. A lot of experience has been accumulated, which needs to be evaluated in terms of applicability, replicability and sustainability. The outcome of this evaluation is expected to give a sound basis for the planning in UBS and the preparation of the next country programme for 1993-1997.

Although the initiative for this evaluation comes from UNICEF, it is hoped, that it will also get the interest and support from HMG and that the outcome will help to improve future sanitation programme planning in semi-urban and urban areas.

III. OBJECTIVES OF THE EVALUATION

The objectives of this evaluation can be described as follows:

- (a) To assess the efficiency of the interventions undertaken in both projects and to compare them by:
 - * determinating the constraints against efficiency
 - * judging the role of subsidies
- (b) To assess the effectiveness of the interventions undertaken in both projects and to compare them by:
 - * determinating the knowledge and attitudes of
 - latrine users
 - latrine owners, but non-users
 - latrine non-owners
 - * determinating the contribution of the interventions towards overall improved sanitation

- (c) To assess the sustainability of the interventions undertaken in both projects and to compare them by: * investigating the perception of the people in project areas after project completion, i.e. their willingness to improve the situation on their own
- * investigating the use of sulabh compost in respect to:
- time of application
 - crops to be applied
 - person which handles the compost etc.
- (d) To come up with general and specific recommendations for sanitary interventions in semi-urban areas for future programmes in Nepal

IV. CONNECTION WITH THE EVALUATION OF THE LOW-COST WATERSEAL LATRINE PROJECT OF DWSS

The low-cost waterseal latrine project of the Department of Water Supply and Sewerage is currently being evaluated in five out of the initially eight sites: Ilam, Janakpur, Pokhara, Birendranagar and Mahendranagar. In this evaluation the emphasis is much on the functioning and the suitability of the waterseal latrines constructed. The evaluation is accompanied by a steering committee, consisting of representatives from MHPP, MoH, DWSS, SSNCC, WHO and UNICEF. One of the objectives of the evaluation is to conduct a orientation workshop for local leaders after completion of the study aiming at the development of an action plan for on-site sanitation in semi-urban areas.

Since the sites of the two evaluations and its emphasis are different it is not advantageous to combine the two evaluations directly. But it is suggested to have the same steering committee for the conduction of the two evaluations in order that this committee can compile the results of both studies - which should complement each other - before coming up with a common strategy for on-site sanitation in semi-urban and urban areas of Nepal. It is also recommended to include the two previous evaluations of the SUSP (Chris Wolz, 1986: "Evaluation of the technologies and implementation of the UNICEF assisted Semi-Urban Sanitation Project") and of the DWSS Programme (Navin K. Rai, 1986: "Sociocultural Perspective on Sanitation in Nepal: A Survey Report") for the elaboration of the strategy.

V. METHODOLOGY

1. Site selection

The evaluation will cover a limited number of the totally 17 project sites, where UNICEF supported activities took place. It is recommended to select after the desk study about four areas according to the following criterias:

- All sites in the Kathmandu Valley (in order to improve the consistency and comparability of the two projects)
- Two SUSP and two EASTAP sites
- Two groups of projects which started in the same year for example two which started in 1982/1983 and two which started in 1984/1985
- At least one site with a strong input in terms of health education and training and one without these components
- The projects to be selected should have no impact from other sanitation projects

2. Data gathering

The data gathering process should be done in three steps:

1. An extended desk study on the existing reports, publications etc. The outcome will be a selection of the sites (after short fieldvisits) and a clear picture on the programme and its achievements.
2. After this desk study the field survey strategy will be outlined and formats for the surveys will be developed. The strategy and the formats are subject to discussions with UNICEF.
3. Finally, the data will be collected according to the strategy developed.

The interviewees should represent the prevailing population pattern in terms of economic background, ethnic group, age, sex etc.

Interviews should also include local leaders (Pradhan Pancha, Ward Chairmen etc.), locally trained people (technical and nontechnical) and informal knowledgeable people as well as involved staff of MPLD/MHPP, East Consult and UNICEF.

3. Manpower requirement for the evaluation

The evaluation should ideally be conducted by a team with members having experience in sanitation technology and implementation. The professional background of the members should ideally cover technical and sociocultural aspects. A mixed team with male and female members would be advantageous.

The team will be backstopped by the previously mentioned steering committee.

4. Proposed time schedule

The evaluation should start by beginning of April and should be conducted within three months (completion of all field work and final presentation by the end of June). The report should be submitted to UNICEF by the end of July.

	APRIL	MAI	JUNE	JULY
Desk study	**			
Site selection	*			
Survey preparation	**			
First presentation		*		
Field surveys		***		
Data compilation			***	
Second Presentation			*	
Report writing				****

(* = Approx. one week)

5. Output

At the beginning of May the progress of the study (results of the desk study and final scope of work) will be presented to the steering committee and invited guests. The outcome of the evaluation and a draft report will be presented to the committee before the writing of the final report (end of June). A final report has to be submitted by the end of July.

VI. SCOPE OF WORK

The following list describes the range of subjects and questions to be covered tentatively. It will be subject to amendments after the extended desk study.

1. Efficiency of the two programmes

- # What sort and level of input was provided at each project site and which output has been achieved?
- # Was the implementation rate on schedule? If not, what hampered the process?

- # What interventions were undertaken to increase the efficiency of the two programmes?
- # What was the specific role of subsidies, health education and training in that context?
- # What can be done to improve the efficiency of such programmes?

2. Effectiveness of the two programmes

- # Had the programmes clearly set objectives?
- # Do these objectives address the major problems of the areas?
- # Have the interventions undertaken worked towards the objectives and to which extent?
- # Have they contributed to the solution of the main sanitary problems of the areas?
- # Which people were reached by the two programmes and which could not be reached? Why?
- # What are the reasons for not buying a latrine, buying a latrine, not using a latrine etc.?
- # Does health education play a significant role towards improved effectiveness of the programme?
- # What should be done to improve the effectiveness?
- # Do the interventions undertaken produce side effects for improved sanitation? Which ones? Should they be supported?

3. Sustainability of the two programmes

- # How is the sanitary situation in terms of number of latrines built versus number of latrines still in use in respect to the project's age?
- # Have people continued to build latrines after project completion (= demonstration effect)?
- # Are there other signs of the people's willingness to improve the situation on their own or do they wait for a new project?
- # Has the sulabh compost been used? If not, what has been done with the compost?
- # Who emptied the pit? How? What sort of problems occurred?
- # When has the compost been applied (season)? To which crops?
- # Is there a need for institutionalizing the pit emptying in urban areas?

