

**Nepal Water for Health  
NEWAH**

**Hygiene Practices at NEWAH Project Sites:  
The Impact of Hygiene Education**

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## FOREWORD

Nepal Water for Health (NEWAH) is a national level NGO which works with some 50 local partners each year to implement integrated drinking water, sanitation and hygiene education projects.

Of all the various challenges this work presents, it is hygiene education that proves the most varied and complex, and yet where the returns for doing it well are the most rewarding and far-reaching. This is true not only for the obvious benefits of improved responses in hygiene related actions, but also for the overall project process. Indeed, hygiene education done well can serve to galvanise and inspire communities in other project and development related activities.

The principal rationale for including hygiene education in drinking water projects is its potential impact on public health. There is now little doubt that the most significant impacts on disease incidence stem less from the construction of water and sanitation facilities and more from behavioural changes that lead to improvements in hygiene. Taken together with access to improved facilities, the potential for improving community health and overall quality of life through hygiene education is dramatically improved.

This report presents a clear synthesis of studies of hygiene attitudes, knowledge and practices in 46 individual project areas. The study shows how different types of behaviour and areas of knowledge have changed following a structured programme of hygiene education. It demonstrates that major impacts can be made if hygiene education work is focused, properly resourced and fully integrated with other project activities.

It is my hope that this report will be of interest to other agencies working in the sector, and provide the basis for NEWAH's own health workers and partners to improve their work yet further.

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Special thanks are due to Greg Whiteside of WaterAid who initiated the study, and provided friendly support and useful criticism at all stages of report preparation.

I hope that the publication of this report will also help repay the efforts of all the people at NEWAH regional offices and in the field, in particular the NEWAH health educators and senior and local health motivators appointed by the partner NGOs, who spent many hours collecting and analysing the data.

Finally, we all wish to thank the many hundreds of participants in the study, the project beneficiaries, who gave generously of their time and energy to answer questions.

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## SUMMARY

This report describes the results of a survey designed to assess the impact of hygiene education in NEWARI project areas. The survey covered 46 projects, 37 in hill regions and 9 in the Terai, implemented in the 1995/1996 season. Information about hygiene attitudes, knowledge and practices was obtained by a combination of participatory rural appraisal (PRA) and household questionnaire survey techniques before and after implementation of water supply and sanitation projects, of which hygiene education was an integral part. The indicators investigated related both to 'known practices', what people were actually observed doing, and to 'stated practices', what people said they did.

The results indicate that overall the hygiene education programme was successful and had a major impact on people's knowledge about and attitudes towards a whole range of hygiene practices. After hygiene education the majority of people had understood the need for and knew how to store water hygienically; they had realised the importance of washing their hands at critical times, of isolating faeces from the environment, of protecting leftover food from contamination, and of disposing of refuse in one place; they had learnt the value of using waste water to develop a kitchen garden; and they understood much more about the causes of diarrhoea, how to prevent its transmission and how to treat it. In the year before project implementation there were 58 deaths from diarrhoea in the project areas, which was reduced to zero in the following year.

Although the overall results were very encouraging there were considerable differences between different project areas, and overall the effects in projects in the Terai were less marked than those in projects in hill districts. Some areas in which the hygiene education programme could be strengthened or modified were identified. More detailed analysis of the different impact in different project areas might help further improvements to be identified. Half of those in the Terai and one sixth of those in the hills who had recognised the potential benefits of a latrine had not built one either because it was too expensive, they had no manpower or they had no land. Thus a way still needs to be found to help poor and landless people to gain access to adequate sanitation facilities.

Some problems were encountered in the data set during data analysis, and some improvements in the survey methodology have been suggested so that these can be avoided in the future.

whereas Terai projects cover all 9 Wards in a VDC (in 1995/6 the average number of beneficiary households was 608, ranging from 134 to 859). The average size of the households served by the projects was the same in both areas (6 persons), but there are important socio-economic differences. Most settlements in Terai areas have developed over the last 40 years as a result of migration from other areas in the country. There is much greater ethnic diversity than in the hills, and greater variability in land tenure. Many more people live in rented accommodation and work as hired labourers. Thus the problems encountered and challenges faced by people living in the two areas differ considerably. In this report the results from projects in these two types of area are presented separately.

### The Hygiene Education Programme

Hygiene education starts before water supply construction and continues beyond its completion (see Appendix 4). One local health motivator (usually a woman) is appointed in each small project and two local health motivators and a senior health motivator in each large project by the implementing partner NGO using guidelines prepared by NEWAH. NEWAH provides training, education guidelines, teaching materials and support. In addition one female health volunteer is appointed for each water point by the User Group (usually 6-10 households) and also given one week of training. The hygiene education is divided into separate topics. The local health motivator holds a series of half to one day teaching sessions with each water point user group introducing each topic separately (approximately 6-10 meetings per water point, or more for small projects with a small number of taps). Ongoing education is provided by the health volunteer. If the health motivator feels that it is necessary, then separate visits will be made to selected households both to support the health volunteer and to see whether the householders have actually gained a genuine understanding of such points as latrine hygiene. Hygiene education sessions are also held at schools whenever possible. Usually all schools are visited in the hill areas, but only some in the Terai where the number of schools in a project area can be very high.

The main purpose of the hygiene education programme is to establish a link in people's minds between unhygienic practices and disease, and to provide information about what constitutes hygienic behaviour. A series of simple pictorial messages portray the most effective primary and secondary physical and behavioural barriers to the transmission of pathogens via faeces. Singing and dancing, role plays, puppets, games, storytelling, video demonstrations and practical exercises are all used to help participants understand and internalise the information. The main points emphasised in the programme are summarised in the box.

#### The major points covered in the hygiene education programme

- the safe disposal of excreta (including from children), preferably through construction of a household latrine which is kept clean
- hand washing at critical times - after defecation, after cleaning children's bottoms, before handling food, before eating and before feeding children
- disposal and use of waste water
- prevention of contamination of water in transit and in the home
- food hygiene - protection by covering, and use of a dish rack
- attention to domestic and environmental hygiene - proper disposal of household refuse and housing of domestic animals
- knowledge of paths of infection and treatment of diarrhoea - oral rehydration therapy
- simple domestic medical treatment using clean water, e.g. water cooling of burns, saline rinse for eye infections

## Study Design and Organisation

The NEWAH study has three basic objectives: 1) to gain information about hygiene attitudes, knowledge and practices in individual project areas prior to project implementation so that the need for hygiene education can be assessed and the programme tailored to the situation in the district; 2) to gain information about hygiene attitudes, knowledge and practices in individual project areas after project implementation so that the success of the hygiene education programme can be evaluated and the need for further intervention assessed; and 3) to assess the overall impact of the hygiene education programme on the hygiene attitudes, knowledge and practices of project beneficiaries. This report is concerned with the third objective.

Two surveys are performed in each project area: a baseline survey carried out prior to the commencement of the project and an evaluation survey conducted after project completion and approximately one year after the baseline survey. A series of indicators of hygiene attitudes, knowledge and practices are investigated. Some of the indicators relate to 'known practices', what people are actually observed doing, and some to 'stated practices', what people say they do. Initially a questionnaire survey method was used (WaterAid 1995) but at the time of the projects described in this report a combination of participatory rapid appraisal (PRA) and questionnaire techniques had been introduced. The initial surveys are performed by NEWAH health staff, some of the household information in the evaluation survey is collected by the local health motivators and senior health motivators.

### *PRA methodology*

NEWAH has adapted typical PRA methods to suit the special requirements of the study. The framework for gathering information is clearly defined, answers are required to a series of preformulated questions although additional information is also welcome. Discussions are thus open at times, but are then focused so that selected topics are always considered. The data collected is semi-quantitative, expressed in percentages on the basis of hand counts rather than assessed according to the participants' conceptions. This approach ensures that there is a reasonable degree of comparability in the data obtained in different project areas. Specifically the procedure is as follows.

After acceptance of a project by NEWAH, a team of health and engineering specialists visits the project area for one week to gather the basic information needed to plan construction of the water points and latrines and the health education programme. A mass meeting is held on the first day with representatives from the potential beneficiary households. This meeting has a threefold objective: 1) to gather the baseline information needed for project design; 2) to gather baseline information on hygiene attitudes, knowledge and practices; and 3) to mark out clusters of user households and select the (preliminary) position of water points. One person per household is asked to come to the meeting. The attendance rate is usually very high, with a large number of women. A single meeting is held for smaller projects (i.e. most of those in the hills), and a series of meetings (one per ward) for the larger projects (i.e. most of those in the Terai).

PRA techniques are used to obtain information on the situation in the village: social mapping to show the location of households, presence of water and sanitation facilities, and location of locally available health services; seasonal calendars to indicate seasonal availability of water and seasonal occurrence of death from diarrhoea; and pie charts to obtain information about water sources used, time taken to fetch water, and hygiene attitudes, knowledge and practices. Care is taken to ensure that women and socially disadvantaged and less confident people participate fully. Where a series of mass meetings is held, the results are later aggregated to give single charts per project.

During the following week a household survey is carried out (see below) and the engineering survey work done. If the PRA data obtained during the first mass meeting appear doubtful their validity is checked by random questioning during informal meetings with beneficiaries through discussions with children, and by observation (triangulation). At the end of the week a second mass meeting (or series of meetings) is held to present the findings of the survey to the local users. This meeting provides an opportunity, often used, to modify the information given in the PRA pie charts.

Water point construction, construction of latrines and the health education programme start approximately six to eight months later (in the dry season). The health education programme is spread over a period of six to nine months (Appendix 4).

Approximately one year after the first mass meeting, after completion of the project, a further mass meeting (or series of meetings) is held. The objective of this meeting is to obtain information on: 1) the acceptance and state of the water supply; 2) preliminary information on breakdowns in the supply and the methods put in place to deal with them (the subject of a separate detailed survey later); and 3) hygiene attitudes, knowledge and practices after hygiene education. One man and one woman, or at least one person, per household is asked to come to the meeting. Attendance at these meetings is sometimes, but by no means always, lower than at the first meetings. The information is obtained by techniques similar to those used in the first meeting.

A household survey is again carried out in the week following the mass meeting (see below) and a further presentation and feedback meeting held after the results of the household survey have been compiled.

#### *Household survey methodology*

A random sample of beneficiary households is interviewed in a questionnaire survey (baseline and evaluation). The guideline at the time of the surveys in this report was to interview 50% of households in projects with less than 100 beneficiary households and 25% in those with more than 100 beneficiary households; occasionally there were slight deviations from this (Appendix 1, Table 1). Random cluster sampling was used, households were selected at random within the cluster to be served by a single water point (generally 6-12 households who form a single User Group). Hindu tradition limits the communal use of water by persons of different caste and status (although the extent of restrictions varies considerably between areas). Although the main factor influencing hygiene attitudes, knowledge and practices is likely to be level of education, this is often indirectly related to caste. Equally groups of close neighbours are more likely to interact with each other and share knowledge (or supposed knowledge) related to hygiene and health. Thus each cluster is likely to represent a more homogeneous group than the average in terms of attitudes and hygiene practices. In general, the same households were interviewed for the evaluation survey as for the baseline survey. In a number of cases, however, particularly in the Terai, the number of water points actually constructed, and thus the number of project beneficiaries, was lower than estimated at the time of the baseline survey. In the Terai, this was usually because the results of boring were not successful (after 3 failed attempts the water point is abandoned), and in the hills because of water source problems or disputes related to land or other social factors. Equally in some project areas additional households migrated into the area, or were included in the project, after the baseline survey was performed. Where the number of project beneficiaries had changed, the number of households interviewed was adjusted accordingly (Appendix 1).

Interviews were held together with all available household members, but most common answers were provided by the female head of house. The interviewer also made direct observations of certain things, e.g. the presence of slime in water containers and of children's excreta around the house (Appendix 3). Many of the questions were the same as those



asked during the PRA, but some questions were either not repeated or were only asked during the household interviews. Thus the household survey acted as a method of triangulation for the PRA as well as providing additional information.

### *Data evaluation*

The questionnaires used during the household survey and as a guideline for the PRA are shown in Appendix 3. Information was gathered for a number of different purposes during the surveys, but only the data relevant to hygiene education are included in this report.

Data from individual projects was compiled in tables. The average values for Terai and hill projects were calculated separately. Simple averages were used (i.e. not weighted according to the number of beneficiary households in a project) to show the average impact across projects. Simple 'Before' and 'After' plots were used to show changes in hygiene attitudes, knowledge and practices.

Many questions were duplicated in the PRA and household surveys, even where this was not originally planned. The results obtained by the two methods were compiled separately. Occasionally one or the other was clearly less reliable, either because the question was not asked by that method in all projects, or in the household survey because participants in some but not all projects were allowed to give multiple answers to a question. Where results obtained by PRA and household survey methods were directly comparable, they were nearly always very similar. In general, when information was obtained by both methods the results shown in this report are those obtained by means of PRA. Any significant differences between the results obtained by the two methods are mentioned in the Results section.

Occasionally, differences between the data obtained in the baseline and evaluation surveys, and in the hills and the Terai, made the exact comparison of results difficult. Problems included no answer being provided for some project areas for certain questions, differences in the interpretation of some questions by the interviewers, and differences in the wording of questions in the baseline and evaluation surveys. Occasionally anomalies were suspected in the data submitted to NEWAH. Where it was not possible to clarify the problems such data was retained in the data set. As far as possible, these problems were taken into account during data analysis, and where errors were suspected and a choice of including or discarding values had to be made, the interpretation chosen was always such that the apparent impact of hygiene education would be shown to be less rather than more. Specific problems are mentioned in the relevant sections of the results (below) and together with the tables of values in Appendix 2. It is clear from the nature of the study, however, that the final results must be seen as indicative rather than absolute.

## RESULTS

In the following, the results obtained in the surveys have been arranged according to the five clusters of hygiene practices (Almedom et al. 1997b) with an additional section related to knowledge about and treatment of diarrhoea. Major differences between the baseline and evaluation surveys are shown in the form of column charts. The complete tables of values are given in Appendix 2.

### A) Water Sources

The change in the type of collection point used for drinking water is shown in Figure 1 (Appendix 2, Table 1). After project completion, 98% of people in the hills collected drinking water from a protected tap, whereas before drinking water was obtained from unprotected sources including unprotected wells, springs and waterways. In the Terai the number using unprotected wells or springs dropped from 54% to 3%.

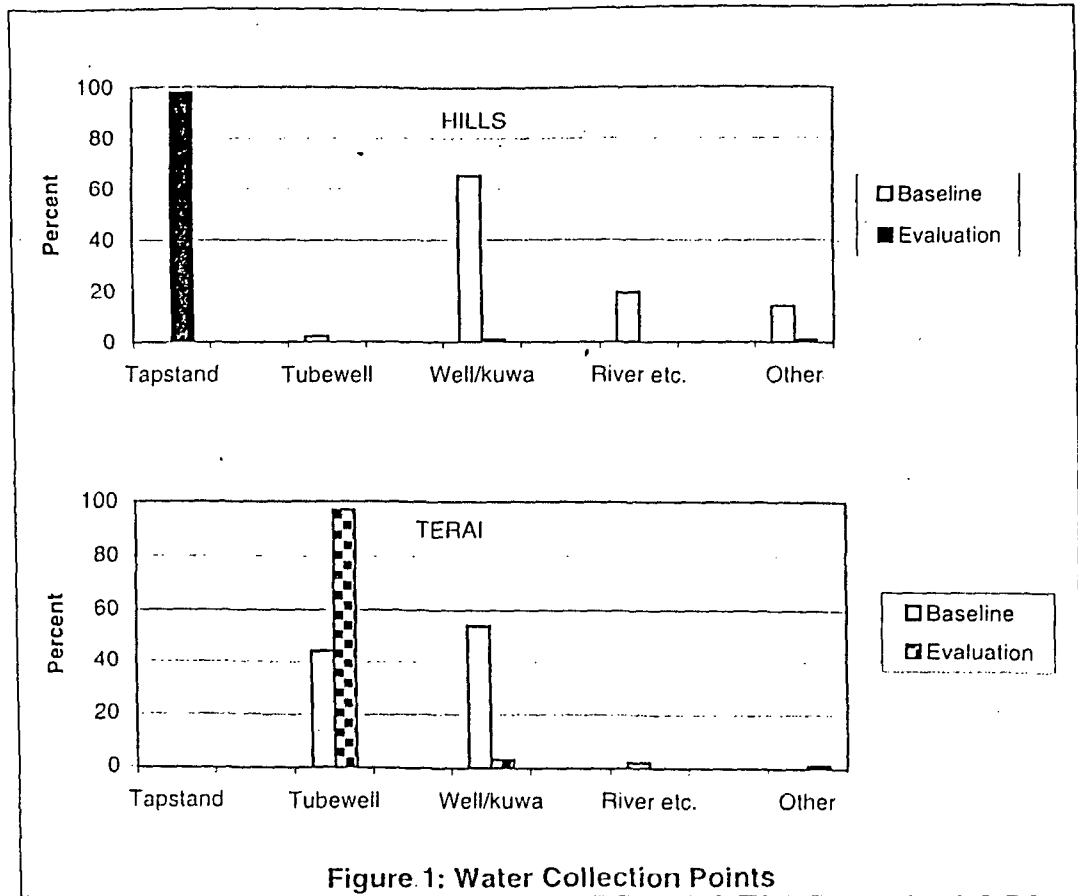


Figure 1: Water Collection Points

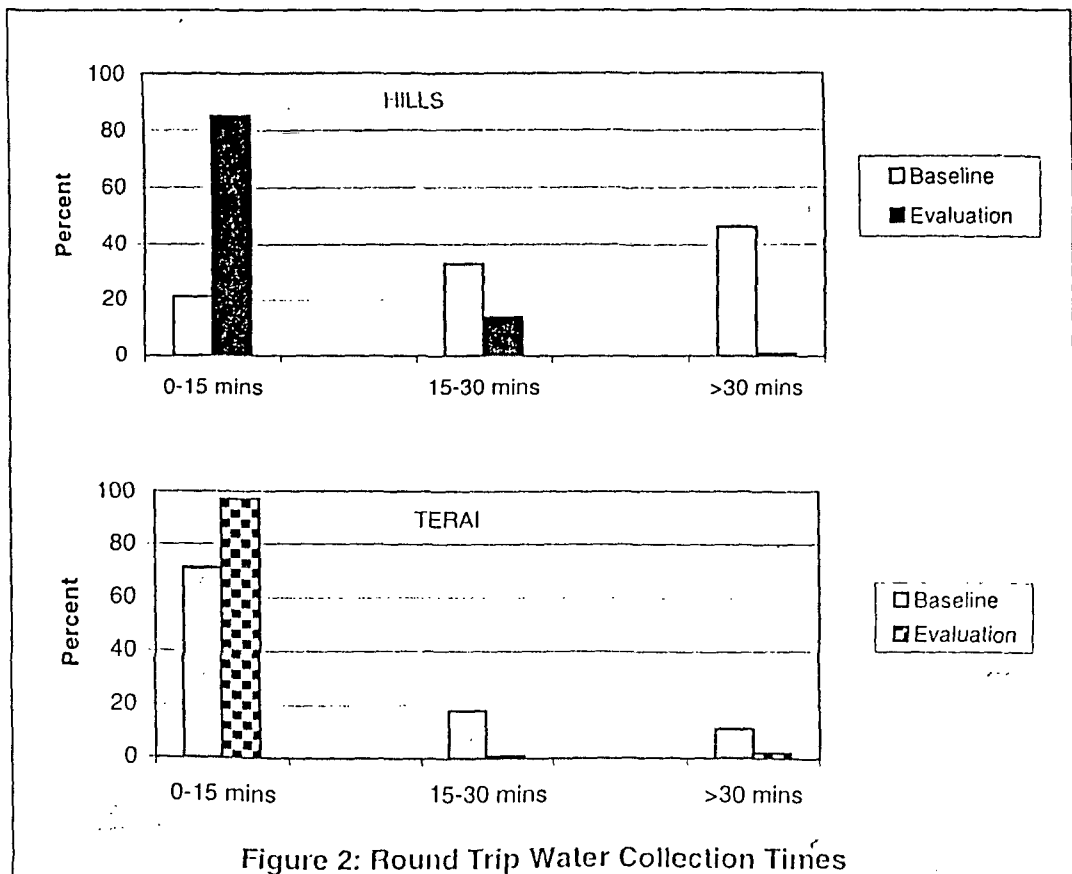


Figure 2: Round Trip Water Collection Times

At the time of evaluation, all potential beneficiaries were using the project water in 2/3 of the hill projects and 1/3 of Terai projects. An average of 3% of hill users (ranging from 0-22% in different projects) and 7% of Terai users (ranging from 0-24% in different projects) were not using the project water.

After completion of the projects, 94% of beneficiaries in the hills and 81% in the Terai considered their water supply to be sufficient throughout the year. In 2/3 of the projects 100% of users considered their water supply to be sufficient at all times. The most common reasons given for not using the water were: in the hills 'traditional source more convenient' and 'source unreliable'; and in the Terai 'poor taste', 'unreliable' and 'too far away' (Appendix 2, Table 2).

In the hill areas the average times taken for a round trip to collect drinking water changed dramatically (Figure 2; Appendix 2, Table 3). The number taking more than 30 minutes to collect drinking water dropped from 46% to 1%. The changes in the Terai were less dramatic since the great majority already took less than 15 minutes to collect water before the projects were implemented. A rough calculation indicates that on average households in the hills saved 15 minutes per round trip, and those in the Terai, 5 minutes; giving a total savings per day of 1.5-2 hours and 30-40 minutes, respectively (6-8 trips per day).

**B) Water Uses**

The cleanliness of water storage containers and extent to which containers were covered are shown in Figure 3 (Appendix 2, Table 4).

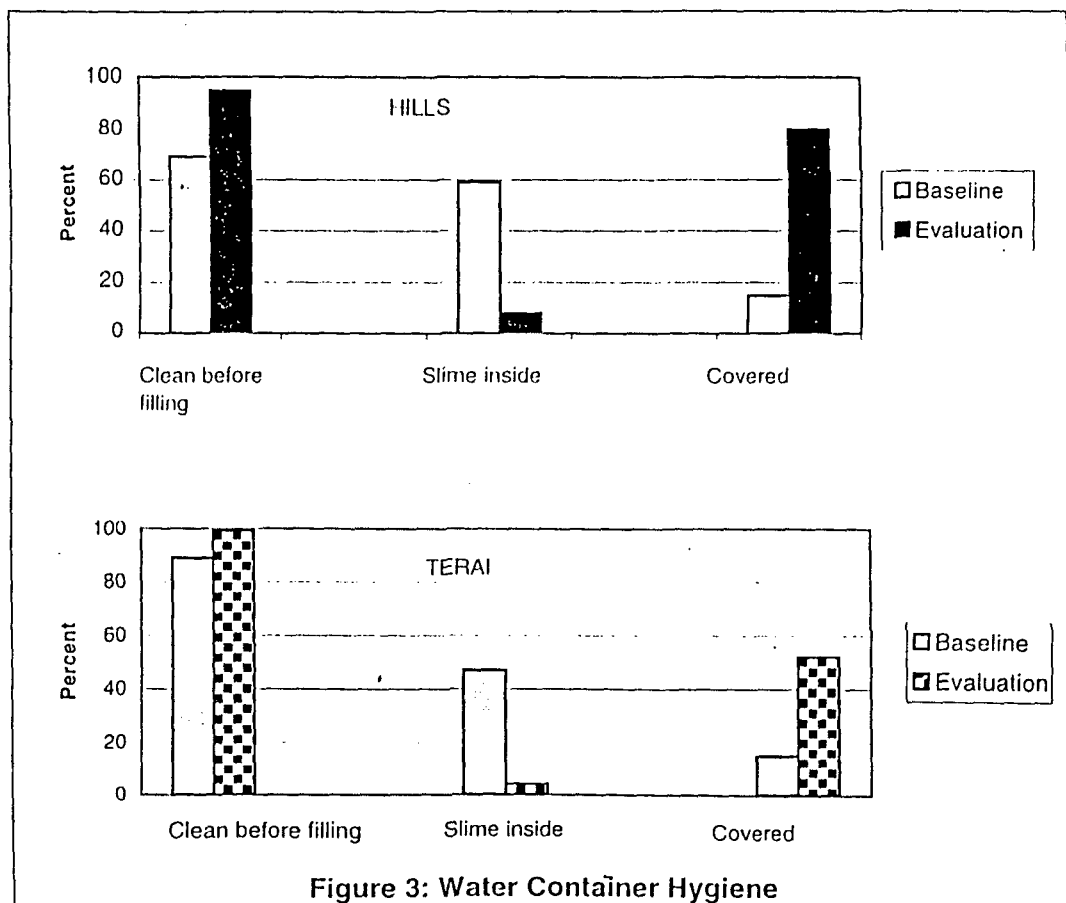


Figure 3: Water Container Hygiene

There was a dramatic reduction in the presence of slime inside water containers, both in the hills and the Terai. Although the same pattern was seen everywhere, these figures hide considerable variation in individual projects. In the hills, changes ranged from a dramatic

reduction from 83% with slime to none at all in one project, to a less successful reduction from 57% to 29% in another.

The increase in the number covering their water containers was also impressive, although at the time of evaluation half of those in the Terai still left containers uncovered. Again there were big differences between projects, the number covering their containers in different project areas at the time of evaluation ranged from 0% to 100%

A large proportion indicated that they cleaned their containers before filling, and this percentage rose to close to 100% after hygiene education (Appendix 2, Table 4). In the hills clearly more people reported that they cleaned their containers when asked during household interviews. The methods used for cleaning are shown in Figure 4 (Appendix 2, Table 5). Again the changes were more marked in the hills, the number using ash and water rather than water only or mud and water, rising from 19 to 84%. The numbers using ash and water increased in the Terai as well, as did the numbers using water with straw or husks

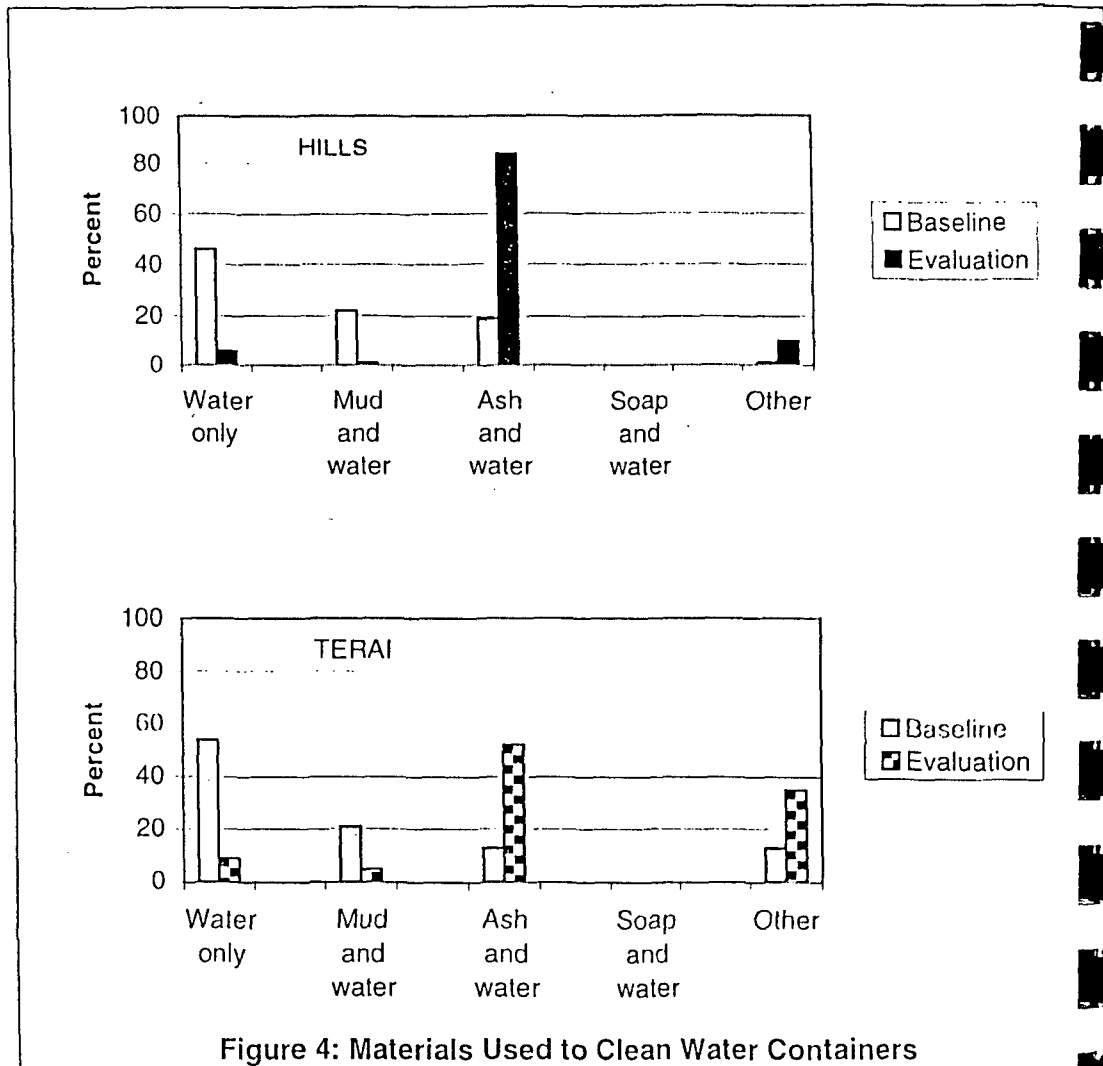


Figure 4: Materials Used to Clean Water Containers

Hand washing practices are summarised in Table 1 (Appendix 2, Table 6). There was an improvement in hand washing practices in the hills, with a marked increase in the number washing their hands after defecation, before meals, after meals and after touching. Practices were already good in the Terai before the project began, but an improvement was seen in the numbers washing their hands after defecation.

Table 1: Hand Washing at Critical Times

HAND WASHING PRACTICES	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
After defecation	62	93	84	94
Before eating (meals)	74	98	96	98
After eating (meals)	86	99	97	98
After touching dirt/waste	62	93	92	90
Before cooking	na	89	na	89
Before feeding child	na	87	na	89

C) Sanitation

The sites used for defecation are summarised in Figure 5 (Appendix 2, Table 7).

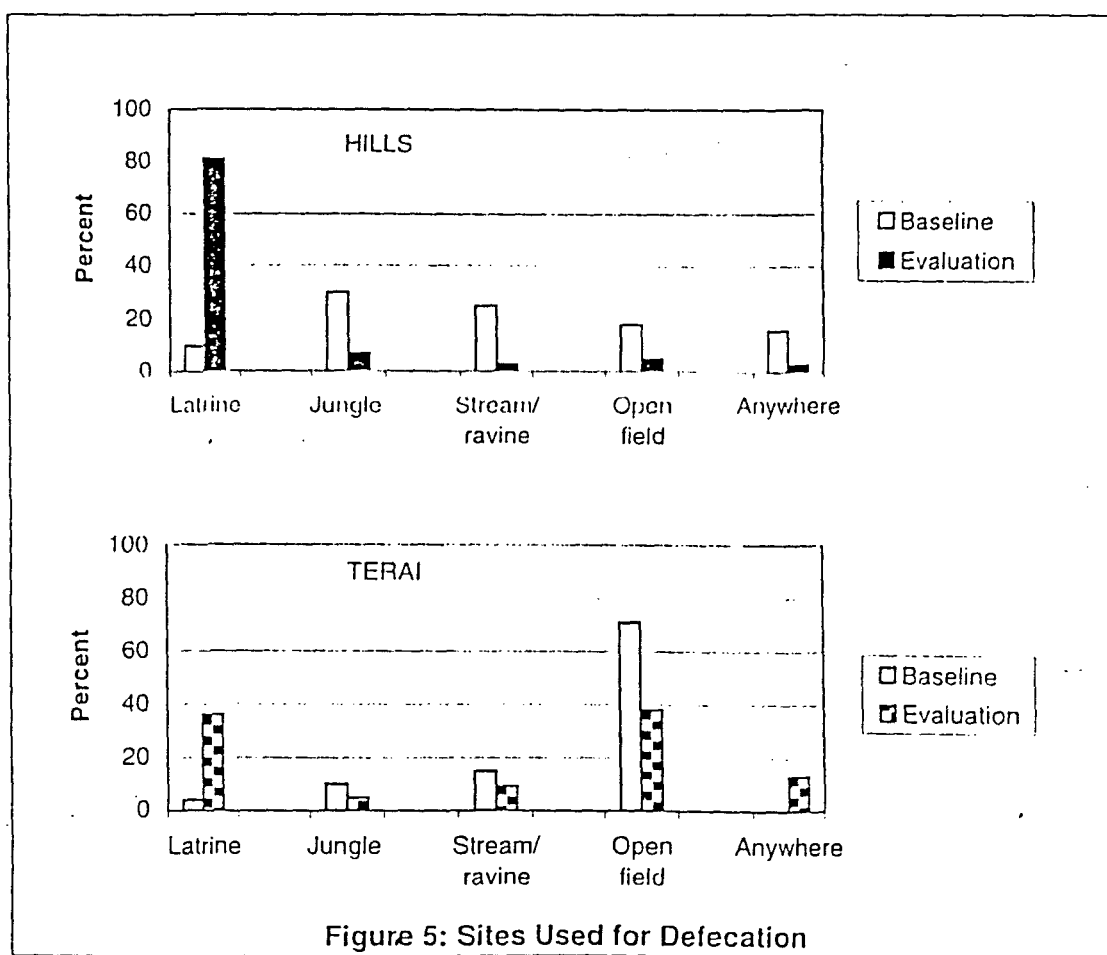


Figure 5: Sites Used for Defecation

There were some problems in analysing the results of this question. The PRA information was gathered on a single pie chart, i.e. the answers totalled 100%. This does not take into account the possibility that one person may use different sites, for example when close to home or at work in the fields, but the answers from different projects are directly comparable. Equally the information gathered in different project areas during the household survey was not properly comparable because multiple answers were allowed by some interviewers but not others, and in some cases the question was not asked during the household survey. The questions of latrine presence and use for defecation were only asked separately in the baseline survey, and then not by all interviewers. On average, where both figures were

available, the same percentage reported having a latrine as did using one for defecation, although higher or lower values were reported in a few projects. When the evaluation results were analysed, it was assumed that if a household possessed a latrine, then this was the place used for defecation.

The change in the place used for defecation was marked. The numbers using a latrine rose to 81% in the hills and to 36% in the Terai. In the Terai the numbers using an open field dropped from 71% to 38%, but the numbers going 'anywhere' rose from 0% to 13%.

Figure 6 shows the percentage of households with a latrine and the state of cleanliness (Appendix 2, Table 10).

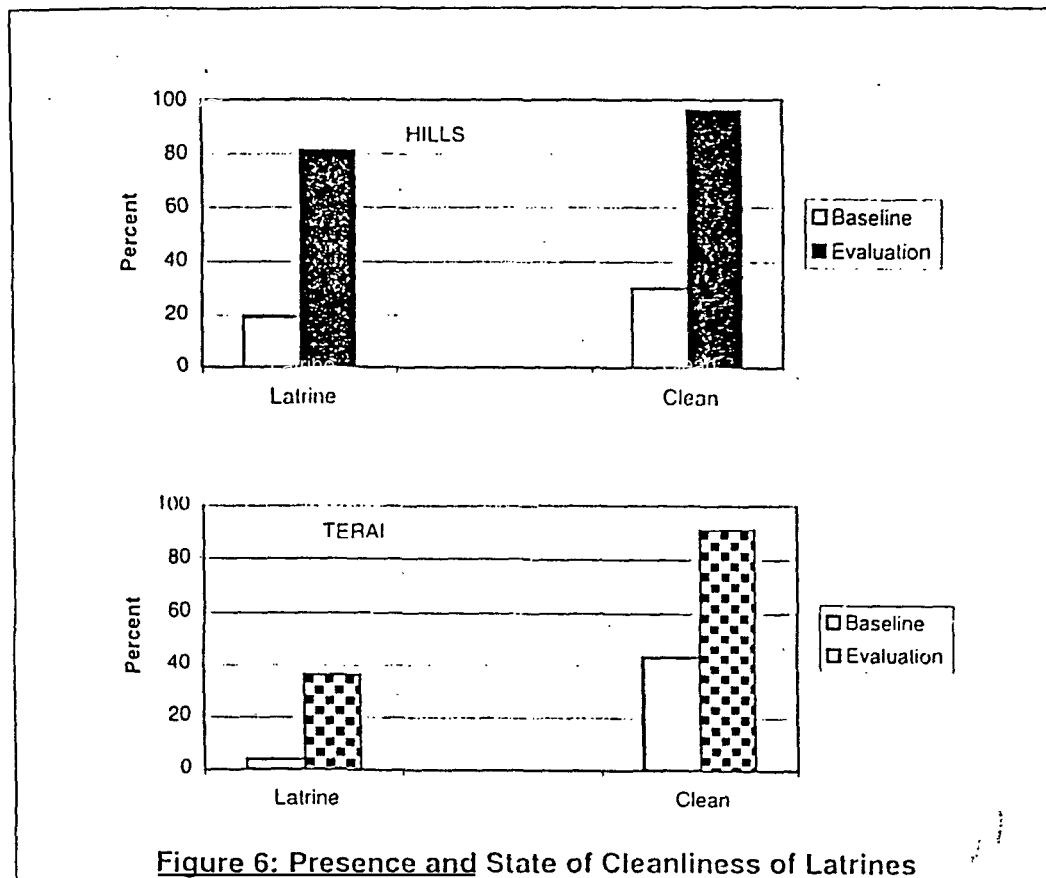


Figure 6: Presence and State of Cleanliness of Latrines

Not only had the number of latrines increased markedly, at the time of evaluation, almost all latrines were found to be clean compared with less than half before hygiene education. At the time of evaluation close to two thirds of users in both areas cleaned the latrine with brush and water, almost all the remainder using water only or ash. Soap was only used in one project area (Appendix 2, Table 10). The most common type of latrine constructed differed in the hills and the Terai. In the hills 30% were simple pit type and 60% were slab pits with a simple cover; in the Terai only 16% were simple pits, and 73% water sealed with single or double pits (Appendix 2, Table 10). These differences reflect differences in the terrain. Latrines were used by men, women and children equally.

The actual percentage of households that had constructed latrines at the time of evaluation differed markedly between projects, from 11% to 100% in the hills, and from 0% to 80% in the Terai. It is not clear to what extent this reflects differences in the impact of hygiene education in the different areas, or differences in local conditions. Prior to hygiene education approximately 50% of people gave 'not necessary' as their main reason for not building

latrine (Appendix 2, Table 10). At the time of evaluation only 3% in the hills and 17% in the Terai cited 'not necessary'. The main reasons given were 'too expensive', 'materials not available', and various problems in particular 'no time or manpower' in the hills and 'lack of land' in the Terai. In both areas the main reason given for building a latrine was cleanliness, closely followed by health and convenience (Appendix 2, Table 10).

Only 1% of hill users reported any problems with their latrines such as being smelly or attracting flies. 5% of Terai users had problems with the water supply, almost all of them in one project, and 1% other problems (Appendix 2, Table 10).

The majority of those with latrines intended to continue to use one after the pit was full (Table 2, and Appendix 2, Table 10). Only 2% in the hills, and none in the Terai, intended to abandon their latrine when the pit was full. The majority intended to build a new latrine, some would dig out or clean the pit, and some had permanent latrines with a septic tank.

Table 2: Action When Latrine Pit Full

LATRINES	HILLS	TERAI
When pit full do what?		
Abandon latrine	2	0
Dig out (and use as compost)	14	13
Build another somewhere else	68	60
Cover pit and plant tree sapling	16	2
Other	5	34

(Those who intended to cover the pit and plant a tree, presumably also intended to build a new latrine, but only a few interviewers allowed multiple answers to be given. 'Other' included 'reuse the latrine after cleaning' (twin-pit latrines) and 'permanent latrine'.)

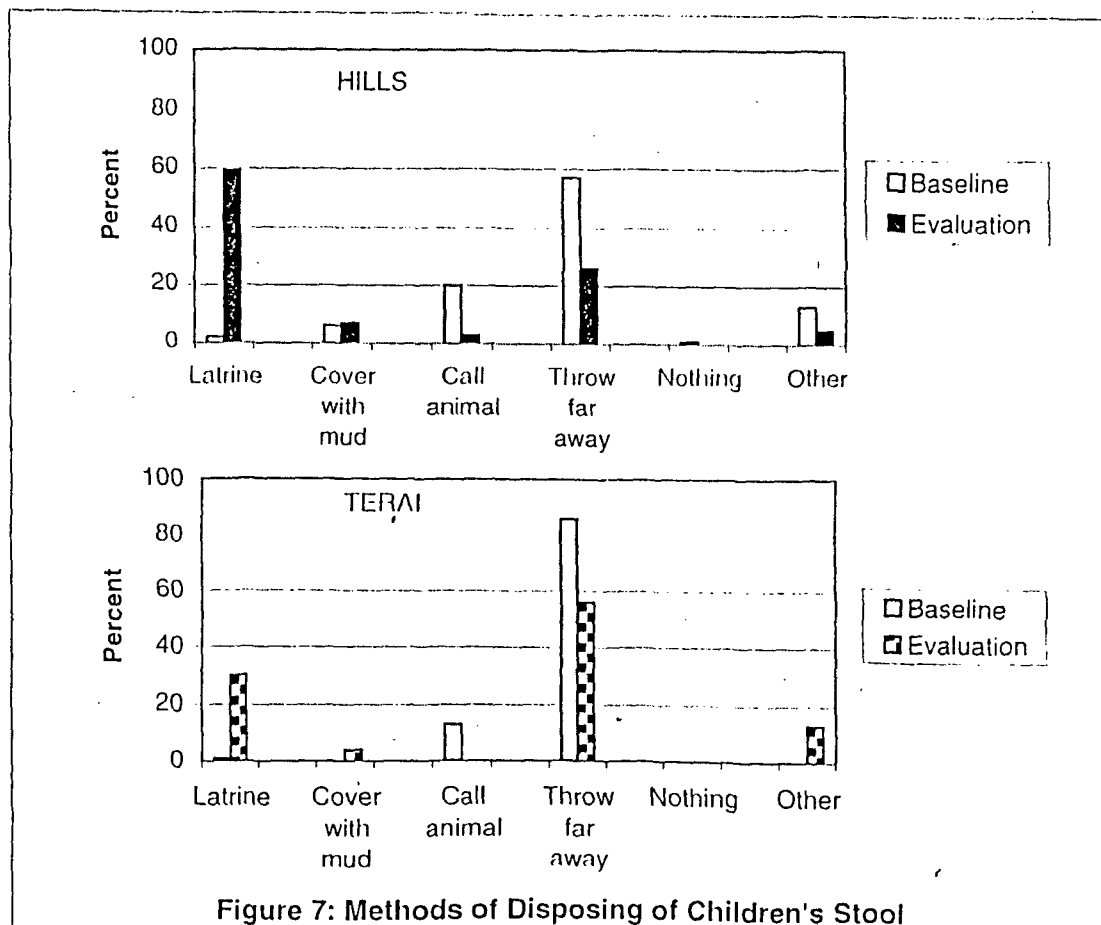


Figure 7: Methods of Disposing of Children's Stool

The methods used to dispose of children's stool also improved, although not quite as dramatically as latrine use (Figure 7 and Appendix 2, Table 8). The number disposing of children's stool in a latrine rose from almost none to nearly 60% in the hills and 30% in the Terai. Most of the remainder threw the stool as far away as possible. However, at the time of evaluation as many as a quarter of those with latrines did not use them to dispose of children's stool.

The percentage washing their hands after defecation is shown in Table 1 and the materials used for hand washing are shown in Figure 8 (Appendix 2, Table 9). There was a big change in hand washing practices. Not only did the actual percentage washing their hands after defecation increase, the number using ash and water or soap and water, instead of water only or mud and water, rose to 91% in the hills (from 17%) and 88% in the Terai (from 14%).

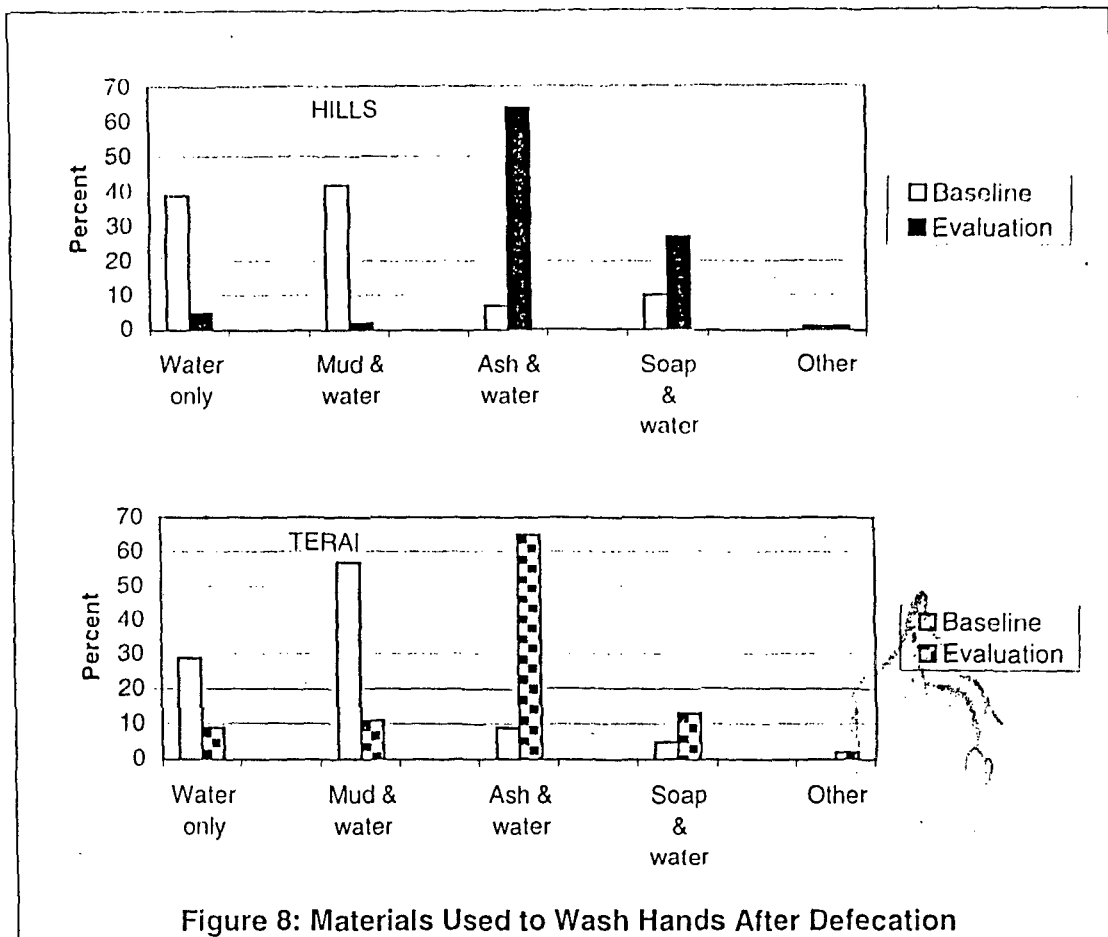


Figure 8: Materials Used to Wash Hands After Defecation

D) Food Hygiene

The proportion who covered leftover food is shown in Table 3, together with the percentage who had constructed a dish rack at the time of evaluation (Appendix 2, Table 11).

Table 3: Food Hygiene

FOOD HYGIENE	HILLS		TERAJ	
	Baseline	Evaluation	Baseline	Evaluation
Cover leftover food	50	92	69	88
Constructed dish rack	na	84	na	51

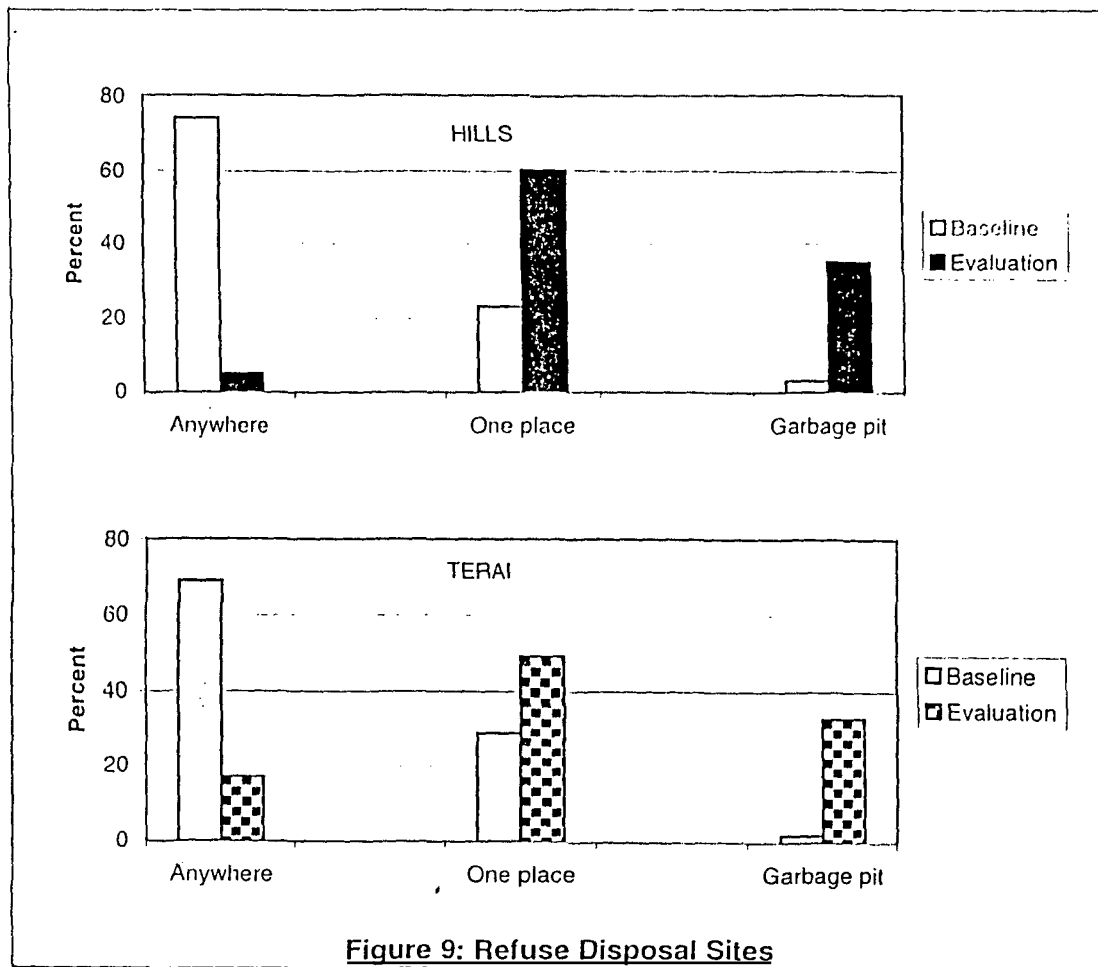


In the hills there was a marked increase to nearly 100% in the number of people who covered food, with a lesser increase in the Terai. Overall the great majority of households in the hills, but only half of those in the Terai, had constructed a dish rack. There were big differences between project areas, the numbers in the hills in different project areas who had constructed a dish rack ranged from 43% to 100%, and those in the Terai from 9% to 92%.

Hand washing practices are shown in Table 1. At the time of evaluation, nearly all people in both areas washed their hands before and after eating, an improvement on previous practices in the hills. Close to 90% also washed their hands before cooking and before feeding children (Appendix 2, Table 6).

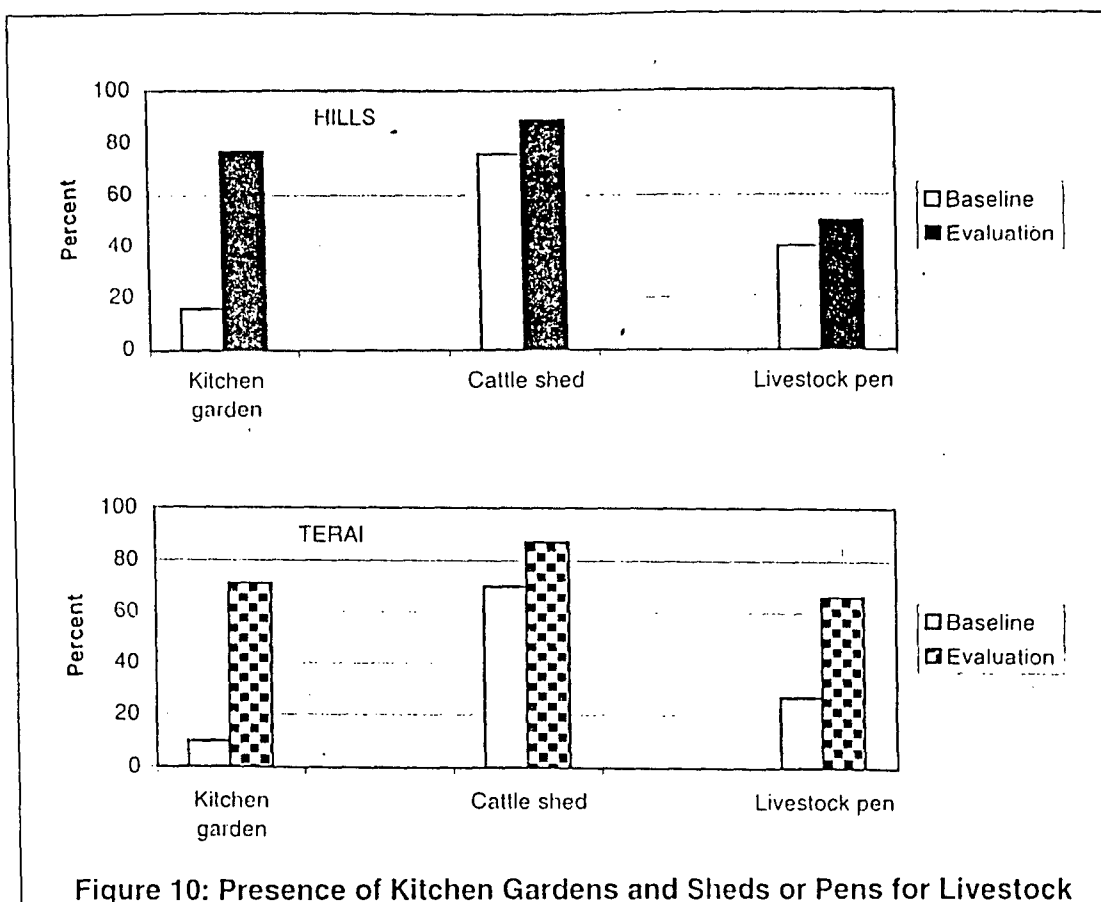
**E) Environment**

Figure 9 shows the sites used for refuse disposal (Appendix 2, Table 12). There was a marked improvement in behaviour, with the numbers throwing their refuse 'anywhere' dropping from 74% to 5% in the hills, and from 69% to 17% in the Terai



**Figure 9: Refuse Disposal Sites**

Figure 10 shows the number of households with kitchen gardens, and the numbers with separate sheds or pens for cattle and other livestock (Appendix 2, Table 13). There was a big increase in the percentage of households with kitchen gardens. The effect was marked, but the figures may have been influenced slightly by different wording in the baseline and evaluation surveys. There was a marked variation in different project areas. Changes from 0% to 100% before and after project implementation were recorded in some hill areas, and from 3% to 95% in one Terai area, but in other areas less than 40% had a kitchen garden at the time of evaluation (and only 3% in one exceptional area in the hills).



There was a small increase in the numbers with separate sheds or pens for cattle and other livestock in hill areas, and a big increase in the numbers with a separate pen for livestock in the Terai. These figures are likely to be an underestimate as they refer to all households, not just those with animals.

#### F) Knowledge about Diarrhoea and Rehydration

The number of people who had died from diarrhoea dropped dramatically from a total of 58 in the year prior to the baseline survey to zero in the year prior to the evaluation survey (Table 4, and Appendix 2, Table 14). There was a big difference between project areas in the original situation, the deaths prior to project implementation all occurred within 5 areas in the hills and 3 areas in the Terai.

Table 4: Number Dying of Diarrhoea in the Previous Year

DEATHS FROM DIARRHOEA		HILLS		TERAI	
		Baseline	Evaluation	Baseline	Evaluation
Age	0-15	26	0	16	0
	Adult	5	0	0	0
	Old	1	0	10	0
	Total	32	0	26	0

People's perception of the causes of diarrhoea also changed markedly (Figure 11 and Appendix 2, Table 15). The values from different projects were not exactly comparable as some interviewers allowed more than one answer to the question; even so the trend is clear. The proportion who recognised that contaminated hands are an important factor rose considerably in both the hills and the Terai, as did to a lesser extent the numbers recognising the role of contaminated water and food.

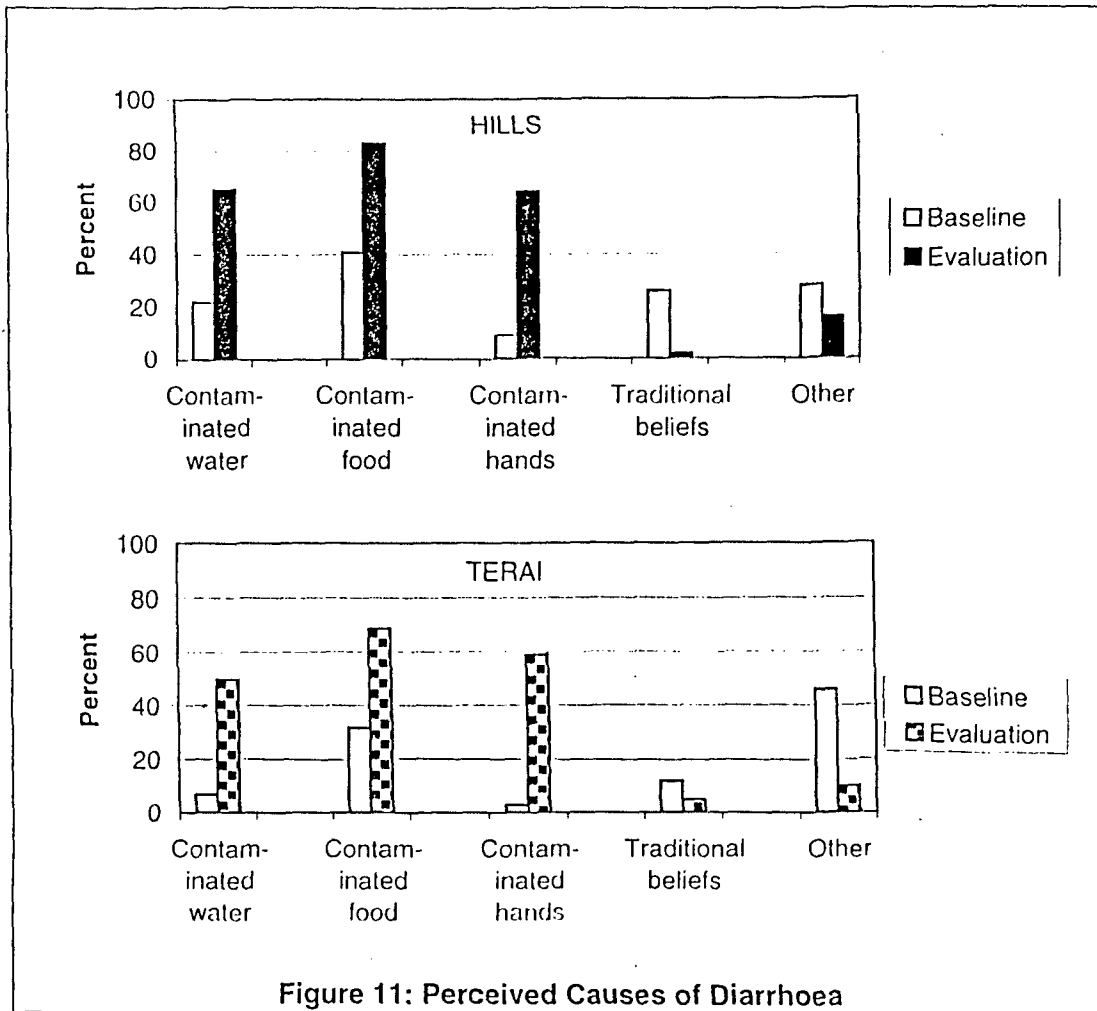


Figure 11: Perceived Causes of Diarrhoea

The methods used to treat diarrhoea also improved (Figure 12 and Appendix 2, Table 16). At the time of evaluation nearly three quarters of all households used Jeevan Jal (the brand name for oral rehydration solution, ORS), and the same percentage could prepare ORS accurately (Appendix 2, Table 16). Most other households said they would 'visit a health post'. There was considerable variation between project areas, however. In one Terai project, for example, only 20% of households knew how to prepare ORS accurately and in the same area only 30% intended to use Jeevan Jal for treatment, 50% preferring to visit a health post and 20% opting for domestic or herbal medicine.

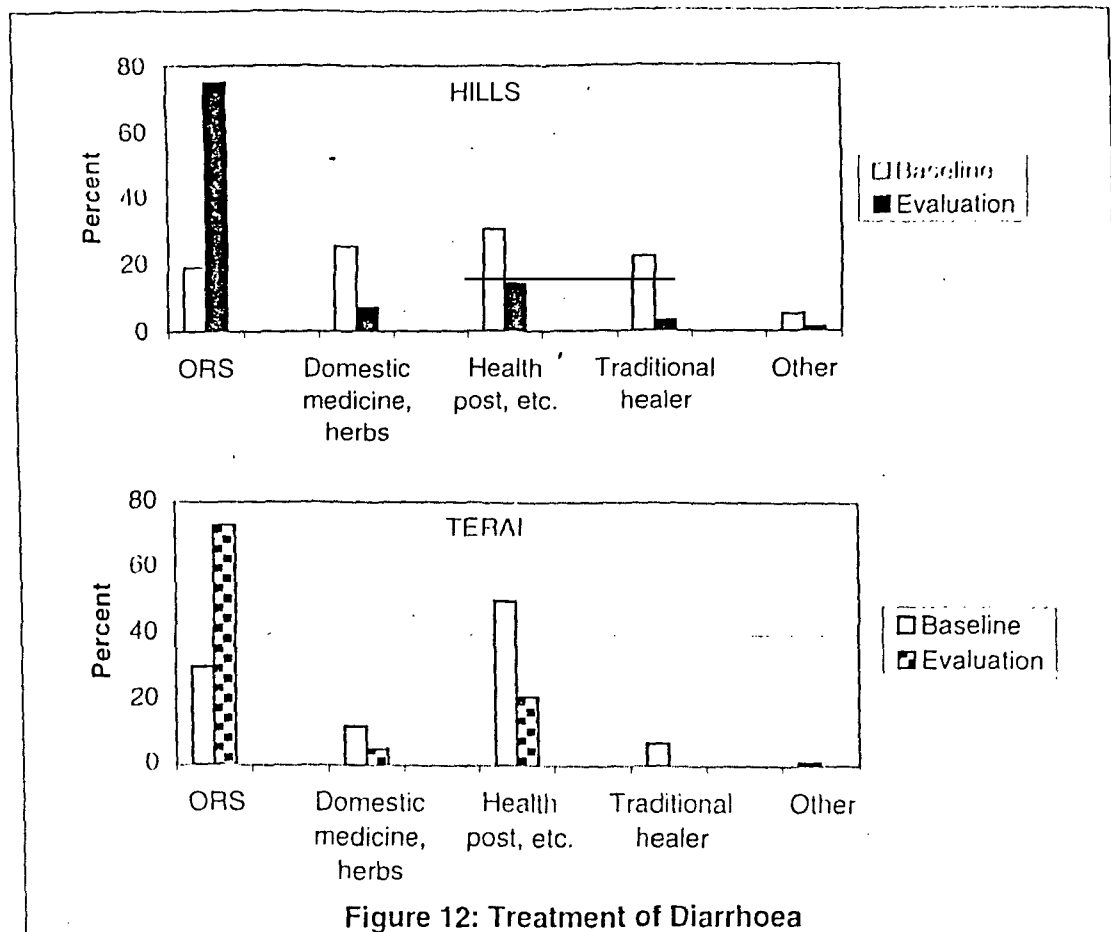


Figure 12: Treatment of Diarrhoea

## DISCUSSION

### Methods

Before discussing the significance of the findings, it is important to consider the validity of the methods used to obtain the information. Both PRA and household survey methods have advantages and disadvantages. All methods of gathering information must contend with the problem that people are desirous of giving the 'right' answer, one that will make them appear in a good light. Both mass meetings and household interviews can lead to 'false positive' answers (peer pressure to conform during PRA, and unwillingness to admit to bad practices face-to-face with an interviewer), and both situations can also encourage greater 'truth' (pressure from others who know what a person really does; being able to admit to something in the privacy of one's own home which would not be said in public).

PRA is widely used to obtain a picture of social conditions and collect information related to social factors in rural communities. One of the problems with PRA is that the skill of the facilitators has a considerable impact on the validity of the findings. The NEWAH staff responsible for the PRA in this study were provided with intense and ongoing training in facilitating, and the PRA framework was clearly defined with a specific focus on those aspects of hygiene attitudes, knowledge and practices, which should have reduced the problems associated with using different facilitators. Even so, it is unlikely that all facilitators brought the same skill to the task and the results in different projects could have been influenced by differences in the capabilities of facilitators. To a lesser extent the same applies to household surveys. The ability of interviewees to understand questions, and their willingness to provide 'true' answers, is clearly influenced by the approach of the interviewee.

Again results in different projects may have been influenced by differences in the approach used by interviewers, and results in baseline and evaluation surveys by the inclusion of health motivators as interviewers for the latter.

As far as the overall assessment of the impact of the hygiene education programme was concerned, the results obtained by the two methods, PRA and household interviews, when both were used to ask the same questions were very similar. The basic trends in hygiene attitudes, knowledge and practices were shown clearly by both. The differences between the results obtained by the two methods were more marked in individual projects, but cancelled each other out when averaged overall.

There were a number of deficiencies in the data that made it unsuitable for detailed statistical analysis. These included the changes in the number of households before and after project completion, the failure to ask all questions by the same methods in all projects, occasional inconsistency by interviewers in allowing or not allowing multiple answers to certain questions, occasional problems in the interpretation of questions, and differences in the wording of questions in the baseline and evaluation surveys. Notwithstanding these problems, the data was sufficiently consistent to show major changes clearly, and was thus appropriate for its purpose.

### Indicators of Change

The results indicate that there was a marked improvement in hygiene attitudes, knowledge and practices in the NEWAH project areas following project implementation. Changes were observed in all types of hygiene practice, not only those related directly to the use and storage of clean water. The indicators related to both 'known practices', practices actually observed by an interviewer, and 'stated practices', what people said they did.

#### A) Water Sources

At the time of evaluation, nearly everyone was collecting drinking water from a protected source (Fig. 1). The great majority took less than 15 minutes for a round trip to collect water, and the water supply was sufficient, so there was no reason for people to be especially careful in the use of water (Fig. 2).

#### B) Water Uses

Water container hygiene improved dramatically (Fig. 3). This was clearly a genuine change, the indicators observed by the interviewers had improved markedly, not just the reported practices. Before project implementation, the great majority reported cleaning their containers before filling with water, but around half of the containers observed had a layer of slime or algae inside which could be felt with the fingers. At the time of the evaluation survey, very few containers had slime inside, and the majority of containers were covered as well. The improvement in cleanliness was probably partly because people started using ash and water, or husks or straw and water to wash their containers (Fig. 4). These methods demand that the inside is really rubbed, not just rinsed, and ash is relatively sterile and straw/husks relatively clean in comparison with mud. (Mud is only recommended as a cleaning agent when ash, straw or husks are not available, and then very thorough rinsing is necessary.) Clearly many people were not as convinced about the importance of covering their water containers, particularly in the Terai (Fig. 3), and it may be that the education related to this point needs to be improved.

There was a clear improvement in the percentage who reported washing their hands at critical times, particularly in the hills where practices prior to hygiene education were worse than in the Terai. (Table 1). At the time of evaluation, almost 90% of people in both areas reported washing their hands at all 'critical times'. Washing before eating and before feeding children is particularly important as most people in Nepal eat directly with their hands. Just as important was the change in the materials reportedly used for hand washing after defecation

(Fig. 8), from water only or mud and water, to ash and water or soap and water. The hand washing practices were reported rather than observed, but the changes in response certainly showed that at the least people's awareness of the importance of hand washing and knowledge of the best materials to use had improved. However, there is no way of assessing how thoroughly people actually washed their hands, how hygienically they dried them, or whether they did in fact wash them as often as reported.

### C) Sanitation

Practices related to sanitation improved greatly. The big increase in the number of latrines, and in their state of cleanliness, meant that most people in the hills and many in the Terai no longer had to defecate in open places (Figs. 5 and 6). The change in the sites reportedly used for defecation is a rather unreliable indicator of changes in real practice, but must at least reflect a change in people's perception of what is an acceptable place for defecation (Fig. 5). The changes in the numbers and cleanliness of latrines were changes actually observed by the interviewers (Fig. 6). Clearly, after hygiene education the great majority of people were convinced of the benefits of having a latrine (compared with only half of those interviewed before), and many had taken advantage of the support provided by the project to build a latrine. Those with a latrine had also learnt how to clean it properly. However around 50% of those in the Terai, and 14% of those in the hills, who had recognised the need for a latrine had not built one either because it was too expensive, they had no manpower or they had no land (Appendix 2, Table 10). Clearly if there is to be any marked improvement in the future, a way must be found to help poor and landless people to gain access to adequate sanitation facilities.

The methods reportedly used to dispose of children's stool were better after hygiene education, although the change was less satisfactory than for other indicators (Fig. 7). Although these results refer to reported rather than observed practices, interviewers were able to determine whether there were any children's faeces visible near the house, and phrase their questions appropriately. After hygiene education very few people relied on animals to dispose of children's stool, and more people had latrines and thus were able to dispose of children's stool in this way. Even so a large number of people, including many with latrines, simply threw the stool as far away as possible. This may be a point where hygiene education could be improved.

### D) Food Hygiene

Food hygiene practices also improved (Table 3). However, although the majority of people covered leftover food there were still as many as 30% in some project areas who did not. It may be that some of these never had leftover food, although those who said so specifically were not included in the assessment. There were big differences between different project areas in the number who were observed to have constructed a dish rack at the time of evaluation, with a much lower proportion overall in the Terai than in the hills. The reasons for this are not clear, but it may reflect the lack of availability of suitable construction materials as well as differences in the effectiveness of hygiene education.

### E) Environment

Practices related to the environment also changed markedly for the better (Figs 9 and 10). The great majority of people said that they had stopped throwing their rubbish just anywhere and started using a 'single place', although this was still more likely to be an unprepared site than an actual garbage pit. Only one third reported using an actual garbage pit so that there is considerable room for improvement. No questions were asked about the treatment of garbage after disposal (burning, digging in).

Kitchen gardens were promoted as an effective and environmentally friendly way of disposing of waste water, and at the same time improving nutrition and providing a possible source of income. A large number of people were observed to have started a kitchen garden.

but there was a big variation between project areas. Again the reasons are unclear. Those who had no garden may have been limited by lack of any or suitable land, lack of access to seedlings, insufficient expertise, or lack of manpower. Equally, the education on this topic may not always have been sufficiently convincing.

#### *F) Knowledge about Diarrhoea and Rehydration*

One of the major indicators of the positive impact of the project on the lives of beneficiaries was the reduction in the reported number of deaths from diarrhoea from fifty-eight in the year preceding the baseline survey to zero in the year preceding the evaluation survey (Table 4). This is likely to indicate a reduction in total incidence, or at least in severity, of diarrhoea cases as well, although this information was not collected. Clearly access to clean water will have played a major role in the change. But improved knowledge of the causes of diarrhoea, the resultant improvements in hygiene practice, in particular the use of latrines, and the increased knowledge of treatment using ORS are also likely to have been major contributing factors (Figs. 11 and 12). Following hygiene education there was a dramatic improvement in the overall proportion of people observed to prepare ORS accurately, from around 10% to more than 70%, and a similar increase in the numbers intending to use ORS to treat diarrhoea. There was considerable variation between project areas, however, and this may be one point where hygiene education requires strengthening.

#### **General**

Taken overall the results are very encouraging. Clearly the hygiene education programme had a major impact on people's knowledge about and attitudes towards a whole range of hygiene practices. Changes were observed in 'known practices', practices actually observed by an interviewer, as well as in 'stated practices', indicating that at least some of the observed effects were real. Access to clean water will have played a major role, without sufficient water it is not possible to have a clean latrine or wash your hands properly, but water itself was only one aspect of the improvement. The majority of people had understood the need for and knew how to store water hygienically; they had realised the importance of cleaning their hands, of isolating faeces from the environment, of protecting leftover food from contamination, and of disposing of refuse in one place; and they understood much more about the causes of diarrhoea, how to prevent its transmission and how to treat it. The reduction in deaths from diarrhoea is an indication of the major impact the projects had on people's lives.

It appears that the approach to hygiene education used by NEWAH is successful, and that the desired messages are reaching those they are aimed at. There is still room for improvement, however, and in some areas the approach may need to be modified. The impact in some individual project areas appeared to be less marked than in others. A study of these, and the reasons for the differences, might help in identifying ways of improving the programme. One area which might need to be strengthened is that of the policy towards local health motivators. At present, the local health motivators are recruited from the project area for the duration of project implementation (one year). During this time they receive training and then implement the hygiene education programme. The advantage of this approach is that those carrying out hygiene education are recruited directly from the local community, and are presumably more aware of the specific features of the community and are more 'acceptable' as educators than someone from outside. The disadvantage is that their skills are lost to the programme at the end of the year, and they are unable to use the experience they gain to improve their implementation of the education programme. Instead of building up a pool of skilled educators, NEWAH allocates considerable resources to training a new group of people every year. This may be one reason for the variability in the impact of the programme in different project areas.

Overall the effects in the Terai areas were not as marked as those in the hills. There are various possible explanations. One is that there were a larger number of landless people in

the Terai. Such people are less able to carry out certain improvements like building a latrine, and may have a less clear feeling overall of being in control of their own lives, and thus less responsible for and able to change their conditions. Equally the Terai projects were much larger, and this may have affected the 'intimacy' of the hygiene education programme and led to a greater feeling of being talked to by outsiders. It is possible that the approach to hygiene education needs to be changed slightly for projects in the Terai.

One major limitation of the study is that it only refers to changes in hygiene attitudes, knowledge and practices observed immediately after project completion, when hygiene education was still fresh in people's minds. It is also important to know the long-term effect on people's lives, whether there is a gradual return to former behaviour, or a continued improvement as the benefits become clearer and others convinced of the need for change. In the future, NEWAH would like to evaluate hygiene practices after a further four years or more, and thus assess long-term improvements resulting from hygiene education. The first pilot studies are in progress.

## CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the hygiene education programme appears to have been very successful, and had a major impact on people's behaviour, at least in the short-term. Marked improvements were observed in all types of hygiene attitudes, knowledge and practices, from water storage to sanitation. Changes were observed in both 'known practices' (those actually observed by an outside observer) and 'stated practices' (those reported by the interviewees, some of which may reflect changes in attitude rather than actual changes in behaviour). Nevertheless, there is still room for improvement. The impact in the Terai was consistently poorer than in the hills, and the impact in some project areas was not satisfactory. By studying the differences between areas where education was more or less successful, it should be possible to identify possible improvements to the hygiene education programme. A change in the policy related to the recruitment of local health motivators should be considered.

Where they could be compared, the overall results obtained by PRA and household survey techniques were very similar. Since NEWAH is interested in identifying major changes in hygiene attitudes, knowledge and practices, not small differences, it should be sufficient in the future to obtain most information by PRA alone, at least for the purpose of assessing the overall impact of the programme. The household survey is very labour intensive and time consuming, and should be limited to questions where the interviewer really needs to observe or where very accurate information is required. Before a final decision is taken, the differences in the information obtained for individual projects should be studied, and the need to assess the impact of the programme in individual areas taken into account. Both the framework for PRA and the household survey need to be reviewed to ensure that the most appropriate information is being collected, that the information collected is necessary, and that there is consistency between the baseline and evaluation surveys. (A partial revision has already taken place.) Finally, interviewers and meeting facilitators need to be given more detailed guidelines on question interpretation, the number of answers allowed to particular questions, and interpretation of answers provided under the category 'other'. This will improve the comparability of the results obtained in different project areas.



### APPENDIX 1: List of Projects PROJECTS IN HILL DISTRICTS

LIST NO.	PROJECT NO.	VILLAGE NAME	BASELINE			EVALUATION		
			Total HHs*	HHs in Survey	Total Beneficiaries	Total HHs	HHs in Survey	Total Beneficiaries
1	1450	MULPANI	81	40	433	81	40	433
2	1451	ANTITAR	67	34	371	62	28	397
4	1454	BAUSE	82	36	484	75	37	475
5	1456	BHANGO	68	34	475	88	44	517
7	1458	BIDHANG	26	12	138	24	12	134
8	1459	CHAPTAR	21	11	128	22	11	128
9	1461	CHILAUNEBAS	214	54	1320	168	30	1095
10	1462	DANDAGAUN	78	40	508	75	37	531
11	1463	DANDAKHOLI	40	25	240	38	19	252
12	1465	DHANBANG	44	44	247	38	19	218
13	1466	DHUSHA	33	17	221	34	17	216
14	1467	DUMLYATI	126	32	701	75	37	474
15	1468	GARAPANI	60	60	271	54	27	294
16	1469	GAURI	105	26	585	105	26	620
17	1470	KATUNJE	42	23	264	39	20	227
18	1471	KUSHADEVI	60	30	336	59	29	352
19	1472	LEKHPHARSA	300	75	1638	315	78	na
20	1474	MANDRA	30	13	188	28	28	191
21	1475	MATHILLO JALPA	157	43	989	164	45	998
22	1477	OKHALDHUNGA	19	16	130	15	15	104
23	1478	PALLO TARI	58	25	289	58	25	267
24	1479	PATGAUN BESHI	61	29	475	55	29	447
25	1482	RAKHA BANGDEL	83	42	432	65	33	342
26	1484	RATAMATA	48	24	na	52	25	292
27	1485	RATMATE	53	27	361	54	27	363
28	1486	SATUKA	71	34	462	69	35	430
29	1487	SEMJONG	255	63	1484	246	62	1394
30	1490	SHRIPUR	70	35	335	63	31	322
31	1491	SIMPANI	60	30	417	36	16	189
32	1493	SOLMA	119	30	739	105	27	665
33	1494	TABAI	54	25	288	43	21	220
34	1495	TALLO JALPA	100	25	580	70	35	310
35	1496	TAPLUNG	136	34	746	134	33	743
36	1497	TASARPU	103	26	529	100	25	529
37	1498	TEKANPUR	112	28	822	111	28	830
38	1499	THAKRE	278	69	1676	237	60	1488
39	1550	THULITAR	87	44	651	81	40	560
		<b>AVERAGE</b>	92	34	554	85	31	474

\*HHs = Households, na = not asked

## PROJECTS IN TERAI DISTRICTS

LIST NO.	PROJECT NO.	VILLAGE NAME	BASELINE			EVALUATION		
			Total HHs*	HHs in Survey	Total Beneficiaries	Total HHs	HHs in Survey	Total Beneficiaries
1	1452	ASHANPUR	730	185	4159	640	160	3487
2	1455	BELAWA	629	140	3940	359	89	2416
5	1473	MAGARAGADI	763	191	5445	590	147	4393
7	1480	PIPRA POKHARIYA	642	165	3325	641	162	3277
8	1481	PRATAPUR	426	64	3155	360	81	2285
9	1483	RATAULI	577	145	2968	578	144	3115
10	1488	SHANTIPUR	859	215	4384	581	145	na
11	1489	SHIVAPUR	134	32	1223	128	39	1208
12	1492	SITAPUR	711	179	3880	543	134	3010
		AVERAGE	608	146	3609	491	122	2899

\*HHs = Households, na = not asked

## APPENDIX 2: Tables of Values

HHS = Household Survey; PRA = Participatory rural appraisal; na = not asked  
 All figures are percentages of total households except where otherwise stated. The figures are simple averages of the results obtained in the 39 hill projects and 9 Terai projects (Appendix 1). The complete data set can be obtained from NEWAH on request.

### A) WATER SOURCES

Table 1: Collection Points for Drinking Water

WATER COLLECTION POINT	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Tapstand	0	0	98	98	0	0	0	0
Tubewell/deep tw/hand dug well <sup>1</sup>	2	2	0	0	44	45	97	96
Well/kuwa <sup>2</sup>	65	64	1	1	54	51	3	4
River/stream/canal	19	18	0	0	2	3	0	0
Other <sup>3</sup>	14	16	1	1	0	0	1	1

<sup>1</sup>Project hand dug well, partially protected; <sup>2</sup>Simple unprotected well; <sup>3</sup>Other includes: wooden tap, temporary pipe (hills baseline), private, temporary pipe (hill eval.), private (Terai eval.)

Table 2: Using Project Water Supply & If Not Why Not?  
 (Evaluation HHS only)

PROJECT WATER SUPPLY	HILLS	TERAI
Using project water supply?	93	93
If not, why not?		
Traditional source more convenient	75	0
Poor taste	0	21
Water unhealthy	0	0
Conditions at water point unsanitary	0	0
Supply unreliable	25	20
Other*	0	59
Water supply sufficient?		
Yes, hot season	94	80
Yes, cold season	94	80
Yes, all year	94	81

\*Other includes: too far, private tw, not completed

Table 3: Round trip water collection times

WATER COLLECTION TIMES	HILLS							
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
0-15 minutes	21	26	85	87	71	71	97	95
15-30 minutes	33	32	14	11	18	20	1	
>30 minutes	46	41	1	2	11	10	2	

## B) WATER USES

**Table 4: Water Container Hygiene**

(HHS/PRA not directly comparable as in many projects question 'clean?' na in HHS)

CONTAINER HYGIENE	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Do you clean before filling, yes	69	78	95	98	89	89	99	100
Slime/algae inside container*	na	59	na	8	na	47	na	4
Container covered*	na	15	na	80	na	15	na	52

\*Interviewer observation

**Table 5: Materials used to clean water container**

(PRA/HHS not directly comparable, in HHS this question na in many projects and in some projects multiple answers allowed)

CLEANING MATERIALS	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Water only	46	42	6	8	54	59	9	17
Mud and water	22	25	1	2	21	16	5	7
Ash and water	19	28	84	81	13	9	52	64
Soap and water (and steel wool)	na	na	0	1	na	na	0	0
Other*	1	5	10	8	13	16	35	12

\*Other includes husks, leaves, or straw and water, and 'anything'

**Table 6: Hand Washing at Critical Times**

(PRA/HHS not directly comparable: in HHS question na in some projects, multiple answers only allowed in some projects. In PRA separate pie charts compiled for each answer.)

HAND WASHING PRACTICES	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
After defecation	62	66	93	90	84	76	94	84
Before eating (meals)	74	78	98	96	96	89	98	78
After eating (meals)	86	80	99	93	97	88	98	64
After touching dirt/waste	62	58	93	66	92	82	90	64
Before cooking	na	na	89	87	na	na	89	72
Before feeding child	na	na	87	73	na	na	89	52

\* 3 of 9 Terai projects not asked this question in evaluation survey

### C) SANITATION

**Table 7: Sites Used for Defecation**

(PRA/HHS not directly comparable: question na in some projects.) For evaluation, figures for latrine use taken to be percentage with latrine in house.

DEFECATION SITES	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Latrine	10	18	81	81	4	4	36	31
Jungle	30	28	7	7	10	10	5	7
Stream/ravine	25	36	3	4	15	16	9	6
Open field (& vegetable garden)	18	14	5	4	71	70	38	42
Anywhere	16	6	3	5	0	0	13	13

**Table 8: Means of Disposal of Children's Stool (HHS only)**

(Only households with children)

CHILDREN'S STOOL DISPOSAL	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
Latrine	2	59	1	30
Cover with mud	6	7	0	4
Call animal	20	3	13	0
Throw far away	57	26	86	56
Nothing	1	0	0	0
Other*	13	5	0	13

\*Other includes: in manure pit, throw anywhere/field (hill baseline); in manure pit, river (hill evaluation); bush, field, manure pit (Terai evaluation)

**Table 9: Materials Used to Wash Hands After Defecation**

HAND WASHING MATERIALS	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Water only	39	34	5	5	29	29	9	16
Mud and water	42	44	2	2	57	58	11	16
Ash and water	7	9	64	64	9	9	65	56
Soap and water	10	13	27	28	5	5	13	13
Other*	1	5	1	1	0	1	2	2

\*Other includes leaves or husks and water

Table 10: Latrines: Presence, Cleanliness and Reasons for Not Building or Building (HHS only)

LATRINES	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
Latrine in house	19	81	4	36
Latrine clean <sup>1</sup>	30	96	43	91
Clean with				
Ashes		22		15
Water only		25		27
Brush and water		66		58
Soap and water		2		0
Other <sup>2</sup>		2		0
Type of latrine				
Simple pit with cover		30		16
Pan slab with pit cover		60		7
Water seal single pit		3		38
Water seal double pit		0		35
Other <sup>3</sup>		7		0
Reasons for building <sup>4</sup>				
Convenience		56		30
Cleanliness		69		46
Health		54		32
Pressure from others		1		3
Other <sup>5</sup>		17		20
Reasons for not building <sup>6</sup>				
Not needed	47	3	56	17
Too expensive	14	18	33	38
Knowledge inadequate	26	0	1	2
Materials not available	11	24	4	4
Other <sup>7</sup>	15	55	7	39
Problems with latrine <sup>4</sup>				
Flies		1		0
Smelly		1		0
Pit full of water (rainy season)		0		5
Inconvenient for children		0		1
Other		0		0
When pit full do what?				
Abandon latrine		2		0
Dig out (and use as compost)		14		13
Build another somewhere else		68		60
Cover pit and plant tree sapling <sup>8</sup>		16		2
Other <sup>8</sup>		5		34

<sup>1</sup>Interviewer observation. <sup>2</sup>Other includes don't know, still building. <sup>3</sup>Other mostly latrines built by other projects. <sup>4</sup>Only households with latrine. <sup>5</sup>Other includes for privacy (shame), prestige, ease (hills); and to prevent disease and for privacy (Terai). <sup>6</sup>Only households without latrine. <sup>7</sup>Other includes no land, no tradition, no manpower/time, no water (hills basel.); no manpower/time, no money (hills eval.); no land (Terai basel.); no land, no manpower (Terai eval.). <sup>8</sup>Some, and probably all, intended to build a latrine too, only a few interviewers allowed multiple answers. <sup>9</sup>Other includes permanent, i.e. septic tank (hills and Terai), clean pit and reuse (twin pit latrines in the Terai).

**D) FOOD HYGIENE**

For hand washing practices see Table 6 above

Table 11: Leftover food covered, dish rack constructed? (HHS only)

FOOD HYGIENE	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
Cover leftover food*	50	92	69	88
Constructed dish rack*	na	84	na	51

\*Interviewer observation

**E) ENVIRONMENT**

Table 12: Refuse disposal sites

(PRA/HHS not directly comparable: PRA na in some projects.)

REFUSE DISPOSAL SITES	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
Anywhere	66	74	8	5	76	69	12	na
At one place	26	23	56	60	16	29	43	49
In a garbage pit	8	3	37	35	8	2	45	33

Table 13: Kitchen garden and animal sheds/pens (HHS only)

KITCHEN GARDEN ANIMAL SHEDS/PENS	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
Have kitchen garden	16	77	10	71
Have shed/pen for*				
cattle	76	89	70	87
goats, chickens, ducks, etc.	40	50	27	66

\*percentage of all households, includes those with no animals; interviewer observation



## F) KNOWLEDGE ABOUT AND TREATMENT OF DIARRHOEA

Table 14: Number Dying of Diarrhoea in the Last Year (HHS only, absolute numbers)  
(Triangulation through seasonal calendar, figures not shown)

DEATHS FROM DIARRHOEA		HILLS		TERAI	
		Baseline	Evaluation	Baseline	Evaluation
Age	0-15	26	0	16	0
	adult	5	0	0	0
	old	1	0	10	0
	<b>Total</b>	<b>32</b>	<b>0</b>	<b>26</b>	<b>0</b>

Table 15: Perceived Causes of Diarrhoea (HHS only)

CAUSES OF DIARRHOEA	HILLS		TERAI	
	Baseline	Evaluation	Baseline	Evaluation
Contaminated water	22	65	7	50
Contaminated food	41	83	32	69
Contaminated hands	9	64	3	59
Traditional beliefs	26	2	12	5
Other*	28	16	46	10

Other includes: don't know, undigested food, 'hot & cold'

Table 16: Methods Used to Treat Diarrhoea, and Preparation of ORS  
(PRA/HHS not directly comparable: multiple answers sometimes allowed in HHS in some projects.)

DIARRHOEA TREATMENT	HILLS				TERAI			
	Baseline		Evaluation		Baseline		Evaluation	
	PRA	HHS	PRA	HHS	PRA	HHS	PRA	HHS
ORS (Jeevan Jal )	19	21	75	80	30	29	73	72
Domestic medicines or herbs	25	23	7	7	12	13	5	5
Health post, etc.	30	31	14	13	50	54	21	23
Traditional healer	22	20	3	2	7	5	0	1
Other*	5	3	1	2	1	1	0	3
ORS preparation correct <sup>#</sup>		9		78		16		71

\*Other includes: do nothing, rice starch with salt, eat certain foods

<sup>#</sup>Interviewer observation



## APPENDIX 3: Questionnaires

### Appendix 3a: Baseline Survey Questionnaire

#### Guidelines for the use of this format:

1. This format is a guideline to collect information on the basis of PRA/RRA.
2. For the evaluation, the information has to be obtained by interviewing and observing 25% households if the total beneficiary households are 100 or more, 50% households if the total beneficiary households are less than 100 but more than 20, 100% households if the total beneficiary households are 20 or less. Households are selected on the basis of simple random sampling. (*Note: in practice clustered sampling used. ed.*):
3. In order to get accurate information, divide the beneficiaries into different groups (i.e., male/female group, privileged groups, etc.) as necessary and gather information by interviewing them individually or in a group, and also by observation and triangulation method of PRA/RRA.
4. Observe the surroundings of selected households for triangulation (cross-checking) and fill in the information in form 1.
5. Include all beneficiaries in a mass gathering/meeting as far as possible.
6. Collect the information using PRA/RRA techniques as given on the right hand side of each question.
7. The given possible answers are only for the guidance of information collectors.
8. Present the findings of the baseline survey to all beneficiaries in a mass gathering and provide a copy of it to the community.

#### **General Information:**

Name of Project :  
 Name of Village :  
 Ward Number :  
 Name of Information Collector :  
 Name of Information Provider :  
 Date of Information Collection :  
 Number of Households :  
 Total No. of Population :  
     Male :  
     Female :  
 0-5 Year old children :  
 6-15 Year old Children :

**A. DISTRIBUTION OF WATER SUPPLY:**

1. From where do you fetch your drinking water? *(Pie chart + individual HH interview)*
  - a. Spring /Kuwa
  - b. River /stream
  - c. Unprotected well
  - d. Private tubewell
2. Show the seasonal availability of water in a year and time to collect the water in each month. *(Seasonal calendar + counter & sticks)*
3. How long does it take to go to your usual water point, fetch water and come back? *(Individual HH interview + pie chart)*
  - a. 0-15 minutes
  - b. 15- 30 minutes
  - c. 30 minutes over
4. Do you promote kitchen gardening during the dry season? *(Individual HH interview)*
  - a. Yes
  - b. No.

**B. HEALTH AND SANITATION:**

1. Do you clean the inside of water storage container before fill it? *(Individual HH interview + pie chart)*
  - a. Yes.
  - b. No.
2. If yes, with what do you clean the inside of your water storage container? *(Individual HH interview + pie chart)*
  - a. Water only
  - b. Mud & water
  - c. Ash & water
  - d. Straw & water, etc.
3. Is there slime/algae on the inside of the water storage container? *(Observation)*
  - a. Yes
  - b. No
4. Is the water storage container covered or not? *(Observation)*
  - a. Yes
  - b. No
5. When do you wash your hands? *(Individual HH interview + pie chart)*
  - a. After defecation
  - b. Before eating meal
  - c. After eating meal
  - d. After touching dirt/waste, etc.
6. With what do you wash your hands after anal cleaning (defecation)? *(Individual HH interview + pie chart)*
  - a. Water only
  - b. Mud & water
  - c. Ash & water
  - d. Soap & water etc.
  - e. other

7. Is leftover food/milk kept covered? *(Observation)*  
 a. Yes  
 b. No
8. Where do you dispose of your household garbage? *(Individual HH interview + pie chart + observation)*  
 a. Anywhere  
 b. At one place / manure pit  
 c. In a garbage pit
9. Do you have separate cattleshed or pen to keep your domestic animals/ livestock? *(Individual HH interview + observation)*  
 Cattleshed                      pen  
 a. Yes  
 b. No

#### C UTILISATION OF LATRINE:

1. Where do you go for defecation? *(Individual HH interview + pie chart)*  
 a. Jungle  
 b. Stream /ravine  
 c. Open field  
 d. Latrine, etc.
2. How many latrines are there in this village? *(Pie chart + social map)*
3. Do you have latrine in your house? *(Individual HH interview + observation)*  
 a. Yes  
 b. No
4. If yes, is the latrine clean and sanitary? *(Observation)*  
 a. Yes  
 b. No
5. Why did you build a latrine? *(Individual HH interview)*  
 a. Latrine is not needed  
 b. Too expensive  
 c. Inadequate knowledge  
 d. Materials not available, etc.
6. If your children defecate around the house what do you do about it? *(Individual HH interview)*  
 a. Dispose of stool in toilet and clean the area with ash  
 b. Cover with mud  
 c. Call dog /pig/chicken to eat it  
 d. Throw it far away and plaster the area with mud & water or cow dung, etc.

#### D. DIARRHOEA AND REHYDRATION:

1. In which month does diarrhoea occur commonly in your village? *(Seasonal calendar)*

- 2.(i) Has anyone died of diarrhoea within this year? *(Individual HH interview seasonal calendar with counter & sticks)*
- a. Yes  
b. No
- 2.(ii) If yes, how many persons of which age group died?
- a. Old persons  
b. Adults  
c. Children (0-15 years)
3. What you think are the causes of diarrhoea? *(Individual HH interview)*
- a. Contaminated water  
b. Contaminated/ rotten food  
c. Contaminated hands  
d. Traditional belief, etc.
4. How do you treat diarrhoea? *(Individual HH interview pie chart)*
- a. Jeevan-jal /salt-sugar-water solution  
b. Domestic medicines or herbs  
c. Health post /hospital /clinic  
d. Traditional healers
5. How do you prepare jeevan-jal or salt-sugar-water solution? Please explain & show if possible. *(Individual HH interview observation)*
- E. LOCAL RESOURCES /OPPORTUNITIES OF HEALTH & SANITATION:**
1. Are there any local health workers? *(Group interview)*
- a. Trained health workers  
b. Homeopathic healers (Vaidhya)  
c. Traditional birth attendants  
d. Traditional healers
2. What are the locally available health services or health agencies? *(Social map)*
- a. Health post /health centre  
b. Medical clinic  
c. Hospital, etc.
3. Are there any literate/educated local women? *(Group interview)*
- Married                      Unmarried
- a. 8th grade or more passed  
b. 8th grade failed but 7th grade passed.
4. Which language do you speak mostly in this village? *(Group interview)*
- a. Nepali  
b. Maithili  
c. Tamang /Gurung /Magar  
d. Rai / Limbu
5. Are the houses scattered or crowded together? *(Social map + observation)*
- a. Crowded  
b. Scattered

## TABLE OF OBSERVATION

Name of Observer :

Date of Observation :

S. No.	Subject Matter	No. of HH Observed.	HH (Yes)	HH (No)	Not Observed HH	Remarks
1.	Is there slime/algae on the inside of the water container?					
2.	Is the water storage container covered?					
3.	Is leftover food/milk kept covered?					
4.	Do you dispose of your household garbage in one place?					
5.	Do you have separate cattleshed away from your house?					
6.	Do you have separate pen for goats, chicken and ducks, etc. away from the house?					
7.	Have you built a latrine?					
8.	If yes, is it clean & sanitary?					
9.	Is there children's excreta around the house?					
10.	Is jeevan-jal/salt-sugar-water solution preparation method accurate?					





## Appendix 3b: Evaluation Survey Questionnaire

### Guidelines for the use of this format:

1. This format is a guideline to collect information on the basis of PRA/RRA.
2. For the evaluation, the information has to be obtained by interviewing and observing 25% households if the total beneficiary households are 100 or more, 50% households if the total beneficiary households are less than 100 but more than 20, 100% households if the total beneficiary households are 20 or less. Households are selected on the basis of simple random sampling. (*Note: in practice clustered sampling used. ed.*)
3. In order to get accurate information, divide the beneficiaries into different groups (i.e., male /female groups, privileged groups, etc.) as necessary and gather information by interviewing them individually or in a group, and also by observation and triangulation method of PRA/RRA.
4. For the observation, fill in the forms 1 and 2 by observing the surroundings of the given percentage of households.
5. Include all beneficiaries in a mass gathering/meeting as far as possible.
6. Collect the information given on the right hand side of each question using PRA/RRA techniques.
7. The given possible answers are only for the guidance of information collectors.
8. Present the findings/results of the evaluation to all beneficiaries at a mass gathering, and formally hand over the programme.

### General Information:

Name of Project :

Name of Village :

Ward Number :

Name of Information Collector :

Name of Information Provider :

Date of Information Collection :

Number of Households :

Total No of Beneficiaries :

**A. DISTRIBUTION OF WATER SUPPLY.**

1. From where do you fetch your drinking water? *(Pie chart)*
  - a. Tapstand
  - b. Tubewell/DTW/HDW
  - c. Unprotected well/kuwa
  - d. River/stream/canal
2. Does the supply give enough water during the hot and cold season? *(Individual/ group interview)*
  - a. Yes in hot season
  - b. No in hot season
  - c. Yes in cold season
  - d. No in cold season
  - e. Yes in both season
3. How frequently do water supply breakdowns occur? *(Individual/ group interview)*
  - a. Never
  - b. Dry season
  - c. Monthly
  - d. Weekly
  - e. Others (explain)
4. For how long do breakdowns last? *(Individual/ group interview)*
  - a. 0-1 day
  - b. 1-7 days
  - c. 7 days
5. How do you participate in the repair of tapstand/ tubewell? *(Individual /group interview)*
  - a. Providing money to the caretaker
  - b. Providing grain to the caretaker
  - c. Providing money for spare parts
  - d. a and c
  - e. Other (explain)
6. How long did it take to go to your usual water point, fetch water and come back? *(Individual/ group interview & pie chart)*
  - a. 0-15 minutes
  - b. 15-30 minutes
  - c. > 30 minutes
7. How long does it take to go to the project water point, fetch water and come back now? *(Individual/ group interview & pie chart)*
  - a. 0-15 minutes
  - b. 15-30 minutes
  - c. >30 minutes
8. What do you do in your spare time? *(Individual/group interview)*
  - a.
  - b.
  - c.
  - d.
9. Do you promote kitchen gardening in your spare time? *(Individual/group interview)*
  - a. Yes
  - b. No
10. Are you using water from the project water supply? *(Individual/group interview)*
  - a. Yes
  - b. No

11. If no, why are you not using the water supply *(Individual/group interview)*
- Traditional source is more convenient.
  - Water from the supply does not taste good.
  - Considers water from the supply unhealthy.
  - Conditions at water point are unsanitary.
  - The supply is unreliable.
  - Other (explain)

12. How do you think that the water supply services should be improved? *(Individual/group interview)*
- More information to and involvement of consumers.
  - Improvements in maintenance.
  - Other (explain)

**B. HEALTH AND SANITATION:**

1. Do you clean inside the water storage container before filling it? *(Pie chart)*
- Yes
  - No

2. If yes, with what do you clean the inside of your water storage container? *(Pie chart)*
- |                 |                            |
|-----------------|----------------------------|
| a. Water only   | e. Straw & water           |
| b. Mud & water  | f. Husks & water           |
| c. Ash & water  | g. Leaves & water          |
| d. Soap & water | h. Steelwool & soapy water |

3. Is there slime/algae on the inside of the water storage container? *(Observation)*
- Yes
  - No

4. Is the water storage container covered or not? *(Observation)*
- Yes
  - No

5. Have you constructed a dish drying rack or not? *(Observation)*
- Yes
  - No

6. When do you wash your hands? *(Pie chart)*
- |                     |                         |
|---------------------|-------------------------|
| a. After defecation | e. After touching waste |
| b. Before cooking   | f. Before feeding child |
| c. Before eating    | g. Other (explain)      |

7. With what do you wash your hands after defecation? *(Pie chart)*
- Water only
  - Mud & water
  - Ash & water
  - Soap & water
  - Husks & water

8. Is leftover food/milk kept covered? *(Observation)*
- Yes
  - No

9. Where do you dispose of your household garbage? *(Pie chart observation + list)*
- Anywhere
  - At one place/manure place
  - In a garbage pit

10. Do you have a separate cattle shed or pen? *(Observation + belongings list)*
- |    | Cattle shed | Pen |
|----|-------------|-----|
| a. | Yes         |     |
| b. | No          |     |
- C UTILISATION OF LATRINES:**
1. Have you built a latrine? *(Observation + belongings list)*
- a. Yes  
b. No
2. If yes, which type of latrine have you got? *(Observation + belongings list)*
- a. Simple pit latrine with pit cover  
b. Pan slab with pit cover (without water seal)  
c. Water seal single pit  
d. Water seal double pit
3. Why did you build the latrine? *(Individual/group interview)*
- a. For convenience  
b. For cleanliness  
c. For health  
d. By pressure of others
4. Is the latrine clean and sanitary? check following: *(Observation)*  
 stool not seen around the pit hole  
 clean slab  
 well fitting lid water seal  
 no flies  
 separate water vessel for anal cleaning  
 Yes                      No
5. What do you use to keep the latrine clean? *(Individual/group interview)*
- a. Ashes  
b. Water only  
c. Brush/broom and water  
d. Soap/detergent and water
6. When the latrine pit becomes full after sometime what would you / do you do? *(Individual/group interview)*
- a. Abandon the latrine.  
b. Dig out the pit and re-use compost.  
c. Build another latrine somewhere else  
d. Cover the pit and plant a fruit sapling.
7. Is there any problem in the utilisation of the latrine? *(Individual/group interview)*
- a. Lot of flies.  
b. Smelly.  
c. Pit full of water during rainy season.  
d. Inconvenient for children to use.
8. In your opinion, what are the ways to improve the latrine? *(Individual/group interview)*
- a.  
b.  
c.  
d.

9. Which members of the household use the latrine? *(Individual /group interview)*
- Male
  - Female
  - Children (1-15 years)
  - Old persons
10. If you do not have a latrine where do you defecate? *(Pie chart)*
- Jungle
  - River
  - Field/ vegetable garden
  - Anywhere.
11. For what reasons did you not build a latrine? *(Observation + individual/ group interview)*
- Latrine is not needed
  - Too expensive.
  - Inadequate knowledge.
  - Materials not available.
  - Impermeable soil or rock.
  - Other (explain)
12. If you find children's excreta around the house what do you do about it? *(Observation + individual/group interview)*
- Dispose of stool in toilet and clean the area around with ash.
  - Cover with mud.
  - Call dog/pig/chicken.
  - Throw far away & plaster the area with cow dung
  - Do nothing
  - Other (explain)
- D. DIARRHOEA AND REHYDRATION:**
1. In which month does diarrhoea occur commonly in your village? *(Seasonal calendar)*
2. How many persons of which age group died of diarrhoea within this year? *(Seasonal calendar + counter & sticks)*
- Old persons
  - Adults
  - Children (1-15 years)
3. What do you think are the causes of diarrhoea? *(Individual/group interview)*
- Contaminated water
  - Contaminated food
  - Contaminated hands
  - Flies/insects/domestic animals & poultry
  - Traditional belief.
4. How do you treat the diarrhoea? *(Individual/group interview + pie chart)*
- Jeevan-jal/salt-sugar-water solution.
  - Domestic medicines or herbs.
  - Health post/ hospital/clinic
  - Traditional healers
5. How do you prepare jeevan-jal or salt-sugar-water solution? Please explain and show if possible. *(Observation + individual/ group interview)*
- Accurate
  - Inaccurate

**E. MERITS AND DEMERITS OF THE PROJECT.**

1. In your opinion, what are the merits of this water, health and sanitation project for you? *(Individual/group interview)*
- - 
  - 
  -
2. In your opinion, what are the demerits of this water, health and sanitation project for you? *(Individual/group interview)*
- - 
  - 
  -

**TABLE OF OBSERVATION**

Name of Observer :

Date of Observation :

S. No.	Subject Matter	No. of HH Observed.	HH (Yes)	HH (No)	Not Observed HH	Remarks
1.	Is there slime/algae on the inside of the water container?					
2.	Is the water storage container covered?					
3.	Is leftover food/milk kept covered?					
4.	Do you dispose of your household garbage in one place?					
5.	Do you have a separate cattle shed away from your house?					
6.	Do you have a separate pen for goats, chicken and ducks etc. away from the house?					
7.	Have you built a latrine?					
8.	If yes, is it clean & sanitary?					
9.	Is there children's excreta around the house?					
10.	Is jeevan-jal/salt-sugar-water solution preparation method accurate?					







## APPENDIX 4: Chronology of Project Implementation

### NEWAH Plan of Operation (Time Frame) for Financial Year 1995-96 Health and Sanitation Programme

MONTH	ACTIVITIES
Chaitra/Baisakh March/April	Feasibility/Baseline survey + monitoring of existing projects.
Baisakh/Jestha May/June	Analysis of survey reports. Monitoring of existing project areas/evaluation + handing over of small projects
Ashad June/July	Monitoring of large project areas + evaluation of previous projects cont. Refresher course for Health staff, Health Programme planning with Health staff.
Shrawan July/August	Recruitment of local health motivators, correspondence. Evaluation of large projects from previous year.
Bhadra August/September	Deposits/money collection for latrines. Health motivators + NGO co-ordinators training. Evaluation of large projects cont. by H.M.
Bhadra/Ashoj Sept./October	Sub-overseers and materials arrive at sites. Formation of PMC and users committees, selection of health volunteers and start of training, selection ceramic tiles. Deposits/money collection for latrines cont.
Kartik Oct./November	Sanitation casting yard + demonstration latrine construction. Domestic latrine construction cont. Detailed HH data collection by Health Motivators. NGOs orientation seminar. Deposits/money collection for latrines cont.
Mangsir Nov./December	Training of health volunteers cont. Deposits/money collection for latrines cont. Health education programme started at each water point.
Poush December/January	Training of health volunteers cont. Health education activities cont. Domestic latrine construction cont. Deposits/money collection for latrines cont.
Magh January/February	Health education activities cont. Domestic latrine construction cont.
Phalgun February/March	Health education activities cont. Sanitation cont. Refresher course for outsider motivators. Deadline for money collection for latrine.
Chitra February/March	Health education cont. Sanitation cont. Evaluation and handing over of small projects. Feasibility (baseline) surveys started for projects in financial year 1996/97
Baisakh April/May	Feasibility (baseline) surveys for projects in financial year 1996/97 cont. Health and sanitation programme cont. Latrine installation cont.
Jestha May/June	Monitoring of large projects, health projects, latrine installation
Ashad June/July	Evaluation handing over of smaller projects

## ABBREVIATIONS AND ACRONYMS

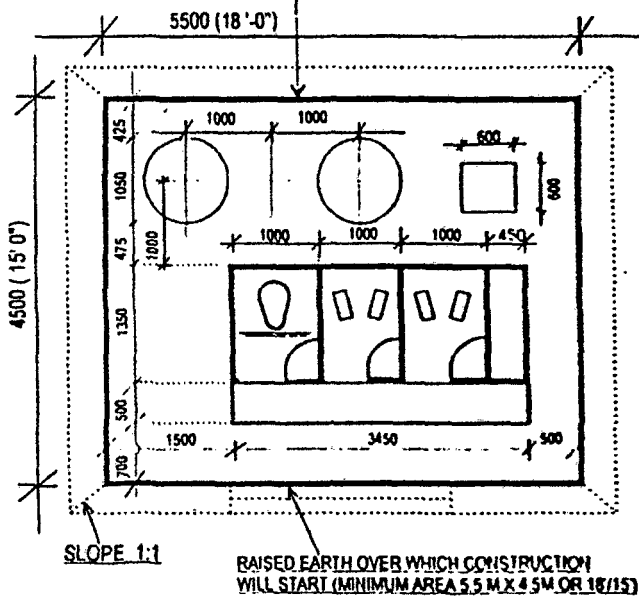
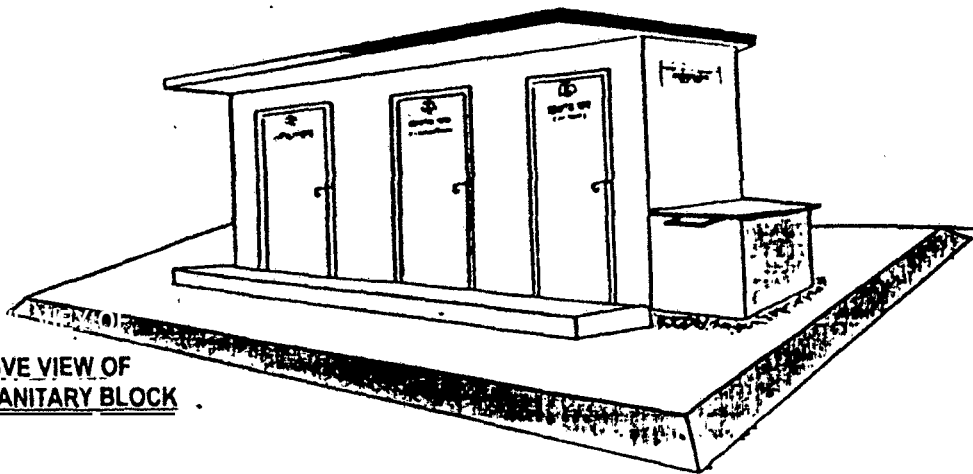
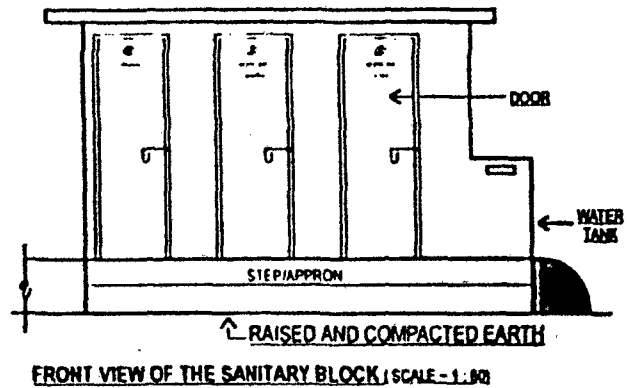
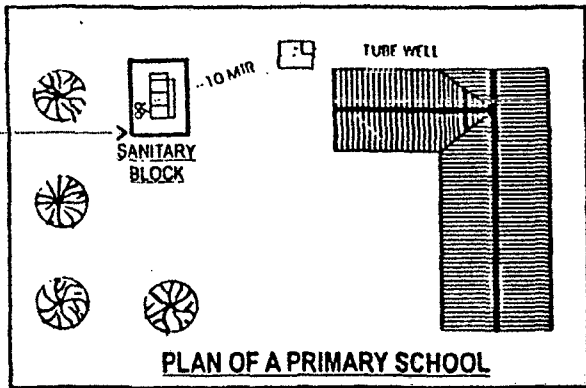
ADB-N	Agricultural Development Bank of Nepal
DFID	Department for International Development (UK)
HH	households
HHS	household survey
NEWAH	Nepal Water for Health
NGO	non-government organisation
ORS	oral rehydration solution
PRA	participatory rural appraisal
SFDB	Small Farmer's Development Programme
Unicef	United Nations Children's Fund
VDC	Village Development Council

School Sanitation Project of Kamrup District

Time Schedule for Phase I Activities. 1998

Proj. sl.no	Activity	Sept 18-23	Octo 6-10	Octo 13-17	Octo 20-26	Octo-Nov 27-3
f.	1 day orientation of HMs	XXXXX				
g.	Orientation of SC members					
	(i)-Meeting of SC, NGO members		XXXXX			
	(ii)-Orientation of SC, NGOs			XXXXX		
i.	Training of Masons					
	(i) -First training		XXXXXXXX			
	(ii)-Subsequent training				XXXXXXXX	
h.	2 day training of Core teacher					XXXXX
f.	18 Sept Dimoria (Friday)					
	19 Sept Rani (Saturday)					
	21 Sept <del>Kamrup</del> Rampur (Monday)					
	22 Sept Chaygaon (Tuesday)					
	23 Sept <del>Kamrup</del> Rampur (Wednesday)					
g.(1)	6 Octo Dimoria (Tuesday)					
	7 Octo Rani (Wednesday)					
	8 Octo Rampur (Thursday)					
	9 Octo Chaygaon (Friday)					
	10 Octo Kamalpur (Saturday)					
(11)	13 Octo Dimoria (Tuesday)					
	14 Octo Rani (Wednesday)					
	15 Octo Rampur (Thursday)					
	16 Octo Chaygaon (Friday)					
	17 Octo Kamalpur (Saturday)					
h. (1)	6 Octo <del>Rampur</del> Rampur (Tuesday)					
	To To					
	12 Octo (Monday)					
(11)	20 Octo Dimoria (Tuesday)					
	To To					
	26 Octo Chaygaon (Monday)					
	Kamalpur					
	<del>Rampur</del> Rampur					
i.	27-28 Octo Dimoria (Tuesday -Wednesday)					
	29-30 Octo Rani (Thursday- Fri day)					
	30-31 Octo Rampur (Friday- Saturdayday)					
	31-1 Oct-Nov Chaygaon (Saturday -Sunday)					
	2-3 Nov Kamalpur (Monday- Tuesday)					

*Sonepur Balika ME School  
 Azara girl's school.  
 Kamrup H.S  
 Chaygaon Govt M.V  
 Amrang H.S*



NOTE:  
 (I) THE MINIMUM DISTANCE BETWEEN THE LEACH PITS AND THE WATER SOURCE SHOULD BE 10 M.  
 (II) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.

## SCHOOL SANITATION PROJECT, ASSAM, (PHASE II)

DESIGNED BY : Dr. B. K. DAS,  
 CONSULTANT, UNICEF

PLACEMENT OF UNITS OVER RAISED AND COMPACTED GROUND

## Annexure 6 E

**School Sanitation Project (Phase II)**  
**Bill of quantities and Estimated \* Cost for Sanitary Block**

Sl No	Materials/ labour	Quantity required	Unit retail price in (Rs) Guwahati	Item cost (Rs)	Total Cost (Rs)
<b>Materials</b>					
01	Brick	1500 pcs	2.10/pc	3150.00	
02	Sand	70 cft	9.0/cft	630.00	
03	½ stone chips	10 cft	25 /cft	250.00	
04	Cement (53 grade L & T)	14 bags	205/bag	2870.00	
05	M.S.Rod 6 mm	20 kg	18/ kg	360.00	
		Total for items 01 to 05		7,260.00	7,260.00
	Breakage, wastage & local price variation 10 % (on items 01 to 05)			726.00	726.00
06	Ceramic pan with trap (rimless, Rural pan 18")	1 set	160/set	160.00	
07	Ceramic foot rest	6 pcs	35/pair	105.00	
08	25mm dia plastic water pipe	3 m	50/m	150.00	
09	Plastic sheet 2m wide	8 m	13/m	104.00	
10	Welded mesh 2" X1" (1.5 m wide X 4 m)	4 m	67/m	268.00	
11	Water proof cement 1 kg & binding wire 0.5 kg			36.00	
12	Lime (1 tin) with 1 brush	10 kg tin	70/ tin	80.00	
13	12 X 100 mm PVC nipple, cap and adhesice	1 set		.21.00	
14	Two small hinges for water tank locking	1set	20 /set	20.00	
15	1 hand grip for latrine	1 pc	30/ pc	30.00	
16	One metallic Soap tray (to be fixed on latrine wall)	1 pc	40/ pc	40.00	
17	3 Iron doors with hinges, locking device, painting and writing as per drawing	3 pcs	700/ pc	2,100.00	
		Total for items 06 to 17		3,114.00	3,114.00
	Local carriage of all items (01 to 17)			500.00	500.00
	Total for materials and carriage				11,600.00
<b>Labour</b>					
18	1 Mason	8 days X Rs 100/ day	Rs 800.00		
	1 semi skilled mason	8 days X Rs 80/ day	Rs 640.00		
	2 labour	8 days X Rs 60/ day	Rs 960.00	Total	2,400.00
	Total cost of Sanitary block				14,000.00
19.	For schools located in inaccessible and difficult areas, additional carriage cost to be made available (average per school)				500.00
	Overall total cost				Rs 14,500.00

\* As on July, 1999

**School Sanitation Project of Kamrup District**  
**Planning for the number of**  
**Orientations/ meetings/ training to be completed**

Blocks	Dimoria	Rani	Rampur	Chaygaon	Kamalpur	Hajo
Total P. Schools	130	98	149	230	107	12
Stage I construction	30	30	30	30	30	-
Stage II construction	50	50	50	50	38	12
Stage III construction	50	18	69	150	27	-
<b>Headmaster's Orientation</b>						
Stage I	65	50	75	75	50	-
Stage II	65	48	74	75	57(+12)	<-12
Stage III	-	-	-	80	-	-
Total number of orientation = 11						
Average schools per orientation = $726/11 = 66$						
<b>School Committee meetings</b>						
Stage I	33+32	25+25	37+38	37+38	25+25	-
Stage II	33+32	24+24	37+37	37+38	30+39	<-12
Stage III	-	-	-	40+40	-	-
Total number of orientation = 22						
Half day meeting : 2 meetings per day : total 11 days						
Persons per school =3 (HM, 1 SC member, 1 NGO member)						
Average schools per meeting = $726/22 = 33$						
<b>Core Teacher's Training</b>						
Stage I	65	50	75	75	50	-
Stage II	65	48	74	75	57(+12)	<-12
Stage III	-	-	-	80	-	-
Total number of orientation = 11						
Average schools per orientation = $726/11 = 66$						
<b>Training of Masons</b>						
Stage I	10	10	10	10	10	-
Stage II	7	7	7	7	7	4
Stage III	-	-	6	33	-	-
Masons trained for Stage I will continue constructions for Stage II & III						
Total number of masons to be trained = 128						
Number of courses = 16						
Average number of masons per course = $128/16 = 8$						

DATA SHEET FOR PRIMARY SCHOOLS IN KAMRUP DISTRICT.  
EDUCATION BLOCK.

Sl No	I t e m	I n f o r m a t i o n
01.	a) Full Name of the School (in block letters) b) Year of establishment	
02.	Postal Address of the School	Vill : Via : P.O : Pin Code :
03.	Name of Head Master/Head Mistress(in block letter)	
04.	Residential/Contanct Address of the Head/Master/Mistress	Name/Care : Vill : P.O. : Pin Code :
05.	Type/Condition of the School	RCC/Assam Type/Thatched/mixed/ Delapidated
06.	Distance of the School from B.E.E.O's Office	Km.
07.	Names of 2 teachers (one lady) to be trained for im- parting health education to the students and for mainte- nance of School Sanitation & water supply facilities.	1. 2. 3.
08.	Number of Students ( Class I to Class IV )	----- Boys ----- Girls
09.	Is there a) Compound wall in the School b) Water source c) Sanitary Latrine d) Urinals e) Availability of highland (above flood level) about 6m x 4m for construction of Toilet Block	Yes/No ; if yes, Permanent/ Temporary/ with gate / without gate. Yes/No ; if yes, ringwell/tube well/ working/not working Yes/No ; if yes, working/not working Yes/No ; if yes, Pucca/Katcha Yes/No ; if no, local community to raise the area before August 1998.

contd.....2/

10.	Is there a School Committee duly established.	Yes/No
	a) If yes, names of members	1. 2. 3. 4. 5. 6.
	b) Name of Bank & A/C No. if any	
	c) Account operated by	1. as 2. as

Collected By : Name :

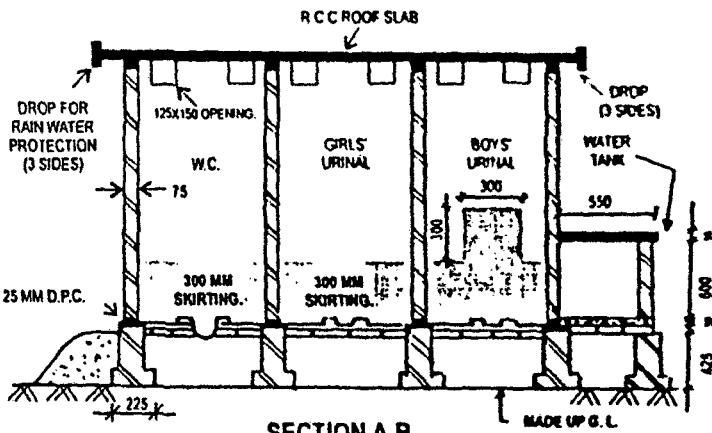
Checked By : Name :

Date :

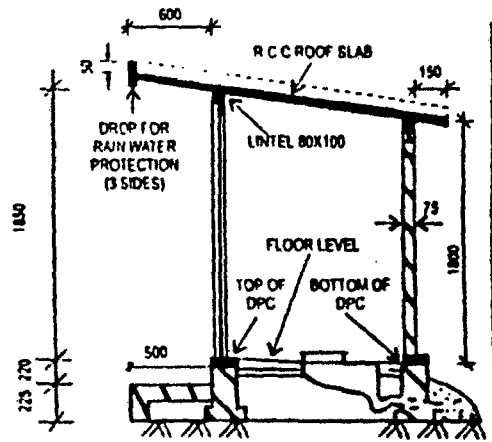
Date :

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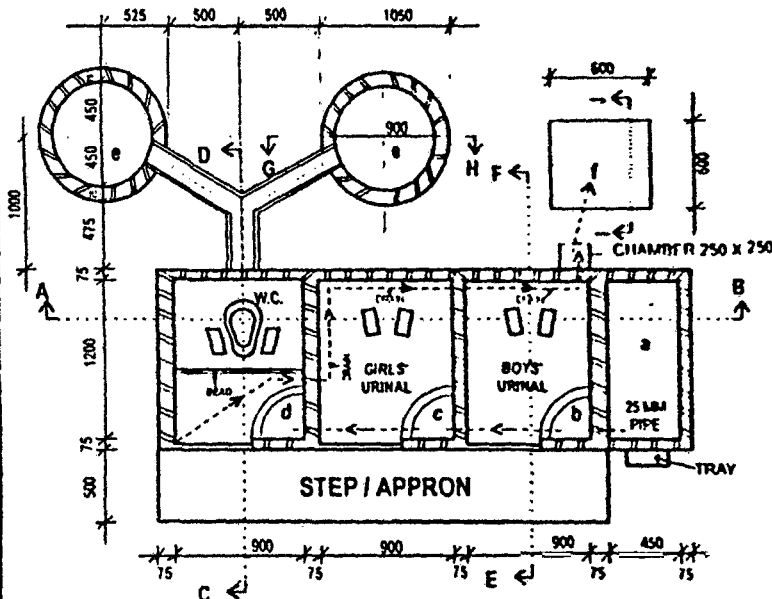




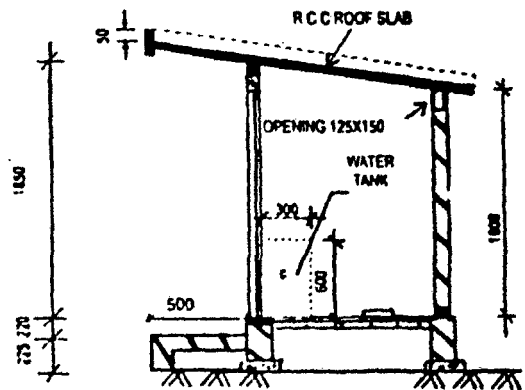
SECTION A-B



SECTION C-D



PLAN OF SANITARY BLOCK



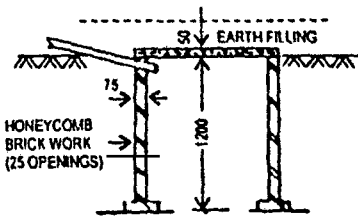
SECTION E-F

**LEGEND**

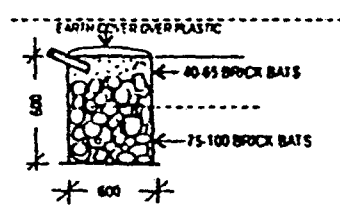
- a : COVERED WATER TANK
- b, c, d. : SMALL OPEN WATER TANK INSIDE
- e : LEACH PIT 900(DIA) X 1200 (DEPTH)
- f : SOAK PIT 600 (L) X 600 (B) X 600 (B)

**NOTE:**

- (I) ALL BRICK WORK 1 : 6 MORTAR.
- (II) ALL PLASTER & FLOOR 1 : 4 MORTAR.
- (III) ALL C.C./R.C.C. 1 : 2 : 4 CONCRETE.
- (IV) ALL DIMENSIONS ARE IN MILLIMETERE UNLESS OTHERWISE SPECIFIED.



LEACH PIT SECTION G-H



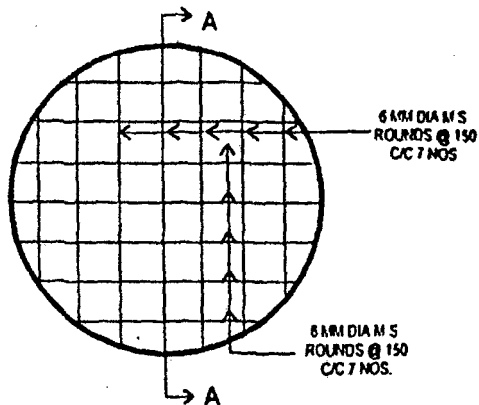
SOAK PIT SECTION I-J

**SCHOOL SANITATION PROJECT, ASSAM, (PHASE II)**

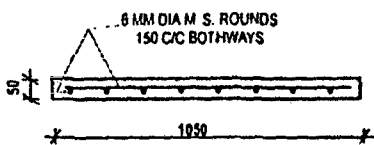
DESIGNED BY : Dr. B. K. DAS,  
CONSULTANT, UNICEF

**PIT COVER**

R.C.C. (1:2:4)  
DIAMETER = 1.05 METER

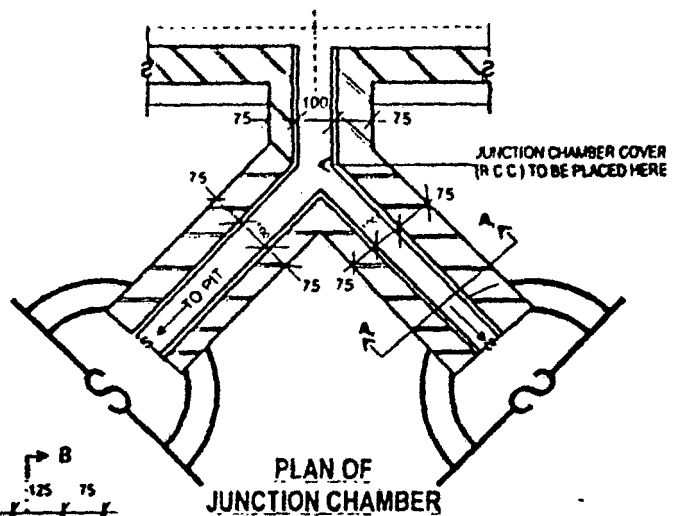


**REINFORCEMENT ARRANGEMENT OF PIT COVER**

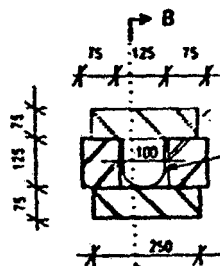


**SECTION A-A**

**JUNCTION CHAMBER (BRICK WORK)**



**PLAN OF JUNCTION CHAMBER**

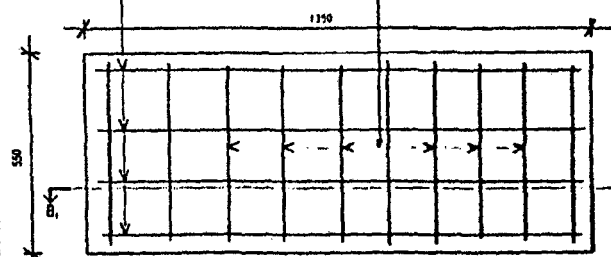


**SECTION A-A**

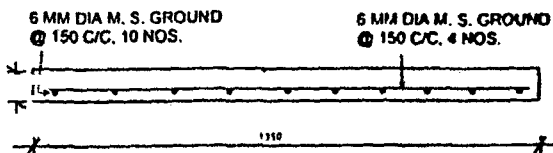


**SECTION B-B**

6 MM DIA M. S. GROUND @ 150 C/C. 4 NOS.      6 MM DIA M. S. GROUND @ 150 C/C. 10 NOS

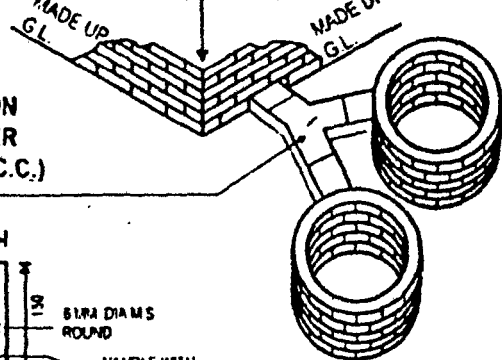


**REINFORCEMENT OF WATER TANK COVER**

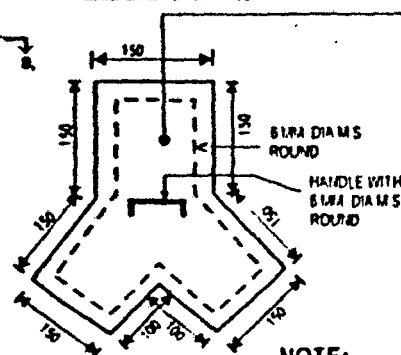


**SECTION B-B**

**THREE DIMENSIONAL VIEW OF LEACH PIT**



**JUNCTION CHAMBER COVER (R.C.C.)**

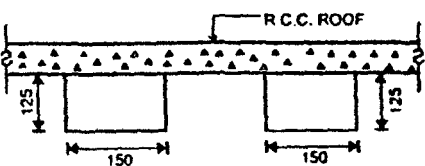


**NOTE:**

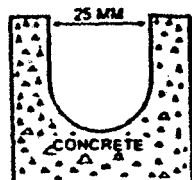
- (I) ALL BRICK WORK 1 : 6 MORTAR.
- (II) ALL PLASTER & FLOOR 1:4 MORTAR.
- (III) ALL C.C./R.C.C. 1 : 2 : 4 CONCRETE.
- (IV) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.

**SCHOOL SANITATION PROJECT, ASSAM, (PHASE II)**

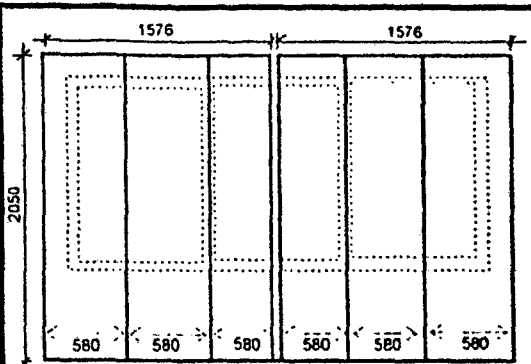
DESIGNED BY : Dr. B. K. DAS,



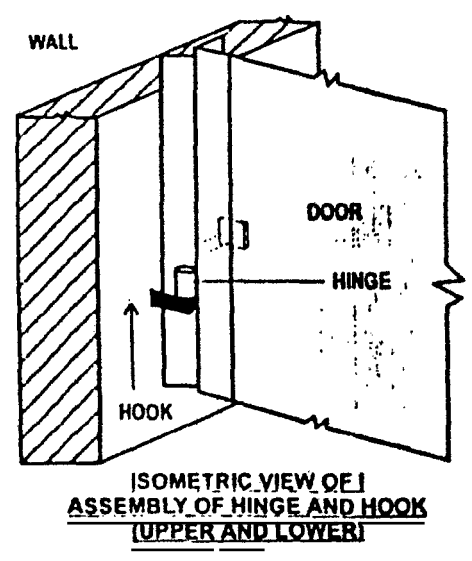
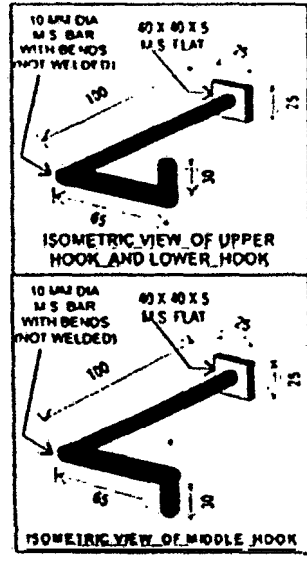
**2 NOS. OPENINGS IN EACH UNIT FOR VENTILATION**



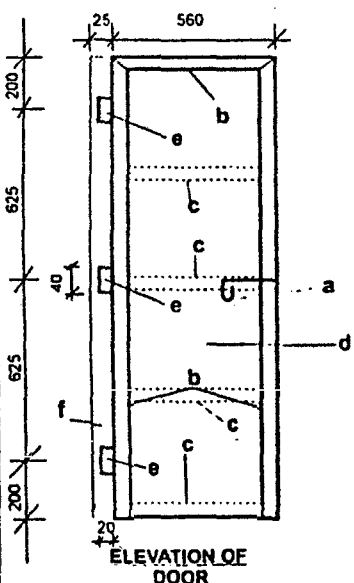
**DRAIN 25 MM (SEMICIRCULAR) INSIDE URINALS.**



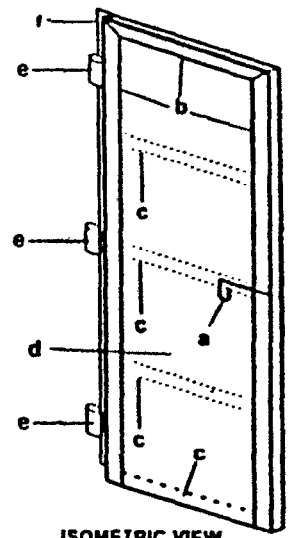
**R.C.C ROOF SLAB 25 MM THICK (1:2:4)  
REINFORCED WITH WELDED MESH 50 X 25**



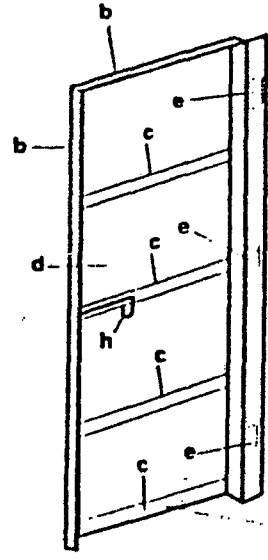
**ISOMETRIC VIEW OF  
ASSEMBLY OF HINGE AND HOOK  
(UPPER AND LOWER)**



**ELEVATION OF  
DOOR**



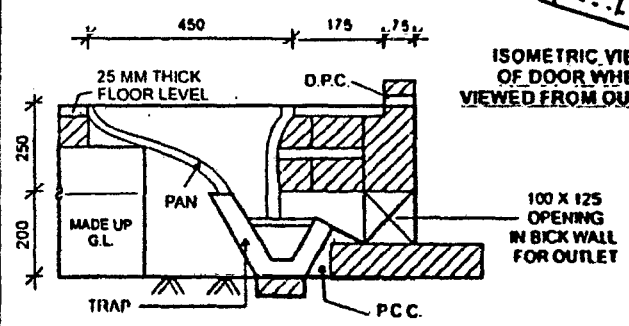
**ISOMETRIC VIEW  
OF DOOR WHEN  
VIEWED FROM OUTSIDE**



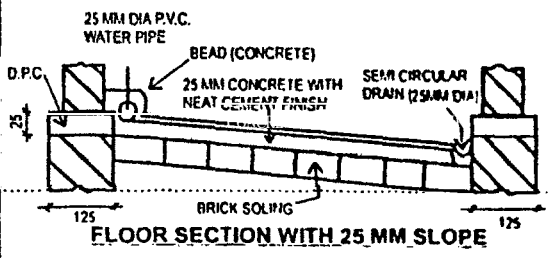
**ISOMETRIC VIEW  
OF DOOR WHEN  
VIEWED FROM INSIDE**

- LEGEND:**
- a = 8" L-DROP(MOZE) OUTSIDE (WELDED)
  - h = 8" BOLT INSIDE (WELDED)
  - b = 25MM. X 25MM. X 4MM. MS ANGLE ON THREE SIDES
  - c = 4 NOS 4MM. X 25MM. M.B. FLAT WELDED INSIDE.
  - d = 22 GAUGE C.R.M. SHEET WELDED OUTSIDE
  - e = 40 MM LONG HINGE MADE UP OF 20MM. DIA O.I. PIPE OF 4MM WALL THICKNESS.
  - f = EXTRA 25 MM. WIDE C.R.M. SHEET WELDED TO THE 25 X 25 ANGLE.

NO ANGLE HERE ONLY 4MM X 25MM MS FLAT TO BE WELDED OUTSIDE



**DETAILS OF CONNECTION  
WITH PAN & SYPHON**



**FLOOR SECTION WITH 25 MM SLOPE**

**NOTE;**

- (1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- (2) UPPER AND LOWER HOOKS SHOULD ENTER THE HINGES FROM BOTTOM BUT THE MIDDLE HOOK SHOULD ENTER THE HINGE FROM THE TOP OF THE HINGE

**SCHOOL SANITATION PROJECT,  
ASSAM, (PHASE II)**  
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CONSULTANT, UNICEF