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UNITED NATIONS CHILDREN'S FUND
CALCUTTA FIELD OFFICE

**INTEGRATED PARASITE CONTROL
AND
FAMILY WELFARE PROJECT**

**SPOT SURVEY OF LATRINES AND
PUBLIC WATER STANDPOSTS**

**FINAL REPORT
MARCH, 1995**

ENVIRONMENTAL ENGINEERS CONSORTIUM

48/60, SWISS PARK, CALCUTTA—700 033



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PREFACE

It has been established by facts and figures that more than 80 percent of the sickness amongst the rural population in India is due to unsafe water and lack of sanitation. Health and well being of mother and child are the principle concern of UNICEF. It is, therefore, in the interest of mother and child the Organisation is deeply concerned with parasitic infection including those caused due to unsafe water and bad sanitation. UNICEF & UNFPA have launched a project on Integrated Parasite Control and Family Welfare Project in the Tea Gardens in North Bengal under the administrative control of Dooars Branch of Indian Tea Association (DBITA). This project amongst several programmes has a programme on safe water and satisfactory disposal of human excreta.

Water supply to these gardens has been from upland streams, dug wells and tubewells. Prior to the launching of the programme, latrines were very few and of different types. Tea Association assisted by UNICEF and UNFPA initiated a programme for the protection of the water and provision of sanitary latrines for which they recommended the use of twin-pit pour-flush latrines. A fairly large number of latrines were built under Phase I under the supervision of DBITA and suitable protective measures were adopted to safeguard the quality of water. While the work on Phase I is over, the work on Phase II is in progress.

In order to obtain an evaluation of the work already completed in Phase I, the Calcutta Field Office of the UNICEF entrusted M/S, Environmental Engineers Consortium (EEC) to conduct a spot survey in these Tea Gardens and prepare an evaluation report on the same. The Consultants visited these gardens and made sample survey of water points and latrines which have been completed and were in use. Their findings have been reported in this document.

Consultants received good cooperation from the members of the DBITA. The Association had deputed their field staff to be with the field teams assigned by the EEC during their field visits. The Consultants wish to acknowledge their grateful thanks to all the members of DBITA and in particular Dr. D.N.Chatterjee, Project Director, Integrated Parasite Control and Family Welfare Project. They also wish to thank the Calcutta Field Office of UNICEF for giving them this opportunity to be associated with a project which concerns the health and well being of the people living in the gardens.

C O N T E N T S



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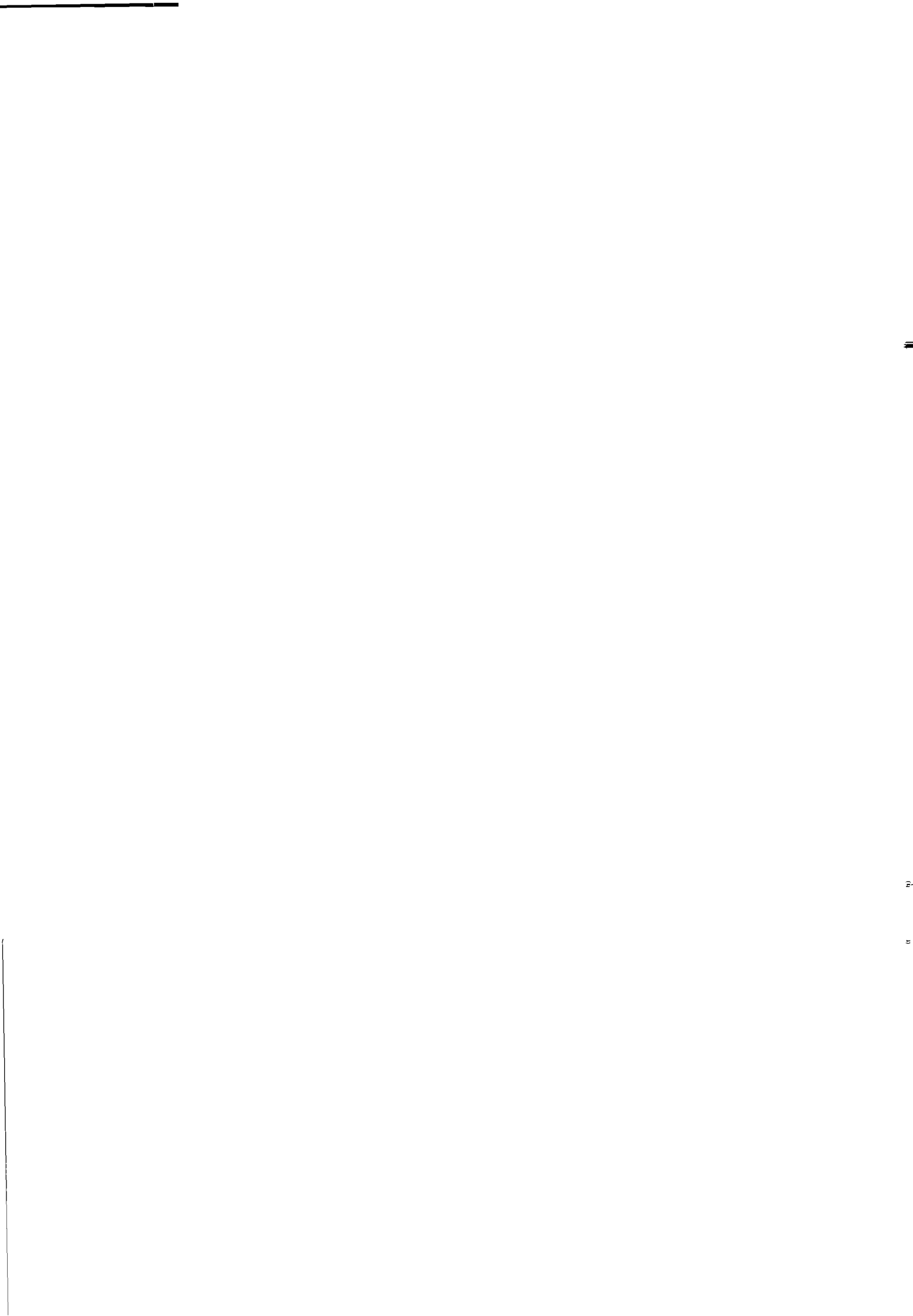
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1.0 INTRODUCTION & BACKGROUND

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Safe Water and satisfactory management of Human excreta are primary requirements for the protection and preservation of health of mankind. The health of the mother and child necessarily depends considerably on these two elements of environmental health. Prevalence of water borne and excreta associated diseases is very high amongst the Indian population particularly in the rural and semi-urban communities. It has been reported that as much as 80 percent of the population in these areas are victims of diseases due to unsatisfactory water supply and lack of sanitation.

Dooars Branch Indian Tea Association (DBITA) launched 'Integrated Parasite Control and Family Welfare Project' in 1991 with assistance from UNFPA and UNICEF to reduce infant and maternal mortality rates, to improve family planning performance particularly spacing methods, to control parasite infections and to provide sanitary facilities and safe drinking water.

Prior to the launching of the present project on water supply and sanitation, most of these gardens had water supply system. The quality and adequacy of supply left a great deal of scope for improvement. Sanitation particularly in respect of excreta disposal was very poor. People used the field for defecation. A few latrines that existed were mostly in the officer's quarters. Those latrines were connected to septic tanks.

The project therefore concentrated on the improvement of the water supply system and provide sanitary latrines in every house for use of the garden worker and his or her family. The project on water supply and sanitation is one of the components of an overall project on Health and Welfare of the garden community.

Provision of suitable platform with drainage facility for the standposts and sanitary protection of wells and small diameter tube wells fitted with hand pumps were the major thrust in their programme. Twin pit pour flush latrines were recommended for use. A token subsidy was offered from the concerned agencies. The balance of the expenses was borne by the management of the Tea gardens. DBITA worked as the implementing agency.

As per records provided by DBITA to UNICEF, 5235 latrines have already been built since the commencement of the project. Most of the standposts have been provided with concrete platform.

UNICEF at this stage felt that it would be desirable to have an appraisal of the project when they have just initiated the Phase II of the Project.

It is with this intention UNICEF have appointed M/S Environmental Engineers Consortium (EEC) to conduct a field survey and report to them on the status of these facilities and their use. EEC had undertaken the survey on a sample basis and are reporting their findings in the subsequent sections of this Report.

SCOPE OF WORK

The Consultants are to undertake spot checks of approximately 10% of (1) the sanitary latrines constructed and (2) public standposts constructed/renovated in the member tea gardens of DBITA which include the following major tasks :

- * Develop and finalize methodology approach for the selection and preparation of schedule.
- * Field work and data collection.
- * Analysis of the data and preparation of draft report.
- * Preparation of final report.

2.0 METHODOLOGY

2.0 METHODOLOGY

The Consultants had a briefing from Mr. C. Sengupta, Project Officer (Sanitation) of UNICEF on the assignment. This was helpful in preparing two sets of questionnaire one each on Water Supply and Latrine programme that were taken up under the joint venture of UNICEF, UNFPA and DBITA. These questionnaires were developed to elicit information needed to spot check the water supply and latrine programme developed through the Project. Since the study related to the programme sponsored and supported by concerned agencies the survey was to limit the questions to those facilities which were installed after 1991, the year of launching of the programme.

The questionnaire relating to water supply was brief and related to the source, transmission, treatment if any and distribution of water to the consumers. Sanitary protection of the source and distribution points and mode of disinfection were to be noted. Information on monitoring of water quality was also to be collected. The adequacy of water supply to the consumers was to be assessed. In the case of piped water supply, per capita consumption was to be noted. In the case of small diameter tube wells fitted with hand pumps and wells the number of people/families served by each such source was the criterion to be used to assess the adequacy of supply. The distance of a small diameter tube well fitted with a hand pump or a standpost from the remotest home it served was also to be noted to assess the convenience of its usage.

The questionnaire on 'Latrine' was more exhaustive than the one on water. The data/information needed were to be collected from the homes which had the latrines. The schedule used contained information on construction details, use pattern, follow-up service, possibility of ground water pollution etc.

Both the questionnaires included opinion survey amongst the users of these facilities. Copies of these questionnaires are presented in the Annexure. The survey schedule were discussed with UNICEF official. Field teams were appraised of the requirements.

The team members reported to Dr. D N Chatterjee, Project Director, Integrated Parasite Control & Family Welfare Project of DBITA and held discussions with him and concerned officers before proceeding to the field. Data/information available in DBITA office were collected. A programme of visit was chalked out in consultation with Dr. Chatterjee and his officers.

Field survey was carried out by three teams each team consisting of two members. A member of DBITA was attached to each team. The field survey was undertaken from 13th September to 27th September, 1994.

On reaching the garden the member assigned by DBITA guided the team members to the 'labour lines' (lanes having the labour quarters) which had the project latrines. The total number of such latrines was already known to the team from the records maintained in the DBITA office. Incidentally this figure differed from the one obtained from UNICEF. Since 10% of the latrines with a minimum of 10 were to be surveyed the number of latrines to be surveyed on the spot was pre-determined. The team proceeded through the labour lines. They picked up homes which had these latrines and wherein they could obtain ready access and find someone to respond to the queries addressed. The teams were instructed to visit as many as possible within the time-frame allotted to them. During the study 600 latrine units (out of 5235 latrines) were surveyed which covers the stipulation laid down by UNICEF for the sample size.

During the same visit they also collected information/data on water supply. A few basic data relating to water supply were obtained from the DBITA Office. The balance data were collected from the field.

Group interviews were also conducted to obtain certain information relating to water supply as well as the group's reaction to the entire project.

As discussed with UNICEF Officials it was decided to visit a few gardens wherein sanitary latrines were being installed under Phase-II (initiation in April 1994) of the Project.

The teams visited a number of houses wherein these latrines have been built under Phase-II programme. These latrines were picked up from different gardens. The observations were confined to constructional details of the Pour Flush Latrines under construction or recently completed.

3.0 PROJECT AREA

3.0 PROJECT AREA

The project area is located in the Dooars which is a part of Jalpaiguri district in West Bengal. The project is intended to improve water supply and sanitation in the member gardens registered with Dooars Branch Indian Tea Association (DBITA).

The gardens under DBITA are distributed amongst 7 sub-districts of Nagrakata, Binnaguri, Dalgaon, Dandim, Chalsa, Kalchini and Jayanti. During Phase-I (1991-1993) of the project the gardens under sub-districts of Nagrakata, Binnaguri and Dalgaon were covered. The Phase-II activities of the project has been initiated in April 1994. In this phase, activities have been initiated in all the seven above mentioned sub-districts.

For the present assignment, the Consultants were to report on the work done under Phase-I. While the Consultants were working in these three sub-districts they made a quick spot survey of a few gardens under phase II in respect of the pour flush latrines that have already been built or were under construction.

Dooars is in the foot hills of the Himalayas which has a typical geo-physical formation. The top soil is shallow and rock outcrops are common. Springs ooze out at many of these points which develop into small upland streams. Shallow tube wells in the areas normally have a low yield. Springs and upland streams are the common sources of water supply. The terrain in a part of the Region under Survey favours gravity supply of water.

Presence of tea plants and forests in the neighbouring areas of the gardens present an environment distinct from the one encountered in the plains.

Plantation labourers come from different regions with their respective social culture. Local Adibasies, Santhals and Nepalees/Gorkhas are the major cultural groups amongst the plantation labour. Each group has its own outlook towards the use of water supply and sanitation facilities which is reflected in the use pattern of the facilities provided in the project area.

4.0 DATA PRESENTATION & DISCUSSION

4.0 DATA PRESENTATION & DISCUSSION

4.1 LATRINES

4.1.1 Constructional features of pit latrines :

Although the field teams surveyed 600 latrines built under Phase-I of the programme in the three sub-districts only 236 may be considered as typical pourflush leach pit latrines. Remaining latrines are provided with rectangular or square pits. Enquiries from the members of the families using square or rectangular pits indicated that these latrines were connected to septic tanks. The construction drawings were not available. The survey team could not contact either the contractors or the masons. The presumptions of the beneficiaries are likely to be correct.

The Consultants are presenting their findings relating to pour-flush latrines (ref. Fig-1) as observed in the 3 sub-districts surveyed. Their observations in respect of the different types of latrines built during this period are also presented in this Report.

The distribution of these latrines is presented in Table-1.

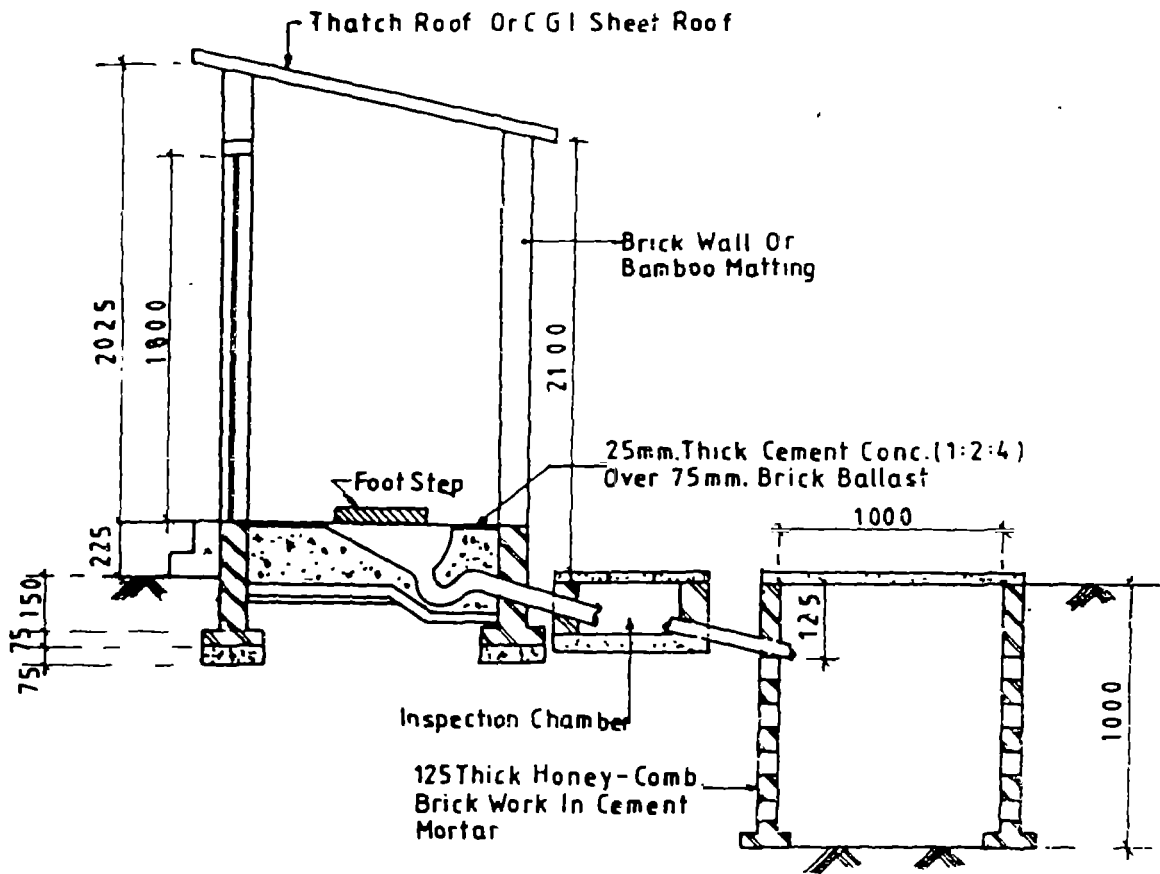
Table -1 shows maximum (116) number of Pour Flush leach pit latrines were built in Binnaguri and the minimum (15) were built in Nagrakata. On an average the number of Pour Flush latrines in the project area was close to 40% of the total number (600) of latrines surveyed in the project area.

Twin leach pit latrines constituted on an average of 64.4% of the total pourflush latrines (236) surveyed in the project area. The remaining 35.6% of the pourflush latrines have single leach pit. Although Nagrakata has the minimum number of pourflush latrines amongst the three sub-districts has the highest percentage (86.67%) of the total pourflush latrines with twin leach pits.

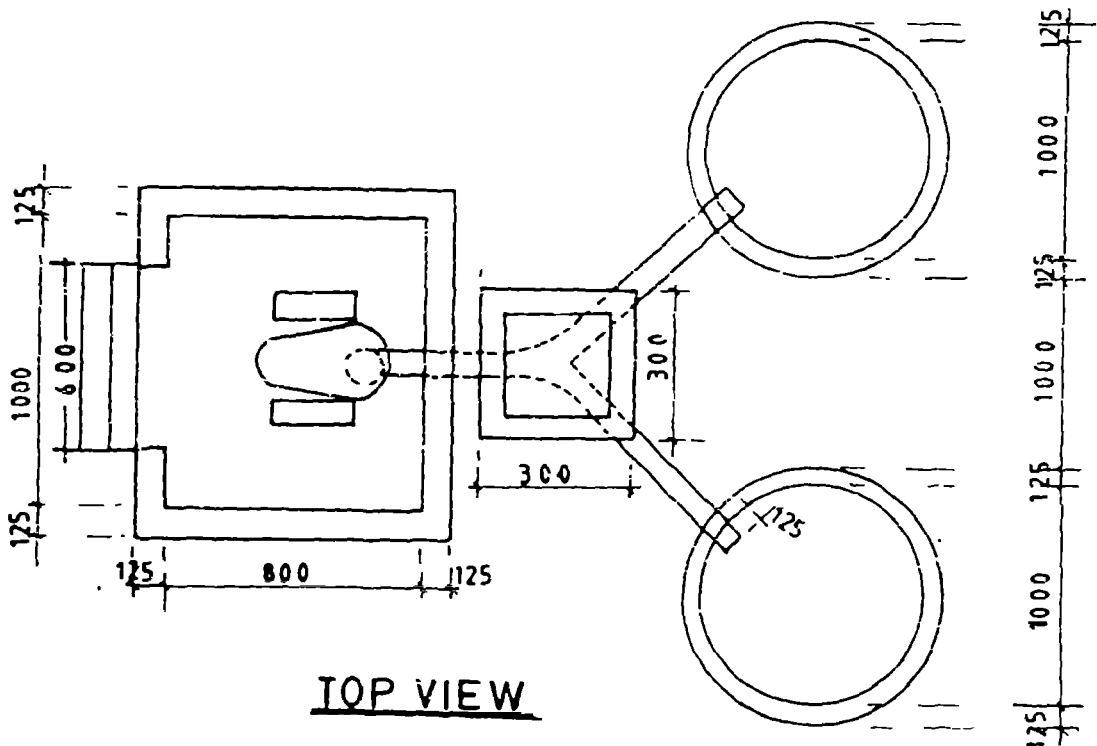
Though UNICEF is recommending a depth of 1 meter, it has been observed in majority of the cases the pit depth is varying between 1 meter to 2 meters. However, in very few cases it has been observed that the pit depth has (9 latrines in Nagrakata Sub-district) gone beyond 2 meters.



FIG-1



SIDE VIEW SECTION



TOP VIEW

POUR FLUSH LATRINE

SCALE-NTS

Table - 1
Distribution of Pour Flush Latrines

| Item | Sub District | | | Total |
|---|---------------|---------------|---------------|---------------|
| | Binnaguri | Nagrakata | Dalgaon | |
| No. of Twin pit Latrine | 81 (69.82) | 13 (86.66) | 58 (55.23) | 152 (64.4) |
| No. of Single pit Latrine | 35 (30.17) | 02 (13.33) | 47 (44.76) | 84 (35.6) |
| Total | 116 | 15 | 105 | 236 |
| Depth of pit less than or equal to 2 meters | 116 (100) | 06 (40.00) | 105 (100) | 227 (96.8) |
| Depth of pit more than 2 meters | 00 (00) | 09 (60.00) | 00 (00) | 09 (3.81) |

Note: Figures in parenthesis indicate percentage

The pan and trap are two most vital components in the proper functioning of the pour flush latrines. The dimensions, shape, slope, size of the throat, depth of water seal and material used in the making of the pan and trap individually and in conjunction with each other have distinct role in the functioning of these latrines. This is primarily so because the flushing of the pan and trap has to be achieved with a small quantity of water and force behind it is very limited. A great deal of study backed up by field testing has yielded these specifications.

It was observed in the present study that commercial ceramic pans as used with normal flush latrines have been used mostly in the project area. It has been reported that pan suitable for use in pour flush latrines are not readily available in the local market and therefore standard pans were used in these installations. These standard pans have floor slope much too flat to permit effective clearance of the waste with pour flush. The trap has a water seal equal or greater than 1 inch (2.5 cm) which does not permit clearance of waste across the water seal with pour flush. These important deficiencies go against their use for pour flush latrines. Their use needs to be discouraged unless the manufacturers agree to make these to the specification of the pans and traps recommended by the concerned authorities.

Ceramic pans have been used in most of the latrines (86.5%) surveyed. Pans made of concrete have been used in the remaining 13.5% of the latrines surveyed. These concrete pans do not have the smooth finish, they need to have. Stains have been observed. With time these become difficult to remove and the latrine looks dirty. This often becomes one of the major factors leading to discontinuation of use of the latrine.

In spite of the authorities (DBITA) as well as UNICEF recommending pour flush latrines to be used in preference to other types of latrines, the people (including Management of the gardens and the users) were not significantly motivated to use this in preference to septic tank latrines.

A brief survey (reported in Chapter 6.0) of the latrines constructed in Phase-II of the programme conducted during this study revealed that majority of the latrines which were constructed in Phase-II were not of pour flush type as recommended by DBITA (refer Table-8).

It was observed that a few septic tanks have two compartments while the others have one. Most of them do not have the facilities for secondary treatment of the tank effluent in the form of soakage pits, leaching pits or tile fields. Mode of desludging is also not as it should be. A correct practice has been described in BIS code of practice. The Management and the beneficiaries should be fully appraised of the hazards and the corrective measures.

It is difficult to single out any particular reason for adopting the single pit in preference to two pit latrine. There is a strong possibility that the garden managements and the users were not made fully aware of the benefits of a two pits latrine over a single pit latrine. The other factor could be lack of ground space to locate twin pits.

Superstructure :

All the latrines that were surveyed had decent pucca superstructure. Most (81.83%) of them were built of brick walls while the rest have pre-fabricated walls of concrete. Flat concrete terrace, asbestos and corrugated tin have been used for roof material. The light and ventilation in these units were found to be satisfactory in most (90.83%) of the installations.

4.1.2 Use Pattern of the latrines built in the Project Area

Availability of latrines in homes is considered an index of sanitation. It has been observed in many rural and semi urban areas that investment on sanitary latrines often have failed to yield

the desired results. The overall picture in the use of latrines in this project area is found to be good considering the use pattern of most of the latrines in the rural and semi rural areas where sanitation projects have been taken up under governmental or non governmental projects. Only 58 (9.67%) latrines built under this project have been reported not being used by the beneficiaries. Of the remaining as many as 505(84.17% of the total) of the latrines were fully used and the balance 37(6.16% of the total) of the latrines were partially used. The families in many cases assigned more than one reason for not using the latrines. Of the various reasons indicated by the families it is observed that three factors namely too close to the house (20%), causes nuisance (23%) and difficult to leave the old habit of open air defecation (26%) are most common. It appears that good house keeping and awareness campaign may be helpful in improving the use status of these latrines.

Use status of the latrines is presented in Table-2.

Table - 2

Use Status of Latrines

| Sub Districts | No. of Gardens Surveyed | No. of Latrines Surveyed | USE STATUS | | | | | |
|---------------|-------------------------|--------------------------|------------|--------------|----------------|-------------|-----------|-------------|
| | | | Fully Used | % | Partially Used | % | Not Used | % |
| Binnaguri | 19 | 292 | 245 | 83.90 | 10 | 3.43 | 37 | 12.67 |
| Nagrakata | 09 | 93 | 90 | 96.77 | 00 | 00.00 | 03 | 3.23 |
| Dalgaon | 12 | 245 | 170 | 79.06 | 27 | 12.56 | 18 | 8.37 |
| Total | 40 | 600 | 505 | 84.17 | 37 | 6.16 | 58 | 9.67 |

There are several factors which contribute to the success or failure of the sanitation programmes. The use status of the latrines built in this region was examined in the background of a few of the major factors. The findings have been presented in Table - 3.

Table - 3
Factors influencing Use Status of Latrines

| Factors | Sub Districts | | | Total |
|---|----------------|---------------|----------------|----------------|
| | Binnaguri | Nagrakata | Dalgaon | |
| No. of Latrines in Phase-I Surveyed | 292 | 93 | 215 | 600 |
| No. of Latrines beyond 10 feet from house | 137 (46.9) | 68 (73.1) | 56 (26.0) | 261 (43.5) |
| No. of Latrines with adequate privacy | 278 (95.2) | 92 (99) | 211 (98.1) | 581 (97) |
| No. of Latrines with approach safe | 221 (75.6) | 65 (69.8) | 176 (81.8) | 462 (77) |
| No. of Latrines in which cleanliness was good or moderate | 211 (72.2) | 62 (91.1) | 131 (60.9) | 404 (67.3) |
| No. of Latrines in use | 255 (87.32) | 90 (96.77) | 197 (91.62) | 542 (90.33) |
| No. of Latrines with water - Outdoor | 238 (93.33) | 85 (94.44) | 192 (97.45) | 515 (95) |
| No. of Latrines with water - Indoor | 17 (06.67) | 05 (05.56) | 05 (02.54) | 27 (5) |

Note: Figures in parenthesis indicate percentage.

While the details are available in the table-3 the observations in respect of the total picture are as follows :

- i) Distance of the latrine from the house did not affect the use of latrines since 43.5% of latrines were beyond 10 feet from the homes.
- ii) Privacy, an important factor in the use of the latrine was satisfactory in 97% of the latrines surveyed.
- iii) It was observed that in 77% of the cases the approach was considered safe.
- iv) It was observed that 67.3% of the latrine enclosures were found to be clean in the category of good and moderate. An un-clean latrine often is a hindrance to the use of latrines.
- v) It was observed that all the families surveyed use water for ablution and have facilities of storage of ablution water. While 5% of the latrines have facilities of storage of water within the enclosure the remaining 95% have the storage outside the enclosure. Although a water point/storage within the enclosure is considered ideal, the availability of water in close proximity (just outdoor) of the latrine did not materially affect the use of latrine in the gardens.

Mothers' Club as reported by UNICEF has been constituted in each garden. The Mothers' Clubs in general are very effective voluntary bodies in promoting health and welfare activities. Such clubs are available and active in all the gardens under DBITA. Amongst many activities they are expected to promote the use of latrines, and serve as an inter-link between the users and the management. The members of the families using the latrines did mention about the existence of the Mothers' Club. But it has been reported that so far, the members of the Mothers' Club are not concentrating to the desired extent on latrine programmes. The users of the latrines however pointed out that the officers of DBITA visited them periodically, inspected the latrines and advised them of the proper use of the facility.

4.2 WATER

4.2.1 Source of water supply

Water Supply in a Tea garden is managed by the garden authorities. Being in the foothills, these gardens have the benefit of a multiple variety of source of supply. Upland streams, springs, wells, small diameter tubewells fitted with hand pumps and large diameter tube wells fitted with power pumps have been used to tap water for the water requirement of the gardens. In certain gardens more than one type of source have been tapped. Table-4 shows the number of gardens using different types of source.

Table - 4
Source of Water Supply

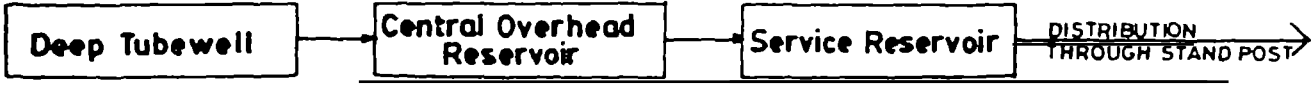
| Source | Number of Gardens |
|--|-------------------|
| Only surface water | 05 |
| Only ground water (Deep tube well, Well, Tube well) | 27 |
| Both | 11 * |
| Total | 43 |

* Includes four gardens which use springs in addition to other sources being used in these gardens.

Makarapara Tea Garden may be considered an exception, since it did not have any organised water supply at the time of survey. They collect and carry the water from a place in Bhutan across the border. It is reported that they had a water supply system earlier which was disrupted due to floods.

4.2.2 Mode of supply

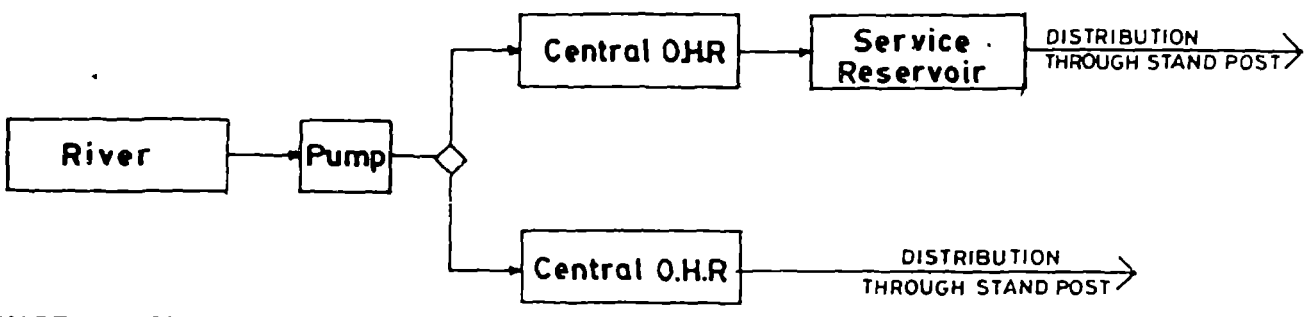
The distribution of water in the Tea Gardens does not follow any set pattern. Several modes of distribution have been observed during the survey (ref. Fig-2). The salient features of these supply systems are presented below :



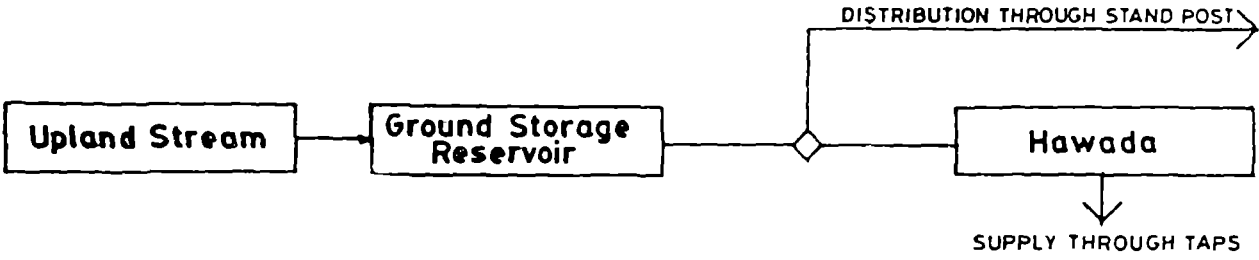
SYSTEM-I



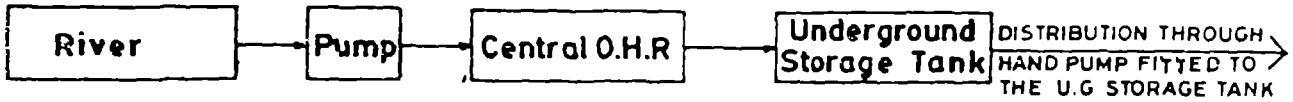
SYSTEM-II



SYSTEM-III



SYSTEM-IV



SYSTEM-V



SYSTEM-VI

VARIOUS WATER SUPPLY SYSTEM AVAILABLE IN THE GARDENS SURVEYED

- I. Water from deep tubewell is pumped up to an overhead reservoir. This reservoir feeds a number of small service reservoirs having low staging heights (ranging between 4.5m to 6.0m) distributed in the labour lines. The service reservoirs ultimately feed the distribution pipes laid in the different labour lines. Standposts are provided along the distribution systems.
- II. Water from deep tubewells is pumped up to an overhead reservoir. The supply pipe from this overhead reservoir splits into a number of service lines to feed the different labour lines. The service lines are provided with the required number of standposts. The distribution system is entirely based on Herring Bone concept.
- III. Water from an upland stream is pumped to a service reservoir suitably located in the garden. Thereafter distribution of water follows either of the two patterns viz., no. I and II as described above.
- IV. Water from an upland stream is stored in a storage reservoir which is usually located at the site of water tapping. The water from this reservoir is then conveyed to the garden by a water supply main. On reaching the garden this main branches off into a number of branch mains to supply various labour colonies in the gardens through standposts. In several gardens the branch lines also feed local distribution tanks/reservoirs (locally known as 'Hawda') strategically located in the labour lines. These reservoirs (Hawdas) are provided with taps, hand pumps or bucket and rope for the people to collect water.
- V. Water from the upland stream is pumped to a central overhead reservoir in the garden. The overhead reservoir feeds water to a number of underground storage tanks spread over the labour lines. These underground storage tanks are provided with a hand pump for drawal of water. People collect their water by using the hand pump.
- VI. A masonry tank is built on the foot-hill to collect water from a jhora. The collected water is next pumped to a central overhead reservoir in the garden. The distribution of water thereafter follows either no. I or no. II pattern as described above.

Conventional Dug Wells are also available in the gardens in addition to the piped water supply as described above. These wells are neither covered nor fitted with hand pumps. The people draw their water from these wells using ropes and buckets. A few gardens have small diameter tubewells fitted with hand pumps. Of the total 43 gardens surveyed, 2 gardens entirely depend on these hand pumps. In other gardens the hand pumps supplement the water available from standposts and wells.

Of the 43 gardens surveyed there are 19 gardens which depend entirely on standposts. The population of each of these gardens and the availability of number of standposts in these gardens were considered to determine the average population served per standpost. This figure ranged between 18 in Diana Tea Garden to as high as 201 in Dhumchipara Tea Garden with an average of 60. Judging by the average the number of standposts is quite satisfactory in the Tea Gardens in Dooars. However, there are a few gardens where the number of people served per standpost is indeed high and needs to be improved by the respective Garden Management. Population served by the standposts in different gardens is presented in Table-5. The supply through standpost is intermittent. The duration of supply and schedule of supply are being controlled by the management of the respective gardens.

The convenience of drawing water from the individual distribution points like standposts, wells and hand pumps depends considerably on the distance to which one has to travel to fetch the water. With wells and hand pumps people often have to go much longer distance to fetch the water than they have to do from a standpost. It is observed from Table-6 (presented in section 4.2.3 of this document) that 72.55% of the distribution points are in the form of standpost, whereas wells and hand pumps accounts for 16.02% and 11.37% respectively.

Table - 5

Population Served by Standposts

| Name of the Garden | Population served by Standpost * | Number of Standposts | Population per Standpost |
|--------------------|----------------------------------|----------------------|--------------------------|
| Bundapani | 4765 | 33 | 149 |
| Dalmore | 4998 | 75 | 67 |
| Dhumchipara | 5441 | 27 | 201 |
| Dheklapara | 1904 | 38 | 50 |
| Gargnda | 4365 | 39 | 112 |
| Hantapara | 6790 | 47 | 144 |
| Lankapara | 6678 | 243 | 27 |
| Nangdala | 4365 | 23 | 190 |
| Tulsipara | 3373 | 58 | 58 |
| Ambari | 3779 | 50 | 75 |
| Banarhat | 3966 | 75 | 53 |
| Chamurchi | 5800 | 98 | 59 |
| Binnaguri | 5282 | 70 | 75 |
| Choonabhutti | 3880 | 93 | 42 |
| Diana | 2873 | 150 | 18 |
| Katalguri | 3569 | 112 | 32 |
| Moraghat | 4365 | 75 | 58 |
| Totapara | 2813 | 55 | 51 |
| New Dooars | 6305 | 50 | 126 |
| Total | 85311 | 1421 | 60.03 |

* Excluding the three percent of population which are being served by house connection.

It was reported that 3 gardens viz. Gandrapara, Lakhipara and Ramjhora have the privilege of house connections almost 100% even in the labour lines.

4.2.3 Sanitary protection of the distribution points

A good apron with drainage facilities should be an integral part of a distribution point. Of the 185 stand posts in the gardens surveyed as many as 67 (36.22%) are without any apron. Even those that are available 24 (20.33%) are not properly maintained. All the 29 small diameter tube wells fitted with hand pumps had aprons of which 8 (27.6%) were in bad shape. Of 41 dugwells 1 did not have any apron. Of the 40 aprons 2 (5%) were not in good repair. Aprons provided with standposts, wells and small diameter tube wells fitted with handpumps encountered were of various shapes and dimensions. No set plan seems to have been observed. Quite a few of them were indeed large. These were built by the management for the convenience of the users, quite likely at their request. The increased size encourages its use for bathing and washing - a practice which needs to be strictly prohibited. In addition to the insanitary condition such usage causes in the environ of the aprons it also deters others, primarily women folk to use the facility when the men folk are using these for bathing and washing.

Drainage from the stand posts is indeed very neglected since only 27 (14.60%) of the total stand posts have drainage facilities. Even those where drainage has been provided they were not as per standard practice. Drainage from wells and hand pumps was also very poor. Of the 29 hand pumps, only 2 (6.9%) had drainage facilities while in the case of 41 wells of the visited only 7 (14%) had drainage facilities.

Even those hand pumps and wells which have drainage facilities do not have them of the right kind. The lead-away drain is short and the drained water is let out on ground. Water was seen all around the apron. The sanitary protection of these sources is very poor.

A summary of findings in respect of the aprons and drainage available with water points viz. standpost, hand pumps and wells is presented in Table-6.

4.2.4 WATER QUALITY

Two major components of any community water supply are adequacy and quality of water which is supplied to the community. Quality control of the water in the tea gardens in Doears leaves

RT AD/BBS (on return)

SH

INTEROFFICE MEMORANDUM
FIELD OFFICE, CALCUTTA

To : Mr S Huda
Project Officer
WESS, ICO

Date : 25 May 1995

From : Chandan Sengupta

Ref : EI/SAN/WB/06/1634

Sub : Spot Survey of Latrines and Public Water Standposts

We enclose herewith 6 copies of the final report of the Spot Survey of Latrines and Public Water Standposts conducted by M/s Environmental Engineers Consortium, 48/60, Swiss Park, Calcutta- 33.

With best regards,

cs:jc

*Are the samples over?
permitted? And why?
Is it in village, a problem
is less extensive. Is it like
to know what Calcutta plan
to do or follow in the case?
R. 2/6/95*

| | |
|------------------------------------|-------|
| WESSICO RECEIVED | |
| To..... | |
| 29 MAY 1995 | |
| ACTION X INFO, Y DISCUS X COMMENTS | |
| From..... | |

Table - 6

STATUS OF WATER POINTS

| Sub District | STAND POST | | | | | HAND PUMP | | | | | WELL | | | | |
|--------------|-----------------|----------------|-------------------|----------------|------------------------|-----------------|----------------|-------------------|----------------|------------------------|-----------------|----------------|-------------------|----------------|------------------------|
| | No. : :Apron | With :Apron | Without :Apron | Apron :Good | Drainage :Available | No. : :Apron | With :Apron | Without :Apron | Apron :Good | Drainage :Available | No. : :Apron | With :Apron | Without :Apron | Apron :Good | Drainage :available |
| Binnaguri | 80 | 59 | 21 | 42 | 06 | 18 | 18 | 00 | 10 | 00 | 19 | 19 | 00 | 17 | 03 |
| Nagrakata | 36 | 17 | 19 | 16 | 07 | 02 | 02 | 00 | 02 | 00 | 22 | 21 | 01 | 21 | 04 |
| Dalgaon | 69 | 42 | 27 | 36 | 14 | 09 | 09 | 00 | 09 | 02 | 00 | 00 | 00 | 00 | 00 |
| Total | 185 | 118 | 67 | 94 | 27 | 29 | 29 | 00 | 21 | 02 | 41 | 40 | 01 | 38 | 07 |

much to be desired. Gastro-intestinal disorders are quite common in these gardens. It sometimes flares up to be considered almost an epidemic. During the period the consultants carried out the field survey they came across such a situation with a large number of the residents in two gardens were down with Gastro-intestinal diseases and garden hospitals were overflowing with patients. A proper and routine monitoring of water quality is almost absent. The garden authorities could not provide the Consultants with water quality analysis reports.

The survey was conducted in 43 gardens in which other than chlorination the water is not subjected to any other treatment. All the gardens in general, use Bleaching powder for disinfection. In most places the Bleaching powder is directly applied in the distribution reservoirs. The person entrusted with this job has been instructed to use a match box for measuring the quantity of powder. The number of box fulls to be applied has been predetermined based on the capacity of the reservoir. It appeared that the operator has been irregular in applying the Bleaching powder to water in the reservoir. Neither the available chlorine in the Bleaching powder nor the residual chlorine in treated water are not examined on a routine basis. Exception to this practice was however observed in 4 gardens (viz. Ghatia tea estate, Hope tea garden, Jiti tea estate and Katalguri tea company) wherein, for each a proper chlorination plant was available.

Physical and chemical quality of water remains unattended. While seasonal variation of ground water quality may not be marked, it is usually not so in the case of surface source. It was reported to the field investigators that the water during monsoon and immediately after monsoon becomes very turbid in certain instances. The same is quite likely to be true in respect of the bacteriological quality. While it was reported in a few gardens (viz. Debpara, Ramjhora, Gandrapara, Lakhipara, Bhogatpur and Jiti tea estates) that laboratory examinations have been carried out. However, the analysis reports were not made available to the Consultants.

It is very necessary that proper monitoring of water quality is introduced in the gardens and the potability of the water is ensured.

5.0 FINDINGS & OVERALL ASSESSMENT

5.0 FINDINGS AND OVERALL ASSESSMENT

5.1 LATRINES

The cost benefit of a latrine programme is very difficult to analyse. The benefit is reflected in the improvement of the health status for which certain parameters are normally examined. There is always a big time lag before the benefit is realised and becomes measurable. The objective of this present study was to conduct certain spot checks and the evaluation of the benefit from the project was not to be attempted. Some of the major observations are stated herein-under.

The coverage of families with sanitation facilities is good, in fact, much better than that encountered in the normal health services in the country. One of the prime reasons for this success is that the subsidy available from the management is 100%. With this subsidy tag it was readily accepted by the plantation workers. The entire cost, irrespective of the type of latrine and inclusive of the cost of super-structure to the choice of the family is borne by the management.

The cost figures for installation of one latrine unit (all inclusive) as obtained from the questionnaire survey revealed that in 22% of the cases the cost varied between Rs. 2,500 and Rs.3,000, while, in 61% and 17% cases the unit cost varied from more than Rs. 3,000 to Rs. 4,000 and more than Rs. 4,000 respectively.

A small number (12) of gardens have indicated the unit cost for installation of twin pit pour flush latrines. These figures indicate that in 17% cases, the said cost varied between Rs. 2,500 and Rs. 3,000, while, in 83% cases the cost ranged between more than Rs. 3,000 and Rs. 4,500. However, as per the DBITA officials the cost for installation of a twin pit pour flush latrine at the present market rate should be around Rs. 2,700.

The plantation workers had seen the managerial quarters provided with privies connected to septic tanks. Most of them believe septic tank latrines are the best, at least superior to pour flush latrine. They hardly know the deficiency of the septic tank latrine and how bad these could be in the congested labour lines. For sanitation like the one encountered in the tea gardens of Dooars the Twin pit latrine is far superior and more hygienic than a septic tank latrine and that too at a lower cost. The beneficiaries (including the garden management and the users) need to be cautioned about the hazards associated with the disposal of the tank effluent and those during the desludging of septic tanks. Realization of the comparative merits and demerits of the two systems viz. septic tank and pour flush twin pit

latrines calls for a massive awareness programme. A few sporadic meetings does not enlighten the labour groups perhaps even the intelligentsia. The pride of owning an expensive unit rides over other factors in one's choice particularly when it does not hurt his pocket.

It is necessary to make the people (management and the workers) in the garden understand the handicaps of septic tank latrines. They should know the hazards of desludging the chamber. Handling and disposal of raw sludge is not only hazardous but is also difficult to organize. The value of digested sludge and the ease with which it can be handled from a twin pit pour flush latrine should be brought home to them.

An additional feature of the latrines in the gardens is the super-structure which is a well built masonry structure. It has been observed in previous studies that good superstructure is essential to improve the use status of the latrine. Selection of building material and constructional techniques is important such that the structure does not become a misfit in the context of the dwellings to which it is attached to and to the neighbourhood. The size of the latrine enclosure should not be more than 4 ft. x 4 ft. since a larger one invites its misuse. A good specification almost rigid need to be written up and followed.

People are using latrines in the garden as observed during the survey. This is certainly a very positive point and its benefit surely will reflect on the health status of the community. Parasitic infection rate and gastro-intestinal incidence amongst the garden population should decline in due course.

5.2 WATER SUPPLY

Two major components of community water supply are adequacy and quality of water.

Adequacy : Most of the gardens have piped water supply. The people collect their water from stand posts.

A variety of pattern in the mode of supply has been observed in these gardens. It was not possible to gather a quantitative estimate of the water used. Based on the opinion survey the water supply seems to be quite adequate.

The number of water points in general appears to be satisfactory. A number of wells and small diameter tube wells fitted with hand pumps are available in these gardens. Supply to individual homes through house connections has been observed in 3 gardens. It certainly improves adequacy of supply. The scope of improvement for adequacy does exist in gradually changing the distribution pattern from standposts to house connections in all the gardens.

Quality : A great deal needs to be done to improve the quality of water supplied to the consumers. Water derived from upland streams requires to be treated. Water from these sources particularly during monsoon and immediately after it, is bad. Even the physical quality is poor; so much so that the consumer avoids using it. Even otherwise surface water should be treated and more so if the source is an upland stream which is characteristically known to be "flashy" both in respect of quality and discharge.

Disinfection is a "must" for all community water supply irrespective of its source. It is being practiced in the gardens, at least it is said so. Bleaching Powder is being used as the disinfectant. Although DBITA has issued an information sheet "Disinfection of water source - some salient points" those do not seem to improve the practice. Those who are entrusted to disinfect the water, do this job in a very elementary manner. Except at 4 centres where proper chlorinators have been installed the rest of the supplies depend entirely on the whims of the operator. Bleaching powder (available stock) demand is not determined even periodically which should have been done daily. The management which is responsible for the well being of the consumers needs to own the responsibility and introduce a strict discipline in this respect.

None of the wells visited can be considered protected. Sanitary protection of these need to be insisted upon.

The distribution points viz standposts, hand pumps, wells, ground reservoirs etc, need badly the sanitary protection. The well maintained aprons which should be of the correct size, drainage, a proper system for drawing water from wells occupy high priority in improving the quality of water. A comparatively small investment on this corrective measure will yield considerable return in the form of improvement of water quality.

It appears from the reconnaissance survey that there is hardly any preventive maintenance programme in water supply system in the garden. The service may be introduced. A small investment on this fetches a big return.

6.0 SANITATION PROJECTS UNDER PHASE II

6.0 SANITATION PROJECTS UNDER PHASE II

The assignment required study of water supply and sanitation project in the tea gardens in the jurisdiction of DBITA. The study of the water supply and sanitation facilities provided with assistance from UNICEF and other international agencies in the Phase-I of the programme was assigned to the Consultants. While working on their specific assignment they observed a few two-pit latrines under Phase-II programme in gardens where the Consultants were working for Phase-I and also in a few adjoining gardens. The field teams were advised to collect certain basic information primarily constructional features of the two pit Pour Flush latrines built or being built under Phase-II.

It had been observed that a large number of latrines built under phase I were not Pour-Flush latrines of the type and design recommended by UNICEF. The information presented in this section relate to the observations on the latrines built under Phase II and which were visited by the field teams. Certain information/data mostly concerning the pits are presented in table-8.

Table-8

Latrines with Pit details

| Sub District | No. of Garden visited | No. of Single pit Latrines | No. of two pit Latrines | No. of Rect/Square pit Latrine | No. of Latrines visited |
|--------------|-----------------------|----------------------------|-------------------------|--------------------------------|-------------------------|
| Kalchini | 03 | 00 | 00 | 08 | 08 |
| Chalsa | 06 | 00 | 00 | 17 | 17 |
| Damdin | 02 | 00 | 03 | 03 | 06 |
| Total | 11 | 00 | 03 | 28 | 31 |

A perusal of Table - 8 reveals that only 3(9.67%) out of 31 latrines visited were Twin-pit Pour Flush Latrines. These latrines did have junction chambers to permit use of one pit at a time. They are reported to be of the design provided by UNICEF. The remaining 28 latrines (90.32%) were septic tanks, for which the field teams could not obtain any drawing from either DBITA or the beneficiaries.

Of the total latrines (under Phase-II) surveyed, 96.77% of the units are fully used by the beneficiaries. 87.10% of these latrine units have brick-walls, while the remaining 12.90% have pre-fabricated walls of concrete. The light and ventilation in all of these units were found to be satisfactory.

6.1 OBSERVATIONS

The reconnaissance survey of the sanitation programme under Phase II covered 11 tea gardens. The field teams visited 31 latrines. In spite of an awareness programme preceding the construction programme, the beneficiaries preferred septic tanks to twin pit latrines. It is rather difficult to explain the attitude of the beneficiaries except that they were accustomed to see septic tank latrines in the tea gardens and their liking for this age old practice - which is very deep rooted. The other reason could be that the cost of the entire installation was borne by the garden management and they preferred the one which was costlier.

7.0 RECOMMENDATIONS

7.0 RECOMMENDATIONS

7.1 LATRINE PROGRAMME

1. Adoption of twin-pit, pour flush latrines has to be encouraged.
2. The design approved by UNICEF is to be followed. The working of twin pit latrines needs to be explained very clearly to all staff members associated with the project.
3. Garden management should be briefed in details of the need for adoption of 2-pit latrines in preference to septic tanks or any other type of latrine.
4. Garden management may detail suitable staff on the sanitation project. They have to be trained properly.
5. Construction staff/agency including mason and pit diggers should be trained for which training camps may be organized by DBITA, with assistance from UNICEF.
6. Construction programme needs strict supervision by competent staff. Drawings and specifications are to be followed strictly. While garden management executes the programme, knowledgeable person(s) from DBITA should be associated with the programme.
7. Management should organise suitable measures for the treatment and disposal of septic tank effluents. Desludging of the tank needs to be undertaken periodically without causing any hazard to the community (refer to relevant Code of Practice of BIS).
8. Awareness programme has to be intensified. Improved communication techniques need to be used to improve the motivation amongst the labourers and their family members to use twin pit latrines in preference to septic tank latrines.
9. Involvement of women's volunteer groups in the project is necessary. Their participation in three stages viz. pre, during and post installation in a house is needed. Their role for the 3 stages has to be different. Members/ member of the volunteer organisation needs to be briefed properly of the material they are to deliver to the families.

10. There is scope for reducing the cost of installation of these units which may be explored.
11. Periodic review of the programme once in 2 years will be desired. DBITA may also undertake a health survey pertaining to water supply and sanitation to assess the benefits if any, due to the programme. This is an exercise common for both sanitation and water supply programme.

7.2 WATER SUPPLY

1. Quality of water supply needs to be monitored at required intervals.
2. Disinfection is a "must" and not "optional" in community water supply. This has to be done in a scientific manner. Residual chlorine has to be checked regularly.
3. Surface water should be treated properly before it is distributed to the consumers.
4. Piped water supply with house connection or stand posts be extended to obtain 100% coverage.
5. Wells and small diameter tube wells be protected against extraneous contamination for which standard practice be followed strictly.
6. Type plans for aprons showing shape and dimensions are to be prepared. Specifications for construction of these are to be drawn up and strictly followed. Large aprons lead to their mis-use. Drainage from aprons has to be ensured and stagnation of water around the aprons has to be prevented.
7. Preventive maintenance of the system is to be provided.
8. Awareness amongst the consumers of their need to use safe water has to be instilled.
9. Trained staff member be assigned in each garden for the maintenance of the system.

ANNEXURE

SANITARY LATRINE

Name of the Tea Garden :

1.0 House Location :

2.0 Head of the family :

3.0 Family composition :

| | Male | Female | Total |
|----------|------|--------|-------|
| Adult | | | |
| Children | | | |
| Total | | | |

4.0 Year of commissioning of the Latrine :

4.1 Who financed the latrine? :

| | Fully | Partly |
|-------------------|-------|--------|
| Garden Management | | |
| Self | | |
| Others | | |

5.0 Type of Pour Flush Latrine

5.1 Pit

5.1.1 Shape : Circular | | Square | | Rectangular | |
Any other _____

5.1.2 Number of pits : Single | | Double | |

5.1.3 Diameter (inches) : 18 | | 30 | | 36 | |

5.1.4 Depth (meters) : 2 | | 2.5 | | 3 or more | |

5.1.5 Lining : Present | | Absent | |



5.1.5.1 Lining Material : Split bamboo cage | | Clay rings | |
Brick | | Peforated conc. pipe | |
Perforated oil drum | |
Any other _____

5.2 Depth of Water Table
below Ground Level (m) : Highest _____ Lowest _____

5.3 Latrine

5.3.1 Shape : Rectangular | | Circular | |
Square | |
Any other _____

5.3.2 Size (m) :

5.3.3 Floor

5.3.3.1 Material : Concrete | | Brick\Stone | |
Kutchha | | Mossaic | |
Any other _____

5.3.3.2 Surface finish : Rough | | Smooth | |

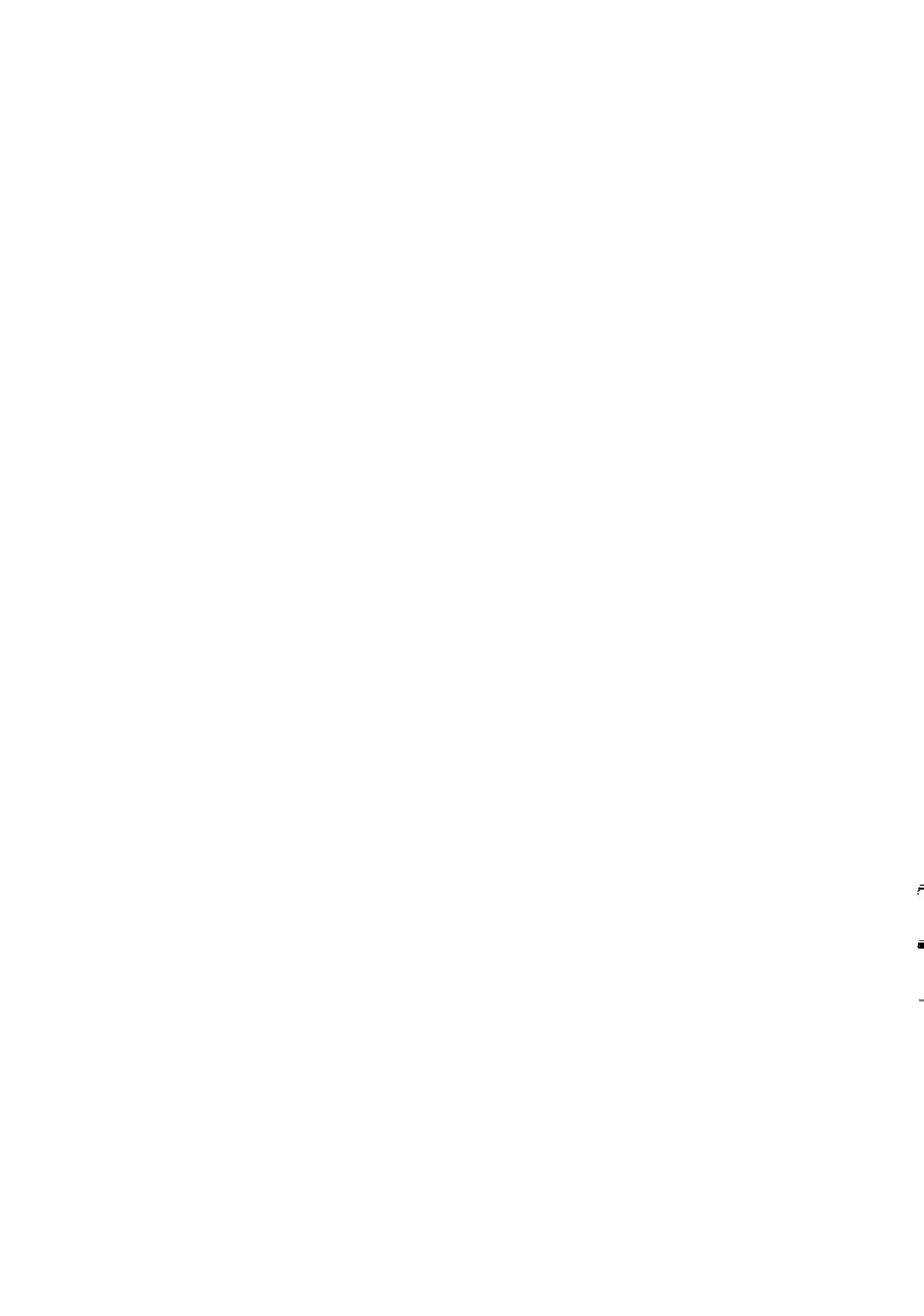
5.3.3.3 Drainability : Good | | Moderate | | Poor | |

5.3.4 Pan & Trap

5.3.4.1 Material : Concrete | | Mosaic | | Porcelain | |
Fibre glass | | Other _____

5.3.4.2 Design : TAG | | UNICEF | | RcA | |
PRAI | | MUH,GoI | |
Other _____

5.3.4.3 Depth of water seal : _____ cm



5.3.5 Superstructure

5.3.5.1 Material : Split bamboo | | Masonary | |
Mud wall | | Hessian cloth | |
Any other _____

5.3.5.2 Light & Ventilation : Adequate | | Inadequate | |

5.3.5.3 Privacy : Satisfactory | | Unsatisfactory | |

5.3.5.4 Protection from sun and rain : Satisfactory | | Unsatisfactory | |

5.3.6 Ablution facility

5.3.6.1 Medium used : Paper | | Leaves | | Water | |
Other _____

i) If Water, its source : Tap | | Stored | |
Pond\Tank | | River\Nullah | |

ii) If Tap or Stored : Indoor | | Outdoor | |
If it is Outdoor : How far from the latrine? _____m

5.3.7 Cleanliness

5.3.7.1 Inside the enclosure : Good | | Moderate | | Poor | |

5.3.7.2 Approach path : Good | | Moderate | | Poor | |

5.3.8 Water for Flushing

5.3.8.1 Quantity (Litres) : 1 or less | | 1 - 3 | |
3 - 5 | | Above 5 | |

5.3.8.2 Does it require flushing periodically
in addition to the efforts of the users? Yes | | No | |

If yes, specify the frequency & approx.
quantity of water used each time ? _____

5.3.9 Maintenance of Latrine Unit

5.3.9.1 Agency : Self | | Labour | | Contractor | |

5.3.9.2 Approx. Cost / year : Rs _____

5.3.10 Desludging

5.3.10.1 Agency : Self | | Labour | | Contractor | |

5.3.10.2 Frequency (once in) : 2 yrs. or less | | 2 - 4 yrs. | |
Above 4 yrs. | |

5.3.10.3 Approx. Cost for each
Operation : Rs _____

5.4 Acceptance of Latrine

5.4.1 Use status :

| | Use Fully | | | | Use Partially | | | | Do not use | | | |
|----------|-----------|------|--------|------|---------------|------|--------|------|------------|------|--------|------|
| | Male | | Female | | Male | | Female | | Male | | female | |
| | No. | Lit. | No. | Lit. | No. | Lit. | No. | Lit. | No. | Lit. | No. | Lit. |
| Adult | | | | | | | | | | | | |
| Children | | | | | | | | | | | | |

6.0 Opinion Survey

6.1 Is the Latrine a useful Unit in the house ? : Yes | | No | |

6.1.1 If not, the reason

| | |
|-----------------------------|--|
| Too close to house | |
| Causes nuisance | |
| Difficult to use | |
| Fear of collapse | |
| Did not know how to use it | |
| Desludging is difficult | |
| Not suitable for children | |
| Cost of maintenance | |
| Lack of privacy | |
| Flooding of squatting slabs | |
| | |
| | |

6.2 Did they have any Latrine before the installation of the Pour Flush Latrine? Yes | | No | |

6.2.1 If Yes, What kind of Latrine was it ?

Bucket | | Pit | | Bore hole | |
Dug well | | Septic Tank | | Aqua Privy | |

6.2.2 How does the P.F.Latrine compare with the previous one

7.0 Follow-up Service

7.1 Visit by project staff : Yes | | No | |

7.1.1 If Yes, how frequent ? :

7.2 Follow-up by Local Organisation : Health Dept. | | Panchyat | |
Voluntary Organisation | |
Womens' Group | |
Others _____

7.3 Which one of the above
is the most effective one? : _____

8.0 Latrine Site details

8.1 How far from the house (approx) _____^m

8.2 Which side of the house ? Front | | Rear | | Side | |

8.3 Visible from public road/path : Yes | | No | |

8.4 Approach road/path : Good | | Bad | | Safe at night | |

8.5 Approx. Distance of the nearest
ground water source : _____^m

Name of the surveyor : _____

Date of survey : _____

OPINION SURVEY (Water Supply)

Name of the Garden :

Name of the respondent :

How do they rate the water supply :

i) Quality wise : Taste| | Odour| | Turbidity| |

ii) Their views regarding the impact of safe water on prevalence of gastro-intestinal disease.

iii) Quantity wise -

| Type Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------------------------|---|---|---|---|---|---|---|---|---|----|
| For Drinking & Cooking | | | | | | | | | | |
| For Other Purpose | | | | | | | | | | |

Code : 1) House connection. 2) Street tap. 3) Private well.
4) Private tubewell. 5) Private pond. 6) Public tubewell.
7) Public Pond. 8) Public well. 9) River/stream. 10) Others.

Maintenance :

Who is responsible :

Staff employed :

To whom they report :

Breakdown - how frequent :

Duration of non-availability of water during such breakdown :

State of repair of the apron attached to the Stand Post :

Pilferage of public taps :

Mode of replacement :

Usual time to replace a lost tap :

Do they use any other source of water to supplement the standpost supply :

If so, what are the common sources :

Name of the surveyor :

Date : / /94

Tea Garden Details

1.0 Name of the Garden :

2.0 Postal address of the Garden :

3.0 Owner of the Garden :

4.0 Approx.number of latrines (all types) available
in the Garden:

| T Y P E | NUMBER |
|---------|--------|
| | |
| | |
| | |
| | |

5.0 Total number of house hold in the Garden :

6.0 Approximate population of the Garden :

Name of the surveyor : _____

Date of survey : _____



WATER SUPPLY

1.0 Name of Tea Garden -

2.0 Area Covered -

3.0 Number of families covered -

4.0 Population served -

5.0 Source :

5.1 Surface :

River | | Upland Stream | | Spring | | Reserved tank | |
Infiltration Gallery | | Impounding Reservoir | |

5.2 Ground water : Tubewells | | Wells | |

5.2.1 Sanitary protection of
ground water source : Satisfactory | | Unsatisfactory | |

6.0 Water Consumption :

6.1 Total Consumption : _____ ltrs / day.

6.2 Average Consumption : _____ ltrs / day.

6.3 Maximum Consumption : _____ ltrs / day.

7.0 Intake - A brief description of the intake structure

8.0 Nature of supply : Continuous | | Intermittent | |

8.1 If intermittent,
the hours of supply : Morning - from to
Afternoon - from to
Evening - from to

8.2 Mode of supply : Public Stand Post | | House Connection | |

