RURAL WATER SUPPLY AND SANITATION PROGRAMME
(RWSS)

DOCUMENTATION OF

VARIOUS LATRINE TECHNOLOGIES

IN RURAL BANGLADESH

DEPARTMENT OF PUBLIC HEALTH ENGINEERING
(DPHE)
UNITED NATIONS CHILDREN'S FUND (UNICEF)
BANGLADESH

FEBRUARY 1995

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LIST OF ABBREVIATIONS AND ACRONYMS

CC	Cement Concrete
CI	Corrugated Iron
DPHE	Department of Public Health Engineering
FC	Ferro-cement
GL	Ground Level
HML	Home-made Latrine
LGED	Local Government Engineering Department
NGO	Non Government Organisation
PVC	Poly Vinyl Chloride
RCC	Reinforced Cement Concrete
SAE	Sub Assistant Engineer
TOR	Terms of Reference
UNICEF	United Nations Children's Fund
WSL	Water-seal Latrine

LOCAL TERMS:

Kutcha	Temporary, made of mud, bamboo, thatch etc
Pucca	Permanent, made of bricks, concrete etc
Chari	Big semi-spherical bowl made of burnt-clay used for animal feed
Motka	Water-bowl or Pitcher made of burnt-clay
Tarza	Woven mat made of bamboo splits
Malsha	Empty coconut shell

DOCUMENTATION OF VARIOUS LATRINE TECHNOLOGIES IN RURAL BANGLADESH

1. BACKGROUND

In Bangladesh thousands of childrens lives are lost every year in diarrhoeal diseases. The causes of such diseases are largely due to poor environmental sanitation and personal hygiene.

According to a recent statistics in 1994, it is indicated that the overall sanitation coverage of the country in the year 1992-93 is only 35%. The same figure in year 1990 was only 9% *(Reference: Progotir Pathey, Published by UNICEF/ BBS, 1994)*.

With the increased coverage of safe drinking water supply it was generally hoped that there would be certain reduction in diarrhoeal disease, the major killer in diarrheal disease. However, satisfactory drop has not found. Increased attention was given to integrated approach to prevent these diseases more effectively, of which sanitation and hygiene are considered as most important component.

Since the various low-cost latrine technologies have been developed in rural Bangladesh by DPHE, NGOs and private sectors, and are in use by rural people, it was felt necessary to carry out a comparative study of various latrine technologies with a view of promotion of such low-cost technologies for the people of rural Bangladesh.

2. OBJECTIVES OF SURVEY

a) Documentation of all acceptable latrine technologies promoted in rural Bangladesh.
b) To collect detail data and specific information about types of latrine technologies promoted in rural Bangladesh and are accepted by the users.
c) To obtain construction details on different types of low-cost latrines in rural Bangladesh.
d) To document different types of latrine technologies in different geographic areas in rural Bangladesh, considering soil condition and socioeconomic pattern.

3. STUDY DESIGN

The field study was designed, inter-alia to collect the following information:

* Type of the technology adapted with dimensions of latrines.
* Soil conditions.
* The type of materials used for pit lining, squatting platform, pit cover and superstructure.
* Cost of materials and labour.
* Users attitudes towards the technology.
* Source of technology, from where information on construction methods was acquired.
* Life span of latrine (mainly pit & squatting slab) of the particular technology.
* Steps taken when the pit was filled up.
* Effects due to weather conditions, if any.
* Source of messages on latrine technology usage.

4. SURVEY AREAS

As per TOR of the study, which is given in Annexure-I, a total of 10 villages, two in each of the 5 survey districts, one from each of the 5 administrative divisions were planned for detail survey. In reality, after discussion with DPHE & NGO-Forum, more than 10

villages were selected. The list of districts and villages surveyed in the study is given in the Table given below.

To have a balanced country-wide distribution of samples, seven districts have been taken from five administrative Divisions, and a total of 24 villages in 13 thanas were surveyed. More than 100 latrines were inspected during the field visits and 53 no. of latrines of different types have been documented.

Soil conditions and availability of participant NGOs were considered for selection of villages for this survey.

TABLE
LIST OF SELECTED VILLAGE FOR SURVEY

DIVISION	DISTRICT	THANA	VILLAGES	LATRINES DOCUMENTED
Dhaka	Dhaka	Dhamrai	1	3
	Gazipur	Sreepur	2	3
	Tangail	Mirpur	4	9
Chittagong	Chittagong	Anwara	2	6
		Hathazari	1	2
		Sitakundu	2	3
Khulna	Khulna	City Slum	1	5
		Fultala	1	2
Rajshahi	Bogra	Sariakandi	1	1
		Sadar	4	9
		Gabtali	1	1
Barisal	Barisal	Sadar	3	4
		Gournadi	1	5
5 Division	7 District	13 Thanas	24 Villages	53 Latrines

5. STUDY PERIOD

The study period was from October to November 1994, during which the consultant has made field visits, collected various information and analysed the data. The consultant made some visits and compiled the report in December 1994. This period is winter season and is relatively dry.

6. SURVEY TOOL AND DATA COLLECTION

One member team with the consultant was engaged for collection of data in collaboration with local DPHE office (mainly with assistance from SAE), and local NGO officials.

For collection of information during the survey, a format was prepared and finalised after discussion with DPHE and UNICEF officials. The format used in the survey is given in Annexure-II.

The information collected from the field surveys were processed and analysed at DPHE VS project office, with assistance of Engr. Rabiul Islam, Sanitation Consultant, Research and Development of UNICEF. A draft report was prepared and was reviewed by DPHE & UNICEF officials before finalising the same.

7. METHODOLOGY

7.1. Information collection at Dhaka

Apart from the contacting the DPHE offices in Dhaka for information, the consultant contacted NGO-Forum office and head office of different NGOs at Dhaka. These are:

* BRAC
* CARE
* CARITAS
* GRAMEEN BANK
* PRISM
* PROSHIKA (MUK) and others

The consultant collected from these offices information regarding promotion of various latrine technologies undertaken by them including the technical details of those latrine patterns and also the project areas where they are being promoted.

On the basis of information obtained from DPHE and various NGOs, a table has been prepared showing different types of low-cost latrines technologies promoted by these organisations in rural areas of Bangladesh. This information is given in Table-I, given at the end of this report. This table also gives the areas where these types of latrines are promoted.

7.2. Field visits

The consultant visited 24 villages of rural Bangladesh in the districts of Dhaka, Tangail, Gazipur, Bogra, Barisal, Chittagong and Khulna along with NGO field officers, Sub-Divisional Engineers, Sub-Assistant Engineers of DPHE from 09 October to 05 December 1994, and has collected detail information regarding rural latrines.

In the field level, the consultant contacted and met with concerned persons of NGO Forum, other NGOs, Superintending Engineers, Executive Engineers of DPHE, and in some places with administrative officials such as Deputy Commissioners (DCs) and Thana Nirbahi Officers (TNOs).

A list of persons contacted in Dhaka and in various districts is enclosed as Annexure-III. Details of field visits is given in the 'Tour Diary' which is given in Annexure-IV.

7.3. Interview with users

The consultant inspected the latrines in the villages, interviewed the users and documented these in the survey formats, as given in Annexure-I of this report. The local NGO officials and DPHE officials helped during such interviews. The reactions of the users and the finding from their interviews have been recorded in this report.

8. DISTRICT-WISE INFORMATION/ DATA COLLECTION

The types of latrine has been classified in 5 groups and are put together in the Table-II, given at the end of this report.

The details of collection of data and information about types of latrine technologies promoted in rural Bangladesh has been tabulated in the following tables in art. 8.1, 8.2, 8.3, 8.4, & 8.5. The tables are given divisions-wise, with one table for each district.

In the following tables HML means 'Home Made Latrine' and WSL means 'Water-seal Latrine'.

8.1. Dhaka Division Data

Dhaka District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
16.11.94	Dhamrai	Kushura	Hat-Kushurua	HML - direct pit (3 nos)
Total			1	3

Gazipur District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
05.12.94	Sreepur	Sreepur	Kewa Paschim Kanda	WSL - 1 ring with two parallel pits
05.12.94	Sreepur	Talihati	Godarchala	WSL - 1 ring with two parallel pits (2 nos.)
Total			2	3

Tangail District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
10.10.94	Mirzapur	Mirzapur	Andhora (Goshpara)	WSL - 2 slab with single pit
10.10.94	Mirzapur	Gorai	Rashid Dewhata	WSL - with many rings (2 nos)
11.10.94	Mirzapur	Gorai	Shohakpara	HML - with direct pit
11.10.94	Mirzapur	Gorai	Shohakpara	WSL - with no ring
11.10.94	Mirzapur	Gorai	Shohakpara	WSL - on wall
11.10.94	Mirzapur	Gorai	Shohakpara	WSL - with 8 rings
12.10.94	Mirzapur	Jamurki	Shatiachura	WSL - with 1 ring and pipe to pond
13.10.94	Mirzapur	Jamurkı	Shatıachura	HML - Direct pit
Total			4	9

8.2. Chittagong Division Data

Chittagong District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
20.10.94	Anwara	Chatori	Shinghora	HML - off-set pit
20.10.94	Anwara	Chatori	Chatori	WSL - with (3 rings)
21.10.94	Hat-hazarı	Fatepur	Purba Pattı	WSL - wıth (1 ring)
21.10.94	Hat-hazari	Fatepur	Purba Patti	WSL - with (4 rings)
22.10.94	Sita-kundu	Syedpur	South West - Syedpur	HML - off-set (2 nos)
22.10.94	Sita-kundu	Syedpur	North Kak-khali	WSL - with (3 rings)
Total			4	9

8.3. Khulna Division Data

Khulna District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
29.10.94	Sadar	Mohsin-abad	Moksed Lane	WSL - 2 parallel pit (3 nos)
29.10.94	Sadar	Mohsin-abad	Moksed Lane	WSL - 8' high 1 ring
29.10.94	Sadar	Mohsin-abad	Moksed Lane	HML - with 1 motka pitcher
29.10.94	Fultala	Atra-Gilabari	Gilabari	WSL - with 1 ring & free pit
29.10.94	Fultala	Atra-Gilabari	Gilabari	WSL - with 1 ring and 10 burnt earth ring
Total			2	7

8.4. Rajshahi Division Data

Bogra District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
18.10.94	Shariakandi	Sharia-kandi	Par-Titparal	WSL - with 5 rings
19.10.94	Sadar	Gokul	Ram Shahar	HML - with direct pit (2 nos)
20.10.94	Sadar	Gokul	Ram-shahar	WSL - with 15 rings (2 nos)
20.10.94	Sadar	Gokul	Gokul	HML - with direct pit
21.10.94	Sadar	Shapgram	Shapgram	WSL - with 20 burnt earth rings
22.10.94	Gabtali	Mohi-shaban.	Mohishaban	WSL - with 18 burnt clay rings
22.10.94	Sadar	Shapgram	Buzrukbaria	WSL - with 4 rings
Total			6	11

8.5. Barisal Division Data

Barisal District

DATE OF VISIT	THANA	UNION	VILLAGE	NO. OF LATRINES DOCUMENTED
1	2	3	4	5
05.10.94	Sadar	Charbaria	Motashar	HML - with off-set pit
05.10.94	Sadar	Charbaria	Kashipur	HML - with off-set pit
06.10.94	Sadar	Charbaria	Isakati	WSL - with 3 rings
07.10.94	Gournadi	Barthi	Bagmara	WSL - with no ring
07.10.94	Gournadi	Barthi	Bagmara	HML - with direct pit (3 nos)
07.10.94	Gournadi	Barthi	Bagmara	HML - with Motka pit
08.10.94	Sadar	Charbaria	Isakati	WSL - off-set with 11 rings
Total			4	9

8.6. District-wise detail Information

District-wise statement showing data and information collected about different types of latrines in rural Bangladesh, has been given in the earlier tables.

Details of information collected in each of the districts listed below are given in the subsequent paragraphs.

1. Barisal district
2. Bogra district
3. Chittagong district
4. Dhaka district
5. Gazipur district
6. Khulna district and
7. Tangail district.

9. DETAILED INFORMATION ON LATRINE TECHNOLOGIES

9.1. BARISAL DISTRICT

The consultant inspected 4 villages in two thanas, Gournadi and Sadar of Barisal district. Visited some 15 latrines and documented 9 in the format which are as follows:

a) Home-Made Latrine, Direct Pit: 3 (three) Nos

Three latrines visited in Village - Bagmara, Union - Barthi of Gournadi thana.

* Depth of the pits are 5 ft, 8 ft and 10 ft and labour charge for construction is Tk. 50 (for all depths).
* Type of soil is clay and deeper pit is possible.
* Squatting slabs are made of bamboo platform, covered with old polythene sheet and 3" thick mud plaster. Cost is Taka 50 to Taka 75.
* Clay soil does not soak water like sandy soil, so the clay soil pit fills up within a short period.

b) Home-Made Latrine with "MOTKA" Pitcher lining: 1 (one) No

One motka latrine was visited in Bagmara village of Barthi union in Gournadi thana.

* Nine (9) motkas (each 1'- 8" dia and 1' - 6" high) have been placed under a bamboo frame squatting platform. Total depth is 13'- 6".
* The caretaker has purchased/ procured old used motka (burnt clay water pitcher) @ Tk. 15 each and total cost including carriage is Tk. 185. New motka will cost more than Tk. 40 each. So motka latrine is uneconomical.
* Maintenance of motka latrine is very difficult. Excreta obstruction at most of the "MOTKA" joints is very difficult to remove.

c) Home-made Latrine, Off-set Pit: 2 (two) Nos

Visited two off-set pit latrines in Charbaria union of Sadar thana.

* The pits are 5 ft deep and without lining.
* As the type of soil is sandy so to avoid collapse the pit is excavated in shape of 'cone' i.e. its diameter at bottom is lesser than that at top.
* Sitting position and a sloped "Tin Pan" is placed just at the edge of pit, with it's slop towards pit. The "Tin Pan" is fixed with 6" extension into the pit, so that water may drop down into the pit without damaging sandy soil wall of the pit.
* Since the off-set pit-cover does not take any load it may be made of lighter bamboo.
* The squatting slab does not need to be much stronger, as it is not over the pit and does not take the load of person using the latrine.

d) Water-seal Latrine, One Slab Without Ring: 1 (one) No

Visited one such latrine at village - Bagmara of Gournadi thana.

* One privately purchased Water-seal FC slab is placed directly on a 12 ft deep pit.
* Diameter of the pit is 30" top and 24" at bottom.
* There is bamboo lining in the pit to improve its stability.
* The lining alone costs in Tk. 250 and the total cost of the latrine stands at Tk. 555. This is higher than other types of latrine.

e) Water-seal Latrine, One Slab Three Rings: 1 (one) No

Visited one latrine at village - Isakati under Sadar thana.

* This is a water seal slab latrine.
* This is produced at CARITAS production center, Sagordi. The pan opening is just like a bend and not like conventional goose neck.

* It creates more obstruction at the time of flush, than in goosneck and the users normally break the bent portion of pan.

f) Water-seal Latrine Slab (Off-set pit, RCC Rings): 1 (one)

Visited one latrine at village - Isakati under Sadar thana Barisal.

* The water-seal slab is a CARITAS product.
* The slab is placed over a single ring.
* The water-seal/ goosneck of the pan is broken and fixed with 4" dia PVC pipe. Then pan is connected by a 3 ft long PVC pipe line to an off-set pit with 11 RCC rings.

g) General Remarks

Superstructure materials used in most of the latrines are poor and without roof. This is due to poverty and also due to negligence of the users.

Soil of Barisal Sadar is sandy but Gournadi thana area has clay. Home-made pit latrine with deep pit is more suitable in Gournadi thana.

CARITAS product Slab is similar to DPHE conventional type slab with a slight deviation at goosneck point. Many people who have purchased such slab, have broken the bent end of the pan to avoid excreta obstruction.

Amirzan Bibi, of village Bagmara union Barthi under Gournadi thana Barisal has built a home-made latrine alone on self-help basis. She has excavated a 10 ft deep pit, Kapila tree branch as squatting slab and ordinary wooden planks and polythene as cover of the slab with 3" thick clay layer on it. She has also constructed a kutcha superstructure with roof on self-help basis.

It was found from interviews with the users that the off-set pit latrine is always better than a direct pit home-made latrine. Superstructure with roof is always good for use of a latrine.

9.2. BOGRA DISTRICT

a) Water-seal Latrine One Slab Five Rings: 1 (one)

Visited such a latrine at village - Partitparal of Shariakandi thana.

* One RCC water-seal slab is placed direct over a 5 RCC ring well.
* This is just a DPHE conventional type.
* Soil of this area is sandy, due to affect of near by river.
* In this area use of either RCC ring or burnt clay ring, is the only way to build a pit latrine. Using bamboo as pit lining in sandy soil is difficult.

b) Water-seal Latrine, One Slab 15 Rings (Off-set): 2 (two) Nos

Visited two such latrines in village - Ram Shahar, union Gokul of Sadar thana.

* User families of both the latrines are rich persons of the locality.
* The superstructure is a pucca building.
* The 15 nos RCC rings are sunk behind the superstructure, away from the latrine platform.
* A pipe connection from pan to ring-well is made.
* Sweeper is engaged to clean this when it is full and the excreta is dumped in a pit excavated near by.

c) Water-seal Latrine, with Burnt Clay Rings (direct pit): 2 (two) Nos

Visited 20 rings latrine at village - Shapgram of Sadar thana and 18 ring latrine at village - Mohishaban of Gabtoli thana.

* RCC and FC water-seal slab is placed directly on pits lined with burnt clay rings of 18/20 nos.
* Both of the user families are professional potters and they have used their own product, burnt clay rings.

* The advantage of using more rings is that it takes longer period to fill-up.
* Such a deep pit may have a chance to contaminate underground water sources through penetration up to ground water table.

d) Water-seal Latrine, One Slab 4 Rings (Off-set): 1(one) No

Visited such a latrine at village - Buzrukbaria of Sadar thana.

* RCC water seal pan and slab is placed on a RCC ring and then connected to a pit lined by 4 nos. cement rings.
* Top of off-set pit, with RCC lining, is not covered by any slab or platform. It is covered by palm tree leaves only, which is quite insufficient and may cause danger by falling of cattle etc.
* Total cost of the latrine is Tk. 360 which seems to be high.

e) Home-made Latrine, Direct Pit: 5 (five) Nos

Visited five such latrine in Gokul union of Sadar thana.

* The poor people have built these latrines.
* The type of soil is sandy-clay (red colored) and pit of 9 ft to 12 ft depth was excavated without problem and the same are in use without being collapsed.
* Only bamboo frame covered with polythene and clay with a square cut hole at centre is being used as squatting platform, without any cover to opening.
* All of the latrines have very poor material superstructure. Without roof which cause damage to latrine during continuous rainfall.

9.3. CHITTAGONG DISTRICT

Covered 5 villages in 3 thanas namely Anwara, Hathazari and Sitakundu and visited some 18 latrines, out of those recorded 11 latrines are documented in the format.

a) Home-made Latrine, Off-set Pit: 7 (seven) Nos

Visited 7 such latrines in Anwara and Sitakundu thana.

* The Off-set pit latrines visited in Chittagong are of better condition than those of Barisal.
* The users take care of the latrines. They do clean the surface of squatting slab and mud polish.
* Depth of pit is 5 ft (maximum).
* Soil is black clay and at certain level (some 3 ft below). While in contact with water it becomes too soft and some time cause collapse of the pit.
* Superstructure do not have roof which may cause damage to the latrine at the time of continuous rain fall.

b) Water-seal Latrine with RCC Rings: 4 (four) Nos

Visited 1 one-slab one-ring and 1 one-slab five-rings water-seal latrines at village - Purba-Patti, union - Fotehpur of Hathazari thana.

* Both were without superstructure and had just a fencing for the purpose.
* The One slab one ring latrine has 2 ft deep free pit under the one ring which becomes full frequently and the caretaker is to abandon the pit and shift latrine frequently within every 7/8 months.
* The one slab five ring latrine is just a DPHE conventional type.

Visited 2 "One-Slab Three-Rings" latrines at Anwara and Sitakundu thana.

* One slab three ring latrine in Sitakundu has 3 ft deep free pit below, i.e. 6 ft total depth.

* When the pit is full, the caretaker makes alternate temporary pit for use. When the excreta is dry and compact in the old pit, the caretaker removes it and clean the original pit for re-use.
* The caretaker is a poor fisherman and he has no land to use the digested sludge as manure.
* The latrine at Anwara thana is built at a slope beside a ditch and a pit at the bottom of three rings always leaking excreta to open space creating insanitation.

9.4. DHAKA DISTRICT

a) Home-made pit Latrines, 3 (three) Nos

Visited some five latrines in Dhamrai thana of Dhaka district and recorded only 3 in the format. All are direct pit home-made latrine of best quality so far inspected. These are in village - Hatkushura, union - Kushura, Dhamrai.

* The type of soil is sandy clay.
* The 5 ft deep 3 ft dia pit latrine have bamboo frame squatting slab covered with polythene and 3" thick clay plaster nicely mud polished.
* The squatting holes are made by fixing burnt clay pot neck nicely finishing with clay cover packing.
* One coconut half shell "MALSHA" is used as cover of squatting hole.
* The superstructure is of low cost with available/ bushy dry leaves but very nicely built.
* The latrine and its surrounding are very neat and clean and nicely mud polished and there is no bad smell.

9.5. GAZIPUR DISTRICT

Visited Sreepur and Telihati unions, villages - Godarchala.

a) Water-seal Latrine, One Slab One Ring with Two Pits in series: 3 (three) Nos

* These latrines are just built and not yet in use.
* Superstructure not yet completed.
* The first pit is just under the slab with one rings.
* The second pit is about 3 ft away with a PVC pipe interconnection and is deeper than the first pit.
* Both of the pits will fill up simultaneously while in use. It is not separate twin pits for alternate use.

9.6. KHULNA DISTRICT

Inspected slum area of Khulna city and Fultala thana, village - Gilabari of Atra - Gilabari union. Visited some 12 latrines and recorded only 7 in the format.

a) Water-seal Latrine, Two Pits in series : 3 (three) Nos

Visited such latrines at slum areas in Khulna City.

* Both of the 2 pits have 6 nos RCC rings each.
* No pit is placed direct under slab, rather both pits are 3 to 4 ft away from slab and there is parallel interconnection between 2 pits and pan slab.
* The pits are in series connection and both fill up equally at the same time while in use.
* One users has pucca Superstructure but without roof. The existing roof is under repair or replacement.
* Another user has constructed one more pucca superstructure with one more slab and ultimately altered the two pit to 2 nos one slab one pit latrines.
* The two pits are still interconnected and one overflow hole just on earth surface is always leaking excreta to open space and to a pond near by.

b) Home-made Latrine, with "One MOTKA": 1 (one) No

Visited such a latrine at slum area of Khulna City.

* The user family has no space to built a latrine of any type.

* He has purchased one medium size burnt clay motka from local market and placed that in the soil with wooden cover on it.
* The motka becomes full within very short period and the user engage sweeper once a month to clean it.
* It fact this latrine is a nuisance of the locality.

c) Water-seal Latrine, One Slab One Ring: 1 (one) No

Visited such latrine at village - Gilabari in Fultala thana of Khulna district.

* It has banana leaf fencing without roof.
* It is built at a distant place from household (more than 100 ft away).
* No one carry adequate water from such a distance and as a result there is excreta obstruction at gooseneck of the pan.

d) Water-seal Latrine, One Slab and Ten Burnt-clay Rings: 1 (one) No

Visited such a latrine in the same village - Gilabari of Fultala thana.

* Ten burnt clay rings are added under the one RCC ring to increase the depth of pit.
* Banana leaf fencing in the large area around latrine is considered as superstructure without roof.

9.7. TANGAIL DISTRICT

a) Home-made Latrine, Direct Pit: 2 (two) Nos

Visited one of such latrine at village - Shatiachura, union - Jamurki under Mirzapur thana.

* Depth of pit is 5 ft.

* Bamboo frame squatting slab, covered by polythene and 3" thick clay, has a hole at middle.
* A piece of tin sheet is used as a cover of squatting hole.
* There is jute stick fencing as a superstructure of the latrine without roof.
* When full the user abandon it and built another such latrine.

Visited another such latrine at Shohakpara union, Gorai of Mirzapur thana.

* The pit is 27" dia and 15 ft deep.
* One burnt clay big bowl (Chari) with a hole at bottom has been placed at the top of the pit, in reverse (overturned) position and then clay cover of 1 ft depth has been provided there as a squatting slab.
* Such a squatting slab is neither strong nor economical.
* The superstructure is very poor and without roof.

b) <u>Water-seal Latrine, Two Slab One Pit with Burnt-clay rings: 1 (one) No</u>

Visited such a latrine at village - Andhor (Goshpara) in Mirzapur thana.

* It is actually two latrines connected to common pit.
* Both the pans have no gooseneck but connected by two separate pipes to a common pit, behind the latrine platform.
* The pit is 13 ft deep with 5 nos. 1 ft. high RCC rings above 16 nos. 6 inches high burnt clay rings.
* The pit has a RCC cover with small piece of pipe fixed at centre for ventilation of gas.
* The superstructure is a pucca building with C.I. sheet roof.
* Total cost of the latrine is Tk. 1,500.
* Most of the villagers are financially unable to built such a latrine.

c) **Water-seal Latrine, One Slab no Ring: 1 (one) No**

Visited the latrine in village - Shohakpara of Mirzapur thana.

* One RCC slab is placed on a 10 ft deep 3 ft dia free pit without any lining.
* The superstructure is just a tarza fencing without roof.
* It is a new one, constructed in August 1994 and the pit is only 10% full.

d) **Slab Latrine without Water-seal, on One Ring and unlined Pit: 1 (one) no.**

Visited this latrine at village - Shatiachura, union - Jamurki in Mirzapur thana.

* The latrine is situated on a bank of ditch behind household.
* Only one RCC ring is placed under a F.C. slab with pan without any water seal.
* One 4" dia PVC pipe is connected from the bottom of the ring up to a bamboo box placed in the ditch. This arrangement is for production of fish food.
* There is a superstructure made of jute stick, with roof.

e) **Slab Latrine without Water-seal, on 8 Rings: 3(three) Nos**

Visited one slab eight rings latrine at Shohakpara of Mirzapur thana.

* One RCC slab and cement concrete pan without gooseneck, purchased privately, is placed in a improved superstructure.
* The C.C pipe connection is made from the pan to the pit of 8 RCC rings.
* One blind C.C. slab has been fixed on the top of the ring well with a hole at centre, for ventilation.
* The superstructure has 4 RCC pillars, C.I. sheet wall and roof.

* The total cost of the latrine as stated by user family is Tk. 4,000.

f) Water-seal Latrine, with more than 5 Rings: 2 (two) Nos

Visited both one slab 13 rings and one slab 20 ring latrines in village - Rashid Dewhata of Mirzapur thana.

* Five (5) RCC rings at top and all other rings below that are of burnt clay rings.
* Both of the latrines are old. One built in 1985 and another one was built 1987.
* Now 80% to 85% is full.
* The water-seals of both the latrines were found in good condition even after a decade use.

g) Water-seal Latrine, One Slab and Brick Wall Square Pit: 1 (one) No

Visited such a latrine at Shohakpara of Mirzapur thana.

* The water-seal slab is placed on the wall of a square size pit tank.
* There is a 4" X 4" trench at the back side of the wall with a brick lining.
* When the chamber is full the packing is removed and the excreta moves to adjacent ditch, creating unbearable nuisance. This type is not acceptable.
* The superstructure is a tarza fencing without roof.

10. TYPES OF LOW-COST LATRINE TECHNOLOGIES IN RURAL BANGLADESH

10.1 GENERAL TYPES OF LATRINE

Types of latrine used in the other countries of the world as mentioned in the book *"Excreta Disposal for Rural Areas and Small Communities" by E. G. Wagner and J. N. Lanoix, published by World Health Organisation, Geneva (1958),* are as follows:

1. Pit latrine — used almost in all the countries as cheap alternative.

2. Aqua Privy	relatively expensive alternative.
3. Water-seal latrine	most used low-cost sanitary latrine.
4. Bored-hole latrine	used in Bangladesh, Egypt and other hilly countries.
5. Bucket latrine	used in India, Bangladesh and Hong Kong.
6. Trench latrine	used in Africa.
7. Overhung latrine	in sanitary way of excreta disposal.
8. Compost privy	Two vault or Twin pit latrine, suitable for durability.
9. Chemical Toilet	used in technically advanced countries

10.2 GENERAL TYPES OF LATRINE IN BANGLADESH

After detailed survey in rural Bangladesh, different technologies of various low-cost latrines have been classified in five types as given below.

Type-1. Home-made (Do-it-Yourself) Latrines
Type-2. Simple Pit Latrine, without lining
Type-3. Water-seal Latrine and RCC rings
Type-4. Water-seal latrine with burnt-clay rings
Type-5. Twin-pit Latrines

After further sub-grouping of the latrine types the following list has been prepared.

Type-1. Home-made (Do-it-Yourself) Latrines
(Squatting platform with indigenous materials and pit)

1.1 Bamboo, timber/ tree branch platform (direct pit)
1.2 Bamboo, timber/ tree branch platform (offset pit)
1.3 Bamboo, timber/ tree branch platform (pit lined with bamboo-mat)
1.4 Bamboo, timber/ tree branch platform (pit lined with full-bamboo)
1.5 Burnt-clay Pitcher platform (without lining)
1.6 Burnt-clay Pitcher platform (with pitcher lining)

Type-2. Simple Pit Latrine, without lining
(RCC slab with squatting hole or pan without WS)

2.1 Direct Pit
2.2 Off-set Pit
2.3 With one RCC ring as base (direct/ off-set pit)

Type-3. Water-seal Latrine and RCC rings
(RCC slab and pan with water-seal)

3.1 Slab with no or 1 RCC ring and unlined pit
3.2 Slab with 3 rings and unlined pit
3.3 Slab with 5 rings
3.4 Slab with more than 5 rings

Type-4. Water-seal latrine with burnt-clay rings

4.1 RCC Slab & Pan with clay rings (direct pit)
4.2 Clay pan with clay rings (off-set pit)

Type-5. Twin-pit Latrines
(With various types of pan and linings including brick-lined ones)

5.1 Alternate use pits
5.2 Pits in series

Consolidating the above information a table has been prepared on documentation of various low-cost latrine technologies in rural Bangladesh. This is given in Table-II of this report.

10.3 PERCENTAGE OF LATRINES BY TYPES

Of various types of latrines use in Bangladesh more than a quarter are home-made latrines, more than half are water-seal latrines and the remaining are other types including concrete slab latrines without water-seal or with just a hole in the squatting platform.

According to *"The 1991 National Survey on Status of Rural Water Supply and Sanitation " conducted by Mitra and Associates* for UNICEF/ DPHE, (Final Report August 1992) the following statistics is available.

i. Home-made bamboo/ timber platform latrine 27%
ii. Concrete slab latrine without water-seal 14%
iii. Water-seal pour-flush latrine 59%

The above figures were found to be nearly the same during the present study.

10.4 DETAILS OF TYPES OF LATRINE

Details for each of the types of latrines as described in 10.2 are described in detail in the following paragraphs.

TYPE-1 HOME-MADE (DO-IT-YOURSELF) PIT LATRINES

(Squatting platform with indigenous materials and pit)

1.1 Bamboo, timber/ tree branch platform (direct pit)

* Visited such latrines at Bogra, Tangail and Barisal
* This is an easy and low cost home-made latrine suitable for rural Bangladesh.
* Excavation of a pit with depth of about 5 ft below the ground and with 3 ft to 4 ft dia width and with a bamboo or timber frame squatting platform on the pit and a squatting hole at centre of the platform is the main part of such a home-made latrines.
* The squatting platform covered by ploythene and then 3" thick clay on that, can improve quality of the latrine.
* There should be cover of the squatting hole. But a squatting hole, covered by piece of wood-plank or tin sheet, can prevent bad smell and contamination by flies.
* Any kind of superstructure, according to financial capacity may be constructed, and are seen in the field.
* A leak proof roof can stop rainfall on the squatting (slab) platform, which may ensure its longevity. So the roof is important item of a superstructure.

How it Fails

* High sandy soil may result failure collapse of the pit
* Continuous rainfall (with no roof), frequent use of water

on the squatting platform may damage the bamboos and may result failure of the platform.

* White ants, rates and termites may also destroy the squatting slab and the superstructure as well. Rat may also cause collapse to the pit. However, detail experience of the above was not available.
* Flood water may submerge the latrine and damage it including the latrine-pit.

1.2 Bamboo, timber/ tree branch platform (offset pit)

* Visited such latrines at Chittagong, Barisal.
* This may be considered as best type of home-made latrines in rural Bangladesh.
* The pit cover is free from any direct or indirect load, so it lasts for longer period.
* As it is "Off-set", so frequent water use has no affect on its cover.
* The only care to be taken, is that, its pan (in slope) is sufficiently extended towards centre of the pit, so that used water does not drop directly on wall inside the pit.
* Superstructure with a roof (covering the entire pit) may ensure longevity of the latrine.
* To built an off-set pit latrine, every thing is locally available, except the 'tin pan' which is not at all expensive.

1.3 Bamboo, timber/ tree branch platform (pit lined with bamboo-mat)

1.4 Bamboo, timber/ tree branch platform (pit lined with full-bamboo)1.

* Visited such latrine in Gournadi of Barisal.
* This type of latrine are same as Type 1.1 and 1.2. The only difference is that these are lined with bamboo-mat or full-bamboo, just for safety of pits from collapse.
* Such type of home-made (lined pit) latrine is built in areas where sand is more than 50% in the soil and pit remains vulnerable to collapse.
* If the cost of lining is more, in comparison to RCC ring or burnt clay ring, then such a lining is not recommendable.

1.5 Burnt-clay Pitcher "Squatting hole" platform (without lining)

* Visited this type of latrine in village - Hat Kushura of Kushura union under Dhamrai thana of Dhaka district.
* This similar to the latrines Type 1.1 with only difference is that, it has a pitcher (neck portion) fixed at squatting hole with good finishing and a nice cover on it.
* This type of latrine as visited in Kushura, Dhamrai are the best amongst all home-made direct pit latrines visited in rural Bangladesh.
* The latrines users in Kushura, were found very much motivated, in maintenance and use of home-made latrines.

1.6 Burnt-clay Pitcher frame (with pitcher lining)

* This type was visited at Barthi union of Gournadi thana in Barisal district.
* The users collected many pitcher and has placed vertically under ground, one below-another with a continuous vertical hole through all of the pitchers placed in the pit'.
* This type of latrine is costly, even more than a burnt clay ring pit latrine.
* Excreta obstruction takes place at most of the pitcher joints, which become very difficult to remove.
* This type of latrine becomes full with in short period, because usually the diameter of pitchers is small (about 18") and not uniform.

TYPE-2 SIMPLE PIT LATRINE, WITHOUT LINING

(RCC slab with squatting hole or pan without WS)

2.1 Direct Pit
2.2 Off-set Pit
2.3 With one RCC ring as base (direct/ off-set pit)

* Visited such latrines at Tangail, Barisal and Chittagong.
* Advantage of these types of latrines are similar to that of home-made direct pit or off-set pit latrines.
* One RCC slab with, "pan without gooseneck" is placed

directly on a pit (lined or unlined)

* The only difference with home-made is that its squatting platform is made of RCC slab, which lasts longer than those built with indigenous materials.
* If the pan is covered properly after use then, it is more hygienic.
* Such RCC slab, if used in an off-set pit latrine then an additional cost is involved for:
  (a) Providing one connecting pipe, from pan to pit (PVC/cement pipe)
  (b) Providing another additional cover on the off-set pit.
* Sanplat latrine, which is being promoted by DPHE through private producers in Pathia (Rajshahi), Hajiganj (Chandpur) and Kushtia falls under this category.
* This is actually a costly half sanitary latrine and similar to a WS slab latrine with broken gooseneck.

TYPE-3 WATER-SEAL LATRINE AND RCC RINGS

(RCC slab and pan with water-seal)

3.1 Slab with no or 1 RCC ring and unlined pit

* Visited such latrine at Barisal and Tangail district.
* This is most economical WS latrine available in rural Bangladesh.
* Its maintenance is easy, and in case it is full then only shifting of the slab to another new pit, can make a new latrine. Only a superstructure is to be re-constructed.
* Placement of one RCC ring under the slab as base can only improve stability of the pit.

3.2 Slab with 3 rings and unlined pit

* Visited such latrine at Isakati, Barisal.
* This is combination of conventional RCC slab with WS latrine pan and the pit lined with 3 rings.
* This type is suitable for the areas where soil is "sandy-clay" (sand is more than 50%).
* This is also suitable for small family.

3.3 Slab with 5 rings

* This type is very common in used and was found every where during visit.
* This type is the first adopted technology promoted by DPHE in rural Bangladesh.
* This is suitable for all kinds of soil in Bangladesh.
* This latrine is more expensive than "home-made" latrine and beyond financial capacity of the poor people of rural Bangladesh.

3.4 Slab with more than 5 rings

* This type of latrine is rarely available in Tangail, Bogra, Barisal, Khulna and almost every where in rural Bangladesh. Only the well to do persons have built such latrines.
* Somewhere more than 5 rings placed under RCC slab and somewhere burnt clay rings are added to 5 RCC rings.
* The only advantage is that it takes longer period to fill up.
* Such deep pit latrines may interfare the nearest underground drinking water source.

TYPE-4 WATER-SEAL LATRINE WITH BURNT-CLAY RINGS

* This type of latrines are visited in Bogra and Tangail. The potters have built such latrines with their self produced "burnt clay rings". They are also used by public.

4.1 RCC Slab & Pan with clay rings (direct pit)

* Such latrines were visited at Shapgram and Mohishaban under Bogra district.
* Some 18 to 20 numbers of clay rings (each 9" high) are placed under a RCC water seal slab.
* The only advantage is that it takes longer period (10 to 20 years) to fill up and the users get clay rings cheaper than other type of rings.

4.2 Clay pan with clay rings (off-set pit)

* This technology is promoted by CARITAS in their project areas at Dinajpur and also by M. A. Rahim Khan, SAE, DPHE, Gournadi, Barisal.
* This technology is still in research and study stage.

TYPE-5 TWIN-PIT LATRINES

(With various types of pan and linings including brick-lined ones)

This type of pit latrines are promoted by DPHE and LGED in rural Bangladesh, mainly in the slum areas.

5.1 Alternate use pits

* This technology is adopted in slum areas of Mymensingh and some other towns in rural Bangladesh.
* There are 2 no RCC ring wells against a single RCC slab with pan, with an alternate arrangement of excreta movement passage. While one well fills up, another remains empty. After the first well is full it is closed and passage to next well is opened. In this way both of the wells are used alternately.

5.2 Pits in series

* This technology have been visited at Khulna city slum.
* Twin-pit is connected to a RCC slab latrine and both the pits are filled up at a time.
* No alternate filling is arranged. So it appears to be a defective arrangement.

10.5 COMPARATIVE STUDY ON MATERIALS, COSTS AND ADVANTAGES

Analyses have been made on the above findings regarding the materials, cost, advantages and disadvantages of different types of low-cost rural latrines in use in Bangladesh.

The following assumption and considerations are made:

1. The latrines are pit latrines. Average depth of pit is taken to be 5 ft. and the diameter to be 30 inches.

2. The costs mentioned are average lump-sum approximate costs and are without the cost of superstructure. The labour cost is not included, as it is assumed that the latrine will be built on self help basis or with help of unpaid community labour.

3. The life span of latrine or its sustainability depends on various factors, such as Construction quality, condition, types of materials used, weather condition etc. In this table of life span of different types of latrines are given as per actual observation, considering all conditions as normal.

On the above basis the following two tables have been prepared and are given at the end of this report.

Table-III	Comparative study of materials and cost
Table-IV	Comparative study of advantages and disadvantages

11. GENERAL CONCLUSIONS

* After field survey an inventory of different types of latrines promoted by GOB and various NGOs has been prepared and is given in Table-I, at the end of the report.

* Documentation of various low-cost latrine technologies in rural Bangladesh has been tabulated on the basis of the above survey and is given in Table-II, at the end of the report.

* Home-made latrines is a step towards better and more durable sanitary latrine. Use of home-made latrine is far better than open defecation. Considering the socio-economic condition of rural people, the home-made latrine should be promoted throughout rural Bangladesh.

* Latrine users should be sufficiently motivated through social mass mobilisation in rural Bangladesh, along with training on basic technical and personal health-care knowledge.

* Home-made pit latrine is suitable for those who have clear sense of sanitation. Inadequate knowledge of home-made pit latrines users may result harmful environment. Squatting platform should be properly made so that air and water may not easily pass through bamboo platform. Squatting hole should be of proper size and covered with lid. Water-tight platform over latrine pit and roof over the home-made latrine can avoid damage of platform and pit by excessive water.

* Construction of RCC slab latrine with water seal pan is, of course, a better choice. However, placing the latrine at a distant place from water source is a great problem. The users are not in a habit to carry large quantity of water from a distance source to a latrine which results excreta obstruction and thus breaking of goose-neck. Users' understanding and carefulness about the water-seal/ goose-neck is very important.

* Latrines with deeper pits with proper lining gives durability and thereby sustainability of the latrines. Latrines with 18 nos rings as pit lining has been observed in use even after 12 years.

* Consideration is to be made on relationship of latrine technology with:
    a) Soil condition
    b) Socio-economic condition
    c) Health education and general knowledge.

TABLE – I

INVENTORY OF VARIOUS LATRINE TECHNOLOGIES IN BANGLADESH PROMOTED BY : GOB (DPHE), UNICEF & VARIOUS NGOS

SL. NO.	LATRINE TYPE	PROMOTED BY	PROJECT AREA
1.	Standard Water-seal pit latrine (Single Direct Pit)	DPHE/GOB, UNICEF, NGO-Forum, other NGOs	All over Bangladesh
2.	Home-made (Do-it-Yourself) Pit Latrine (Direct Single Pit)	UNICEF, BRAC, other NGOs & Ansar, VDP etc.	All over Bangladesh
3.	Off-set Pit Latrine	PRISM Bangladesh	Noakhali, Laxmipur and other districts
4.	Off-set Pit Latrine	CARE, PRISM and other NGOs	All over Bangladesh
5.	Water-seal Burnt-clay Latrine	CARITAS	Dinajpur, Barisal and other districts
6.	Water-seal Pit Latrine (different type syphon)	CARITAS	Dinajpur, Barisal and other districts
7.	Water-seal Pit Latrine (different type syphon)	RDRS	Greater Rangpur and Dinajpur districts
8.	Two-pit (parallel) Water-seal Latrine	PROSHIKA MUK and others	Sreepur, Dhaka and some places in Khulna & Chittagong district
9.	Twin-pit (Alternate use) Water-seal Latrine	DPHE and LGED of GOB, NGOs like CONCERN and others	Dhaka, Chittagong other urban areas & urban slums

TABLE – II

DOCUMENTATION OF VARIOUS LOW-COST LATRINE TECHNOLOGIES IN RURAL BANGLADESH

TYPE	DESCRIPTION
Type-1	Home-made (Do-it-Yourself) Latrines (Squatting platform with indigenous materials and pit)
1.1 1.2 1.3 1.4 1.5 1.6	Bamboo/ timber platform (direct pit) Bamboo/ timber platform (offset pit) Bamboo/ timber platform (pit lined with bamboo-mat) Bamboo/ timber platform (pit lined with full-bamboo) Burnt-clay Pitcher platform (without lining) Burnt-clay Pitcher platform (with pitcher lining
Type-2	Simple Pit Latrine, without lining (RCC slab with squatting hole or pan without Water Seal)
2.1 2.2 2.3	Direct Pit Off-set Pit With one RCC ring as base (direct/ off-set pit)
Type-3	Water-seal Latrine and RCC rings (RCC slab and pan with water-seal)
3.1 3.2 3.3 3.4	Slab with no or 1 RCC ring and unlined pit Slab with 3 rings and unlined pit Slab with 5 rings Slab with more than 5 rings
Type-4	Water-seal latrine with burnt-clay rings
4.1 4.2	RCC Slab & Pan with clay rings (direct pit) Clay pan with clay rings (off-set pit)
Type-5	Twin-pit Latrines (With various types of pan and linings including brick-lined ones)
5.1 5.2	Alternate use pits Parallel pits

TABLE - III

TABLE FOR MATERIALS AND COSTS FOR VARIOUS LOW-COST RURAL LATRINES

Type of Latrine	Materials		Average Approximate Cost	Approximate Life Span
	Requirement	Availability		
Type-1 Home-made (do it yourself) Latrine				
i) Bamboo, Timber or tree-branch frame (direct pit)	a) Bamboo or Tree branch b) Polythene	Locally	Tk. 50	2 years
ii) Bamboo/Timber frame (offset pit)	a) Bamboo/Tree Branch b) Polythene c) Tin pan	Locally	Tk.100	3 years
iii) Bamboo/Timber frame (pit lined with bamboo-mat)	a) Bamboo/Timber b) Polythene c) Tin pan d) Bamboo mat	Locally	Tk.350	3 years
iv) Bamboo/Timber frame (pit lined with full-bamboo)	a) Bamboo/Timber b) Polythene c) Tin pan d) Full bamboo for lining	Locally	Tk.450	3 years
v) Burnt-clay Pitcher frame without lining	a) One pitcher	Local market	Tk. 35	2 years
vi) Burnt-clay Pitcher frame (with pitcher lining)	a) Many Pitchers	Local market	Tk.450	3 years
Type-2 Single Pit Latrine without lining (RCC slab with squatting hole or with pan without water-seal)				
i) Direct Pit	RCC slab 1	Production centre nearby	Tk.100	2 years
ii) Off-set Pit	a) RCC slab 1 no b) PVC cement pipe 1 no	a) Production Centre b) Pipe from market	Tk.150	3 years
iii) With one RCC ring as base (direct off-set pit)	a) RCC slab 1 no b) RCC Ring 1 no c) PVC cement pipe 1 no	a) Production Centre b) Pipe from market	Tk. 200	3 years

Type-3	Water-seal Latrine and RCC Rings (RCC slab & pan with water-seal)			
i)Slab with no or 1 RCC ring and unlined pit	a)W.S/ RCC slab with pan b)RCC ring	Production centre of PP	Tk. 100-125 + self help	1 - 2 years
ii)Slab with 3 rings and unlined pit	a)RCC slab & pan b)RCC ring 3	Production centre of PP	Tk.175 + self help	2 years
iii)Slab with 5 rings	a)RCC slab & pan b)RCC ring 5	Production centre of PP	Tk.300 + self help	2 years
iv)Slab with more than 5 rings	a)RCC slab 1 b)RCC ring=<5	Production centre of PP	Tk.500 or more & labour	Many years
Type-4	Water-seal Latrine with Burnt-clay Rings			
i)RCC Slab & Pan with clay rings (direct pit)	a)RCC slab & pan b)Clay rings many (5 ft)	a)Production centre for slab & pan b)Rings from potter	Tk. 200	Many years
ii)Clay pan with clay rings (off- set pit)	a)Burnt clay pan 1 b)Clay pipes as per distance c)Clay rings as need	All from potter	Tk.450	Many years
Type-5	Twin Pit Latrine (with various types of pan and linings)			
i)Alternative use pit	a)RCC slab with pan 1 no b)Cement pipe with one "Y" connection c)RCC ring 6+6	Production centre of PP	Tk.1000	Many years
ii)Pits in series	As above	Production centre of PP	Tk.1000	6 Years

TABLE - IV

TABLE FOR ADVANTAGES AND DISADVANTAGES FOR VARIOUS LOW-COST RURAL LATRINES

Type of Latrine	Advantage	Disadvantage	Users Reaction
Type-1 Home-made (do it yourself) Latrine			
i) Bamboo/timber frame (direct pit)	Lowest cost and everybody can efford	a) Users load direct on squatting platform results early damage b) Not fully sanitary	Most people use it
ii) Bamboo/timber frame (offset pit)	a) This is more sanitary than direct pit b) This is more sustainable as no direct load on squatting platform	More technical than direct pit	This is most popular where technic is known
iii) Bamboo/timber frame (pit lined with bamboo-mat)	Pits do not collapse	Costly & poor villagers can not efford	Not popular
iv) Bamboo/timber frame (pit lined with full-bamboo)	Pits do not collapse	Costly, even more than burnt clay rings	Most people do not like
v) Burnt-clay Pitcher frame without lining	Low cost	Risky to use clay pitcher as squatting slab	Not popular
vi) Burnt-clay Pitcher frame (with pitcher lining)	Unused rejected pitcher may be used	Frequent excreta obstruction at every pitcher junction	Not popular
Type-2 Single Pit Latrine without lining (RCC slab with squatting hole or with pan without water-seal)			
i) Direct Pit	a) As good as home-made b) Long lasting c) Can be re-used in net pit	a) This is without WS & not very sanitary b) Poor villagers can not efford	Rearly used
ii) Offset pit	a) As good as home-made b) Long lasting c) Can be re-used in net pit	a) Not fully sanitary b) Poor villagers cannot effort c) Most users fix pipe end to open pitch	Very rare in use
iii) With 1 RCC ring as base (direct/offset)	a) As good as home-made b) Long lasting c) Can be re-used in net pit	a) Not fully sanitary b) Poor villagers cannot effort c) Most users fix pipe end to open pitch	Very rare in use

Type-3 Water-seal Latrine and RCC Rings (RCC slab and pan with water-seal)			
i)Slab with no or 1 RCC ring and unlined pit	This is acceptable sanitary latrine	a)Costly to poor village villagers b)Gooseneck broken by users c)Do not easily flush causing excreta abstruction.	Liked by users who can efford
ii)Slab with 3 rings and unlined pit	This is acceptable sanitary latrine	a)Costly to poor village villagers b)Gooseneck broken by users c)Do not easily flush causing excreta abstruction.	Liked by users who can efford
iii)Slab with 5 rings	This is acceptable sanitary latrine	a)Costly to poor village villagers b)Gooseneck broken by users c)Do not easily flush causing excreta abstruction.	Liked by users who can efford
iv)Slab with more than 5 rings	This is acceptable sanitary latrine	This may polluts the nearest under ground water source	Liked by the villagers only who can efford
Type-4 Water-seal Latrine with Burnt-clay Rings			
i)RCC Slab and pan with clay rings (direct pit)	This is acceptable sanitary latrine (as it is water seal)	a)Costly to poor villagers b)Gooseneck broken to avoid water flash	Used by only who can efford
ii)Clay pan with clay rings (off-set pit)	This is acceptable sanitary latrine (as it is water seal)	a)Costly to poor villagers b)Gooseneck broken to avoid water flash	Used by only who can efford
Type-5 Twin Pit Latrine (with various types of pan and linings)			
i)Alternative use pit	a)More acceptable sanitary latrine b)Excreta can be used as manure	More costly	Only used in Urban slum areas
ii)Pits in series	Less advantage than alternate pit	a)More costly b)As this is parallel the pits fill up at a time and no scope to use as manure	Only used in Urban slum areas

ANNEXURES

ANNEXURE – I

TERMS OF REFERENCE FOR CONSULTANTS

1. ASSIGNMENT
   To assist DPHE in documentation of various latrine technologies in rural Bangladesh

2. DUTY STATION
   Dhaka

3. SUPERVISOR
   Dr.Luong, Sanitation Coordinator, WES Section

4. MAJOR TASKS

1. Prepare work plan and travel schedule for completion of work.
2. Collect various latrine design drawings promoted by DPHE and NGOs.
3. Conduct a survey in 10 selected village in 5 Districts (one per division) to study various designs of latrines promoted by NGOs and the individual families and accepted by the users.

3.1 The selection of survey villages will be based on the following criteria:

3.2.

   a. Different socio-cultural condition of the rural communities and various soil/ geological formation.
   b. Village where a variety of technologies of latrines are known to exit.

3.3 Design, pretest and finalise survey format for information collection. The information will include:

   a. Advantage and disadvantage for the design and maintenance
   b. Users reactions
   c. Who build the latrine

3.4 Take colour photos for all types of latrine technologies encountered.

4. Provide design drawings with dimensions for all type of latrine technologies encountered during the survey. List the quantities of materials required for each type of latrine and indicate whether local materials are used.
5. Make a comparative study of all types of latrine found in use and submit a report

5. END PRODUCT
   A final report Time Frame: Two months

ANNEXURE – II

SURVEY OF VARIOUS LATRINE TECHNOLOGIES IN RURAL BANGLADESH

Excluding hanging open latrines

DATE OF VISIT:

1. LOCATION. DISTRICT:

THANA:

UNION:

VILLAGE:

2. TYPE OF SOIL WHERE LATRINES ARE LOCATED

SANDY	RED CLAY	BLACK COTTON CLAY	OTHER

3 USERS PARTICULAR

(A) NAME OF EXECUTIVE HEAD OF FAMILY.

(B) OCCUPATION:

(C) EDUCATION:

(D) TOTAL FAMILY MEMBERS:

MALE:	FEMALE:	ADULT:	CHILDREN:

4. TYPE OF LATRINE (DESCRIPTION)

5. SPACE LEFT FOR DRAWING & MEASUREMENT:

6. DETAILED DESCRIPTION:

(A) PIT:

- Date of starting use ?
- How much full now ?
- How deep is the pit ?
- How long it takes to fill up ?
- Whether the users clear, when it is filled up ?
- Whether the excreta is used as manure on dumped?
- If it is collapsed :-
  - (1) Life span before collapse ?
  - (2) Do rats fill up the pit by earth ?
  - (3) Do earth worms/insect fill up ?
  - (4) Was it filled up due to submerge by flood water ?
  - (5) If no action taken after collapse, then where do they go for defecation ?
- If the pit is lined :-
  - (1) Materials used for lining ?
  - (2) Cost of lining ?
  - (3) Present condition of lining ?
  - (4) Life span of lining if collapsed ?
  - (5) Cause of collapse ?

(B) Squatting slab (including pan):

- Type of slab (description) ?
- Materials used ?
- Cost involved ?
- At what interval it is cleaned ?
- Whether the pan or gooseneck is broken ?
- Termites problem encountered when bamboo or wood are used for squatting slab ?
- What materials used for the cover of squatting hole ?

(C) Superstructure :-

- Type of superstructure ?
- With or without roof ?
- Materials used ?
- Cost involved ?
- Has it been repaired ?
- If repaired then,
  - (1) When repaired ?
  - (2) Repairing cost ?

7. In various locations - ask ?

(1) Is it the first type of latrine they are using ?

(2) If not, then what was the first type ?

(3) Resons for choosing this type ?

(4) Who suggested/teach them to build this type ?

(5) Where do they learn the technic/skill ?

(6) Are the local skill available for this type ?

(7) Are the materials available locally ? or from outside the area ?

8. PHOTOS SHOULD BE TAKEN:

Coloured photos should be taken for all types of latrine technologies used in various places, the photo should capture the functional types and the non-functioning type such as those collapsed latrines including the superstructures.

ANNEXURE – III

LIST OF PERSONS MET/ CONTACTED

1. BARISAL

Mr. M. A. Quddus, Deputy Commissioner, Barisal
Mr. M. A. Sabur, TNO, Gournadi, Barisal
Mr. Md. Salehuddin, SDE, DPHE, Barisal South
Mr. M. A. Subhan, SDE, DPHE, Barisal
Mr. M. A. Rahim Khan, SAE, DPHE, Gournadi
Mr. Shahidul Islam, Project Officer, WHO Barisal
Mr. Md. Mokarram Hossain, Project Asst. NGO FORUM, Barisal
Mr. James Malaker, Welfare Officer, CARITAS, Barisal
Mr. Rashid Ahmed, Field Officer, CARITAS, Barisal
Mr. Alfred Sarker, AFO (Representative) CARITAS, Isakati
Mr. Md. Shakwat Ali Choudhury, Area Manager, BRAC, Barisal
Ms. Kanan Prova, Programme Organiser, BRAC, Kashipur
Ms. Tulshi Rani Bepari, Programme Asst. (Health), BRAC, Kashipur
Mr. Nazrul Islam, Area Co-ordinator, PROSHIKA (MUK), Barisal

2. BOGRA

Mr. M. Golam Kibria, ADM, Bogra
Mr. M. A. Bari, EE, DPHE, Bogra
Mr. Md. Abul Hossain, SDE, Bogra
Mr. M. A. Quashem, SAE, DPHE, Sariakandi, Bogra
Mr. Omar Faruque Chowdhury, Executive Director, CDS (HO- Dhaka), Camp - Bogra
Mr. Nazrul Islam, Project Director, CDS, Bogra
Ms. Hosneara Begum, Director, TMSS, Thengamara, Bogra
Mr. Md. Nuruzzaman Bhuyan, Deputy Commissioner, Bogra

3. CHITTAGONG

Mr. Kazi Nasiruddin Ahmed, Supdtg. Engineer, DPHE Chittagong
Mr. Shafique Uddin Ahmed, EE, DPHE, Chittagong Division
Mr. Md. Abul Bashar, SDE, DPHE, Store Divn. Chittagong
Mr. Jeeban Kanti Chakraborti, SAE, DPHE, Anwara
Mr. S.M. Enayet Kabir SAE, DPHE, Hathazari
Mr. M. A. Kashem, SAE, DPHE, Sitakundu
Mr. Kazi Sirajul Hoque, Project Manager, SAE, CARE, Chittagong

Mr. Mahmood, Project Officer, CARE, Anwara
Mr. A. K. M. Zahidul Islam, Project Officer, CARE, Sitakundu
Mr. Mohammad Ali, Centre Coordinator, CODEC, Bakkhali, Sitakundu

4. DHAKA

Dr. A. M. Shamsul Haque, Project Director, VS Project, DPHE, Dhaka
Mr. Ahmed Mofazzal, EE, DPHE, VS-I, Dhaka
Ms. Ether, EE, DPHE, VS-II, Dhaka
Mr. Kabirushan, Chief Health Education Officer, DPHE, Dhaka
Mr. A. K. Faruk Ahmed, SDE, DPHE Sadar, Dhaka
Mr. Shafiqul Islam, SAE, DPHE, Dhamrai, Dhaka
Mr. M. A. Rashid, Director, NGO Forum, Dhaka
Mr. Robin Gomes, Welfare Director, CARITAS, Dhaka
Ms. Raquiba Akhter Jahan, Coordinator (SAFE), CARE, Dhaka
Mr. Aloysius Matin Khan, Communications Manager, BDRS, Dhaka
Mr. Musharref Hossain Bhuyan, Sanitation Coordinator, PROSHIKA MUK, Dhaka
Mr. Rafiqul Haider, Program coordinator, PRISM, Dhaka
Mr. Rezaul Darim, (WHDP) BRAC, Dhaka
Ms. Saleha Begum, Program Officer, GRAMMEN BANK, Dhaka.

5. KHULNA

Mr. Matiur Rahman, EE, DPHE, Khulna Division
Mr. Syed Eskender Ali, SDE, DPHE, Khulna
Mr. Md. Abdul Majid, SAE, DPHE, Fultala
Mr. Safiqul Islam, Division Chief, Unicef, Khulna

6. TANGAIL

Mr. Khandaker M.A. Matin, Deputy Commissioner, Tangail
Mr. M. H. Jahangir, EE, DPHE, Tangail
Mr. M. A. Awal, SDE, DPHE, Tangail
Mr. Md. Anwar Hossain, SAE, DPHE, Mirzapur
Mr. Zakir Hossain, Executive Director BURO-Tangail
Mr. Md. Ruhul Amin, Programme Organiser, BRAC, Mirzapur
Ms. Salma Akter Field Worker, BRAC, Mirzapur
Ms. Suchitra Gope, Field Worker, BRAC, Mirzapur

ANNEXURE-IV

TOUR DIARY OF THE CONSULTANT MR. SALEHUDDIN AHMED

01 Oct. '94 (Saturday)

Joined Unicef office. It was week-end holiday. Only Mr. Philip Wan, Chief, WES Section, Dhaka was present in the office, who kindly instructed me to meet Mr. Rabiul Islam, Sanitation consultant, of WES Section Unicef, at DPHE VS project office, New Eskaton, Dhaka.

02 Oct. '94 to 06 Oct. '94 (Sunday to Thursday)

Preparatory office works under guidance of Mr. Rabiul Islam, Consultant at Dhaka.

* Preparation of work plan and make survey format.
* Discussion in NGO-Forum office Dhaka. (Contacted Mr. M. A. Rashid).
* Preparation & submission of tour programme, sending letter, by PD, DPHE, VS Project, Dhaka to concerned E.E'S.
* Finalisation of copies of survey format.
* Requisition for T. A. advance.

07 Oct. '94 & 08 Oct. '94 (Friday & Saturday)

Office closed for weekend and no advance could be drawn. Arranged money from own source, collected camera, film, measuring tape and drawing materials from own source.

TRIP TO TANGAIL (09 OCT. '94 TO 16 OCT. '94)

09 Oct. '94 (Sunday)

Arrived DPHE Executive Engineer office Tangail at 1230 hrs, (raining heavily). Discussed with Mr. M. H. Jahangir, Executive Engineer DPHE Tangail, Mr. M. A. Awal SDE, DPHE, Tangail and others SAEs and Estimators regarding various types of latrine promoted in Tangail district by DPHE and other NGOs.

At the 1700 hrs attended one NGO office BURO (Bangladesh Unemployed Rehabilitation Organization), Tangail along with SDE Mr. Awal. Discussed with the officer Mr. Zakir Hossain Executive Director, BURO Tangail. The BURO is working in Tangail since 9 years back. They have produced DPHE type RCC slab and rings with materials received from DPHE store and distributed in project area at Village Natiapara of Dubail Union under Delduar thana, Tangail district and no other latrine technology is promoted by them.

10 Oct. '94 (Monday)

Trip to Mirzapur thana: Mr. Awal, SDE accompanied.

* Attended DPHE SAE'S office, NGO and BRAC office Mirzapur.
Persons met :

1. Md. Ruhul Amin, Programme Organizer
2. Syed Md. Manjur Hossain
3. Miss Salma Akter, Field Worker
4. Miss Suchitra Gope, Field Worker

Discussed with them and went out to field. Miss Akter and Miss Gope accompanied here visited 3 latrines, one at Andhora (Bosh para), Mirzapur union, another at Rashid Dewhata Gorai union then came back to camp Tangail.

11 Oct. '94 (Tuesday)

Field trip to village - Sohagpara, union - Gorai, thana Mirzapur, Mr. Awal SDE, Tangail, Ms. Akter and Ms. Gope accompanied. There visited and record 6 (six) latrines, both DPHE type and home made.

12 Oct. '94 (Wednesday)

Fields trip to village - Shatiachura, union - Jamurki, thana - Mirzapur, Mr. Awal SDE Tanglail accompanied. Visited six latrine and recorded data for 2 latrine.

13 Oct. '94 (Thursday)

Field trip to village - Shatiachura, union - Jamurki, thana - Mirzapur, Mr. Awal SDE Tangail, accompanied. There visited three latrine and recorded data for 1 (one). Back to Tangail and discussed with Executive Engineer DPHE Mr. Jahangir, Sub-Divisional Engineer Mr. Awal and other SAE'S present up to 1830 hrs in Executive Engineer office, regarding various types of latrine promoted by any individual in Tangail, with in their knowledge.

16 Oct. '94 (Sunday)

Attended Unicef office collected questioner forms and discussed with Ms. Ayesha Hossain and Mr. Rabiul Islam and also tried to receive T. A. advance but cheque was not ready.

TRIP TO BOGRA : (17 OCT. '94 TO 23 OCT. '94)

17 Oct. '94 (Monday)

Arrived Bogra at 1815 hrs. Discussed in the evening with Jonab M. A. Bari Executive Engineer DPHE Bogra and Jonab Abul Hossain Sub-divisional Engineer DPHE Bogra. They were very busy with, preparation for opening day of sanitation week on 18 Oct. '94.

18 Oct. '94 (Tuesday)

* 0800 hrs to 1300 hrs. (opening of Sanitation week) as requested by EE Mr. Bari, attended the rally and seminar at Zilla Parisad conference room with Jonab Helaluzamman Talukder (lalu), MP, Chief Guest and Jonab Nuruzzaman Bhuyan, Deputy Commissioner, Bogra presided the meeting, Jonab Golam Kibria, Additional District Magistrate and other District Officer, NGO representatives and also school students.
* 1400 hrs to 2200 hrs : Field trip to Shariakandi thana. Attended DPHE office. Mr. Abul Quashem SAE was present. Visited 7 latrines at village - Titparal of Shariakumor union and two (2) latrine at village - Debdanga, Kutubpur union. All were DPHE conventional type latrines and no other pattern found. Some home made were un-receptable.

19 Oct. '94 (Wednesday)

* 1000 hrs to 1500 hrs : Trip to Thengamara NGO TMSS, Mr. Abul Hossain Sub-divisional Engineer accompanied.The TMSS persons were busy with a interview of some one thousand service candidates. Then went to village - Ram-shohar, under Gokul union, and visited 2 latrine and recorded datas.
* 1600 hrs to 1800 hrs : Meeting with NGOs. A discussion meeting was held with the local NGOs in the office chamber of Executive Engineer DPHE Bogra on sanitation week. I also discussed with the NGO'S present on latrine technology and found most of them are dealing with DPHE conventional type.

20 Oct. '94 (Thursday)

* 0800 hrs to 1500 hrs : Fields Trip to Gokul in village - Ram-shahar (Uttarpara), union - Gokul, visited 4 home made latrines.
* Village - Gokul, union - Gokul visited home made latrine and a private latrine production center at Gokul.
* Meet Ms. Hosneara Begum, Director TMSS (Thengamara Mohila Sabuj Shangh) at her Thengamara office and visited a latrine production center (all female mason and labours working in the center).

21 Oct. '94 (Friday)

* 0800 hrs to 1200 hrs: Field trip to Gabtoli. Visited TARA Tubewell and school latrine newly constructed at Shondhabari primary school, union Gabtoli (It is the latest pattern). Visited home made latrine at village - Shapgram, union - Shapgram, thana - Sadar.

22 Oct. '94 (Saturday)

* 1000 hrs to 1500 hrs: Field trip to Mohishaban. A. Hossain Sub-divisional Engineer accompanied. Visited NGO office CDS (Center for Development Service) Latthiganj and discussed with Mr. Nazrul Islam and Rafiqul Islam field officer.

* Visited home made latrine at village - Mohishaban (a potter villages), union - Mohishaban, thana - Gabtoli, along with Mr. N. Islam Field co-ordinator and Mr. R. Islam of CDS.
* Visited latrines of village - Buzrukbaria, union - Shapgram, thana - Bogra sadar.

MEETINGS WITH HEAD OFFICES OF NGOs AT DHAKA

24 Oct. '94 (Monday)

CARITAS, 2, Outer Circular Road, Santibag, Dhaka - 1217
Tel: 835641, 835405
Contacted Mr. Robin Gomes, Welfare Director, discussed and collected drawings of 2 types of rural latrine design. They have such project at Barisal and Dinajpur.

25 Oct. '94 (Tuesday)

Worked at home.

26 Oct. '94 (Wednesday)

BRAC, 66 Mohakhali C/A, Dhaka - 1212
Tel: 884180-7/2027
Contacted Mr. Rezaul Karim, WHDP (department of BRAC). Discussed and he could not provide me with any printed drawing of pit latrine they have promoted. Only he made a rough sketch of pit latrine while discussion and I collected that.
Project areas of BRAC are as follows:

Dinajpur	: Fulbaria, Parbotipur
Mymensingh	: Phulpur, Muktagacha
Tangail	: Mirzapur

27 Oct. '94 (Thursday)

CARE, House # 60, Road # 7/A, Dhanmondi R/A, Dhaka - 1209
Tel: 814195-8
Contacted Raquiba Akhter Jahan, Coordinator, SAFE (Sanitation and Family Education Project). Discussed and collected photostat art pictures of pit latrine they have introduced.
Project area Chittagong.

RDRS (Rangpur Dinajpur Rural Service), Dhanmondi R/A, Dhaka - 1209. Tel: 310101-3, 816184-5
Contacted Mr. Milon Khan, Communications Manager, their project has only one type of latrine i.e. 1 slab 1 ring like DPHE and no more promotion of new latrine technology as stated by Mr. Milon Khan.

1030 hrs attended Unicef office and discussed with Mr. Rabiul Islam and T. V. Luong, and after lunch at 1230 hrs started to Mirpur to meet NGO'S there.

29 Oct. '94 (Saturday)

PROSHIKA (MUK), Mirpur-2
Contacted: Mr. Mosharref Hossain Bhuyan, Coordinator.
Discussed and collected papers from Mr. Mosharref.

Project Areas:
Dhaka : Sreepur (North of Mawna)
Barisal : Sadar, Gaurnadi, Ujirpur, Ulania & Agoiljhora.
Mymansingh: Bhaluka

* The field Coordinator of Gaurnadi thana, Nigar Sultan, happened to be present at head office and talked to her.
* GRAMEEN BANK, Mirpur, Section - 2 Tel : 801081
Contacted:Saleha Begum. GRAMEEN BANK produce conventional DPHE type slab and ring, no other promotion of technology.
Project Areas:
Barisal - Barguna thana, Dhaka - Jhitka, Harirumpur.

Visited DPHE Training Center, Mohakhali. No officer present visited the models.

30 Oct. '94 (Sunday)

Attended Unicef and discussed with T. V. Luong and Mr. Rabiul Islam, on the survey so for made.

Attended NGO office PRISM and discussed with Mr. Rafiqul Haider Programme coordinator and collected from him Diagram of Sanitary Off-set pit latrine and 2 photos on building such latrine, and also sketch of Direct Pit Latrine.

Project Areas: District Laxmipur.

	Thana	Village	Working Period	Latrine built
1.	Ramgati	all	5 Oct 92 to Sep 93	28492
2.	Raipur	all	Feb 94 to Sep 94	11456 (80% off-set)

N.B. Quality and progress in Raipur is better than that of Ramgati. The Ramgati thana was taken over first. The experience gathered there could modify and improve quality in Raipur thana. But the superstructure is poor as stated by Mr. Haider. Only Banana leaf, Hogla leaf and Batel-nut leaf fencing.

31 Oct. '94 (Monday)

Attended DPHE PD. office. Contacted and discussed with: Mr. Ahmed Mofazzal, Executive Engineer VS, Mrs. Ether, Executive Engineer VS and also Dr. A. M. Shamsul Haque PD in presence of Mr. Rabiul Islam. Other office work under guidance of Mr. Rabiul Islam.

TRIP TO BARISAL (4 NOV. '94 to 9 NOV. '94)

4 Nov. '94 (Friday)

At 1600 hrs started for Dhaka Sadarghat terminal and left terminal for Barisal by launch at 1900 hrs.

5 Nov. '94 (Saturday)

* Arrived DPHE complex Barisal at 0600 hrs and attended EE'S office at 1000 hrs Mr. Qutubuddin, SE, DPHE Barisal circle and Mr. Bazlur Rahman, EE, DPHE Barisal both were outside Barisal on official business. Discussed with Mr. Salauddin SDE (south) and Mr. A. Sobhan SDE (north) about my trip and request for their co-operation in doing the job.Mr. Salauddin SDE kindly deputed one of his office staff Mr. Fariduddin working as draftsman, to accompany me (as a guide) during my visit to different NGO offices at Barisal town. Mr. Farid has no motor cycle even.
* Attend CARITAS office and found the office closed (Saturday) but one Mr. Saiduzzaman Field Officer Agriculture Develop Project was still working in the office and I discussed with him. Mr. Saiduzzaman advised me to come on next day (6 Nov. '94) at 0900 hrs, when Mr. James Malaker Welfare Officer will be available. He further advised me to see Mr. Alfred Sarker AFO (Representative) at village - Isakathi of Kashipur union, under Barisal sadar thana. Then we arrived Isakati office and found Mr. Alfred Sarker out.
* Then attended BRAC office and talked Ms. Kanan Prova, Programme Organiser on her request Miss Tulshi Rani Bepary programme Assistant accompanied us an a guide to visit latrines. Then attend the village - Motashar and visited 4 latrines and recorded 2 (two) of those one Jesmeen and others Ambia. Then come back to BRAC office Kashipur at 1800 hrs, where Mr. Baikuntha Nath Biswas, Regional Manager, BRAC and Mr. Shakawat Ali Choudhury, Area Manager, Barisal sadar, happened to be present. Discussed with them about my trip and left for camp at 1900 hrs. The BRAC office Kashipur has a latrine production center in office premises. The produce DPHE pattern water seal slab.

6 Nov. '94 (Sunday)

* Attended DPHE office. SE, DPHE Barisal Circle and EE, DPHE Barisal division was out on official work at Dhaka. Moreover, both of the SDE'S Mr. Salauddin and Mr. Sobhan left Barisal for Dhaka on 5 Nov. '94 evening. So there was none of DPHE above SAE'S at Barisal to help and co-operate me. However, Mr. Nurunnabi Estimator accompanied me as a guide (as instructed by Mr. Salauddin SDE).
* Attended CARITAS office to see Mr. James Malaker, Welfare Officer. Discussed with him and requested him to provide me with detailed information about promotion of latrine technology by CARITAS in Barisal, mainly.

a) Burnt-clay made pit latrine.
b) New pattern of RCC slab with curv ended FC. pan.

Mr. Malaker explained about their activities on "promotion of latrine technology" where in he stated that no "Burnt-clay made pan" latrine has been built by CARITAS at Barisal only the said FC. pan has been produced and distributed by them. He advised to contact Mr. Alfred Sarker at his office a village - Isakathi, Kashipur.

* Attended SHARBIK MANOB UNNAYAN SHANGSTHA, (Isakathi, Kashipur) Then we went to Isakati, Kashipur and discussed with Mr. Alfred Sarker who stated that no such type of slab was received by him from CARITAS office. The only pattern he received last year (1993) is DPHE type slab with gooseneck and not carve ended pan. Visited 3 latrines along with Mr. Alfred Sarker and Mr. Nurunnabi, Estimator and recorded 1 (one) latrine of village - Isakathi.
* Attended NGO FORUM office Barisal. Discussed with Mr. Mokarram Hosain, Programme Assistant and Soma Datta, Office Assistant and then back to Camp.

7 Nov. '94 (Monday)

Trip to Gournadi Thana (0700 hrs to 2130 hrs)
Persons meet are

1. Mr. Abdur Rahim Khan, SAE, DPHE
2. Mr. Shahidul Islam, Project Officer, WHO (accompanied from Barisal)
3. Mr. Sabur, Thana Nirbahi Officer, Gaurnadi, Barisal
4. Mr. Nigar Sultana, Field Organiser, FROSHIKA

Went to Bethi union some 10 km north of Gournadi Head Quarter and visited 8 latrines of village - Bagmara and recorded 5 latrines data.

8 Nov. '94 (Tuesday)

0630 hrs collected Steamer ticket for Dhaka.

* Attended CARITAS office and discussed again with Mr. James Malaker to over come the confusion about "plane carve ended pan and gooseneck pan". Mr. Malaker then gave me a distribution list of such slab latrines having plane carve ended pan. Again attended Mr. Alfred Sarker's office and visited 5 such latrines along with him and recorded 2 (two) nos. 1300 hrs go to photo studio for develop and printing of the film. 1400 hrs courtesy visit to the Deputy commissioner, Barisal. At 1600 hrs come to launch terminal.

9 Nov. '94 (Wednesday)

At 0700 hrs back to Dhaka from Barisal.

16 Nov. '94 (Wednesday)

Trip to Dhamrai.

TRIP TO CHITTAGONG (19 NOV. 94 to 23 NOV. '94)

19 Nov. '94 (Saturday)

Started for Coach station at 0800 hrs. and left Dhaka for Chittagong at 0945 hrs and arrived at DPHE office of Executive Engineer Dewanbazar at 1530 hrs Discussed with Mr. Shafique Uddin Ahmed, Executive Engineer and Mr. A. Mannan, Estimator about my programme at Chittagong.

20 Nov. '94 (Sunday)

Attended CARE office at 0900 hrs Discussed with Kazi Serajul Haque, Programme Manager. Then along with him went out on a trip to Anwara thana. Attended DPHE office and discussed with Mr. Jiban Kanti Chakraborty Sub-Asst. Engineer and meet with Mr. Mahmood, Project Officer CARE Anwara, who accompanied as a guide to the villages Shinghora and Chatori of Chatori union under Anwara thana.There visited 8 latrine and recorded 6 (six) latrine data and came back to Chittagong CARE office at 1700 hrs. At that time Chittagong city was full of violence after killing of two (2) polytechnic students. Then was barricade on most of the main roads by unusually moves and it took 4 hours on my part to reach Agrabad rest house from CARE office by a local rickshaw.

21 Nov. '94 (Monday)

There was half day Hartal at Chittagong and after it was over I went on a trip to nearest thana Hathazari where I could contact Mr. S. M. Enayet Kabir, SAE, DPHE, Hathazari and visited 5 latrines out of which recorded only 2 (two). Talked to Mr. Engr. Rabiul Islam, Unicef Consultant over telephone and on the basis of discussion with him I extended my trip to Chittagong for one day more.

22 Nov. '94 (Tuesday)

Attended Chittagong CARE office and contacted Mr. M. A. Samad, Administrator, Mr. Kazi Serajul Haque, Programme Manager but no one could accompany me as guide. They were engaged for some other office business. Then I alone went on a trip to Shitakundu thana when I contacted DPHE SAE Mr. Abul Kashem who accompanied me to Saidpur union and attended CODEC office (Cooperative Development Center) at village - Bakkhali where Mr. A. K. M. Zahidul Islam, Programme officer CARE Shitakundu was happened to be present. I along with all of them visited latrine in different village under Saidpur union built under guidance of CARE and DPHE.

23 Nov. '94 (Wednesday)

Back from Chittagong to Dhaka and worked at home.

27 Nov. '94 (Sunday)

Attended DPHE office, discussed with Mr. Rabiul Islam. Telephoned to Khulna Unicef Division Office and talked with

Mr. Shafiqul Islam, Chief Unicef Division Office, Khulna. Telephoned to XEN, DPHE, Khulna Division. Finalised tour purpose to Khulna Division from 28 Nov. to 30 Nov. '94.

TRIP TO KHULNA (28 NOV. 94 to 30 NOV. '94)

28 Nov. '94 (Monday)

Started at 0800 hrs for Gabtoli Bus station and left Dhaka (Gabtali) for Khulna at 0930 hrs and arrived Khulna DPHE complex at 1830 hrs one same day. Contacted at 1900 hrs to 2030 hrs with Mr. Syed Eskender Ali, SDE, DPHE, Khulna, Mr. Abdul Majid, SAE, DPHE, Fultala thana, Mr. Matiur Rahman, EE, DPHE, Khulna (over telephone) and discussed about my programme at Khulna.

29 Nov. '94 (Tuesday)

* A rainy day and it was difficult to move out. Visited two pit latrines in slum area at City Corporation and also one Motka latrine along with Mr. M. A. Majid, SAE, DPHE, Fultala. Visited 6 latrine and recorded 4 nos.
* Afternoon went out with Mr. M. A. Majid, SAE, DPHE, Fultala by his motor cycle to Fultala thana, Village - Gilatala and visited 3 latrines and recorded 2 nos all one slab one ring. Back to Khulna by 1800 hrs. Attended Unicef Division Office, Khulna and met Mr. Shafiqul Islam, Unicef Division Chief, discussed with him and back to camp at 2030 hrs evening.

30 Nov. '94 (Wednesday)

Started back to Dhaka at 0930 hrs and arrived at 1930 hrs evening.

01 Dec. '94 to 10 Dec. '94

Work in Dhaka for compilation of the report. Also visit to Gazipur district with Mr. Rabiul Islam of Unicef and Mr Mosharef Hossain of Proshika Muk.

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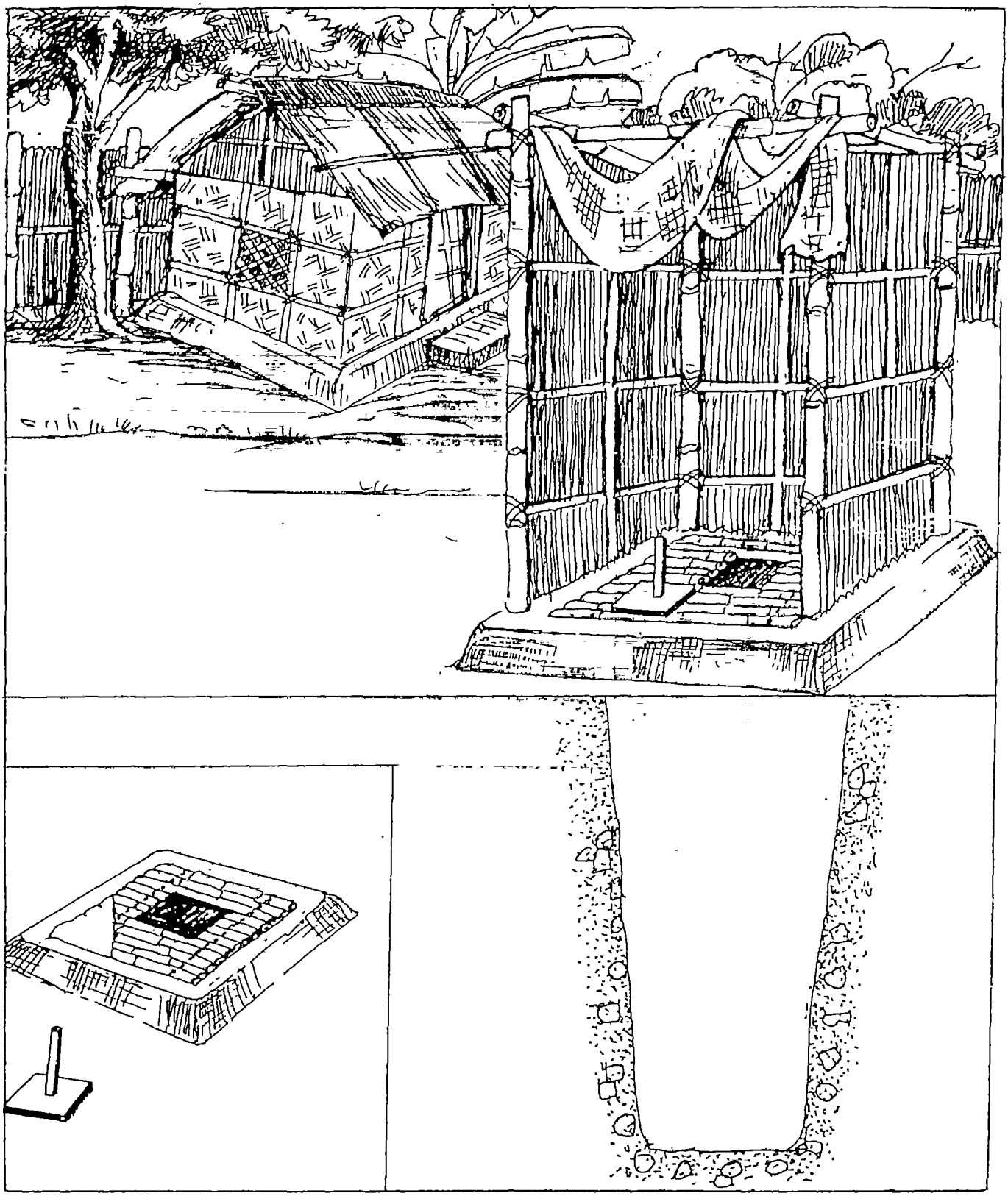
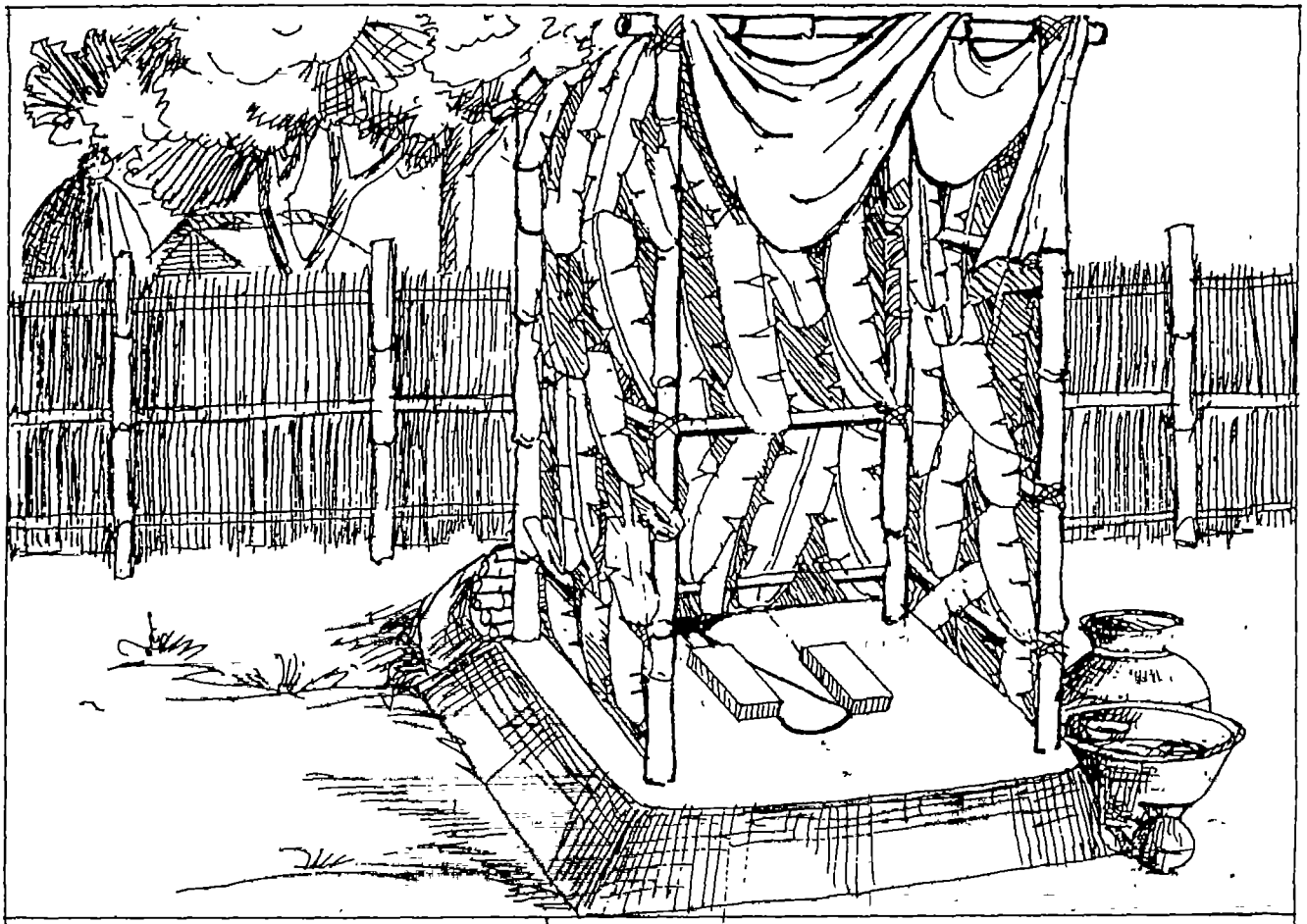
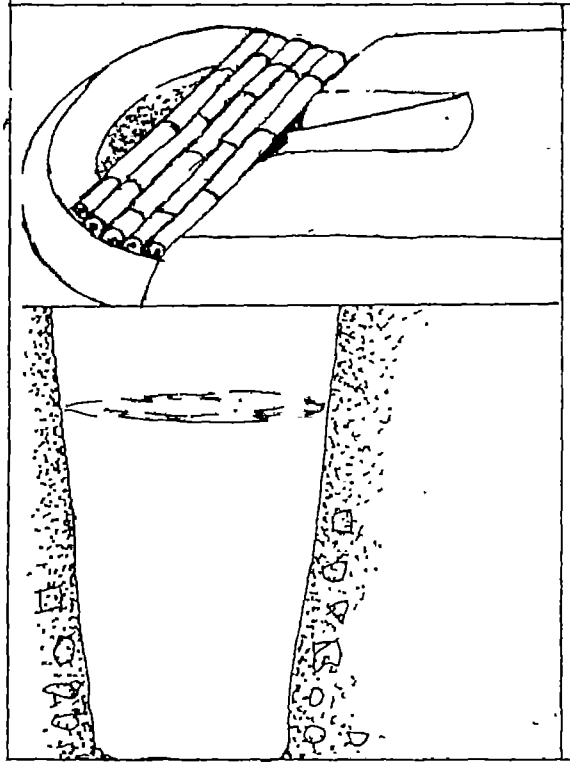
SKETCHES



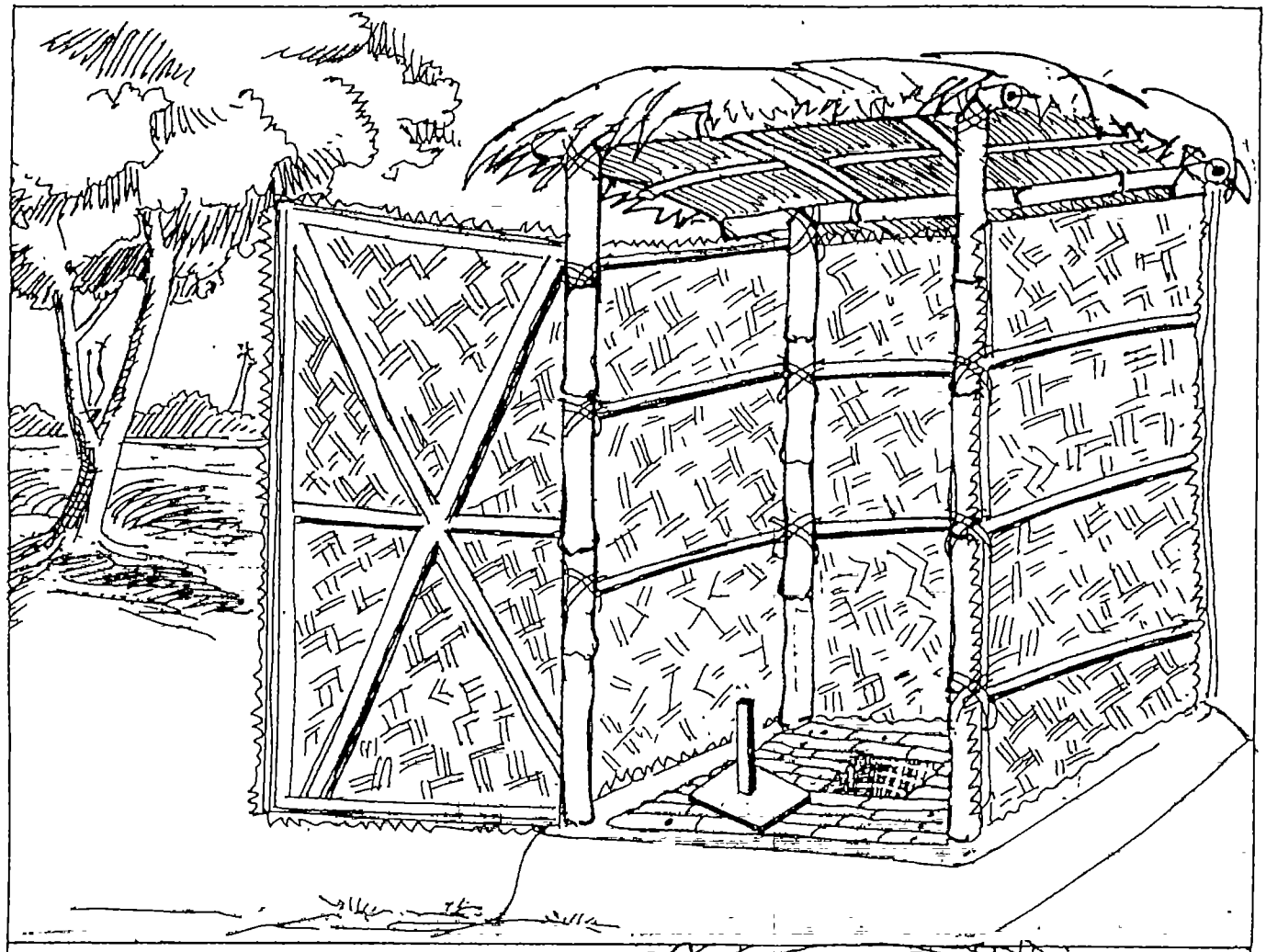
HOME-MADE (DO-IT-YOURSELF) LATRINES

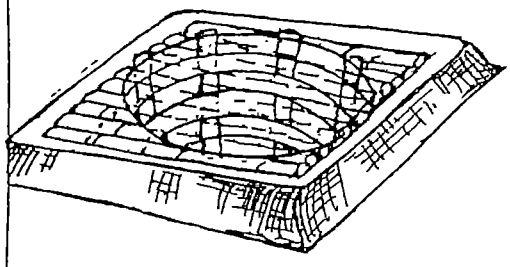
TYPE 1.1 Bamboo/timber platform (direct pit)

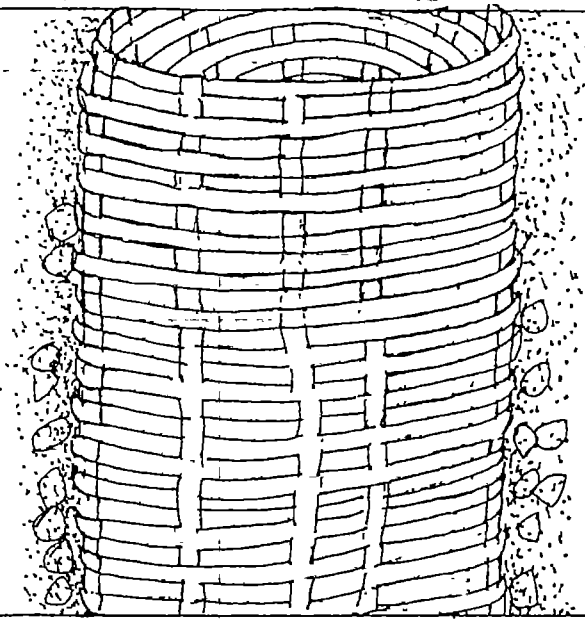




HOME-MADE (DO-IT-YOURSELF) LATRINES
TYPE 1.2 Bamboo/timber platform (offset pit)

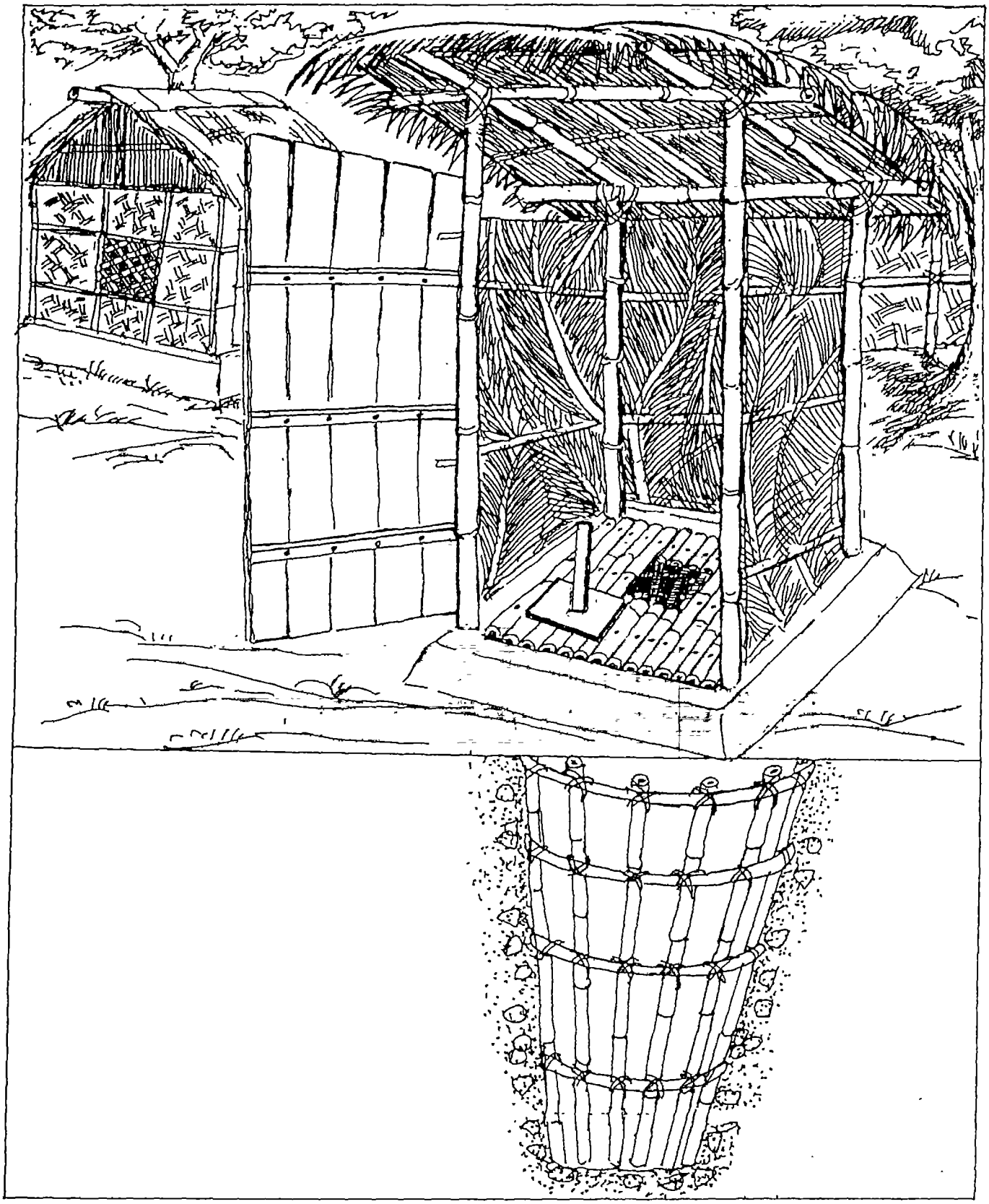




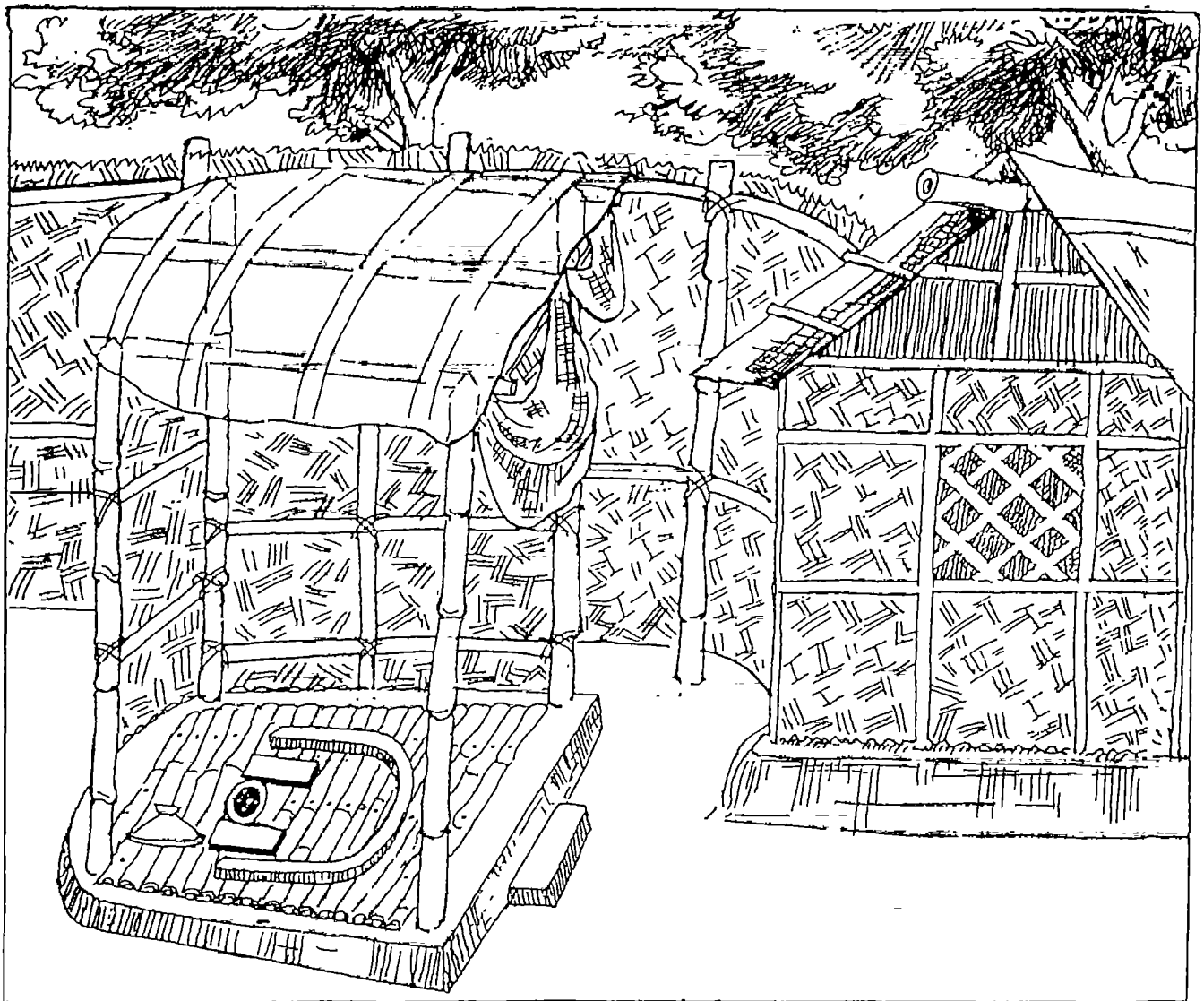


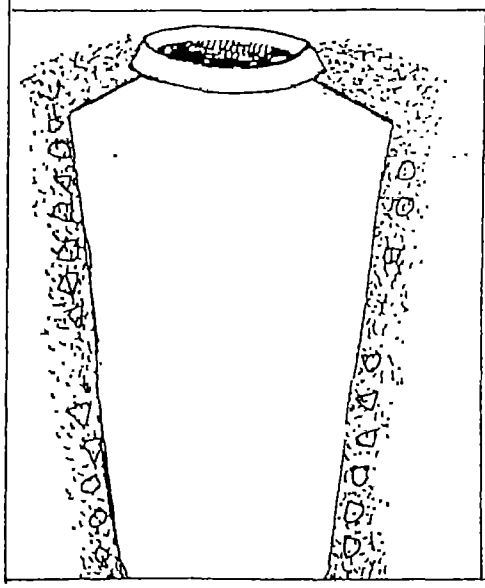
HOME-MADE (DO-IT-YOURSELF) LATRINES

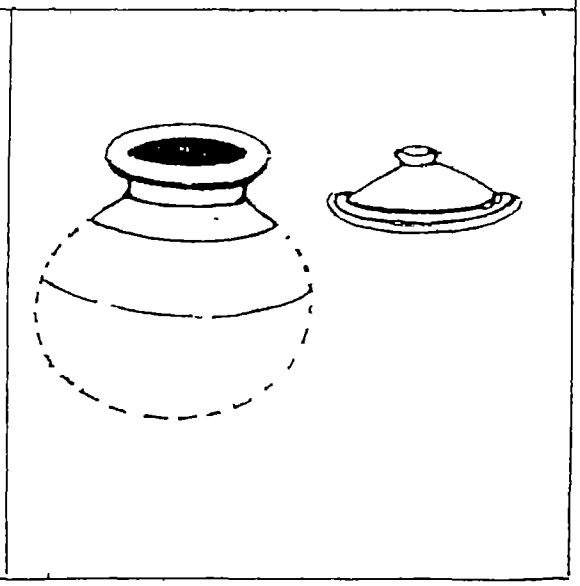
TYPE 1.3 Bamboo/timber platform (pit lined with bamboo-mat)



HOME-MADE (DO-IT-YOURSELF) LATRINES
TYPE 1.4 Bamboo/timber platform (pit lined with full-bamboo)

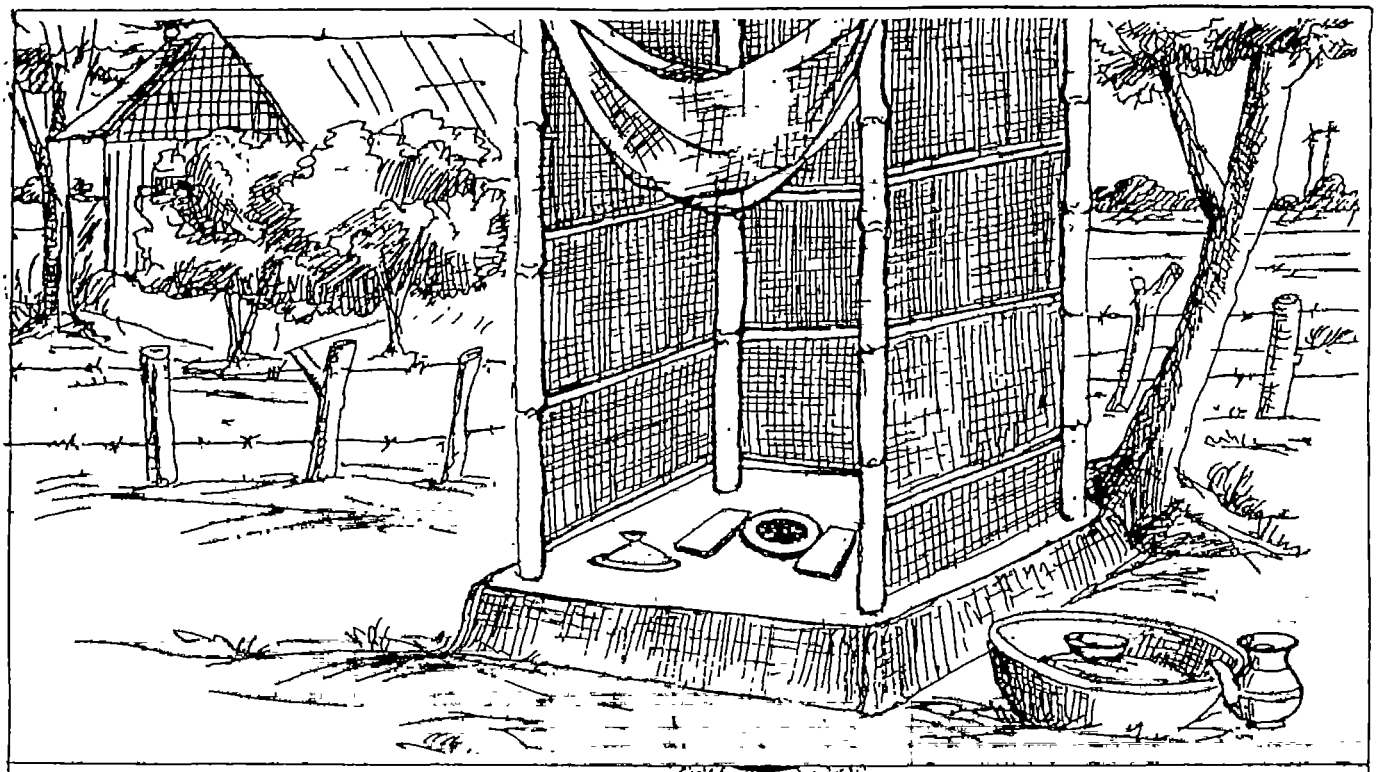


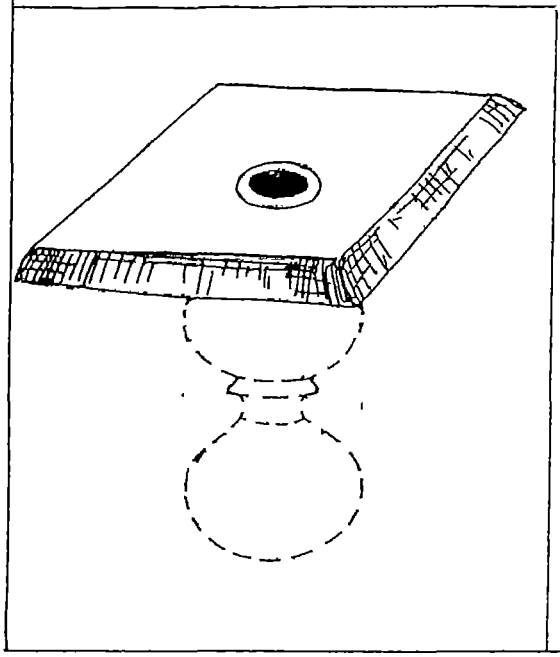


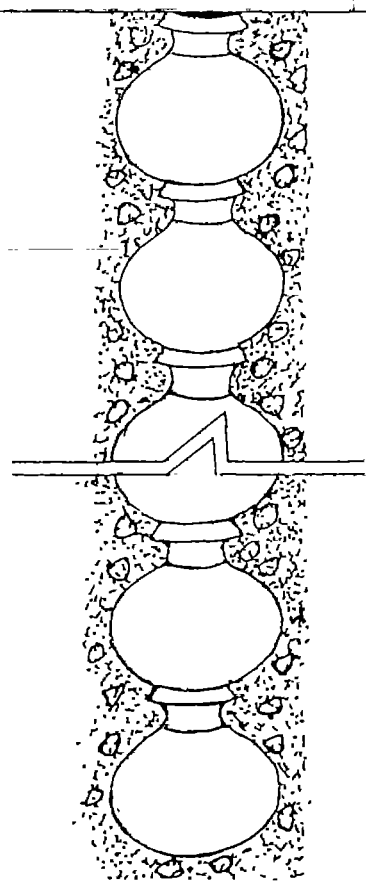


HOME-MADE (DO-IT-YOURSELF) LATRINES

TYPE 1.5 Burnt-clay Pitcher platform (without pitcher lining)

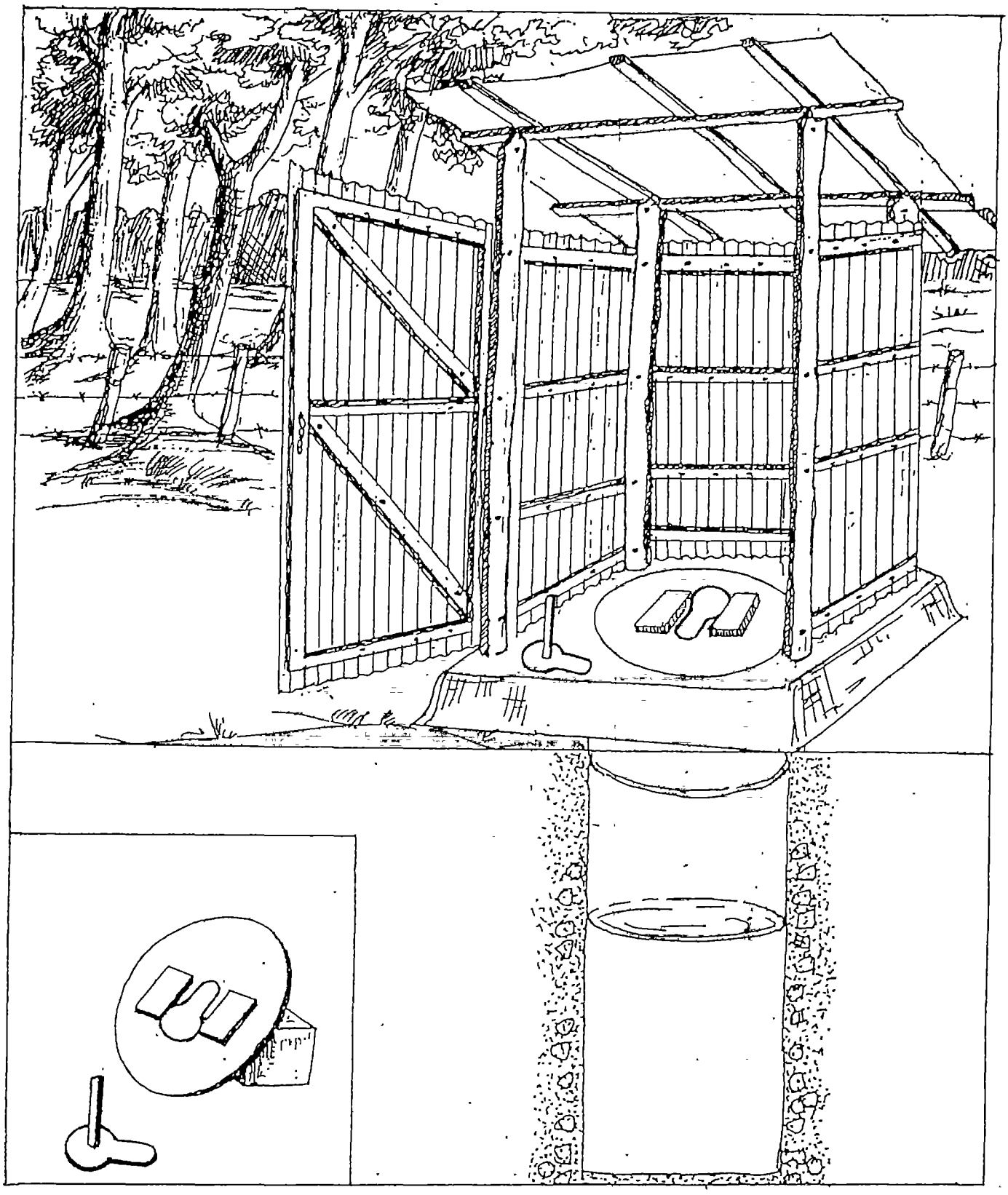




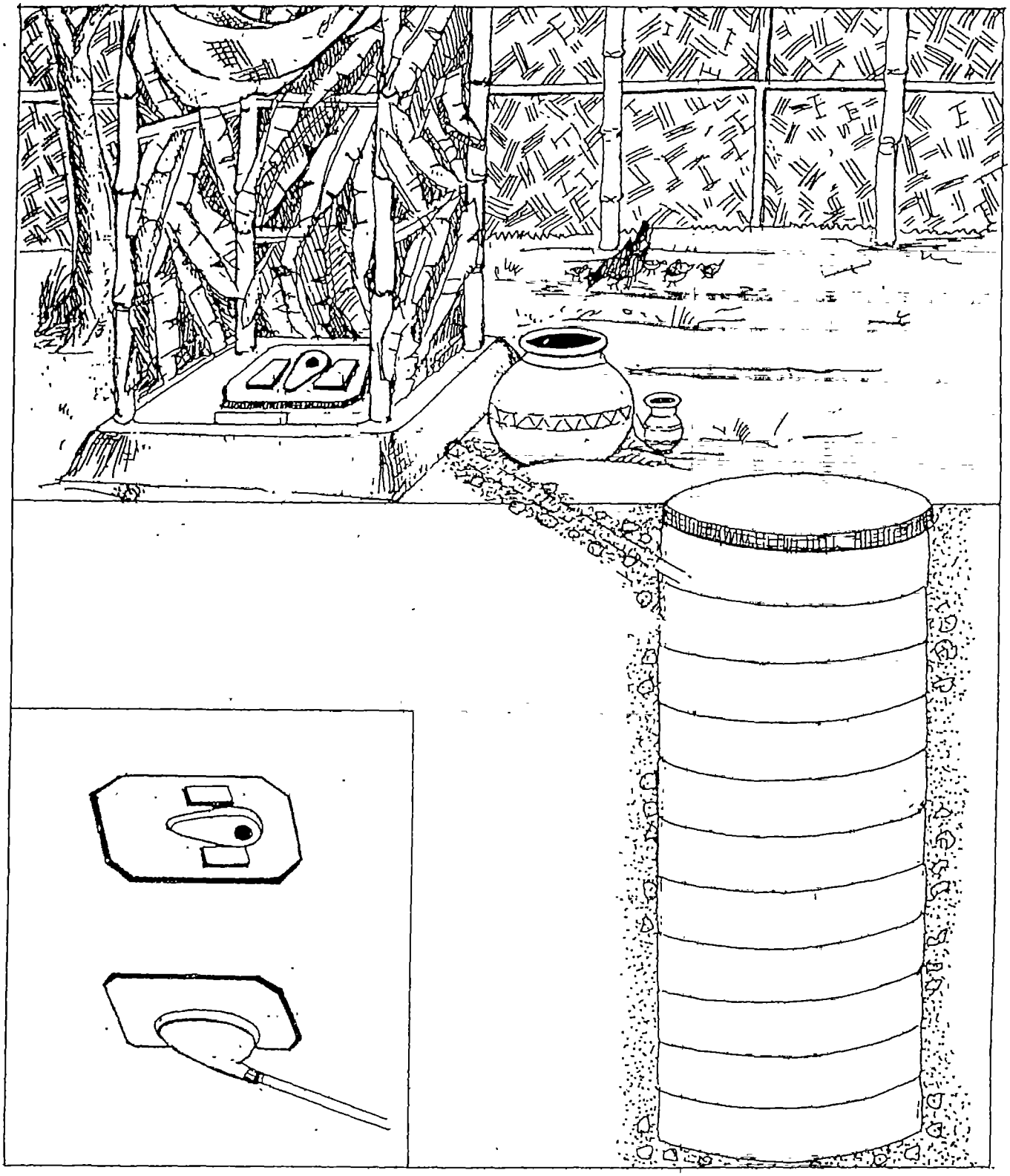


HOME-MADE (DO-IT-YOURSELF) LATRINES

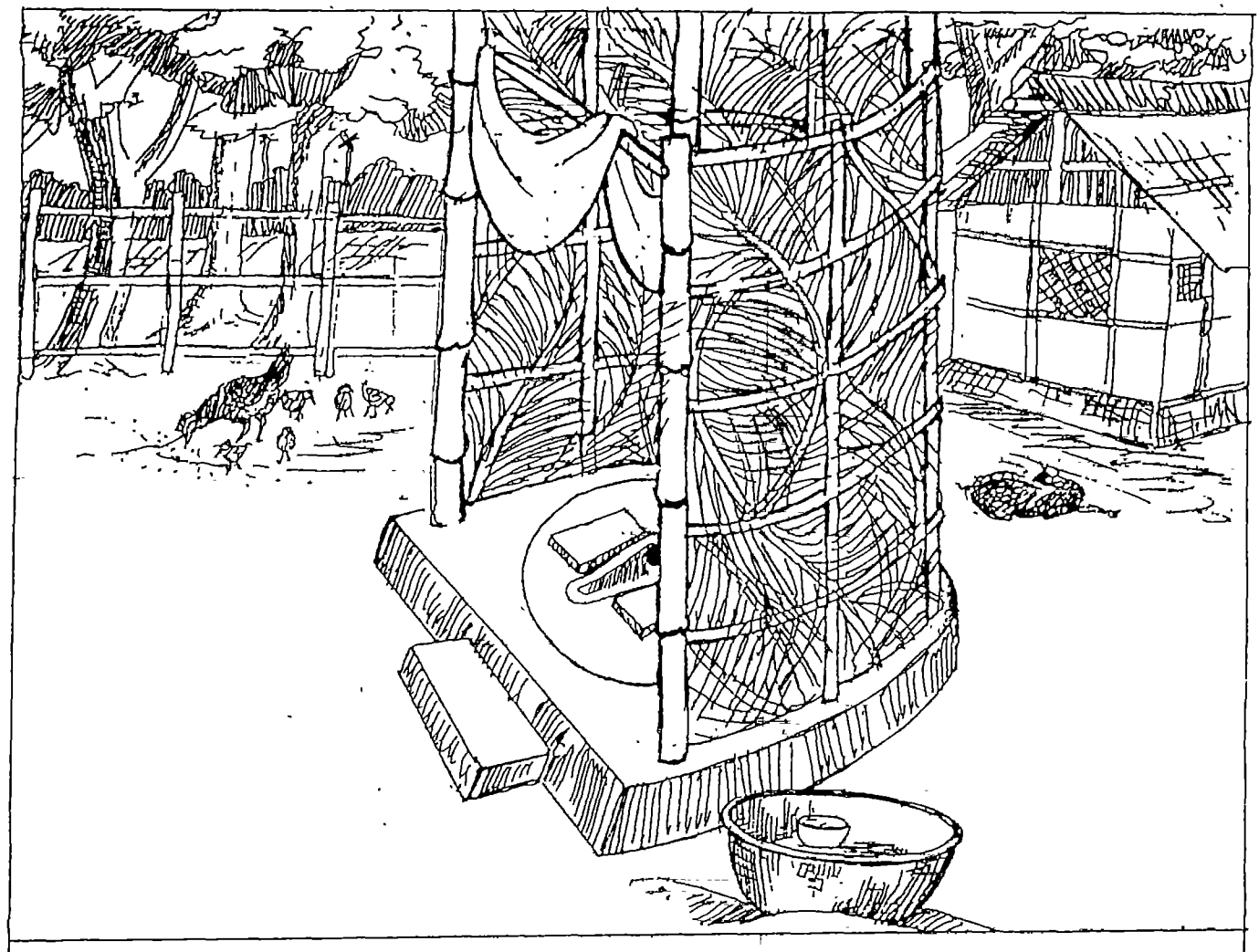
TYPE 1.6 Burnt-clay Pitcher platform (with pitcher lining)

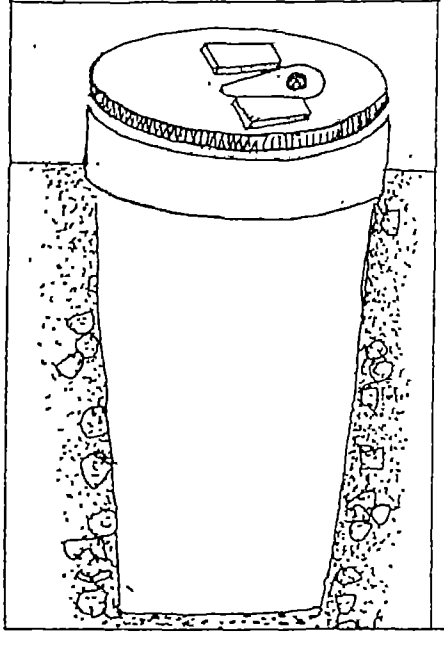


SIMPLE PIT LATRINE, WITHOUT LINING
(RCC slab with squatting hole or pan without WS)
TYPE 2. 1 Direct Pit

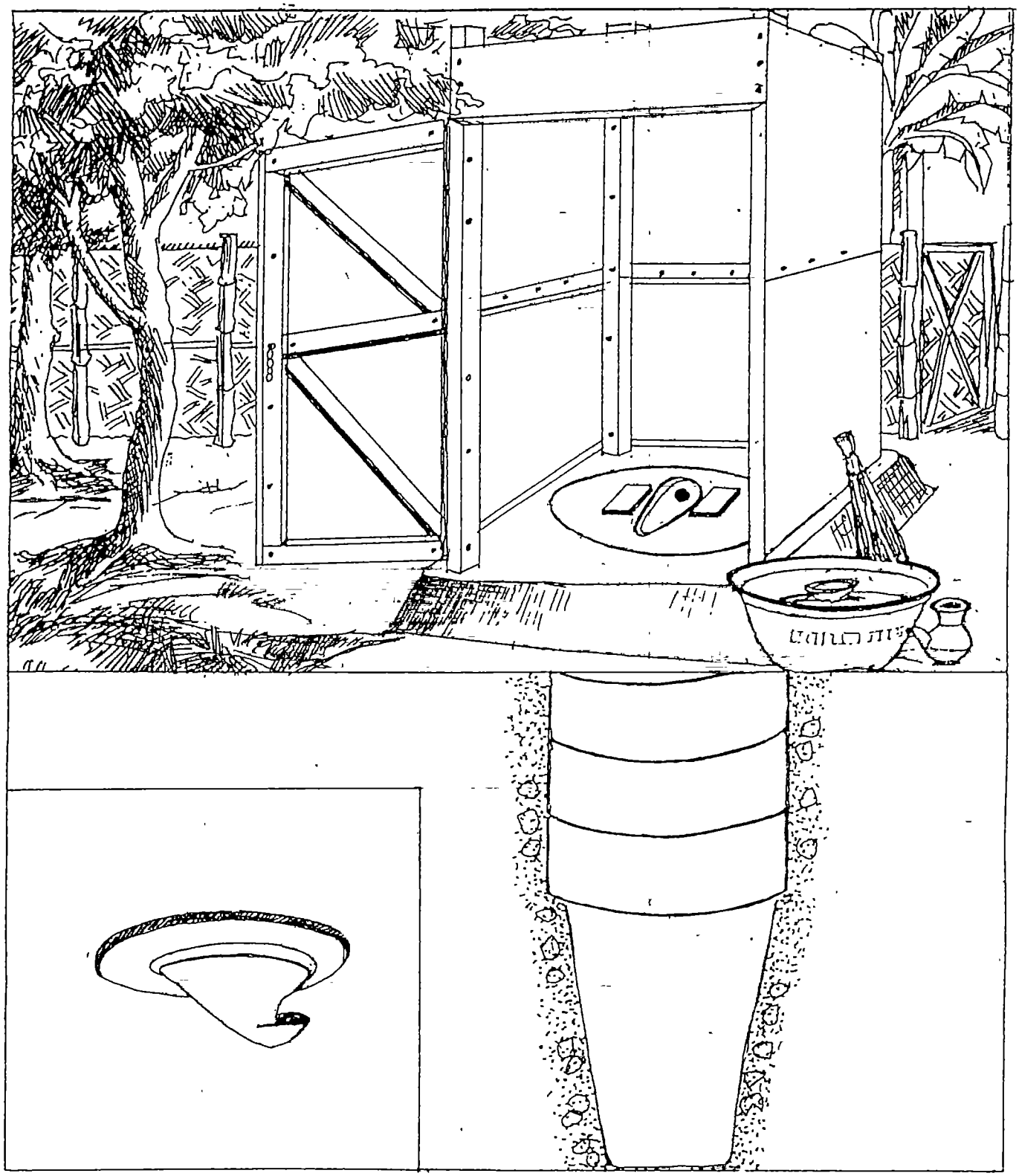


SIMPLE PIT LATRINE, WITHOUT LINING
(RCC slab with squatting hole or pan without WS)
TYPE 2.2 Off-set Pit

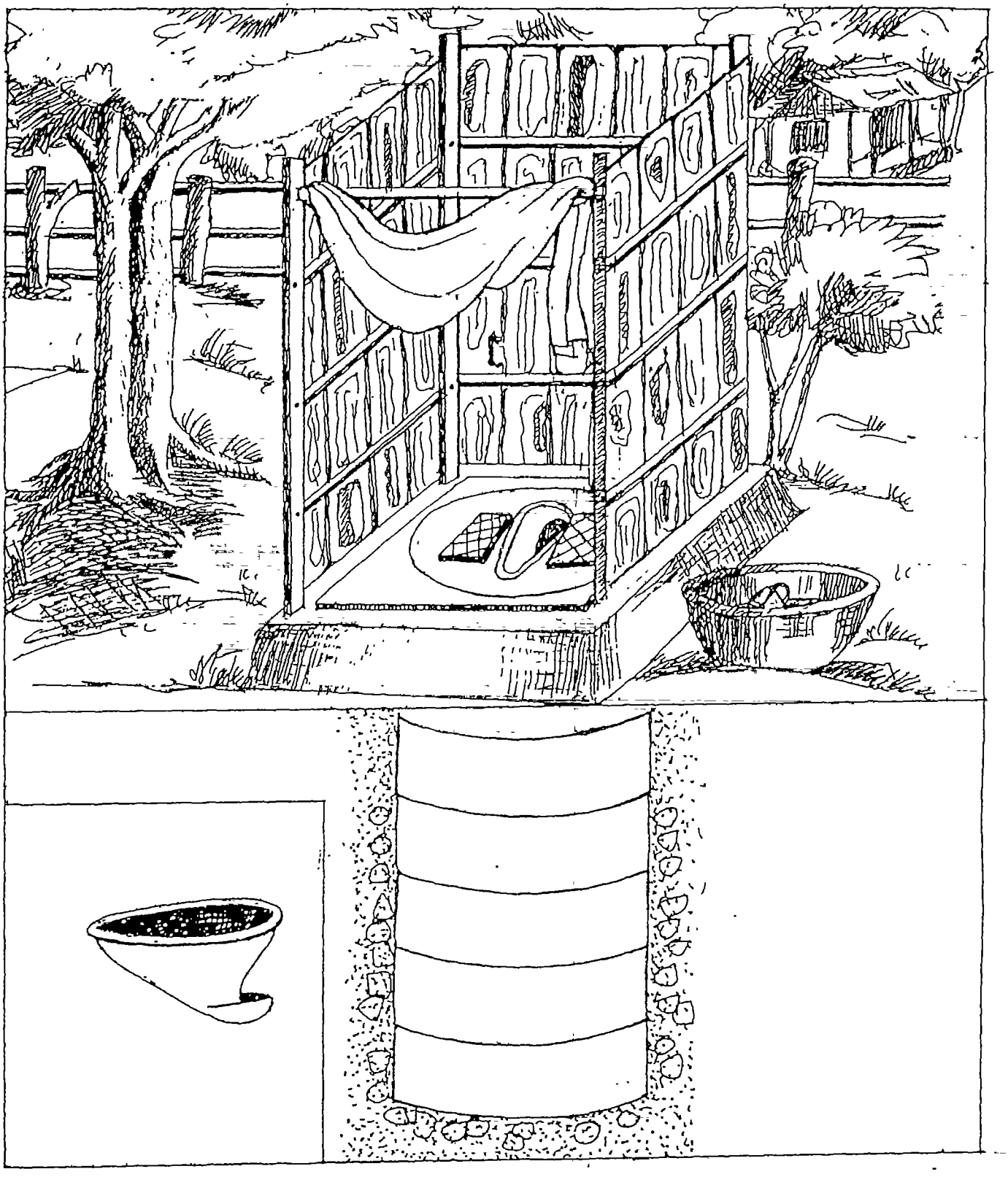




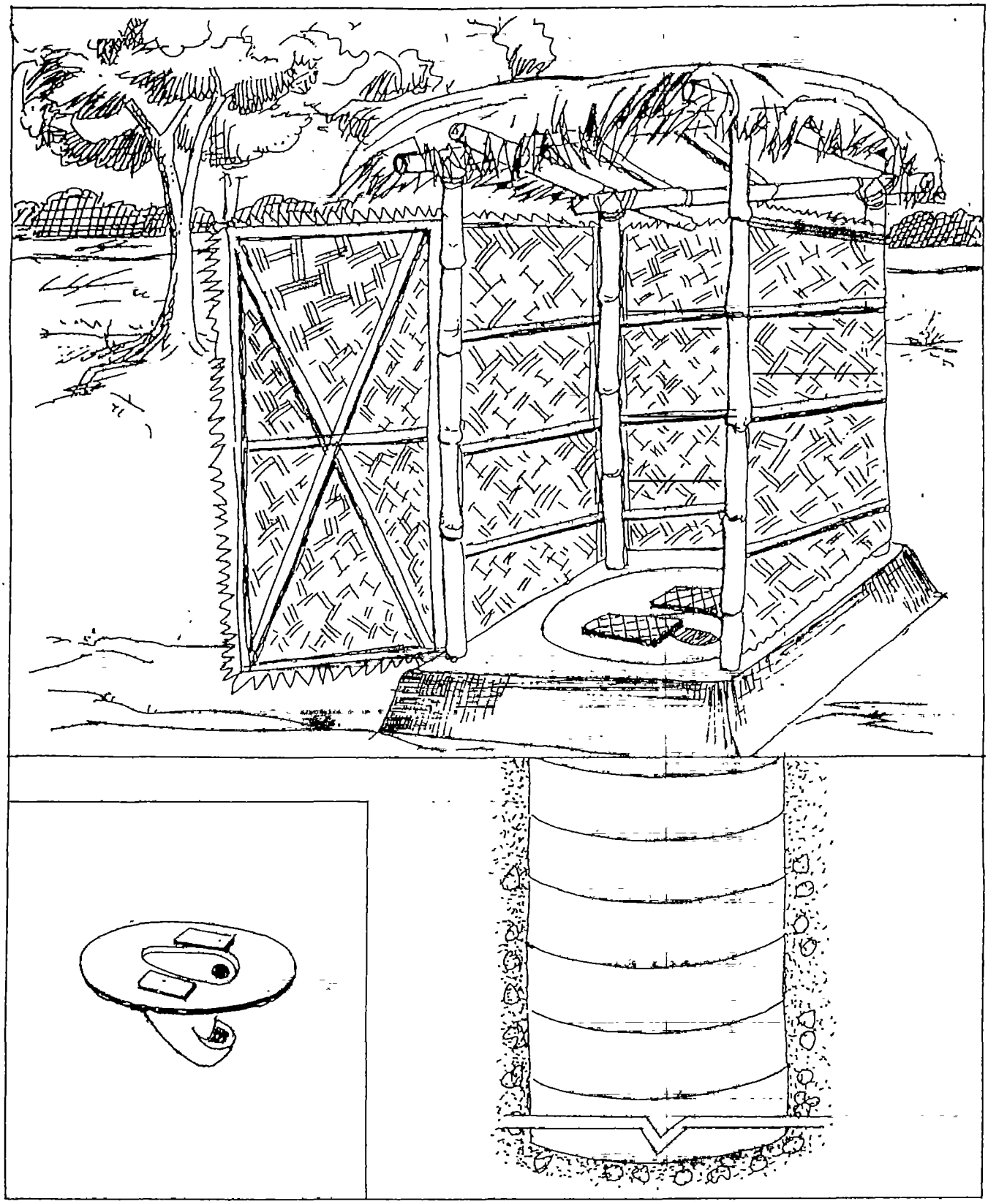
WATER - SEAL LATRINE AND RCC RINGS
TYPE 3.1 Slab with no or 1 RCC ring and unlined pit



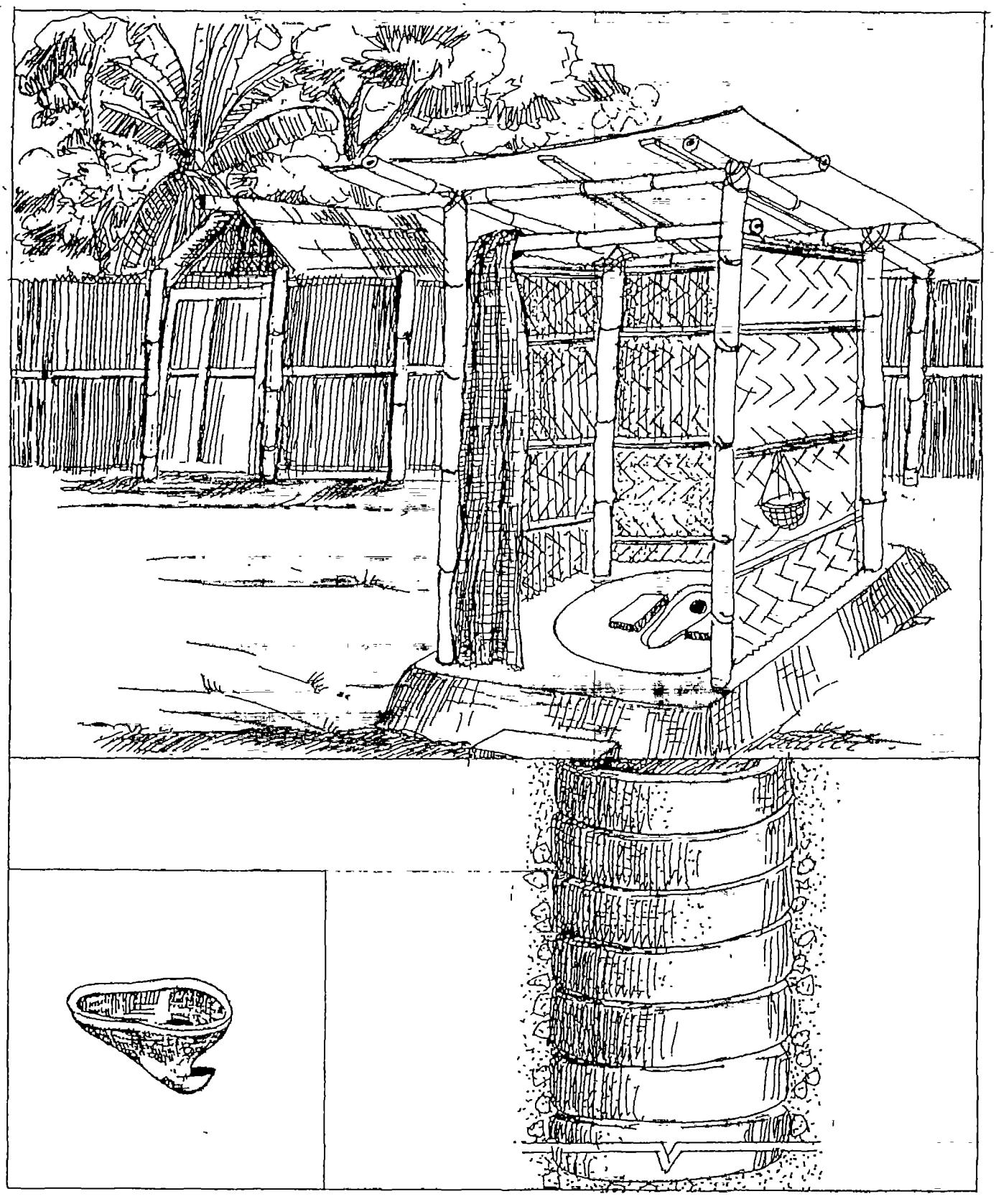
WATER - SEAL LATRINE AND RCC RINGS
TYPE 3.2 Slab with 3 rings and unlined pit



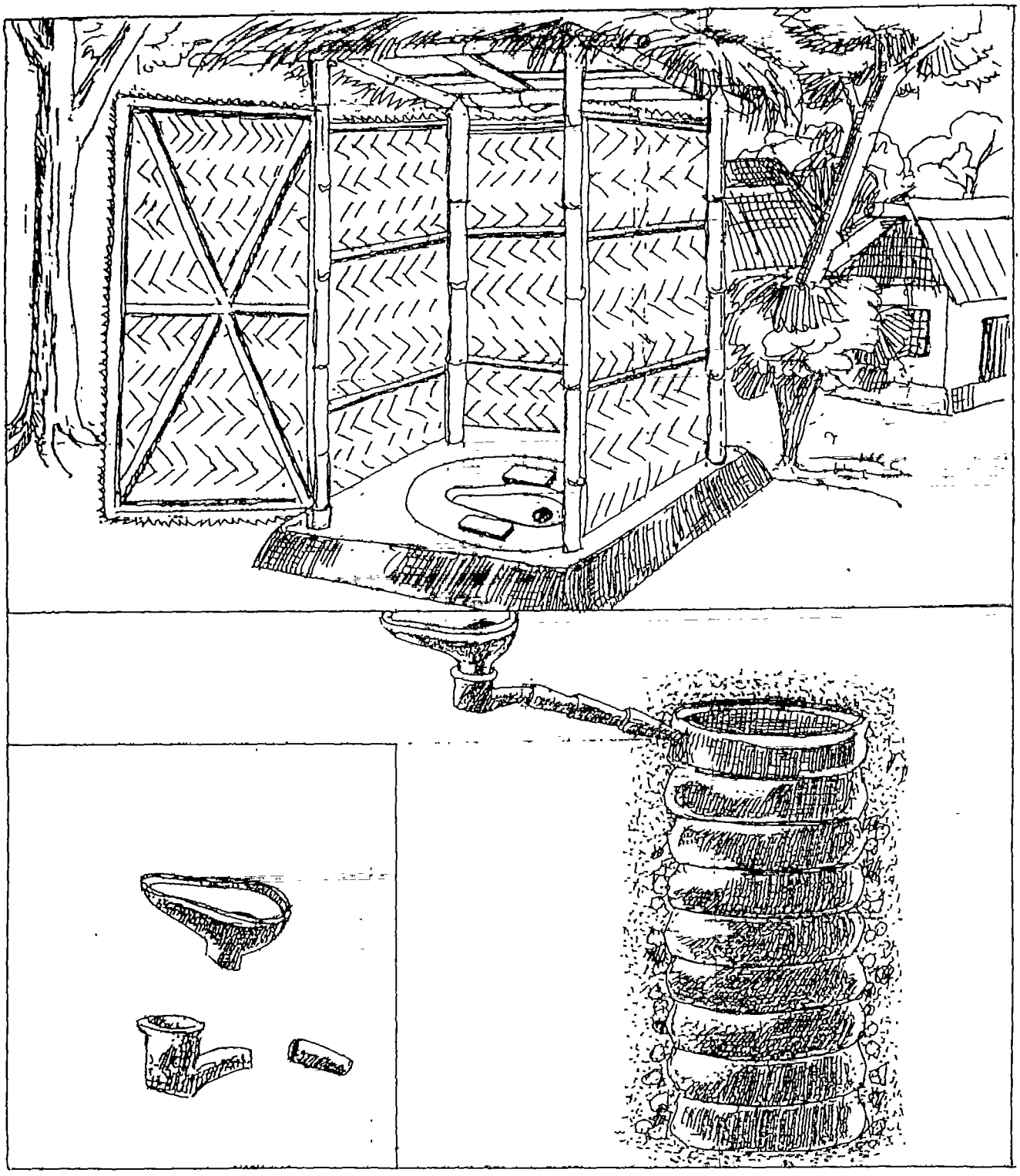
WATER-SEAL LATRINE AND RCC RINGS
TYPE 3.3 Slab with 5 rings



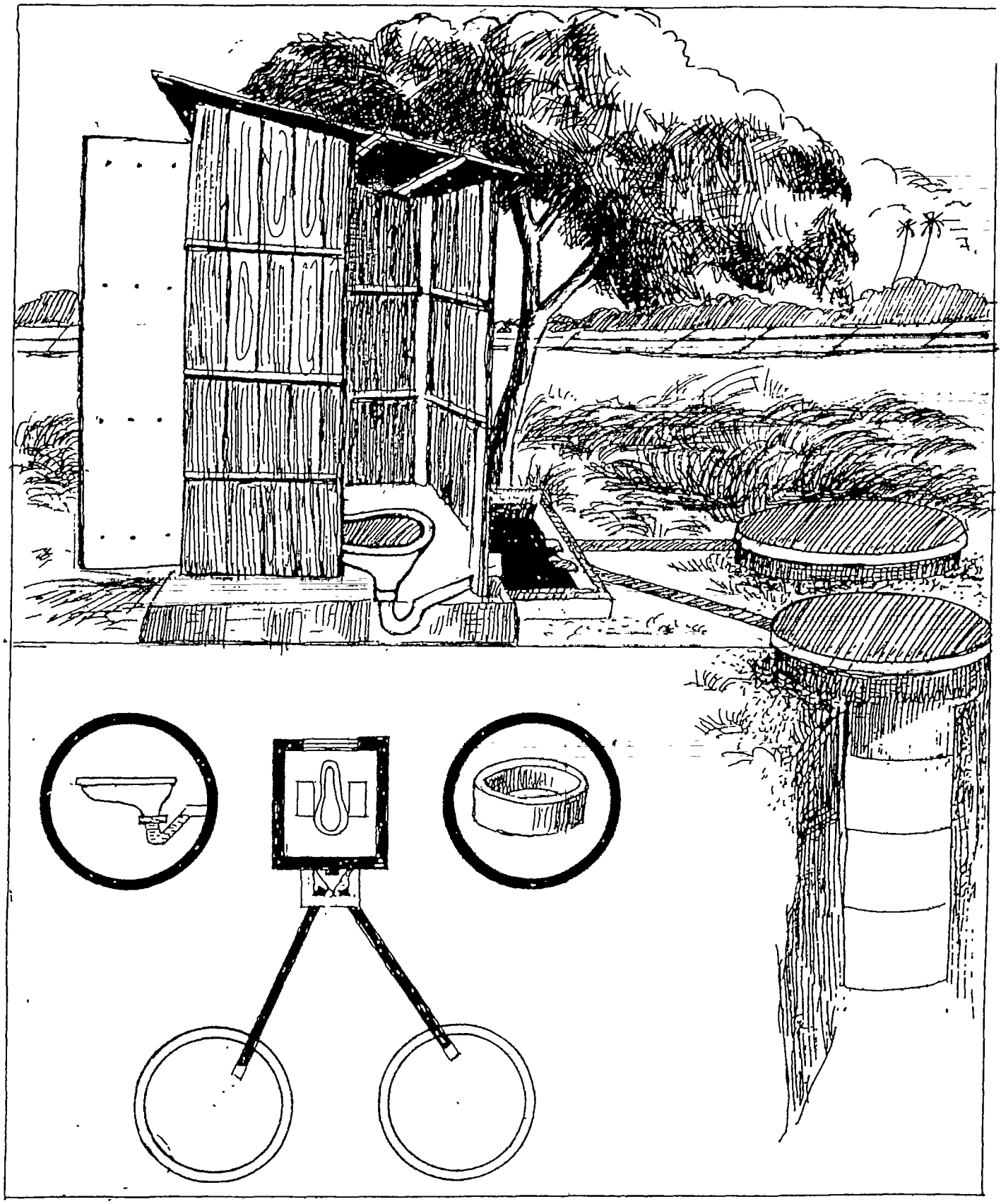
WATER-SEAL LATRINE AND RCC RINGS
TYPE 3.4 Slab with more than 5 rings



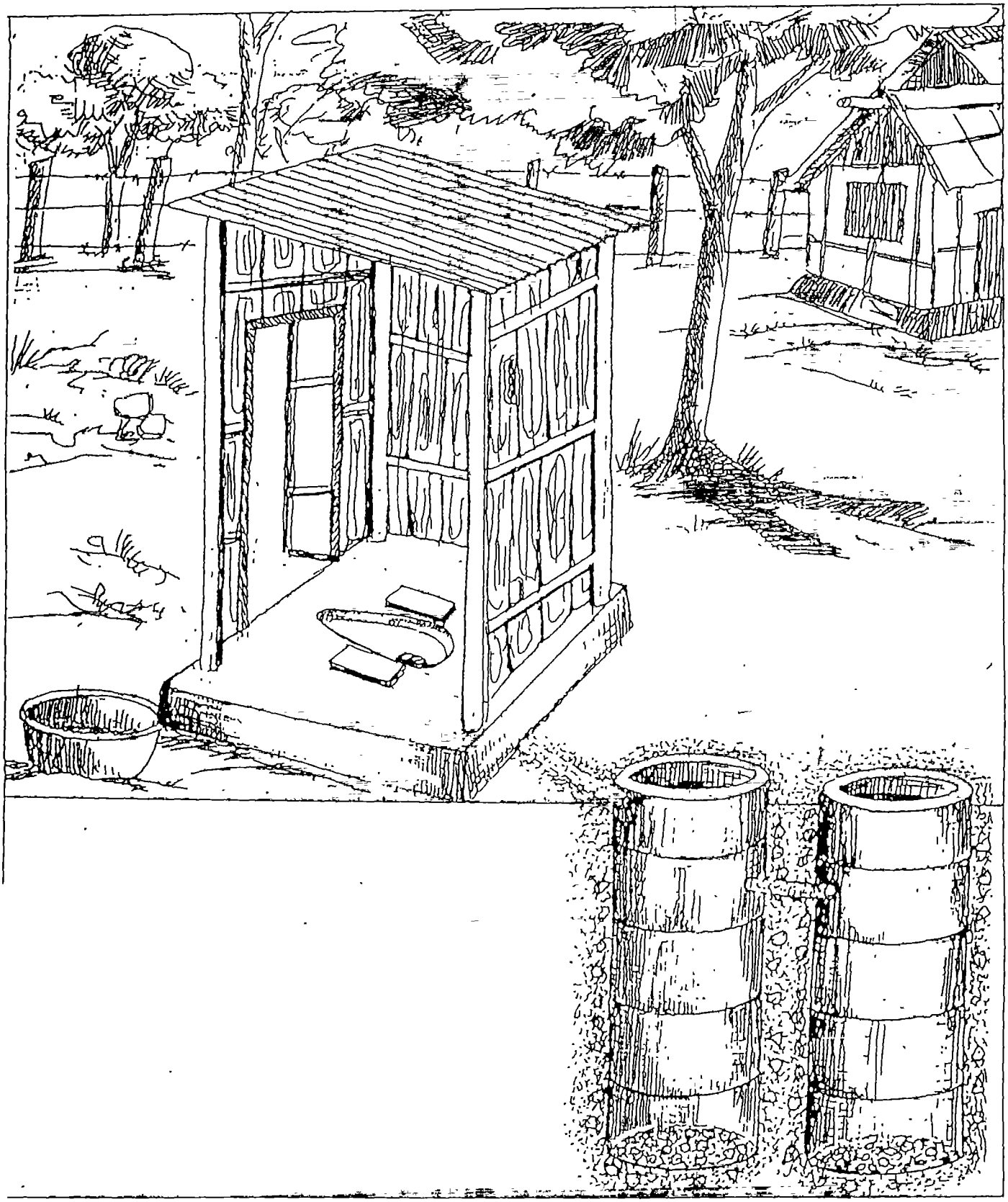
WATER-SEAL LATRINE WITH BURNT - CLAY RINGS
TYPE 4.1 RCC Slab and Pan with clay rings (direct pit)



WATER-SEAL LATRINE WITH BURNT CLAY RINGS
TYPE 4.2 Clay pan with clay rings (off-set pit)



TWIN - PIT LATRINES
TYPE 5. 1 Pits in series



TWIN-PIT LATRINES
(Various types of pan and-linings including brick-lined ones)
TYPE 5.2 Pits in series

PHOTOGRAPHS

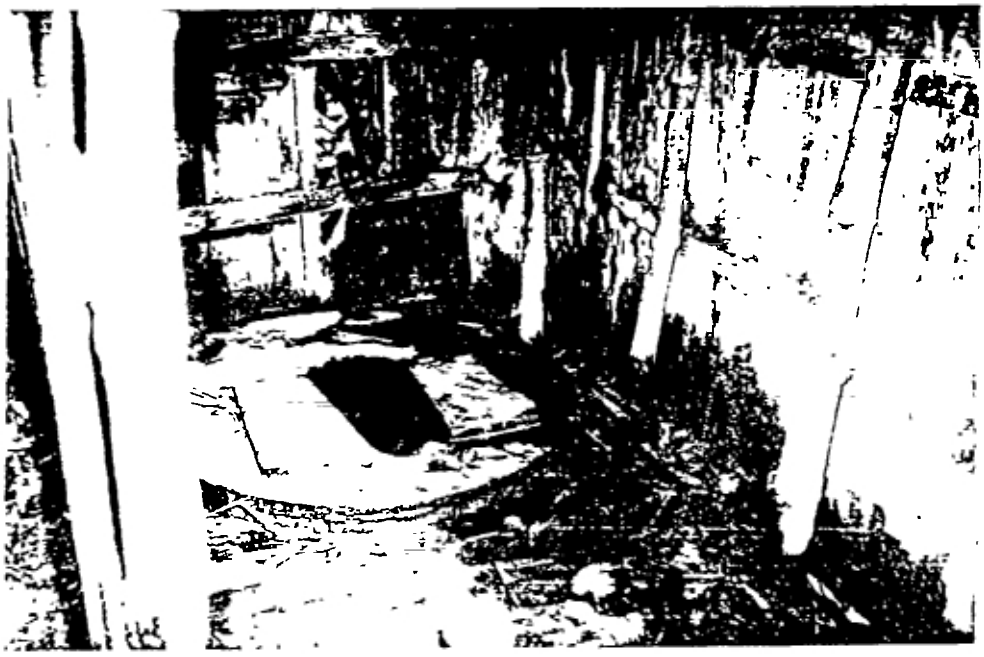


PHOTO-1
Water-seal latrine with RCC & clay-rings
with timber superstructure
(In Mirzapur Tangail)

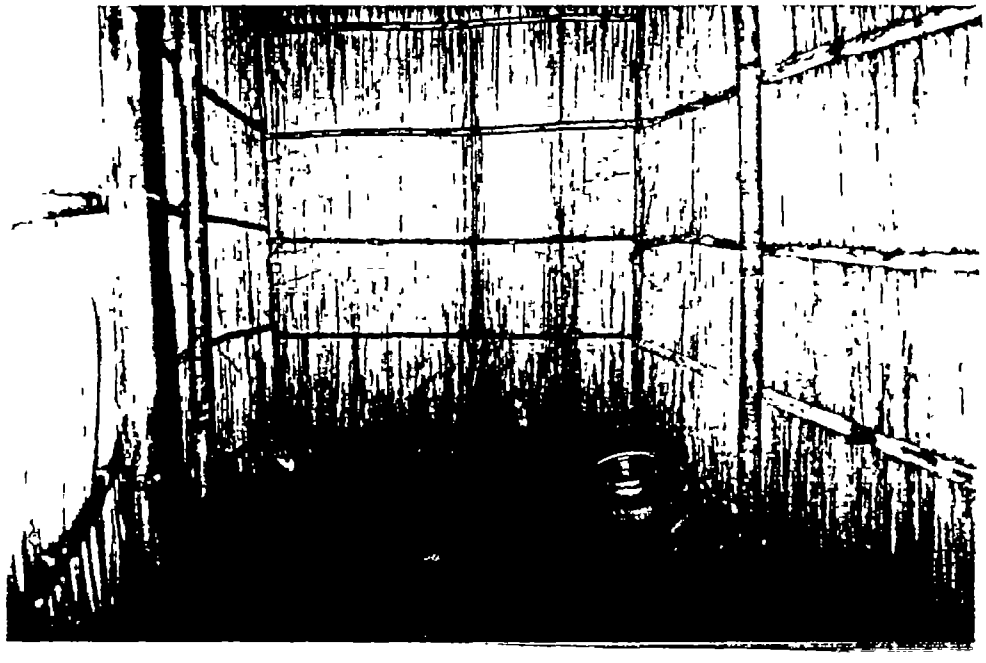


PHOTO-2
Water-seal latrine with RCC & clay-rings
with jute stick superstructure
(In Mirzapur Tangail)

PHOTO-3
A home-made improvised latrine
with inverted "chari" platform
(In Shohagpara, Mirzapur, Tangail)

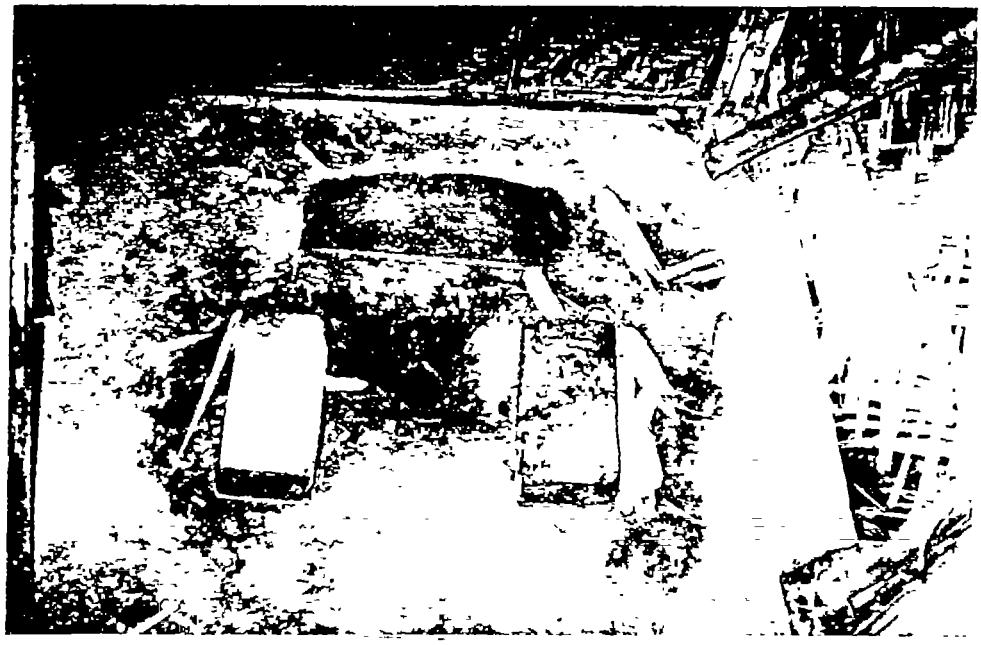


PHOTO-4
A 'concrete slab with hole' latrine
brick walled lining pit
(In Shohagpara, Mirzapur, Tangail

PHOTO-5
Home-made off-set
pit latrine
(In Anwara, Chittagong)

PHOTO-6
Home-made off-set pit
latrine with semicircular
bamboo mat fence
(In Anwara, Chittagong)

PHOTO-7
Home-made off-set latrine
on court-yard, near to cooking area
(In Anwara, Chittagong)

PHOTO-8
Home-made pit latrine
under construction
(In Anwara, Chittagong)

PHOTO-9
One slab one ring WS latrine
(In Saidpur, Shitakundu, Chittagong)

PHOTO-10
Single "MOTKA" (Water-seal) latrine
(In Khulna city slum, Mohsinabad)

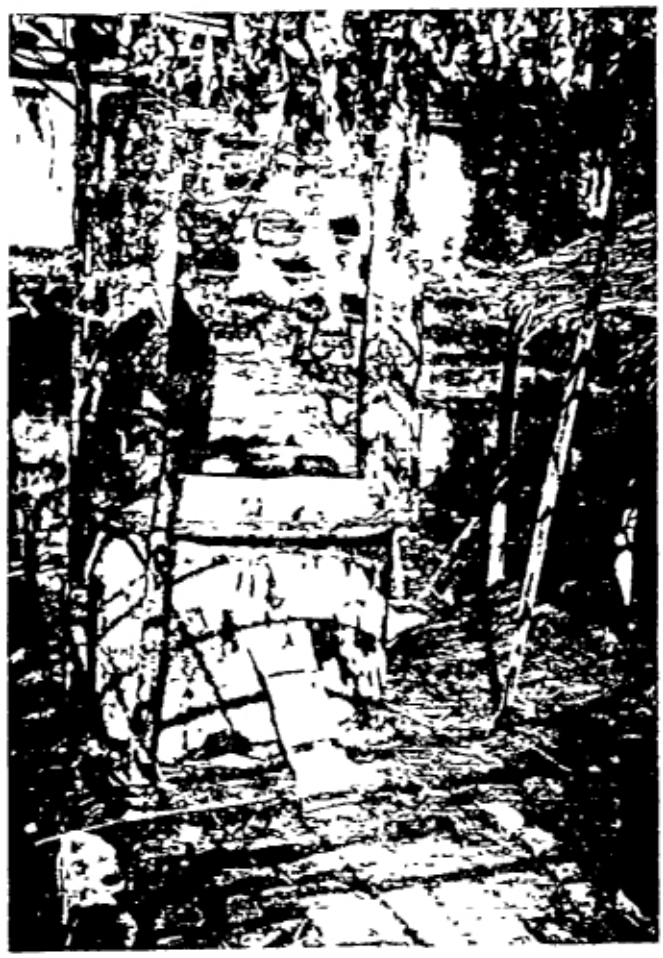


PHOTO-11
RCC WS slab on RCC pipe with brick wall superstructure
(In Khulna city slum, Mohsinabad)

PHOTO-12
RCC WS slab on 10 nos, burnt-clay rings
(In Gilatola, Fultala, Khulna)

PHOTO-13
Home-made direct pit latrine
(Partly damaged)
(In Gokul union of Bogra district)

PHOTO-14
Home-made direct pit latrine with jute stick superstructure
(In Gokul union of Bogra district)

PHOTO-15
Slab with WS pan directly on pit
with bamboo lining
(In Barthi, Gournadi, Barisal)

PHOTO-16
Home-made pit latrine with
raised earthen platform
(In Bagmara, Gournadi, Barisal)

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জাতিসংঘ শিশু তহবিল (ইউনিসেফ)

RWS/ 407/ 804
Date: 14 June, 1995

To: See distribution list

Subject: "DOCUMENTATION OF VARIOUS LATRINE TECHNOLOGIES IN RURAL BANGLADESH"

I am pleased to share with you the above report. The study was initiated by DPHE/ UNICEF with support from DPHE village sanitation project.

The report has been prepared based on findings of intensive field visits in areas representing general picture of Bangladesh. The report summarises the design of latrines currently in use in rural and semi-urban areas of the country as follows.

Type-1 Home-made (do-it-yourself) pit latrine with bamboo or timber platform with covered squatting hole — direct or offset pit, with or without lining.

Type-2 Direct pit latrine with concrete slab and squatting hole and lid with handle (SANPLAT) -- with or without lining.

Type-3 Pit latrine with concrete slab with burnt clay pan or cement pan without water seal — direct or off-set pit, with or without pit lining.

Type-4 Single pit RCC slab and water-seal pan latrine — direct or off-set pit, with or without lining.

Type-5 Double pit water-seal latrine with lining.

Hope this report will provide you useful information for your sanitation promotional activities.

Sincerely yours,

Dr. T.V. Luong
Sanitation Coordinator
WES Section

Encl: 1 report

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