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PHASE III

Proposal for the Introduction
of a New Strategy for the

PROMOTION OF SANITATION IN BANGLADESH THROUGH THE PRIVATE SECTOR

Study carried out for
SDC/UNICEF/DPHE

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Annexures 70

Following annexures have only been added with a few master copies of this report:

Rationale and Scope of Study

Rationale

The Government of Bangladesh (GoB) has made substantial progress during the past 10 - 15 years in promoting and implementing low-cost sanitation in rural areas. It is being supported in these efforts by UNICEF since 1975 and by NGOs. Between 1975 and 1990, in the order of 600,000 single-pit water-seal latrines were installed under the programme executed by GoB's Department of Public Health Engineering (DPHE) and the sub-district ("Upazila") authorities. This is a good achievement. However, the current latrine coverage among the over 12 million rural households is still only about 4 %, and the anticipated rate of implementation with present means and approaches is still too low.

DANIDA and SDC have been major donors to UNICEF for its assistance to DPHE's rural water supply and sanitation programme since several years. This support is likely to continue at least through 1993, the end of the current (1988-1993) UNICEF support phase. Earlier missions of SDC and DANIDA carried out in 1986 and 1987 have come to the following conclusions:

- The DPHE-executed programme is unable to meet the demand of those willing and able to pay for a DPHE latrine at the subsidized price.
- A significant proportion of rural families is financially unable to purchase a DPHE latrine consisting of 1 slab/pan + 5 rings) even at the subsidized rate.
- There is a lack of systematic and prolonged promotion of feasible technical alternatives to the standard water-seal latrine which could be within the reach of the rural poor.

In the light of this, it was concluded by those responsible for the programme that possibilities should be sought to re-orient and amend the rural sanitation implementation strategy as follows:

- Doubling the DPHE/Upazila latrine production centres by 1990
- Creating a suitable framework for increased latrine supplies by private producers
- Devising and providing at the hands of the rural families cheaper options for latrine construction with emphasis on locally available material and artifacts
- Introducing the concept of using the stored excreta as manure[1].

Scope of Study

The following is a general outline of this five study phases which shall lead to the trying-out of new latrine delivery mechanisms.

Phase I:

- Preliminary quantitative assessment of the current situation regarding rural sanitation, current sector programmes and involved actors.
- Qualitative assessment of the potentials and limitations of the current sector activities.

[1] A demonstrating project towards this end has been initiated by Prism, a non-profit consulting group. The project is to demonstrate the use of wastewater (later also of excreta) for the production of duckweed which in turn, serves as a fish feed. Research and development is under way at the Kumudini Hospital complex in Mirzapur (Dhaka Div.). The results of this work are not being awaited. This Report does therefore not deal with the project at this stage. The Consultants are not aware of any other project on excreta use in Bangladesh.

- Study of potential or assessment of existing strategies and technologies through which use is made of the excreta.
- Formulating the task of local consultants to collect further data and information; this includes the formulation of the questions to which answers are required and of the ToR for the local consultants.
- Deciding on the organizational set up, including coordination/supervision, for the Phase-II consultancy.

For finding and proposals of Phase I Study see annexure 1.

Phase II

- Collection and processing of data on users' ability and willingness to buy a latrine; on private producers; production cost and sales, and on production and delivery of latrines by the subsidized sector.

See annexure 2 for TOR of Survey Consultant

Phase III

- Interpretation of the collected and processed data by the Mission.
- Drafting of report presenting the results of the survey.
- Formulation of new and/or additional mechanisms of latrine delivery.
- Steps towards action research in sanitation.

See annexure 3 for TOR for Phase III. For activity schedule and persons met, see annexure 9.

Phase IV

- Review of drafted strategy by all bodies concerned

Phase V

- Preparation of final report
- National Seminar for presenting and discussing new potential strategies and to accept an action plan for its testing and implementation.

This report constitutes the outcome of Phase III of the overall task.

ACRONYMS, ABBREVIATIONS AND TERMINOLOGY

ADAB	–	Association for Development Agencies in Bangladesh
AEN	–	Assistant Engineer
BIDS	–	Bangladesh Institute of Development Studies
BRAC	–	Bangladesh Rural Advancement Committee
CARE	–	Co-operative American Relief Everywhere
DANIDA	–	Danish International Development Agency
DPHE	–	Department of Public Health Engineering
EAWAG	–	Swiss Federal Institute for Water Resources and Water Pollution Control
FC	–	Ferrocement
FY	–	Financial Year
GoB	–	Government of the People's Republic of Bangladesh
HCL	–	House of Consultants Limited
IA	–	Integrated Approach
ICDDR,B	–	International Centre for Diarrhoal Disease Research, Bangladesh
IRCWD	–	International Reference Centre for Wast Disposal
Karai	–	Metal container
Khoa	–	Bangla name for brick chips
LGEB	–	Local Government Engineering Bureau
mistri	–	small contractor (in Bangla)
MLGRDC	–	Ministry of Local Government, Rural Development and Co-operatives
NGO	–	Non-Government Organization
Para	–	a hamlet of houses (in Bangla)
Parishad	–	elected local council (in Bangla)
Pourashava	–	Municipality (in Bangla)
R&D	–	Research and Development
RCC	–	Reinforced Cement Concrete
RWSS	–	Rural Water Supply and Sanitation
RDRS	–	Rangpur Dinajpur Rural Service
SAE	–	Sub-Assistant Engineer
SDC	–	Swiss Development Cooperation
SDE	–	Sub-Division Engineer

TARD	-	Technical Assistance for Rural Development
Taka	-	currency of Bangladesh
Tk	-	Taka, currency of Bangladesh
TOR	-	Terms of Reference
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations Children's Fund
Union	-	Subdivision of Upazila
Upazila	-	a division of Zila (district) (in Bangla)
VSC	-	Village Sanitation Centre
WES	-	Water and Environmental Sanitation
WHO	-	World Health Organization
XEN	-	Executive Engineer
Zila	-	district, part of division (in Bangla)

EXCHANGE RATE: 1 U.S. DOLLAR = TAKA 35
1 SWISS FRANC = TAKA 23

Phase3*acronym

TARD	–	Technical Assistance for Rural Development
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Phase3*acronym

Summary

Results, Conclusions and Recommendations from the Survey on the Willingness/Ability-To-Pay

The Users

Main surveys have been carried out to estimate willingness/ability-to-pay for the sanitary components and to assess the performance of delivery mechanisms.

1. The survey comprises 400 families who have already installed a latrine, and 2400 families who have not got a sanitary latrine yet.

2. It was found that:
   - Mainly, more well-off families have already installed an improved latrine.
   - Those already owning a latrine have got higher education, better houses and more cultivable land than non-owners. They belong mainly to the occupational groups of formal service post holders and small business people. Non-owners are mainly farmers and daily labourers.

3. The median age of the already installed latrines is 2 years. The pit filling time is very slow (6 years on the average).

4. The median price already-owners have paid for a complete latrine installation is Tk. 1600, comprising Tk. 350 for the slab + 4 rings, Tk. 60 for transport, Tk. 1,000 for the superstructure and Tk. 200 for installing the latrine. Higher cost of superstructure has been due to the fact that survey did not exclude the latrines of the type other than those of DPHE model.

5. Of those not having a sanitary latrine yet, approximately $^3/_4$ have indicated that they are aware of the availability of latrine components, the majority, through seeing these items being sold in the market.

6. The survey yielded the following results with respect to the willingness/ability-to-pay (full payment upon purchase):

4% can/want to pay	**Tk. 450* or more**
27% can/want to pay in the range	**Tk. 250 to Tk. 450***
69% can/want to pay a max. of	**Tk. 250****
19% can/want to pay a max. of	**Tk. 100**
7% can/want to pay a max. of	**Tk. 70*****

(* the current approx. average sales price of private producers for a 5-ring set
** the current DPHE sales prices for a 5-ring set
*** the current DPHE sales price for 1 slab + 1 ring)

For payment by installments, more people would be willing/able to purchase at somewhat higher prices.

7. In absolute numbers, the stated, country-wide potential demand for latrine sets at prices below Tk. 70 is approx. 900,000, for prices up to Tk. 250 approx. 8.5 million, and for prices about Tk. 450 approx. 450,000.

8. For families living far away from Village Sanitation Centres to buy a latrine is significantly lower than for those living closer to a VSC.

The Suppliers

9. There are, at present, about 750 operational DPHE production centres, which have had an approximate output of 270,000 slabs + pans and 780,000 rings in the 1988/89 fiscal year. The revolving funds has more than doubled itself at the centres. Alternate use of these funds needs to be initiated to counter possible inflation of raw material prices.

10. Roughly estimated 700 private producers, in rural Bangladesh, are currently producing and selling about 140,000 slabs + pans along with 840,000 rings per year.

11. Starting with the fiscal year 1989/90, DPHE production centres are directed to sell but 2 instead of 5 rings per set. While this may in the long run, lead to an accelerated latrine coverage, it has temporarily lead to a stockpiling at the production centres, since many potential customers wish to purchase more than 2 rings. The "standard" latrine has long been propagated to consist of 5 rings. Therefore, many customers believe that a 2-ring latrine is sub-standard.

12. A limited number of NGOs also contribute to the promotion and sale of latrines - usually within a geographically limited area but through rather effective delivery channels, notably credit systems. For most of these organizations, sales prices allow to cover the production cost. Country-wide, the contribution to latrine coverage through the NGOs has, so far, been rather limited.

13. In spite of the sale of heavily subsidized latrine components by DPHE, a fair number of private entrepreneurs have been able to set up and maintain latrine production. The cost of production of private producers are approximately 14% lower than the cost of production of DPHE.

14. Private producers have, so far, not considered the DPHE production centres as competitors. To date, the two entities have been producing for different market segments. Moreover, the DPHE and UNICEF promotional activities appear to have lead to additional demands for latrine components for private producers.

15. An assessment has been made by the study to look at the market share met by DPHE which has produced 4% sanitation coverage so far. The reduction of sale of rings per slab has created a complementary market share for the private producers. Besides, DPHE production capacity cannot meet the total demand even at a DPHE price range leaving the unmet demand for the private sector to cater for.

16. About 20% of rural population cannot afford even the subsidized price at which the DPHE sells the sanitary components. On the other hand a segment of the market is ready to pay higher prices for better service (easier purchase procedure and immediate delivery) and improved latrine components.

17. Barring about 3-4 NGOs, it seems that the NGOs have so far not developed into a satisfactory delivery channel. Their market share is rather insignificant and considerable amount of assistance given to NGOs has not resulted in promising outputs. It is necessary to establish useful monitoring system and possibly reduction of the number of assisted NGOs for better results.

Inferences and Recommendations

18. The lack of an easily accessible credit system for investment and working capital is being felt by the private producers to be, one of the main limiting factor for expanding their production and sale.

19. Reduction of production cost and sales prices of latrines can be attempted:

a. By reducing the production cost of rings and slabs. This can be achieved by introducing alternate technologies, by minimizing material inputs for the standard construction, or/and by applying alternate latrine technologies.

The Action Research described in Section 5 focuses on these points.

b. By promoting the construction of latrines fully or partly from indigenous material at the user's homestead or nearby. This approach might be successful mainly where there exists a continued and intensive contact between latrine users and extension workers from DPHE or NGOs such as in the Integrated Approach villages. If this is possible or not, on a long term basis, has yet to be established.

20. It has been of special interest for the team to look into the strategies which have a direct linkage with the private sector involvement for delivery of latrine components. Therefore the following topics have been specially looked into:

- Mobile production of latrine components
- Mobile sale of latrine components
- Reduction of number of rings per slab
- Motivational activity

21. It is assessed that mobile production and sale, which inherently needs more flexibility, is rather complicated when channeled through the formal sector of delivery because of lack of clarity in costing and instructions for handling of funds etc. It can be a considerable load on the DPHE activities.

22. As the subsidy varies with different combinations of sanitary latrine components, the potential demand from the private producers also varies as a result thereof. As long as the people consider that a good latrine consists of five rings and a slab, the lower ring of rings per slab ratio tends to increase the market for the private producers.

23. The subsidy level has over the years increased because of two reasons namely due to increase of prices of raw materials over time without increasing the sales price and the reduction of rings per slab (heavier subsidy on slab and on slab – 1 ring). For an FC slab latrine the subsidy varies from about 50% to 65% depending upon the number of rings in a set. The subsidy level in absolute figures means US dollars 2.4 to 3.0 million on the basis of

planned targets for 1989-90. The trend of achieved targets, however, indicates considerably lower figure.

24. Promotional activities for increasing the motivation to purchase latrine components is of a very special significance because it will lead to the market size increase for all actors involved on the supply side. UNICEF has used print medium, audio-medium, audio-visual medium and inter-personal medium, all essentially carrying health and hygiene messages. Efforts should be done to address issues like privacy, status, convenience also as it is easier to reinforce the people's intentions to buy latrines on grounds where they are already half convinced.

25. Strengths and weaknesses of private producers and DPHE as delivery channels have been looked into and for an optimal increased coverage of sanitation in Bangladesh, it is recommended that the strategies followed should look at maximization of outputs from these two complementary channels of delivery.

26. A simple calculation has shown that at the present rate of production and taking the life of the sanitary latrine components in view the total potential demand of the country shall never be met. For the sake of analysis distinction has been made between stated demand, projected demand and actual demand.

27. In an attempt to meet the challenging task of meeting the countries demand in sanitation the central questions become, if all we involved in sanitation, want to see the complementary involvement of private producers or not. A proposal has been made here to work out a detailed strategy of a Pilot Programme for Private Producers' Participation (5-Ps) in a limited geographical area. The suggested strategy is based upon production of only slabs and pans by DPHE, complementary sale of rings by private producers, extension of credit and training to private producers and an emphasis on motivational activities in selected area together with a suitable monitoring system.

28. In consequence to the recommendations of phase I, a limited effort in action research in sanitation technology has been initiated with inputs from DPHE and UNICEF. This work is being carried out in the DPHE research centre at Mohakhali. Priority has been given to the production of rings with perceived variables like ring thickness, type and placement of reinforcement, material mix in manufacture and manufacturing devices. The rings are expected to pass through rather tough rolling, handling and laboratory crash tests for compression etc. An attempt will be made in looking at strength vs cost curves. The initial results are not likely to be available till end October 1990. Selected 1 or 2 types of rings are proposed to be field tested in a limited area for a period of time before adoption of the proposal on country-wide basis. In order to include tests during a rainy season, it is suggested that this activity is continued till October 1991.

Besides the rings, certain amount of action research has been detailed for improved slabs, pans, pit lining and superstructure etc. These activities shall continue in parallel at the same time as the other action research activities mentioned above.

Comments on this report of Phase III are expected from the DPHE, UNICEF staff and other interested persons in the field of sanitation latest by end August, 1990. The receipt of these comments marks the Phase IV of the on-going study which shall then produce the recommendations during Phase V.

1. The Survey on the Willingness/Ability-to-Pay for Latrines (Phase II of the Study)

1.1 Rationale, Scope and Methodology

1.1.1 Rationale

During the exploratory mission in April/May 1989, the Mission found (see Annex. 1), both through field observations and study of relevant documents that:

- a large proportion of the rural population cannot afford the 5-ring latrine sold by DPHE although it is highly subsidized
- at present, the market niche for private producers is relatively small
- the availability of latrine components at subsidized prices through DPHE distorts the demand pattern.

The findings were almost entirely qualitative based entirely on opinions expressed and a few interviews. It was therefore decided to conduct a survey through which the actual "demand curve" should be established in a quantitative way, i.e. indicating the ranges of the willingness/ability-to-pay for various socio-economic strata. The data should serve as one of the bases for future decisions on new latrine delivery mechanisms and on the shared future roles of both DPHE/UNICEF and the private producers.

1.1.2 Scope

Based on statistical grounds, the sample size for households, not having a sanitary latrine yet, was fixed at 2400. With the survey carried out in four geographically distinct areas (the 4 Divisions), for three to-be-defined socio-economic strata and with the distance between household and centre as an additional factor, the chosen sample size, it was estimated that it will guarantee an accuracy of the results of $\pm$10%.

The sample size for households already having a sanitary latrine was fixed at 400 (100 in each Division).

On the supply side, the target was to survey 40 private producers (10 in each Division). However, only 37 could be traced due to non-availability of sufficient number of private producers in the selected upazilas and logistic problems. Eight DPHE centres were visited (1 in each of the 2 Upazilas randomly selected in each of the 4 Divisions) to collect detailed data on production and sales factors. In addition, information on the quantities of latrine components produced and sold in 40 Upazila production centres (10 in each Division) was collected at DPHE headquarters. Finally, information regarding latrine production and sales was also collected from 13 NGOs.

1.1.3 Methodology

The collection of field data was contracted out to House of Consultants (HCL), a Dhaka based firm specialized in project evaluations, surveys and feasibility studies. The data were collected by means of questionnaires which were pre-tested and re-shaped prior to the

survey. A separate questionnaires were developed for each target group both on the demand side (3#) and on the supply side (4#). In all 7 questionnaires were used for the survey namely #1 for general information from the buyers; #2 for those not having sanitary latrines; #3 for those having a sanitary latrine; #4 for private producers; #5 sales and production figures from 40 DPHE production centres; #6 detailed information from 8 DPHE production centres and #7 for information from NGOs. For detailed reference to the questionnaires refer annexures 11 to 13 (only included in the master copies of the report). Annexure 11 contains all the 7 annexures in English whereas Annexure 12 contains only annexures 1 to 3 (used in the field) in Bangla.

A. Survey Structure

The survey was structured and the households selected according to the procedure outlined below:

1. Two Districts (Zila) were selected at random from each of the 4 administrative Divisions.

2. Two Upazilas were selected at random from each selected District.

3. Villages were selected partly at random and partly purposely. It was assumed that the villages in the neighbourhood of the Upazila growth centres are more exposed to rural sanitation programmes than the villages in the remote areas. In order to find out the difference in sanitation parameters in these two types of villages, 8 villages (about 26%) were selected purposely near the Upazila growth centres and 22 villages were selected at random.

4. For the random selection of the 22 villages, one Union in each selected Upazila was selected at random, and then one village was selected again at random from the selected Union.

The Unions containing the villages selected purposely were excluded from the list of Unions for random drawing of the 22 villages. The number of villages selected at random was 6 each in the Dhaka and Chittagong Divisions, and 5 each in the Rajshahi and Khulna Divisions.

The tables below show the sample-draw scheme, as well as the Districts and Upazilas actually selected.

Random selection of villages:

Division	District	Upazila	Villages selected purposely (near Growth Centres)	Villages selected at random
Dhaka	2	2x2 = 4	1x2 = 2	1x4 + 2 = 6
Chittagong	2	2x2 = 4	1x2 = 2	1x4 + 2 = 6
Rajshahi	2	2x2 = 4	1x2 = 2	1x4 + 1 = 5
Khulna	2	2x2 = 4	1x2 = 2	1x4 + 1 = 5
Total	8	16	8	22

Names of randomly selected Districts and Upazilas:

Division	Districts	Upazilas
Dhaka	1. Kishoreganj	1. Bhairab
		2. Kishoreganj
	2. Narsingdi	1. Monoherdi
		2. Shibpur
Chittagong	1. Noakhali	1. Senbag
		2. Begumganj
	2. Brahmanbaria	1. Brahmanbaria
		2. Akhaura
Khulna	1. Barisal	1. Goumadi
		2. Bakerganj
		2. Daulatpur
Rajshahi	1. Rangpur	1. Gangchara
		2. Mithapukur
	2. Dinajpur	1. Fulbari
		2. Birganj

5. The selection of households was made as follows:

A cluster of households in a village was chosen for interview. The interviewers started from one end of the cluster and moved on from one household to another until the required number of households was surveyed. If a cluster was short of the required number of households, the interviewing team moved on to the next closest cluster. In the process of administering Questionnaire 1, the questionnaire assessing the relevant socio-economic data of users and non-users, the households having improved latrines were identified. The maximum number of such households surveyed was 400 distributed among 30 villages selected for the survey.

The total number of households surveyed was 2800 altogether, and the survey work stopped whenever the respective total of each village was reached.

B. Survey Observations

The Survey Consultant remarked the following with respect to the field observations:

a. Households: It was often observed that many households desiring to have a sanitary latrine hesitated to quote a money figure which they would be willing to pay. The interviewers were instructed not to prompt them to come up with a figure. Such replies were recorded as "No Response"[1]. The reason for their hesitation to quote a money figure was that they were not sure of anything, i.e., the demand for a sanitary latrine by such households was not considered effective. In other words, until the day of this interview, sanitary latrine was not in the list of goods to be purchased then or in the foreseeable future

[1] and excluded from the willingness/ability-to-pay calculations presented in Chpt.1 2 below

b. Production/Sale by DPHE Producers: From the statement collected from the DPHE Head Office (Village Sanitation Division) about the annual production and sale of latrine components, it appears that there is a large year-end stock. The reason for such large stocks was not immediately known. The period April-June is considered to be a lean period when sale of sanitary latrine tapers off. However, the DPHE producers keep on the production trend and hence during the month of June the stock tends to be large. The period from December-February is considered to be peak for sale of sanitary latrine components[2]. This does not really explain the situation because the data covers the whole year.

c. Measurement of Materials for Production of Sanitary Latrines: The masons producing the latrine components normally use buckets or Karai (metal container) for mixing materials (cement, sand, khoa). They initially measure the items and then place them in the bucket or Karai. Subsequently, they use the level mark instead of actually weighing machine for the measurement.

Our investigators believe that producers tended to give an exaggerated figure for cement and reinforcement in the mix while in practice they might use lower quantities of these two items. The possibility of malpractice (viz, selling of cement, reinforcement materials by them) for private gain cannot be completely ruled out. However, our investigators could not verify this.

d. Survey of NGOs: A number of NGOs showed reluctance to give information and in many cases our investigators required to make a number of visits. Several others, however, were quite cooperative and provided the information during the first visit. It may be mentioned here that many NGOs changed their addresses, and the UNICEF did not have the current address.

e. Some of the people who know about the availability of sanitary latrines think that the Government should supply them free of cost. Some others think that the procedures may be too complicated, although they did not actually apply for the latrine components. They have the misgivings that anything to do with the Government or outside institutions must be a complex affair.

f. Many people (non-users) believe (without any basis) that the latrine components may not last long enough to justify the required investment. They do not seem to have the technical information or the utility of such latrine components. This warrants a wide-scale dissemination of information among the rural people.

g. Some users of sanitary latrines mentioned that flushing is a difficult process and therefore they break the water seal. They are not aware of the utility of the water seal.

h. Scavenging the filled-up latrine is reported to be difficult.

i. Private producers do not always follow the DPHE measurement.

[2] Remark by the writer of this report: Over a 12-month period, however, these imbalances between production and sales should even out. Yet 90% of the records indicate stock-piling (see Chpt 12, The Suppliers)

C. Computer Aided Analysis

Computer assistance has been utilized wherever it was economically recommendable particularly with regard to three of the main questionnaires pertaining to the demand side and involving the 2400 households not having a sanitary latrine and 400 households already having a sanitary latrine. Computer softwares have been utilized for creation of data base records for each households and creating crosstabulations and for analysis of co-relations. Software packages used were dBase IV, Fox Base, SPSS, Lotus 1-2-3, Harvard Graphics, WordStar and Ventura Publisher.

For detailed reference see computerized tabulation of survey database in Annexure 10 (included only in the master copies of the report).

1.2 Results and Discussions

Below follows the presentation and discussion of those results which we consider to be the key elements of the survey. They were selected according to their direct relevance for future latrine promotion and delivery strategies, in which particular emphasis is put on private producer involvement. The full array of results is contained in Annex. 10.

1.2.1 The Actual and Potential Users

A. General Features

The following general information pertinent to the Study have been collected from the 2800 households interviewed:

	Those not having yet a san. latrine	Those having a san. latrine
Family size:		
Average no. of persons	6.5	7.7
≤ 5 persons:	43%	26%
6-10 persons:	49%	84%
Literacy of household head:		
Can neither read nor write:	40%	9%
Reads and writes with difficulty:	35%	22%
Reads and writes well:	24%	68%
Formal education of household head:		
No formal education:	41%	10%
I-V grade:	34%	21%
VI-VII grade:	9%	11%
Sec. School Certificate:	8%	23%

[1] Figures do not add up to 100% for all the items since only a selected number of sub-categories has been chosen for most of the items

	Those not having yet a san. latrine	Those having a san. latrine
Occupation of head of households:		
Farmer:	43%	28%
Fisherman:	1%	-
Daily labourer:	10%	1%
Formal (mainly government) service:	11%	26%
Business (trader, shopkeeper e.g.):	19%	29%
Whether homestead is on elevated land:		
Yes:	89%	93%
No:	11%	7%
Whether homestead is above flood level:		
Yes:	66%	70%
No:	34%	30%
Roof of house made from:		
Tin/tally:	65%	84%
Kaccha:	23%	6%
Wall of house made from:		
Kaccha:	59%	37%
Tin/tally:	21%	34%
Cultivable land area:		
None:	28%	11%
100 decimals (≤ 0.4 ha):	46%	22%
100-200 dec. (0.4-0.8 ha):	14%	24%
200-300 dec. (0.8-1.2 ha):	6%	14%
300 dec. (1.2 ha):	6%	28%
Distance from nearest pucca road:		
≤ 0.5 mile:	23%	28%
0.5 - 1.0 mile:	37%	35%
1.0 - 3.0 miles:	20%	19%
≥ 3 miles:	20%	18%
Max.	9 miles	9 miles
Average:	2 miles	1.9 miles

		Those not having yet a san. latrine	Those having a san. latrine
Distance from nearest Village Sanitation Centre:			
	≤ 0.5 miles:	6%	6%
	0.5 - 2.0 miles:	29%	37%
	2.0 - 6.0 miles:	45%	39%
	> 6.0 miles:	21%	18%
	Max. :	10 miles	10 miles
	Average:	4.2 miles	3.9 miles
Distance from nearest private producer:			
	≤ 0.5 miles:	7%	12 %
	0.5 - 2.0 miles:	36%	
	2.0 - 6.0 miles:	46%	
	≥ 6.0 miles:	11%	
	Max. :	9 miles	9 miles
	Average:	3.5 miles	3.4 miles
Method of excreta disposal:			
	Open defecation:	50%	N A.
	Kaccha latrine:	47%	
Separate latrines for men and women (1788 respondents):			
	Yes:	27%	22%
	No:	73%	78%
Monthly household expense:			
	Median	Tk. 1,800	Tk. 2,100
Socio-economic category[1] (see Annex. 4):			
	"Low" (cult. land < 1.5 a, monthly income <Tk. 1700 Kaccha-type house):	47%	15%
	"Medium" (Cult. land 1.5-2.5 a, monthly income upto Tk. 2400, house roofed with tin, walls kaccha or tin):	43%	47%
	"High" (Cult. land >2.5 a, monthly income >Tk. 2,400, pucca house):	10%	38%

1. See Annex — for the definition of the socio-economic categories

The data give a general description of the households interviewed in the non-user and already-user groups. They show, the non-surprising fact that, so far:

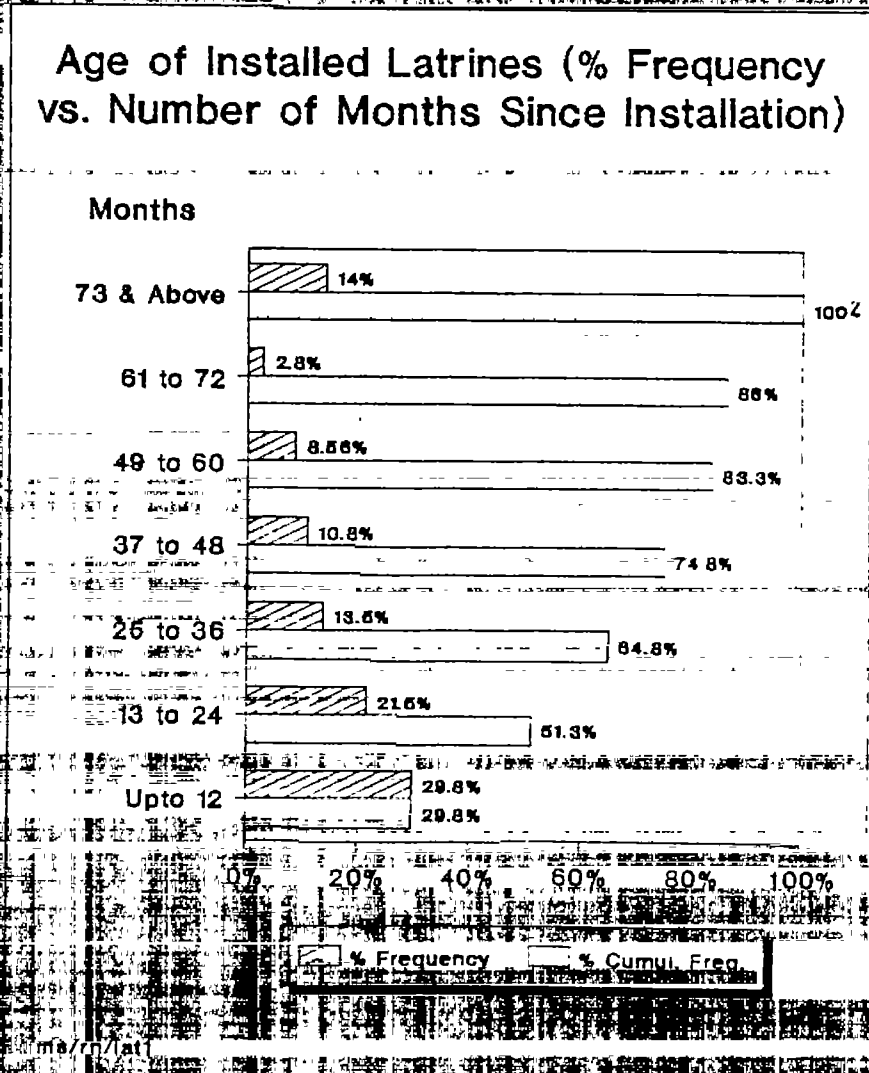
- Mainly more well-off families have already installed an improved latrine.
- Both the basic and the formal education are higher among those already having a sanitary latrine than among those not having yet.
- The already-havers belong mainly to the occupational groups of formal service post holders and small business people, whereas the non-havers are mainly farmers and daily labourers.
- The already-havers have got better houses and more cultivable land than the non-havers of latrines.

B. Those already having a sanitary latrine (Questionnaire No. 3)

i. Time since the latrine was installed?

In Fig. 1.1, the frequencies for the number of years since the households have installed the improved latrines are plotted. Surprisingly, as many as 30% of the latrines installed at the 400 surveyed households, were put up in the last 12 months and 65% in the 3 years preceding the survey. **This indicates that latrine promotion and delivery has been increasingly effective in the recent past.**

Fig. 1.1



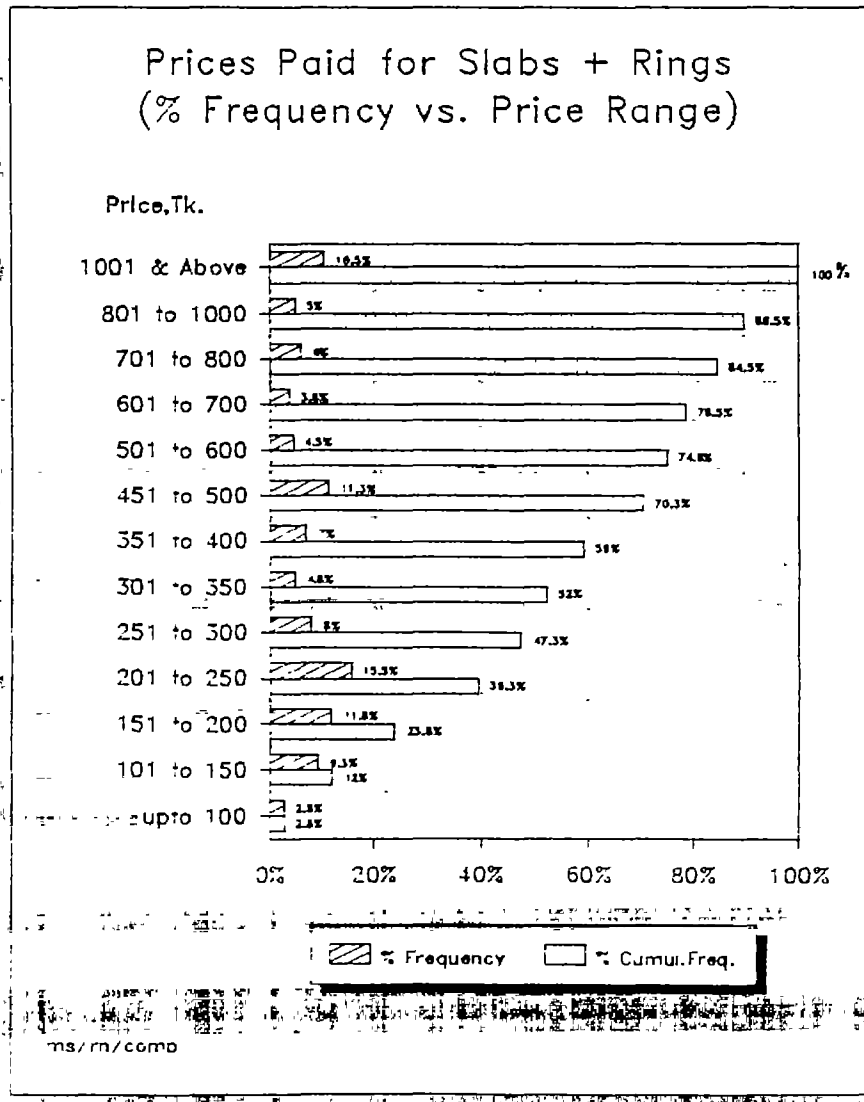
In summary, the age for the 400 latrines is statistically described as follows:

	Age of latrines (years)
▫ average	3
▫ median (50%-ile)	2
▫ range	1 month - 8 years
▫ 30%	1
▫ 75%	4

ii. Prices paid for slabs and rings; the number of rings installed and the supplier of the slabs and rings

Fig. 1.2 shows the % **frequency** and the **cumulative percentage** of all 400 households for the **prices paid** for slabs and rings in the ranges of Tk. 50-100 to Tk. 1000 and above. Approximately 40% purchased the slab and rings at a total cost of Tk. 250 or less. Half of the buyers paid Tk. 300 or more and 30% paid Tk. 500 or more. **The median price** paid amounts to Tk. 350, the minimum was Tk. 50 and the maximum Tk. 10,000.

Fig. 1.2



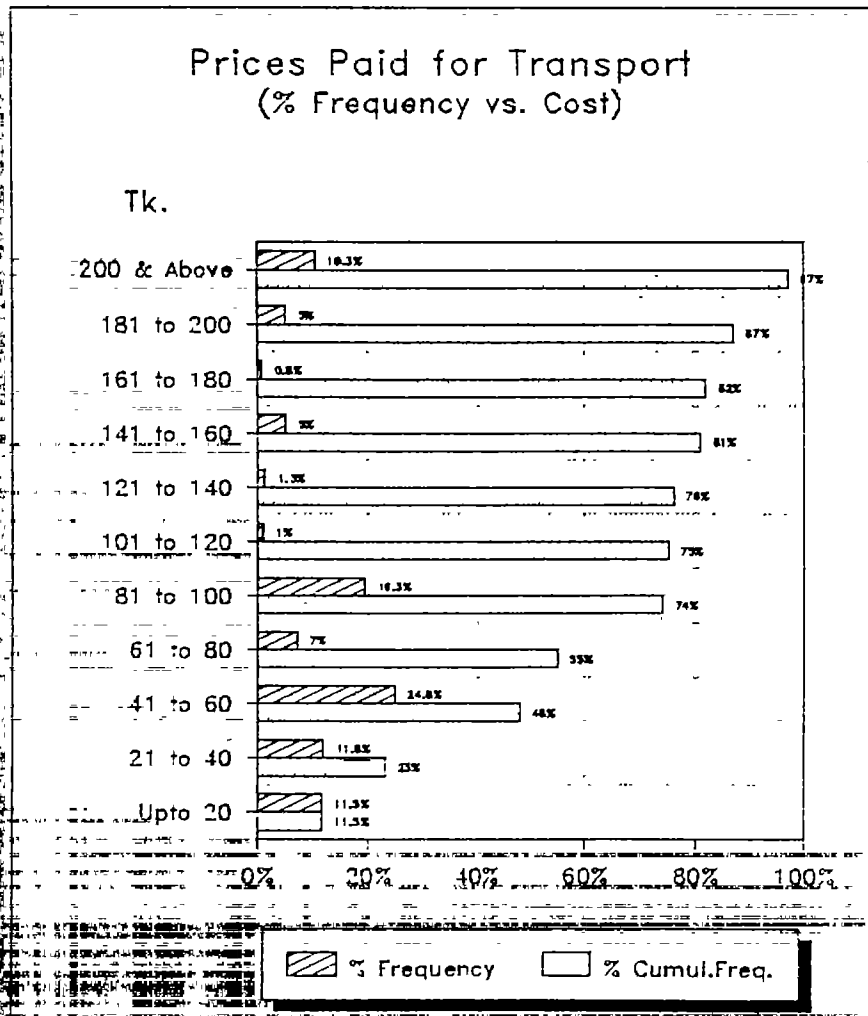
The **average numbers of rings** installed is 4.2, some latrines were built without any rings. Approximately **half** of the latrines were purchased from **DPHE Village Sanitation Centres** and **half** from **private producers.**

Overall, those already owning a sanitary latrine, paid substantially higher prices than those not having would be prepared to pay. The difference is even more significant if one takes into consideration that the cost of construction has been increasing substantially since the latrines were purchased and installed.

iii. Price Paid for Transport

From Fig. 1.3 which shows the % frequencies for the transport price categories it can be inferred that for 50% of the households transport cost amounted to a maximum of Tk. 60, 33% paid between Tk. 60-160 and 10% paid Tk. 200 and above, the average being Tk. 117.

Fig 1.3



ms/rm/tmcost3

iv. Price Paid for the Superstructure

Generally, the households spent substantial sums of money for the superstructure of the latrines, as the data below are showing:

Prices Paid, Tk	
▫ average: 2,190	
▫ median (50%-ile):	1,000
▫ 19% of families:	≤150
▫ 32% of families:	≤450
▫ 47% of families:	>1,000

Thus, apparently, much higher prices were paid for the latrine superstructure than for the latrine substructure. This indicates that many people installing a latrine have improved status, privacy and comfort as their prime motive.

v. Prices Paid for Latrine Installation

Almost all household had at least some cost incurred for the installation of the latrine. 50% paid from between Tk. 20 and 200, while the other 50% paid substantially higher prices. The average expenditure was Tk. 500.

vi. Overall Prices Paid for Latrines

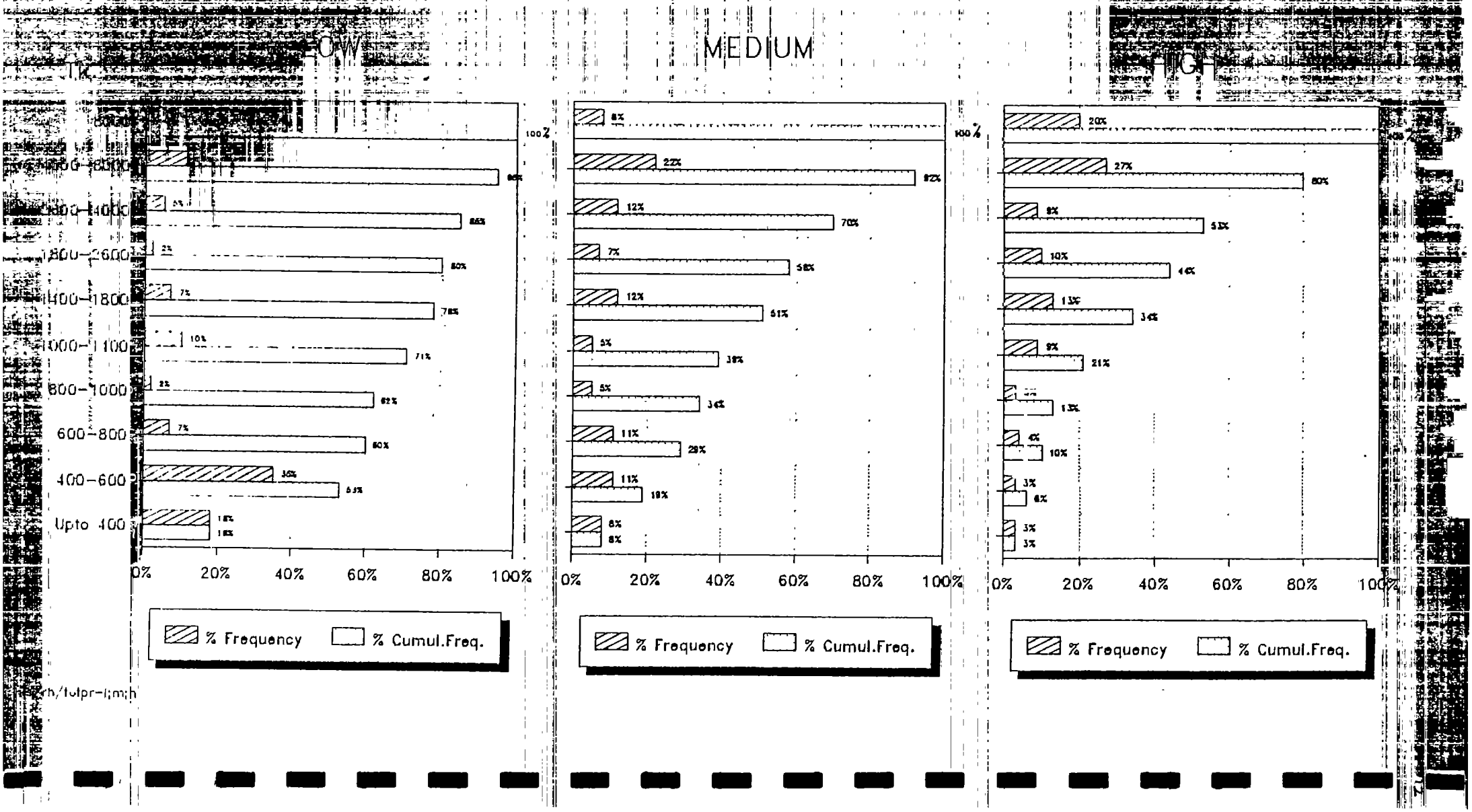
The average and median (50%-ile.) total price paid by the sample of 400 households is composed as follows:

	Average, Tk.	Median, Tk.
Price of slab + 4.2 rings	700	350
Price of transport	117	60
Price of Superstructure	2,190	1,000
Price of installation	504	200
Total Tk.	3,511	1,610

Fig. 1.4 on the next page shows the % frequencies in the categories for total prices paid for the three socio-economic groups defined earlier. From this, it may be seen that in the "low" socio-economic group only about 50% of the households spent more than Tk. 600, while 80% of the "Medium" group and over 90% of the "High" group paid Tk. 600 or above.

The big difference between the median (Tk. 3,511 and the average Tk 1,610) total price paid for the "package", indicates that, while the majority of the families have spent moderate overall prices, a few have spent much higher prices, i.e. Tk 10,000 and above. The higher price

Fig. 1.4 Total Prices Paid for Sub and Superstructure, Transport Land Installation as a Function of a Family's Socio-economic Level



ranges have been paid by rather rich persons who were interested to install a latrine with strong aspirations for comfort and status. The relative distribution of the user and the non-user families in the three socioeconomic categories shows that those who have already installed a latrine, belong to the medium to that those who have already installed a latrine, belong to the medium to high socioeconomic groups, respectively. Prices paid by some of these families can therefore not serve as "lead" values for the population as a whole. There will, however, also in future be a substantial market for relatively high-cost latrines, a considerable market niche which can be filled by increased production capacities to be developed by private producers.

vii. Frequencies of pit filling; pit emptying

The frequency with which latrine pits fill up and the action taken by the users, are important issues of each latrinization programme. Too often, however, insufficient attention is given to the questions of pit emptying, its cost, its cultural implications and its health risks involved.

The survey reveals that pits fill up very slowly:

- Of 344 latrines (85% of those surveyed) having an age of up to **6 years**, only 30 filled up once, 15 filled up twice and 7 three times - 281 latrines (70%) to be emptied yet.
- Of the 56 latrines which have got an age of **6 years or more**, never had to be emptied.
  - 54% never filled up
  - 10% filled up 1 times
  - 10% filled up 2 times
  - 10% filled up 4 times
  - 10% filled up 5 times or more
- The average filling time thus amounts to more than 6 years.

When asked what was done when the latrine pit filled up, **93%** of the 157 respondents[1] said they **emptied** it. Whether they have done it themselves or have employed scavengers, was not asked. 3% said they have installed a second latrine.

In complementation of the above data, the mid-term evaluation of DPHE's "Village Sanitation Scheme Phase III" (1985-90) carried out by DPHE, WHO and UNICEF (see also the list of complementary documents in Annex....) yielded the following information on pit filling and pit emptying practices:

- Out of a total of 1322 latrines surveyed, 968 (73%) never had to be emptied yet. This is a very surprising result, because some of the latrines may have been installed as long as 8 or more years ago, i.e. during the Village Sanitation Scheme Phase I (in the seventies) and Phase II (1982-85).
- 209 **(16%)** out of 1322 households are using the same pit after having **desludged** it. 3% of the households have reportedly installed a second pit and a small number of users made holes in the uppermost rings to allow increased seepage of fecal liquids into the surrounding ground. Whether drainage trenches were dug in addition to this was not reported.
- In 93% of the cases where latrines had to be desludged, **scavengers** were employed. The remaining households did the desludging themselves. The **cost** of desludging were:

1 There were more respondents to this question than persons indicating that their pit has ever filled up. Some of the answers regarding pit emptying must therefore would do" responses.

	No. of households	%
• Tk. 50 - 75	100	48
• Tk. 75 - 100	87	42
• Tk. 100 - 175	21	10

Considering that it takes apparently more than 6 years on the average for pits to fill up, the ecohomical cost of pit emptying are very small, i.e. Tk. 10-30 per year. However, the actual expenditure to be paid at one time might be a considerable financial burden for poor households.

In 91% of the cases in which latrines were desludged, the contents were buried, in the remaining cases, they were simply deposited on the ground.

Emptying of filled-up pits of single-pit latrines, whether done by scavengers or by the users themselves is always associated with a potential risk of infection because it involves the handling also of recently deposited feces. These doubtlessly contain substantial loads of pathogenic organisms.

Does the use of sanitary latrines therefore pose a higher health risk than the use of traditional ("kaccha") latrines or open defecation? The answer is speculative: if, as appears to be case, the majority of pits are getting emptied by scavengers (the "Menthor" community), the overall risk of infection through pit emptying might be low, as these persons probably have:

- developed skills to avoid contamination,
- adopted improved practices of personal hygiene, i.e. for hand washing and bathing
- acquired high degrees of immunity).

Based on the filling frequencies reported from the recent survey and based on the size of the pit and on the average number of family members, the rate of the **per-capita excreta accumulation** can be calculated as follows:

- standard pit volume (5-ring pit) = 1.50 m x (0.11 x 3.14) = 0.5 m^3
- average family size in the 400 households surveyed 7.7
- adult excreta equivalents assumed:
  - with 4 children @ 0.5 adult equivalents 5.7
  - with just adults 3.7
- Filling time assumed 6 years
- Average excreta accumulation
  - 0.5 m^3 / 6 yrs x 5.7 equiv. = **0.015 m^3/cap, yr**
  - 0.5 m^3 / 6 yrs x 3.7 equiv. = **0.022 m^3/cap, yr**

This range of accumulation rates is very low compared to what elsewhere has been observed as "normal" accumulation rates ranging from about 0.04 - 0.06 m^3/cap yr

The main reason[1] for the low accumulation rate is probably, that the latrines might not be used by all the family members all the time.

There are indications from the survey that this might in fact be the case: of the 400 households interviewed, almost half said that children are (often) not using the latrines. Moreover, a certain percentage of adults may have resorted to using again the traditional system of excreta disposal, i.e. open field defecation or use of a kaccha latrine. Further to this, people certainly do not use the latrine when they work out on the fields. The majority of the heads of household interviewed as owners of improved latrines, work in formal (mostly government) and in the small business sectors, i.e. away from their houses. This might be another reason for a low rate of latrine usage.

viii. Flooding of latrines

The houses of 70% of those already having a sanitary latrine are built above flood level. For 90% of them, the latrine has never been flooded. 50% of those having their house on low ground reported that their latrines have been or are getting flooded. This indicates that the introduction of latrines is likely to reduce the spreading of fecal contamination through floods as compared with open defecation. The effect appears to be very substantial for dwellings on elevated land, and not negligible for dwellings for latrines built on low-lying ground.

C. Those not having a sanitary latrine yet (Questionnaire No. 2)

i. Awareness about availability of improved latrines

An important introductory question which these families were asked, aimed at finding out whether they were aware of the availability of improved latrines produced by government, NGO or private suppliers. Answers to the question can give an indication as to the effectiveness of the various formal and informal methods of how this message may be spread and whether the government's latrine delivery programme also has a "diffusional" effect.

Of those responding to the question, the ratio of answers and routes of information were as shown in Table 1.1.

Table 1.1. Awareness of Availability of Improved Latrines and Ways How Information was Obtained.

	%		Numbers	
No, not aware of availability	28%		665	
Yes, aware of availability; thereof:	72%		1748	
• Seeing latrine components in the market		69%		1748
• Seeing neighbours using a latrine	21%		367	
• Health education programmes	9%		154	
• Other means	1%		15	
Total	100%	100%	2413	1748

[1] The average numbers of rings installed is 4.2. Although some latrines are deeper than this and therefore have longer fill-up periods, the average pit size is calculated above. Excessive pit sizes appear to be rare and can therefore not be the reason behind the slow filling rates.

The data reveal that a near 3/4 majority of non-users of sanitary latrines are aware of their availability. Most of them apparently became aware through seeing latrine components being sold by private or public suppliers and through neighbours who are using such a latrine. Only few have received information through health education programmes.

ii. Opinion about usefulness of an improved latrine and interest to buy one.

The vast majority of persons interviewed responded that they believe in the usefulness of a sanitary latrine (97%). Of these, 90% said they are intending to buy one.

Although these answers might be interpreted as if everybody not having a sanitary latrine yet would be strongly motivated to buy one if only the supply would be sufficient and the price would be adequately low, the results must be viewed with caution. Many respondents may have provided answers (willingly or unwillingly) which they thought might please the interviewers and/or to show that they are up-to-date with "modern" concepts of improved latrine.

iii. The willingness/ability-to-pay (slabs and rings)

This is the central subject around which the survey was designed and probably the most difficult to get a correct answer for this question will allow to establish to a reasonable degree the "**demand curve**" as it was defined *in the Interim* Report to Phase I of the Study (pp. 18+22).

Figures 1.5 and 1.6 on the next page show the demand patterns resulting from the survey for two modes of payment, i.e.

a. if users would have to pay the full price-ex-store for the latrine components at once, and
b. if users could pay in installments.

The figures contain both the **percentages of users willing/able to buy at a certain price level** as well as the **cumulative "demand curves"**. The following inferences can be made:

(a) When allowed to pay in installments, a considerable number of users are willing/able to pay higher prices than when asked to pay in one lump sum. Almost half (46%) of those who stated potential interest in buying a latrine, would be willing/able to pay Tk 250 or above if given the chance to pay in installments.

Where trustful relationships exist between potential customers and suppliers, purchase by installments increases the willingness/ability-to-pay. It leads to increased stated demand i.e. it shifts the demand curve to the right. Information received from some NGO (e.g. RDRS) revealed that rather poor families paid non-subsidized prices, i.e. up to Tk. 450, when provided with a suitable credit system. Private producers at times allow their customers to pay in installments (see also Chpt. 1 2.2)

Fig. 1.5

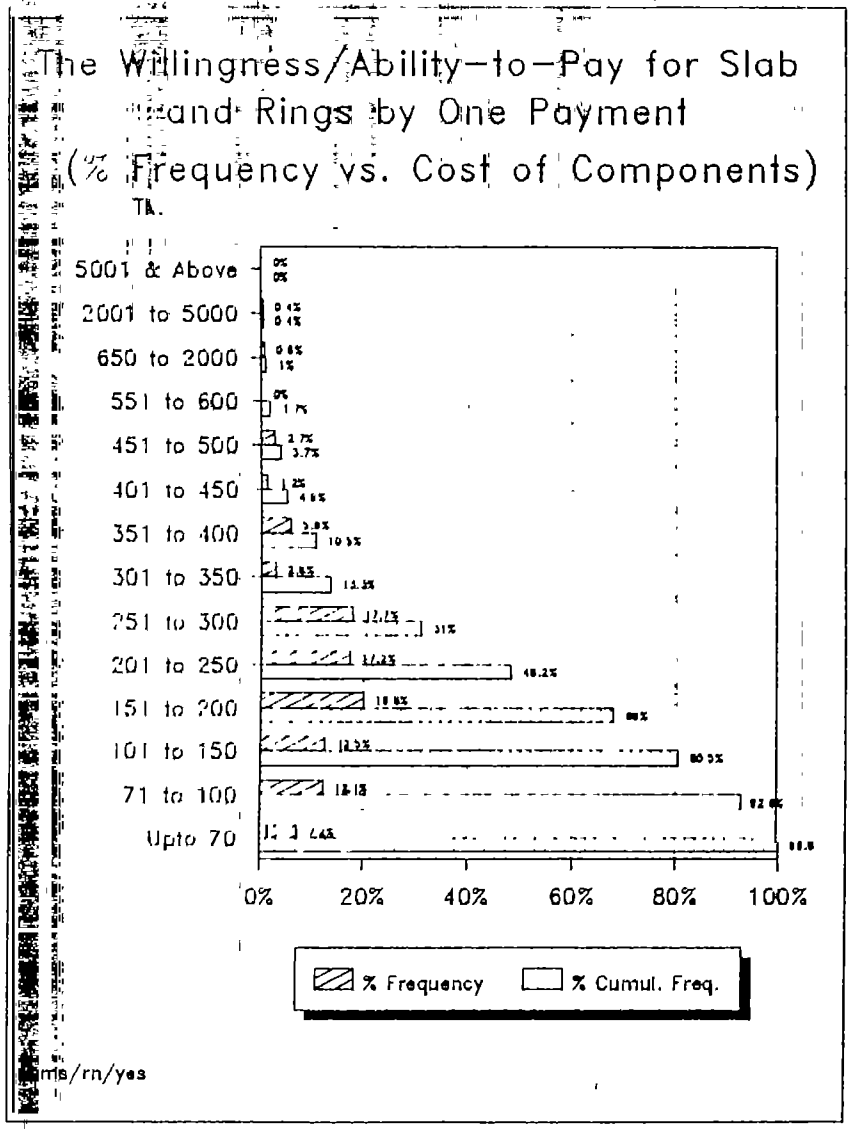
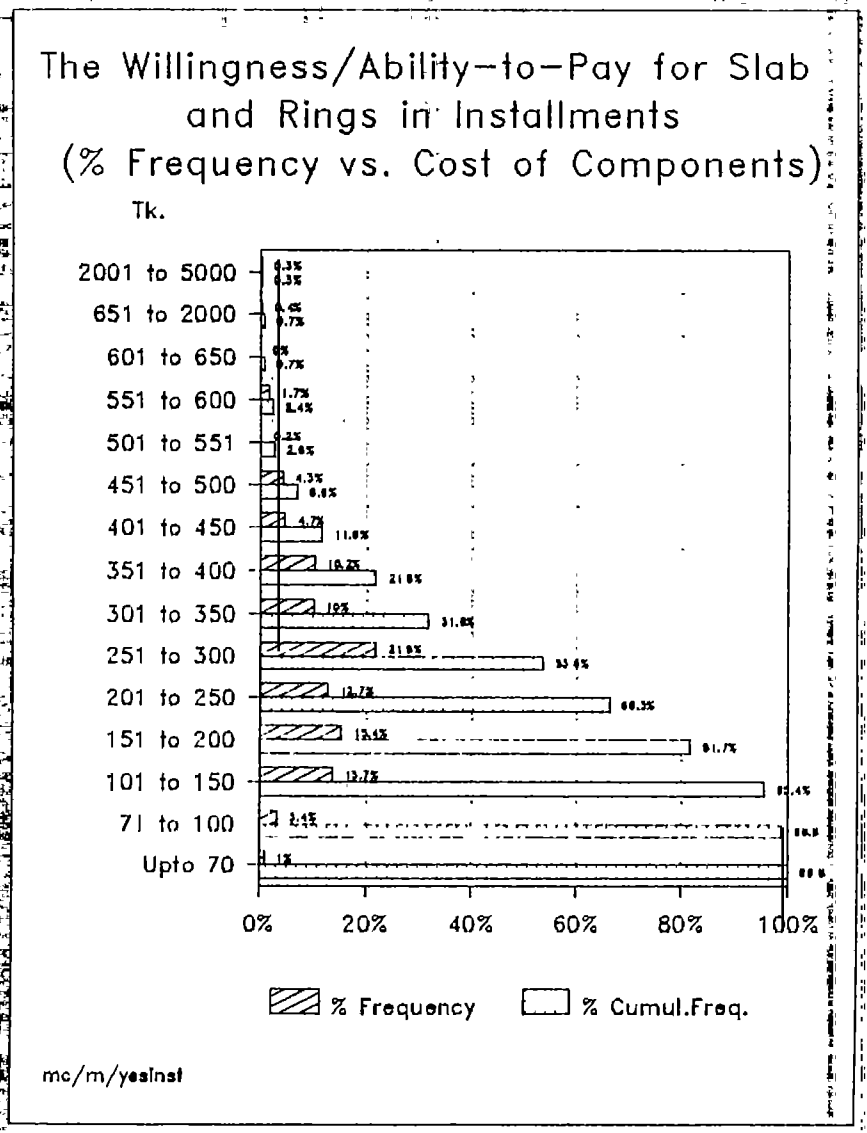

The Willingness/Ability-to-Pay for Slab and Rings by One Payment
(% Frequency vs. Cost of Components)
Tk.
5001 & Above
2001 to 5000
650 to 2000
551 to 600
451 to 500
401 to 450
351 to 400
301 to 350
251 to 300
201 to 250
151 to 200
101 to 150
71 to 100
Upto 70
0%
20%
40%
60%
80%
100%
% Frequency
% Cumul. Freq.
ms/rn/yes

Fig. 1.6


The Willingness/Ability-to-Pay for Slab and Rings in Installments
(% Frequency vs. Cost of Components)
Tk.
2001 to 5000
651 to 2000
601 to 650
551 to 600
501 to 551
451 to 500
401 to 450
351 to 400
301 to 350
251 to 300
201 to 250
151 to 200
101 to 150
71 to 100
Upto 70
0%
20%
40%
60%
80%
100%
% Frequency
% Cumul.Freq.
mc/m/yesinst

(b) For those indicating an interest to buy a latrine (2179 respondents), their willingness/ability to buy slabs and rings can be summarized as follows[1]:

For full payment at once	For payment by installments	
7%	1%	Can/want to pay a max. of Tk.70
19%	4%	Can/want to pay a max. of Tk. 100
69%	46%	Can/want to pay a max. of Tk.250
4%	8%	Can/want to pay Tk. 450 or more

This indicates that one-fifth (19%) of the rural population, needs options which cost Tk. 100 or less, and for 69%, the cost must not exceed Tk. 250 for payment in one sum. This could be achieved in basically three ways:

a. By the construction of latrines from indigenous materials available at the user's homestead or nearby
b. By reducing the unit cost of the latrine rings and slabs and /or
c. By reducing the number of rings sold or purchased.

Interestingly enough, all three approaches have already been or are being initiated:

a. In IA villages where user groups have to install a minimum of latrines to qualify for a tubewell, latrines are constructed exclusively from indigenous material.
b. This is the subject of the Action Research funded by SDC and started in Feb. 1990. Similar efforts were undertaken by DPHE in the earlier part of seventies.
c. The sale of just 1 slab and 1-2 rings has already become the general strategy of DPHE/UNICEF although the potential customers have not fully accepted the new concept as yet (see also Section 2.2). The current DPHE sales price for 1 slab (Tk.50) + 1 ring (Tk.20), is Tk.70 This price is affordable to about 80% of those who stated interest to buy a latrine.

(c) The numbers of installments villagers would like to be provided with, are :

up to 4 installments:	36%
5 - 8 installments:	44%
9 - 12 installments:	17%
> 12 installments:	3%

1 Among those stating an interest to buy a latrine, there were about 15% who could or did not answer when asked how much they are willing/able to pay for a latrine. For the ffield surveyors, this "no response" reaction was taken as an indication of the fact that, until the day of the interview, sanitary latrines were not in these families' list of goods to be purchased. The "no response" data were excluded from the calculation of percent prequencies and cumulative frequencies.

(d) All rural households surveyed were truncated into **socio-economic categories** designated "Low", "Medium" and "High" . The proportions of households in these categories for those not having a sanitary latrine yet were:

		Estimated no. of households in rural Bangladesh:
"Low":	47%	5.8 million
"Medium":	43%	5.3 million
"High":	10%	1.2 million
all :	100%	12.3 million[1]

Fig. 1.7 on the next page illustrates the willingness/ability-to-pay for the three socio-economic levels. The data are condensed in Table 1.2

Table 1.2 Percent and Approx. Numbers of Families Willing/Able-to-Buy Slab + Rings According to Socio-Economic Category (Payment in one sum)

	Socio-economic category	Approx. % of households in that category	Approx. no. of households in rural Bangladesh
Willing/able to pay a max. of Tk. 70	Low	13%	0.75 mill.
	Medium	3%	0.16 mill.
	High	3%	0.04 mill.
	all	7%	Tot. 0.9 mill.
Willing able to pay up to Tk. 250	Low	77%	4.5 mill.
	Medium	67%	3.5 mill.
	High	43%	0.5 mill.
	all	69%	Tot. 8.5 mill.
Willing/able to pay Tk. 450 or more	Low	1.7%	0.1 mill
	Medium	4.3%	0.2 mill.
	High	9.5%	0.1 mill.
	all	3.7%	Tot. 0.45 mill.

Assuming the total rural population at 80 million and the size of household at 6.5 persons

1 Source: Bangladesh Bureau of Statistics, Statistical Pocket Book of Bangladesh 1989.

Fig.1.7 Willingness/Ability to Pay According to the Socio-Economic Level (% Frequency vs. Prices of Components)

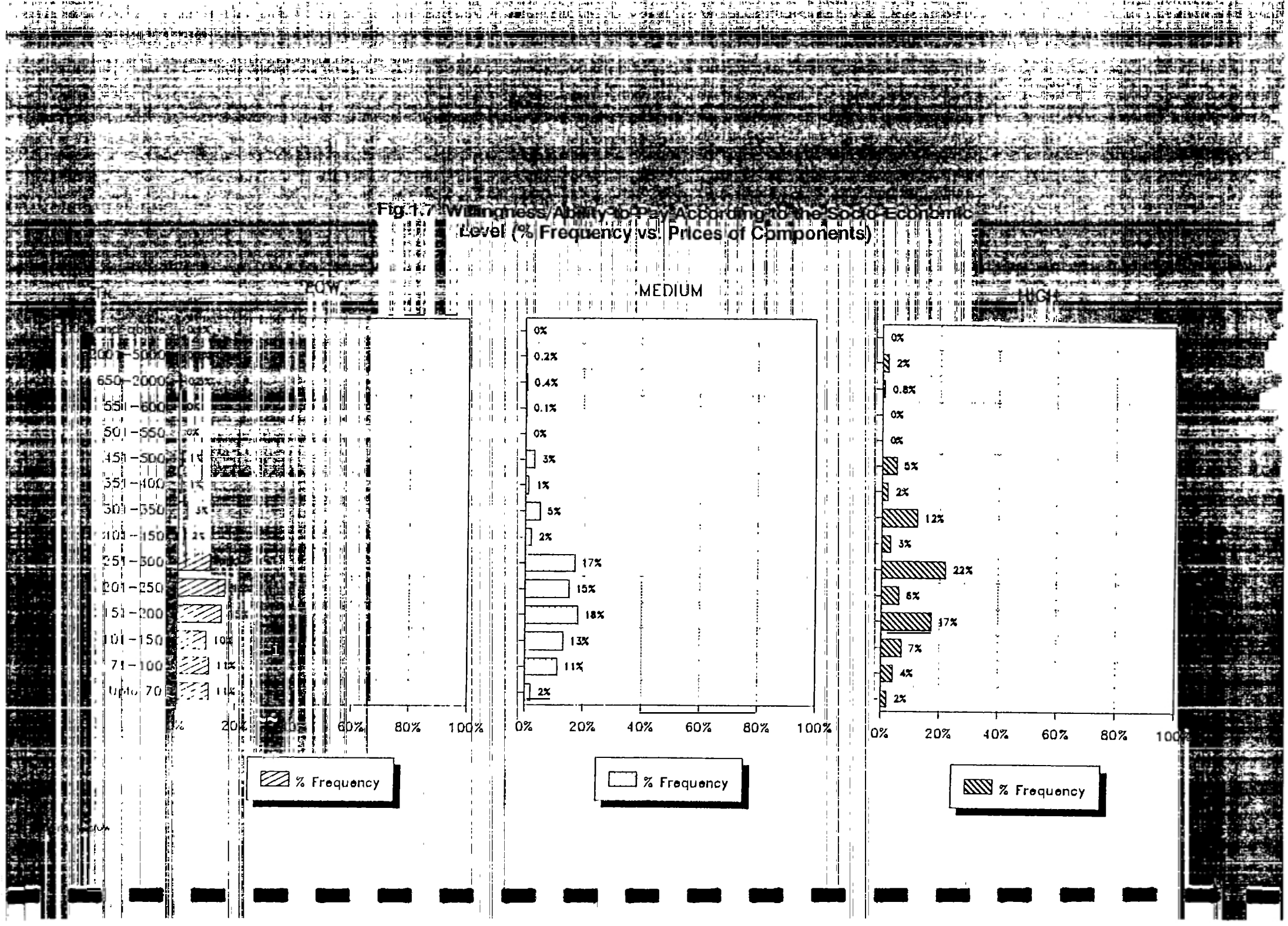


Table 1.2 shows in approximate numbers the "market" for latrines sets at price levels of up to Tk. 70 and Tk. 250, and of Tk. 450 or more. In the lowest ($\leq$ Tk. 70) and the higher ($>$ Tk. 450) price range, the potential markets are relatively modest, i.e. 900,000 and 450,000, respectively. In contrast to this, the market in the intermediate price range ($\leq$ Tk. 250) is substantial, i.e. in the order of 8.5 million households. The figure of 450,000 for the high-price market might be distorted to too low a value due to the existence of the DPHE/UNICEF subsidized sale of latrine components, from which also many well-off families take advantage.

(e) The **distance** between a "para" or village and the nearest village sanitation centre (VSC) was expected to play an important role in determining the stated interest and the willingness or ability to pay for a latrine. Fig. 1.8 and 1.9 show these dependencies.

Fig. 1.8

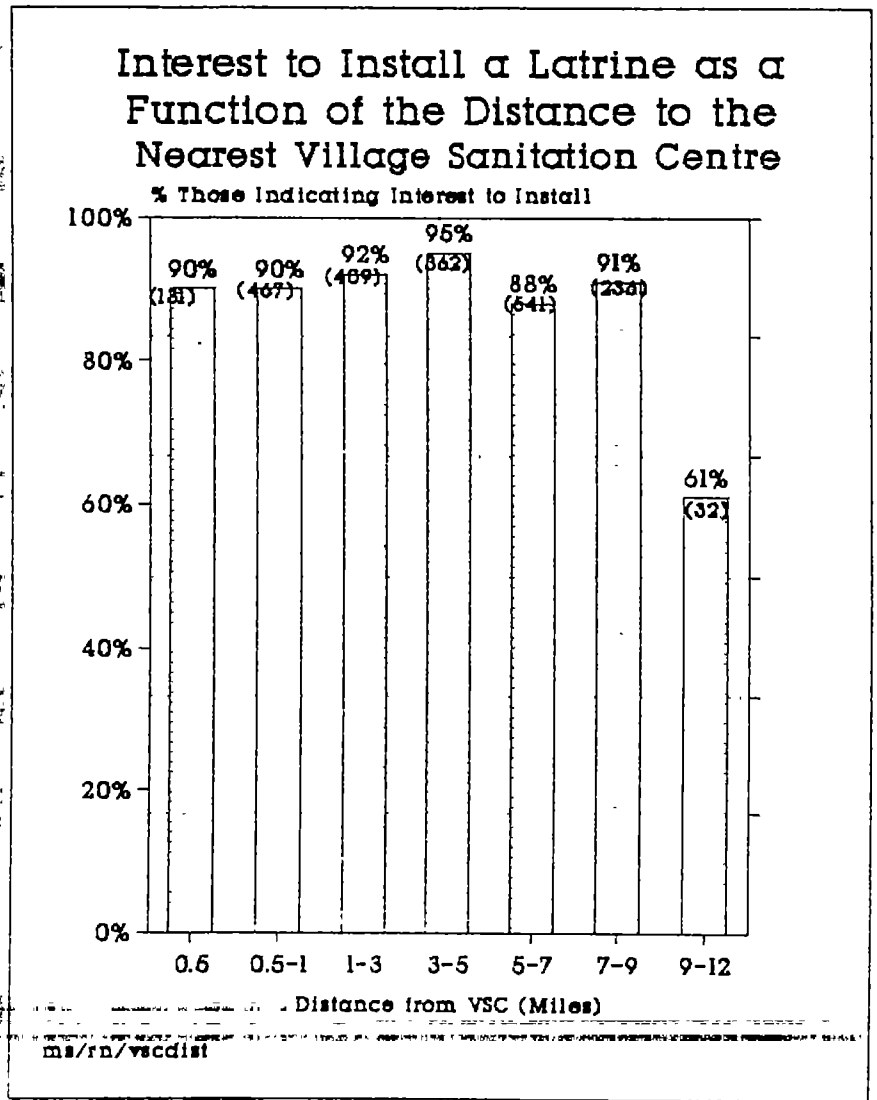
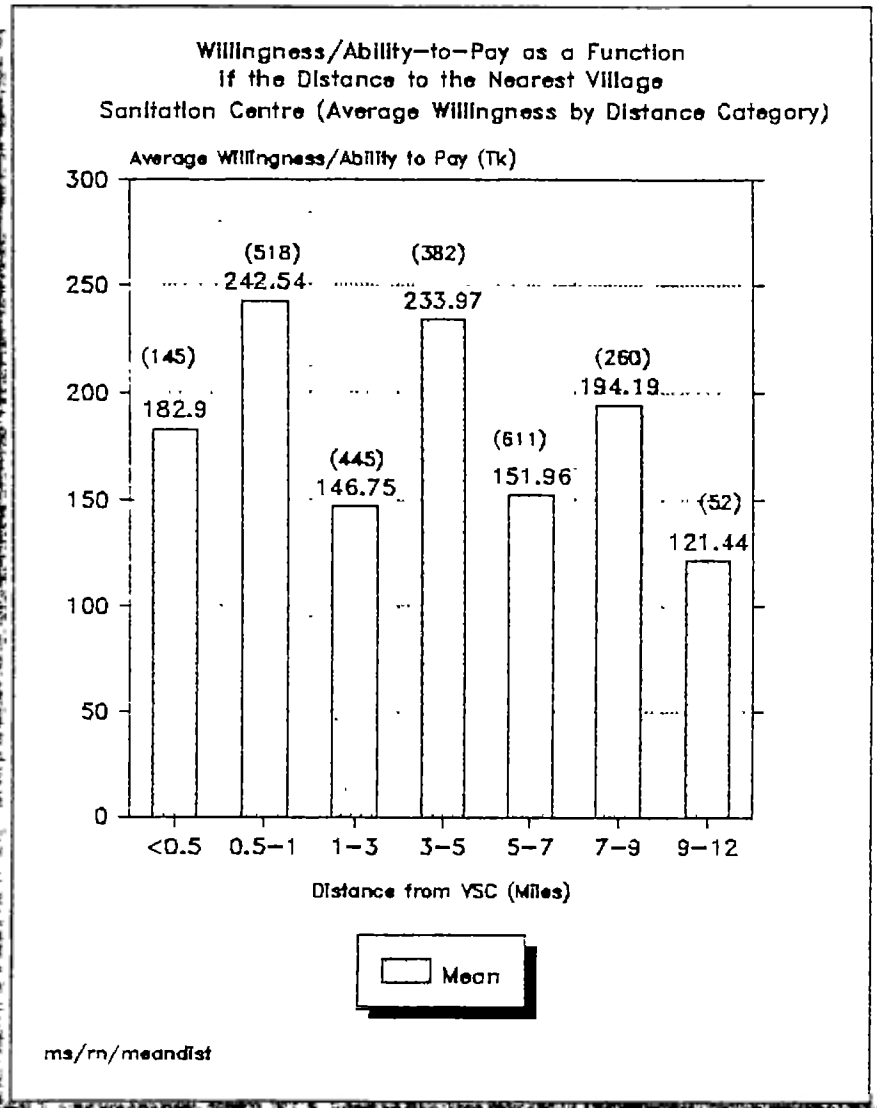


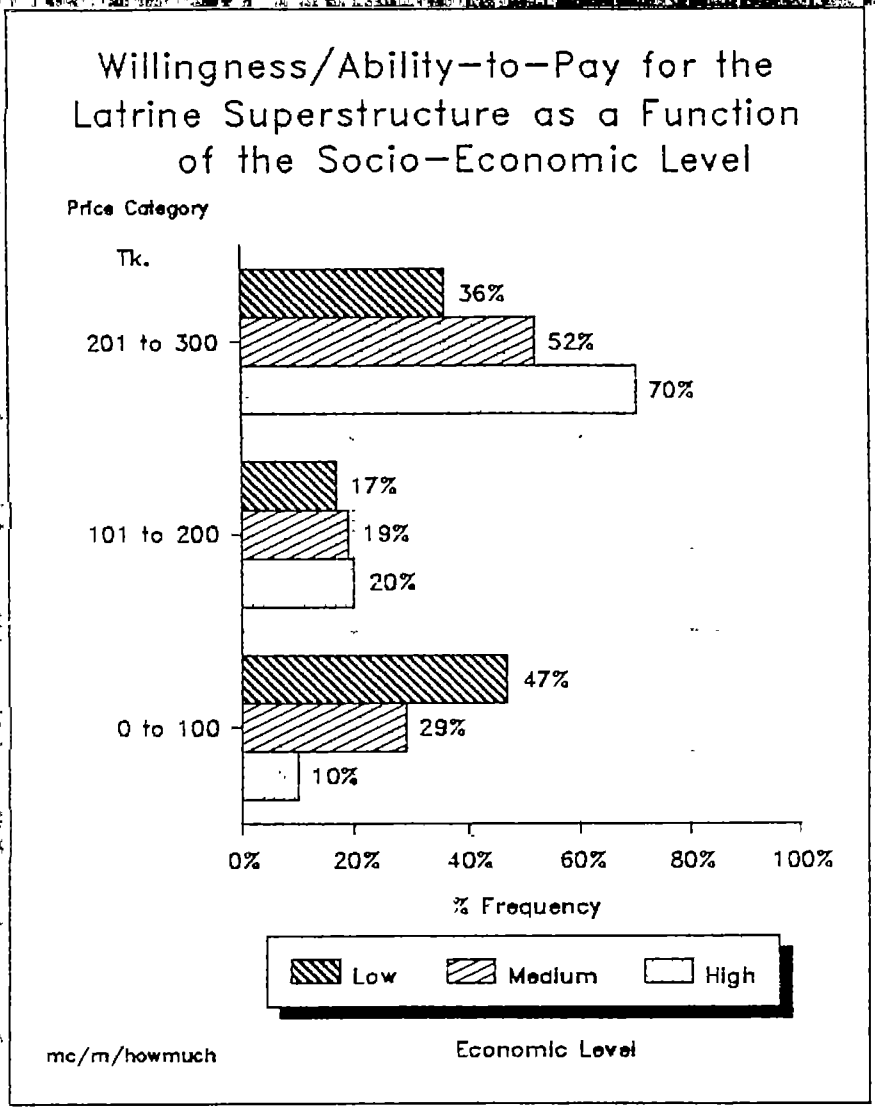
Fig. 1.9



Among the families living more than 9 miles away from a Village Sanitation Centre, there is a considerably lower interest to buy a latrine than among those living within a 9 mile radius (Fig. 1.8)[1]. Regarding the willingness/ability-to-pay as a function of distance from the VSC (Fig. 1.9) the statistical analysis of the data reveals that there is a significant negative correlation between the two variables. Globally, i.e. if one observes a large number of households, the willingness thus tends to decrease with distance, although the visual interpretation of Fig. 1.9 does not necessarily lead one to suppose this.

[1] The difference is statistically significant (= 0.25%).

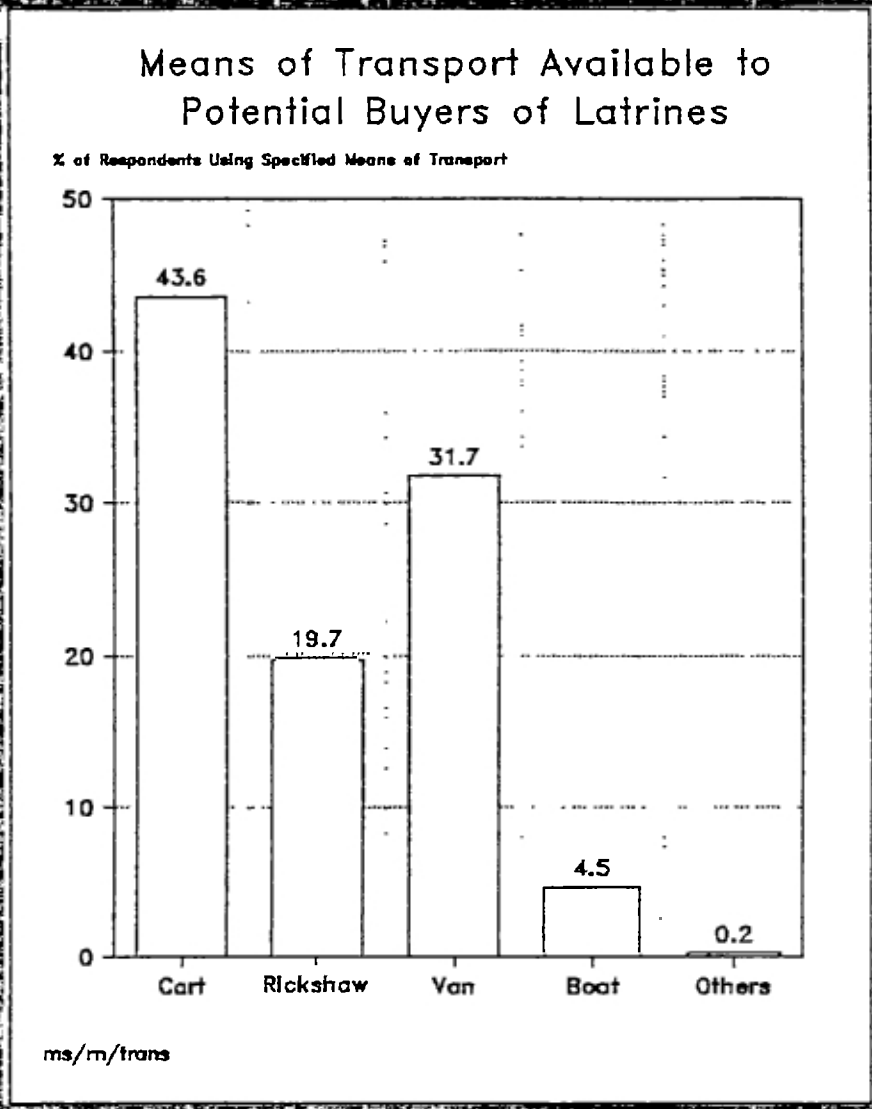
Fig. 1.10



The Figure shows that approx. 50% of the low-income group households are unable or unwilling to pay more than Tk. 100 for a latrine superstructure. In contrast to this, half of those in the medium and 70% of those in the high economic category are able and willing to spend as much as Tk. 200-300.

(g) Finally, potential users were asked as to the **transport means and cost** incurred for transporting latrine components from the nearest supplier to their house. Fig. 1.11 shows the choice or availability of suitable means of transport as indicated by 2175 respondents.

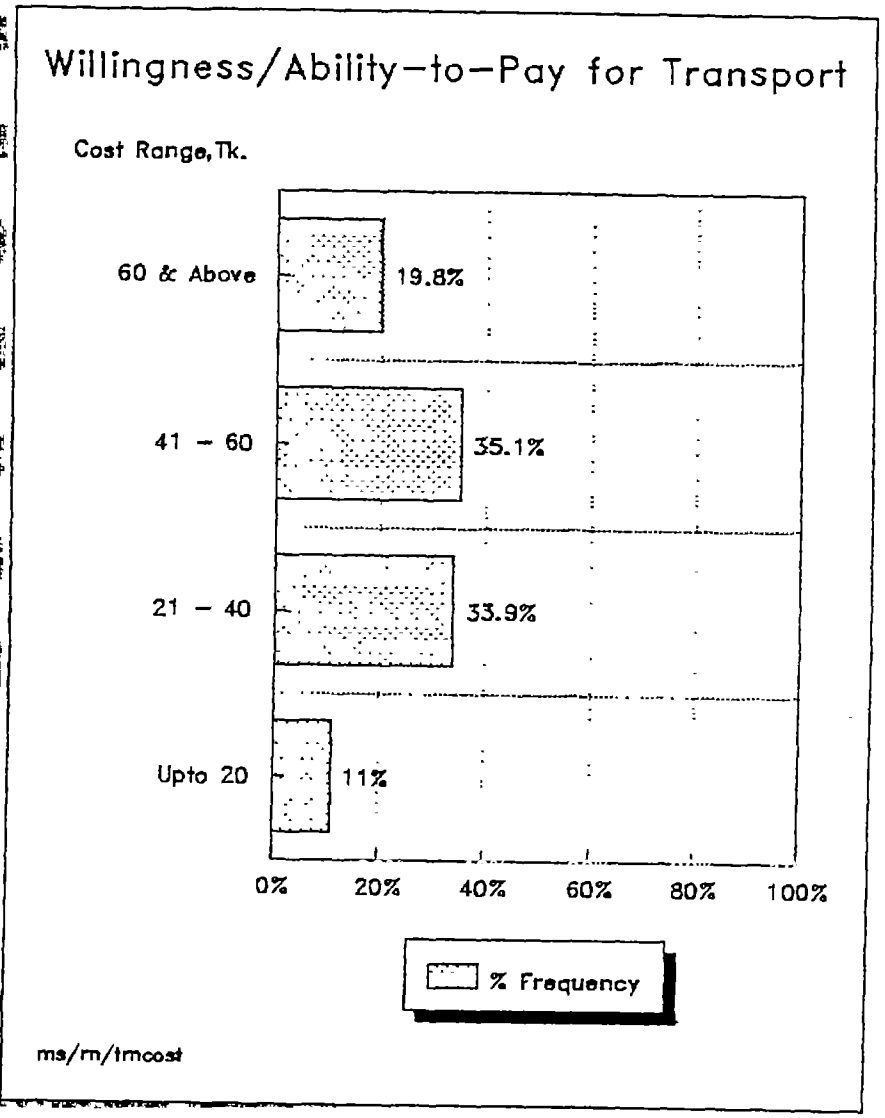
Fig 1.11



For almost half of the respondents, the ox or push cart is the most suitable means of transport. Quite surprisingly, one third considers the van as most appropriate, although this tends to be a comparably expensive means of transport. Only few indicated to use the boat (4%). This figure probably underrates the importance of boat transport, which is still considerable in Bangladesh, particularly in the monsoon period, in spite of the extending road network and the increased numbers of bridges built[1]. Regarding the cost of transport, Fig. 1.12 illustrates that approximately half of the 2176 respondents would be willing or able to afford a max. of Tk 40, one third between Tk. 40 - 60 and 20% Tk. 60 or more. The three socio-economic groups differ only slightly with respect to the affordability of transport.

[1] The random selection of Upazilas for this survey resulted in a geographical selection through which areas favourable for boat transport were under-represented.

Fig. 1.12



1.2.2 The Suppliers

A. The Private Producers

A total of 37 private producers (11 in Dhaka, 5 in Khulna, 9 in Rajshahi, and 12 in Chittagong Division) were visited and interviewed. Detailed data collected is given in Annexure 5. Below, the relevant information is summarized.

22 out of 37 producers (60%) have started latrine production between 1986 and 1989. Only a relatively few have been producing latrine components for a longer period of time. One may therefore conclude that the coming into business by the private producers is rapidly increasing, interestingly enough with the parallel expansion of the number of DPHE Village Sanitation Centres. On the other hand, the data might also indicate that the business

prospects have not been attractive enough for private producers to find the market sufficiently sustainable over a long period of time. It is therefore important to develop strategies which will allow the private producers to keep or even expand the market niches which they have found.

For the majority of producers (89%), latrine components are only part of their enterprise turnover. Around 80% also produce drainage pipes and boundary markers, 50+% also window grills, all from concrete. The diversity of products helps them to maintain more evened out year-round sales. In most places, demand for latrine components is high during the dry season and low during the rainy season.

All of the producers make concrete rings and RCC slabs. A minor number (16%) also produces FC slabs.

Half of the producers are owners of the premises where they produce the components, and half of them are renting the premises. **Investment and running cost** range as follows:

Owners: cost of working shed:	avg. Tk. 12,000	range Tk.500 - 51,000
Renters: monthly charge:	avg. Tk. 466	range Tk. 42 - 1,000
Moulds & Tools:	avg. Tk. 11,600	range Tk. 500 - 70,000
Working capital:	avg. Tk. 75,000	range Tk. 550-150,000
	Median Tk. 10,000	

Production and sales quantities vary considerably shown by the figures below:

	Monthly sale (no.)	
Slab + Pan	avg.: 17	range: 1-70
Rings	avg.: 101	range: 8-350

The **cost of producing** the latrine components have been calculated based on careful observations and detailed inquiries with a selected number of private manufacturers[1]. The average prices of the materials used by the private producers from the information received from 37 private producers have been as follows:

Cement	Tk. 3.31 per kg. (prices have gone-up considerably after the survey)
Khoa (Brick-chips)	Tk. 13.39 per cft.
Sand	Tk. 3.72 per cft.
MS Rod	Tk. 23 per kg.
MS Wire	Tk. 32.77 per kg.
Wiremesh	Tk. 27.29 per kg.

Only 6 out of 37 producers market FC slabs. This yielded the following figures (price level April 1989) for a **5-ring set**[2]:

[1] Done during the exploratory mission (Phase I) in April/May 1989 in Chittagong and Dhaka Divisions (see Annex. 10 in Lüchtenfeld/Strauss/Chadha, Interim Report of Exploratory Mission on Promotion of Sanitation in Bangladesh through the Private Sector, SDC/UNICEF/DPHE, June 1989)

[2] In 1989, both DPHE centres and private producers were still selling 4-5 rings per set. Meanwhile, the number of 4-5 rings per set has come down to 1-2, at least for many of the DPHE centres

	Unit rate, Tk.	Cost per set, Tk.
RCC slab	117.23	117.23
Pan	24.05	24.05
5 rings	54.94	274.70
Total Manufacturing cost (labour + Material):		415.98
Cost of capital invested into shed, moulds and tools:		17.82
Total cost of production (excluding cost of supervision and profits):		Tk. 433.80

Based on these figures, the production cost for latrine **sets with 1 and 2 rings**, would amount to **Tk. 200** and **Tk. 255**, approximately (price level 1989).

Observations made by the exploratory mission in April/May 1989 revealed that many private producers are using ring reinforcement which is inferior to that used by DPHE. Also in many of the pans produced by private manufacturers, the gooseneck was improperly made so that there is no water seal.

At the time of the field survey (Dec. 1989 - Feb.1990), more than 90% of the producers were (still) selling 5-ring sets. Among those interviewed, the **sales prices** were as follows:

- For slab + Pan:

average:	Tk. 174
range:	Tk. 50 - 400
60%	< Tk.150

- Ring:

Average:	Tk. 59
range:	Tk. 30 - 100
60%	< Tk. 50

For a **5-ring set**, the average sales price would thus amount to (174) + (5x59) = **Tk. 469.**

In recent months, the price for one bag of cement has been rising from Tk. 170 to Tk. 210, approximately (April 1990). With cement constituting around 40% of the overall production cost, the sales price for a 5-ring would rise by about 10%.

When comprising the cost of production[1] and the average sales price[2] as listed above, a **profit margin** of approx. **Tk. 35 for a 5-ring set** results. This is about 8% of the production

1 2 Although the figures are not originating from the same set of obsrevations, an indicative calculation of the statistically average profit margin is made here.

cost, and thus constitutes a rather **modest margin of profit.** The economy of scale for the production of latrine components is very small, since capital cost amount to only about 4% of the total cost of production. Just enlarging the turnover of the private producers would thus not lead to a lowering of their sales prices, because their profit margin is quite small.

Answers and comments received from private producers during the Phase I exploratory mission showed that their production capacity is strongly limited by the non-availability of **credits for investment and working capital.** Also, it became clear that many private producers interviewed in villages and rural towns, appear to have **little knowledge and skills in production management and marketing.** The survey therefore also tried to shed light on these aspects and tried to sense the producers' needs and opinions. The authors believe that any future strategy trying to enhance private producer involvement must focus primarily on these key production and marketing elements.

About one third of the producers have used loans, the majority (85%) from friends or relatives. Very few producers (2 out of 37 contacted during the survey) have ever tried or managed to receive **bank loans.** Reportedly,commercial banks do not provide credits to small-scale production enterprises of this type. This is understandable from a banking point-of-view, since it is more attractive to provide loans to fast-turnover and high-profit-margin enterprises (e.g. traders of consumer goods and manufacturing inputs). Production of latrine components, however, is coupled with relatively low profit margins and - due to its small-scale nature - with relatively slow turnovers.

From a rural development point-of-view, however, there is a need to develop easily accessible credit schemes for small-scale rural enterprises. Job creation and increased rates of latrine coverage would be important spin-offs. **95% of the producers interviewed** are of the opinion that **improved credit availability** would enhance their production and sale. At the same time, results of the survey indicate that there exists a demand from buyers to be able to buy on an installment basis. 35% of the producers have been selling latrines allowing users to pay in installments.

B. DPHE (Questionnaires Nos. 5 and 6)

Information was collected from 8 DPHE Upazila centres on the production, sale and cost of latrine components. Two centres were randomly selected from each of the four Divisions, i.e. Dhaka, Khulna, Chittagong and Rajshahi.

The production costs of the components vary only little between the eight centres. Based on the figures obtained during the Survey, the average production costs (material and labour) are divided as follows:

- FC slab: Tk. 96
- Ring: Tk. 72
- Water-seal pan: Tk. 32

The capital costs for the sheds, moulds and tools are included on the basis of approximate investment costs. Supervisory overhead costs are not included.

Table 1.4 contains the summarized production and sales figures for the 8 randomly selected VSCs.

Table 1.4 Production and Sales Quantities of Eight Randomly Selected Village Sanitation Centres (2 in each Division)

	Production[1]			Sales[1]		
	Mean	Median[2]	Range	Mean	Medium	Range
• slabs	235	202	152-525)	202	210	140-320
• pans	267	225	152-525)			
• rings	790	610	199-1764	650	664	447-874

[1] only 7 out of 8 centres surveyed were producing during the preceding fiscal year
[2] the 50%-ile value)

All the centres surveyed were producing more slabs (incl. pans) and rings than were sold in the past fiscal year (1988/89) except one centre which sold as many rings as were produced. Furthermore, it is quite striking to observe substantial differences among the centres regarding production and sales quantities. Such differences might be attributed to bottle-necks in the supply of production inputs such as cement, sand, khoa or steel, or differences in demand patterns among the villagers living nearby, or differences in the productivity of the workshops.

Besides the above only the production and sales data was collected from 40 DPHE upazilas. The fact that many VSCs have recently been stockpiling latrine components manifests itself also in the production and sales data collected from DPHE Headquarters for 40 DPHE Upazila Production Centres (see Annex. 6). The 40 centres have each produced on the average 360 slabs + pans and 1040 rings in the 1988/89 fiscal year. Extrapolated fro the currently existing 750 operational centres, this results in a country-wide yearly production of 270,000 slabs + pans and 780,000 rings. 90% of these Centres have sold considerably less components than they have produced. Only a few show balanced sales and production figures. The main cause for the stocking is the potential customers; hesitance or reluctance to buy latrines with only one or two rings as dictated by the recently enacted government rule. Many customers apparently postpone the purchase of a latrine or buy the latrine components from a private producer where they can buy as many rings as they like.

From the data collected from the 8 DPHE production centres, it was noticed that the revolving fund balances ranged from Tk. 31,634 to Tk. 77,206 with a current average of just over Tk. 50,000. Apart from this even higher figures have been noted by team members for other DPHE production centres. Alternate utilization of these funds needs to be looked into so that it does not lead to artificial inflation of raw material prices which are higher compared to those of private producers.

C. NGOs

In an attempt to achieve better coverage for sanitary latrines in rural Bangladesh, UNICEF has for some time given one-time assistance to a number of NGOs in the form of moulds, tools and some materials for initial involvement in the production and sale of latrine components matching in design with those produced by DPHE. An attempt has been made to look into the performance of this NGO channel of delivery. Addresses for the NGOs receiving UNICEF assistance were obtained from UNICEF. Another list was obtained from Association for Development Agencies in Bangladesh (ADAB). The task of contacting these NGOs in the course of survey during Phase II was entrusted upon the House of Consultants Ltd. (HCL), Dhaka.

UNICEF list contained names of 282 recipient NGO units whereas the ADAB list contained 45 names of the NGOs but these were also included in the UNICEF list. In the UNICEF list many units of the same NGOs were included separately. Both the lists obtained above covered NGOs in both water and sanitation sectors. Individual sector-wise lists were not available. Most of the NGOs were found to be operating in the field of water supply and not in the field of sanitation. A number of NGOs were contacted in accordance with the list and it was observed that a few of them had ceased to operate. A few of the NGOs provided the required information during the first visit of contact with them while the others had to be persuaded with repeat visits. Quite a number of them expressed reluctance to release any information to the investigators. The process of finding out the NGOs was rather arduous because a number of them had also changed their addresses. Annexure 7 shows a list of the NGOs contacted by HCL, number of visits required and their new addresses wherever applicable. It was planned to contact 20 NGOs but after much effort only 13 NGOs submitted filled-in questionnaires or supplied the necessary information during interviews with them.

Annexure 8 shows the data collected from the NGOs. With the majority, detailed quantitative data about field operations were not available at the head office. A few relevant features are summarized below:

I. Credit system

5 out of 13 NGOs (Grameen Bank, BRAC, Family Planning Association of Bangladesh, Service Civil International, Comilla Proshika Centre for Development) have got a credit system for beneficiaries of their respective programmes (see also Interim Report of the Exploratory Mission made in April/May 1989 regarding credit system models). The percentage of credit recovery appears to be relatively high, since 3 out of 4 NGOs which had this information at hand, indicated recovery rates of between 70 and 97%.

II. Production of latrine components:

(data provided by NGOs)

	average	range
Slabs + pans	324	35 - 1,000
Rings	1362	175 - 3,000

iii. Production cost and sales prices:

No. of NGOs reporting	Type of set (Slab + Pan + Ring no.)	Cost of prod.(Tk.) avg.	low	high	Sales prices avg.	low	high
1	1(FC) + 1 + 1	-	-	-	157	-	-
2	1(FC) + 1 + 5	387	300	475	450	400	500
3	1(RCC) + 1 + 1	-	-	-	166	125	202
6	1(RCC) + 1 + 5	-	-		404	250	530

The figures for the sales prices listed above show that the NGOs tend to sell the latrine components at about production cost. The organizations, apparently, do not provide any subsidies, or if so only of minor extent, for the sale of their products. Provided the beneficiaries are given access to a suitable credit system, they are thus able to pay for latrine components at a level which corresponds to the cost of production. In two cases, latrine sets are sold at prices which even exceed the production cost.

Use of non-standard[1] construction materials/techniques:

5 out of 13 NGOs have indicated that they use alternative (also low-cost) technologies or construction materials for the production of latrine components. These include, notably, dry pit latrines, and bamboo reinforced slabs and slabs made from bamboo directly.

iv. Findings

- Barring a few NGOs like Grameen Bank, Comilla Proshika Centre for Development, BRAC, Family Planning Association of Bangladesh, For Those Who Have Less and Technical Assistance for Rural Development (TARD), other NGOs have either not been serious in their involvement or the information could not be obtained. Grameen Bank's performance is a class by itself. RDRS who are quite active in the field could not provide the needed information from their head office in Dhaka.
- It can be easily concluded with even this partial exercise that the use of NGOs for increased sanitation coverage has so far not contributed significantly.
- After the one-time assistance, UNICEF has not been able to organize its monitoring effort that was necessary for assistance to NGOs in the field of sanitation.

With regard to the involvement of NGOs the current report does not claim to have done any elaborate evaluation but indicates the directions of hitherto progress.

1 The currently standard latrine substructure consists of an FC-slab and pan and of 1 or more RCC-ring(s).

2. Recent DPHE/UNICEF Strategies in Rural Sanitation: their Impact on Latrine Delivery and on Private Sector Involvement.

2.1 The Mobile Construction and the Mobile Sale of Latrines

During end 1987, the DANIDA mission report suggested that mobile production centres should be attempted to serve the need of the buyers located at longer distances from the main Upazila production centres. The idea has been tested in and around Noakhali area. The selection of area depended more on the initiative of an individual rather than a deliberate effort of converging the effort in Noakhali. Two approaches have been followed namely:

1. Mobile production
2. Mobile sale

The discussion below is based upon information received during the visit to Noakhali Area and discussion with XEN and SDE of the DPHE office and the report by Mr. Habibul Islam, Field Officer of UNICEF, Chittagong.

2.1.1 Mobile Production

The demand was initiated by Char Majid Gucha Gram Samity situated at a distance of 27 kms from the Noakhali Sadar Upazila centre. Transport cost for materials for 100 sets of latrines (1 slab + 2 rings) was borne by Gucha Gram implementation committee. The transport cost per set worked out to be only Tk. 20 instead of Tk. 400. It took 28 days for a mason and a labourer to finish the work. The work was carried out in the open air and the Union Parishad Office offered storage for materials and tools. In the meanwhile the work at the Upazila production centre obviously stopped.

A similar effort was met in the village Char Lengta in the Char Fakira Union of the Companiganj Upazila. Materials for the 50 sets (1 slab + 5 rings) were transported from the Upazila Sanitation Centre to the site by a public transport. The cost borne by the Upazila Parishad worked out to be Tk. 120 per set instead of Tk. 350 per set. It took a mason and a labourer 20 days to carry out the assignment.

In the above cases, khoa and sand was also provided by the respective requisitioning groups.

Similar attempts were made in the village Hamchi Prasad, Chaprashirhat of the Noakhali Sadar Upazila. They expressed a desire to purchase 30 sets including Tk. 45 for transport cost. Another request was received from Sirajpur Krishi Samabaya Samity of Companiganj Upazila. Efforts were also made by Char Kakra Sawdagarpara Krishi Samabaya Samity of Companiganj Upazila for purchase of 30 latrine sets (1 slab + 2 rings). The samity collected Tk. 100 from each beneficiary family for transport and khoa and sand costs. However none of these efforts could be implemented due to lack of clear instructions concerning accounting as discussed below.

2.1.2 Mobile Sale

The underlying idea in this case is that the latrine components are manufactured at the Upazila Centre only but the manufactured components are transported in bulk for a group requirement. Some of the examples of experience are given below:

Six families of Ghoshbag village of Noakhali Sadar Upazila, situated at 9 kms from Upazila Centre purchased 6 latrine sets (1 slab + 3 rings) and the transport cost by push cart worked out to be Tk. 70 per set instead of the expected Tk. 150 per set.

From the village Lalanagar of Arshadia Union situated at a distance of 8 kms from Noakhali Sadar Upazila, 12 families purchased latrine sets (1 slab + 4 rings). The transport cost arranged by the village group by push cart worked out to be Tk. 65 per set instead of Tk. 100 per set anticipated.

Gucha Gram Committee of Char Clerk Gucha Gram, situated at a distance of 30 kms from Noakhali Sadar Upazila purchased 40 sets (1 slab + 5 rings) in bulk and looked after their own transport to economise on the transport cost per set. An example of this kind can be more termed as bulk purchase rather than mobile sale because the former is due to the initiative of the buyer while the latter is based upon a marketing strategy of the seller.

2.1.3 Concluding Remarks

In the guidelines for implementation of Village Sanitation Project issued jointly by DPHE and UNICEF, some of the requisites of the above types of mobile production/sale have been listed. An April 1989 guideline describes this under item 14. The main responsibility in such cases lies with the is the SAE of the respective Upazilas who have to make special arrangements and satisfy in number of requirements including accounting of funds. This is clearly an additional load of work and therefore the system, being not mandatory, can workout only in some cases depending purely on the individual initiative of the SAE concerned.

Although the experience with these arrangements is limited, it has already posed a number of queries needing clarification and has presently led to a stale mate. Some of the issues that need to be clarified are:

- Why should the buyers pay extra for khoa and sand because they are paying the normal price of the latrine set?
- If the DPHE staff have to carry out this additional responsibility what incentive is possible to extend them.
- The mobile production is considered additional to the annual targets allocated to the each Upazila. What is the impact of the cost calculation per set for the normal programme when some of the reinforcement and cement are used for the extra add-on programme.
- As the transport funds are received in advance, the centres do not know how to handle these funds in their accounting system.
- Repercussions on the monthly progress report prepared by SAEs.
- Leakage and theft of materials during transport is a clear possibility although it has not yet been experienced or recorded.

This kind of exercise should mainly be carried out by the help of private sector involvement in one form or the other and is discussed under section 3.3 later in this report.

3.2 Sale of Reduced Numbers of Rings per Set

Due to the presence of a large potential demand in the country and a limited production capacity of the DPHE Upazila Production Centres, it has been advocated by different reports and individuals to reduce the number of rings because of the fact that each latrine slab makes for a latrine whereas each ring does not mean a latrine. UNICEF has made efforts in this connection and over the period of time the average number of ring/slab ratio has reduced as follows:

- 1986-87 = 5
- 1987-88 = 4.5
- 1988-89 = 3.5

The production capacity of the DPHE Centres has reportedly gone up from around 40 latrine sets per month to 90 sets per month during 1989-90 due to the reduction of number of rings to two per set.

However the above development also implies that the subsidy level per set has gone up considerably because of the presence of heavy subsidy on the latrine slab and the first ring. The subsidy on the subsequent rings is marginal. This strategy also implies that the total subsidy amount will considerably increase and that for the programme over the same period of time larger funds will be necessary from the donors because the subsidy pertains to the donor funded materials. A further re-emphasis on 1 slab, 1 ring ratio being considered for future will be another step towards increasing the subsidy level.

The tables on the next 4 page show the cost calculation for the manufacture of sanitation components i.e. slab, pan, ring and total cost and the percentage of subsidy with different slab:ring ratios based upon the current material prices as follows:

Cement =	Tk. 220 per bag of 50 Kg
Reinforcement for Rings =	Tk. 22 per Kg
Chicken Mesh =	TK. 3.50 per sq.ft.
Brick Chips (Khoa) =	Tk. 20 per cubic ft.
Sand =	Tk. 6.80 per cubic ft.

The prices are averages from the surveys (Nov.-Dec. 1989). The cement prices have however recently increased and the increased prices have been used to represent the latest situation. The last table on the next page also shows the amount of subsidy in US dollars required in absolute numbers for the various slab:ring ratios.

3.3 UNICEF/DPHE Promotional Activities

As emphasised during Phase-I report, the motivational efforts directed on the rural population of the country is very central for the increased coverage of the sanitary latrines irrespective of the delivery mechanism which can be the DPHE channel, NGOs and the Private Producers. Subsequently UNICEF has developed a write-up for Communication Strategy for Rural Water

CALCULATION OF ACTUAL COST OF COMPONENTS

PRODUCED BY DPHE - UNICEF

TYPICAL UPAZILA CENTRE

FC SLAB,(Dia. = 30" x 1" thick) RATIO 1:3

MATERIALS	QUANTITY	RATE Tk.	UNIT	COST/UNIT Tk.
CEMENT(Kgs.)	6.65	220.00	/ 50 Kgm.	29.26
SAND(Cft.)	0.49	6.80	/ Cft.	3.33
WIRE MESH(Sq.Ft.)	9.80	3.50	/ Sq.Ft.	34.30
TOTAL				66.89

Labour	Quantity	Days	ost/mnth.	Cost/Unit
Mason	40.00	10.00	1,300.00	10.83
Helper	40.00	10.00	1,100.00	9.17
Total Labour Cost:				20.00
Total:				86.89
Overhead cots say 10 %				8.69
Grand Total:				95.58

sdc*fcslabp3

CALCULATION OF ACTUAL COST OF COMPONENTS

PRODUCED BY DPHE - UNICEF

TYPICAL UPAZILA CENTRE

WATER SEAL PAN. RATIO 1:1

MATERIALS	QUAN-TITY	RATE Tk.	UNIT	COST/UNIT Tk.
CEMENT(Kgs.)	3.38	220.00	/ 50 Kgm.	14.87
SAND(Cft.)	0.08	6.80	/ Cft.	0.54
WIRE MESH(Sq.Ft.)	0.50	3.50	/ Sq.Ft.	1.75
Kerosene oil				0.50
Wax				0.50
Crude oil				0.50
Total Material Cost:				18.67

Labour	Quantity	Days	ost/mnth.	Cost/Unit
Mason	40.00	5.00	1,300.00	5.42
Helper	40.00	5.00	1,100.00	4.58
Total Labour Cost:				10.00
Total:				28.67
Overhead Cost say 10%				2.87
Grand Total:				31.53

for pans

CALCULATION OF ACTUAL COST OF COMPONENTS

PRODUCED BY DPHE - UNICEF

TYPICAL UPAZILA CENTRE

RCC RINGS,(Dia 30"x1.5" thick) RATIO 1:3:6

MATERIALS	QUAN-TITY	RATE Tk.	UNIT	COST/UNIT Tk.
CEMENT(Kgs.)	5.93	220.00	/ 50 Kgm.	26.09
KHOA/BRICKCHIPS(Cft.)	0.84	20.00	/ Cft.	16.80
SAND(Cft.)	0.43	6.80	/ Cft.	2.92
BWG18 GI WIRE(Kgs.)	0.57	22.00	/ Kgm.	12.54
CRUDE OIL(Gallon)				0.80
Total Material Cost:				59.16

Labour	Quantity	Days	ost/mnth.	Cost/Unit
Mason	200.00	15.00	1,300.00	3.25
Helper	200.00	15.00	1,100.00	2.75
Total Labour Cost:				6.00

Total:	65.16
Overhead Costs say 10%	6.52
Grand Total:	71.67

sdcringp3

CALCULATION OF SUBSIDIES PRESENTLY INVOLVED IN SINGLE PIT LATRINE COMPONENTS

COST EXAMPLE FROM A TYPICAL DPHE CENTRE

Cost of Individual Elements:

	Taka
FC Slab:	95.58
Pan with Seal:	31.53
5 Rings:	358.35
Cost/Ring:	71.67

SET	COST Taka	ALE PRICE Taka	SUBSIDY Taka	UBSIDY %	QTY. # SETS	Total Subsidy Lac Taka	Total Subsidy US $ Million
1 Slab+Pan	127.11	50.00	77.11	60.66	1,080	832.79	2.38
2 Slab+Pan+1 Ring	198.78	70.00	128.78	64.79	810	1,043.12	2.99
3 Slab+Pan+2 Rings	270.45	115.00	155.45	57.48	650	1,010.43	2.89
4 Slab+Pan+3 Rings	342.12	160.00	182.12	53.23	540	983.45	2.81
5 Slab+Pan+4 Rings	413.79	205.00	208.79	50.46	460	960.43	2.74
6 Slab+Pan+5 Rings	485.46	250.00	235.46	48.50	400	941.84	2.69

Assumptions:

Annual Quantities of Production per DPHE Centre:

Latrines consisting of FC Slabs only	1,080
Latrines consisting of FC Slab + 1 ring only	810
Latrines consisting of FC Slab + 2 rings	650
Latrines consisting of FC Slab + 3 rings	540
Latrines consisting of FC Slab + 4 rings	460
Latrines consisting of FC Slab + 5 rings	400

(The above is based upon the received information that about 5 slabs or 5 rings can be produced per day by the mason/helper team at the DPHE centres when producing only the slabs or the rings respectively)

Numbers of DPHE Centres in the country 1,000

dc:subsidy-sc

Supply Sanitation and Hygiene in Bangladesh. The UNICEF situational analysis has looked into the following different mediums:

- Print Medium
  - Leaflets
  - Posters
  - Newspapers and Periodicals
- Audio Medium
  - Radio
- Audio-visual Medium
  - Slide Sound Projection
  - Video Film
  - Cinema Film
  - Television
- Inter-personal Medium

The Study Team re-emphasizes the need of greater efforts on the motivational development because it has large potentials for increasing the total demand for sanitary latrines for all kinds of delivery channels and is likely to have a lasting effect. Apart from the posters and the inter-personal medium of communication, the team considers that video films should be able to offer an interesting alternative which is both entertaining and educative for the uneducated rural population. The films tend to be remembered and should therefore make a lasting impact. Investment of this type should be easily economically defendable.

As discovered during the survey and the analysis of the data people tend to purchase latrines for various reasons as mentioned below:

- Privacy
- Status
- Convenience
- Health Reasons

The last mentioned may be the most important one when looked upon from hygiene and health reasons from a macro-level perspective but the other reasons appeal more to the rural population who purchase the latrine sets. As long as the people buy the latrine and also use the same the overall purpose is served. The UNICEF brochures and messages tend to concentrate entirely on hygiene and health. This seems also natural because health being the central theme in the UNICEF efforts and therefore they have the best competence around this subject. However, for the promotion of sanitation the development of mediums must emphasize in the areas which are more atune to the present thinking of the rural population. It is easier to reinforce the half thinking of the potential buyers rather than to mould their thinking altogether. An attempt will be made in this direction and if possible, a video film shall be projected during the Phase V presentation. Improvements on that can subsequently be made by UNICEF for mass projection.

2.4 Plan of Activities 1990-93

Discussions have been held with DPHE senior staff and UNICEF regarding the physical targets for village sanitation programme for the coming years. It has been difficult to get a reliable information concerning the targets. This is because during 1989- 90 GoB has increased the ADP allocation considerably in an attempt to enhance the physical targets for achievement. There has been a significant emphasis from higher levels in GoB for increased targets and subsequently more funds have been allocated to this programme which is remarkable considering the environment where most other projects were subject to financial squeeze. Accordingly UNICEF had during end 1989 prepared rather high targets for the coming years up to year 2000.

DPHE has, however, not been able to achieve the high level of sanitary latrine production targets. By April 1990, they had produced only 141,000 sets and expected to achieve 220,000 sets target by end June 1990. Each set has been considered to consist of 1 slab + 2 rings. In most centres the sales have temporarily not been in conformity with the production and there is considerable stock piling mainly based on demand for more rings per slab.

The table on the next page gives an indication of the plans for 1990-93 which are presently being conceived by UNICEF. The figures have been obtained from UNICEF but we have been given to understand that the targets in the DPHE project extensions more or less match with these figures.

These figures are far below the conceived future targets as estimated earlier during end 1989.

It is expected that the figures for the coming years shall be finalized in association with the Task Force expected to take place in a couple of months.

Implementation Plan for Village Sanitation Programme

#	Item	1990-91	1991-92	1992-93	Total
1	Production of DPHE Latrines (Normal ADP)	300,000	275,000	300,000	875,000
2	Prod. of other UNICEF Latrines. (Intensive Sanitation in 5 Upazilas)	10,000	20,000	30,000	60,000
3	Prod. of other UNICEF-Assisted Latrines	10,000	15,000	15,000	40,000
4	Construction of non-Govt. Production Centres	40	60	80	180
5	Construction of DPHE Latrine Prod. Centre	185	0	0	185
6	Const. of UNICEF-assisted Latrine Prod. Centre	16	25	25	66
7	Training/Retraining of Masons & Skilled Labourers (DPHE)	300	200	200	700
8	Training of other Masons of UNICEF-assisted Centres	15	20	15	50
9	Training/Retrain. of TWMs (IA)	250	300	500	1,050
10	Training of SAE (IA)	128	128	130	386
11	Training of SDE (IA)	0	0	0	0
12	Refresher Training of SDEs(IA)	64	0	64	128

phase3*implplan.wk1-rn

3. Strategies for the Increased Involvement of Private Producers

3.1 The Current and Potential Share of the Private Sector

It is roughly estimated that there are, at present, approximately 700 private producers of latrine components in rural Bangladesh[1]. UNICEF is presently trying to assess the country-wide total number of private producers and their production capacities in cooperation with DPHE production centres in each upazila. If dependable figures are available by Phase V of this study, the revised figure shall be used. The yearly output of these enterprises may be estimated based on the average rates of production of 37 producers included in the Survey (see also Section 1.2.2).

	Yearly Production Observed Average (37 producers)	Extrapolated Estimate for 700 producers
Slabs & Pans	200	140,000
Rings	1200	840,000
Sets with 5 rings	200	140,000
Extra rings	200	140,000

During Phase I about 15 private producers were interviewed at random by the three mission members. It was noted that many producers over stated their production capacities in expectation of possibly greater external assistance. It is feared that even in this survey some of the producers may have over stated their production figures. In comparison with the above figures, overall DPHE production has been in the order of 270,000 slabs + pans and 780,000 rings during the 1988-89 fiscal year (assuming 750 centres being in operation, at present) (see Section 1.2). It is thus interesting to note, that the yearly production quantities of DPHE and of the private producers (in the order of 140,000 slabs & 840,000 rings) appear to be of a similar order of magnitude. However, the two suppliers are yet producing for different market segments. In future, the number of rings per set purchased by customers is likely to gradually decrease from an average of 5 to possibly 2 or more likely around 3, as is already the case for sets sold by DPHE. A certain percentage of customers will, however, always want to purchase 5 rings for reasons of pit stability in sandy soils and/or for reasons of status, prestige and envisioned quality.

With the above production capacities estimated for a total of 700 producers, an estimate can be made of the number of customers who may be served if sets with the slab and only 2 rings per customer would be produced, leaving the production and sale of subsidized slabs to the DPHE production centres (see also Section. 3.3).

[1] This figure is based on the fact that during the Survey 24 producers could be found, in the 16 randomly selected villages, i.e. an average of 1.5 per Upazila. 13 additional private entrepreneurs had to be traced in other Upazilas. For the 460 Upazilas in Bangladesh, a number of 700 producers has therefore been extrapolated.

the assumption is made that one slab-production capacity unit is equivalent to three ring - production units.

	Number of households suppliable yearly by the 700 private producers
If sets of 1 slab + 2 rings are sold	250,000
If only 2 rings are sold (assuming that the slab is bought from DPHE)	600,000

Although the above figures are theoretical or speculative, they allow to make reasonable guesses of the range of potential outputs and market shares which private producers will be able to cover in future. Based on the above figures, the **potential yearly coverage based on production capacities** ranges from about 140,000 households if 5 rings per set are sold to 250,000 with 2 rings per set to 600,000 with only 2 rings per set. Customers' preferences and needs will vary from place to place and with time, so actual overall yearly outputs will be somewhere between the 140,000 and 600,000 extremes.

Private producers will, of course, produce only as many slabs and rings as customers will be willing or able to buy at specific price levels. The results presented in Section 1.2 (Fig. 1.5 & 1.6) together with the current unit sales prices of private producers (Section 1.2.2) give an indication of the potential market share as determined by the demand side.

Set combination and sales price	Willingness/Ability-to-pay the given price	% of rural population	No. of households (in million)
slab/pan + 5 rings:	Tk. 469[1]	4-7	0.5-0.9
slab/pan + 2 rings:	Tk. 292	31-54	3.8-6.6
2 rings only:	Tk. 168[2]	68-82	8.4-10.1

1 lower figure: if full payment at once; higher figure: if payment in installments

2 includes the subsidized sales price of DPHE for a slab + pan (Tk. 50)

The figures show that the present potential market share, where private producers are still selling 5-ring sets mainly, is indeed rather small, i.e. in the order of 4-7% only. However, the market shares of the private suppliers could be substantially increased in future, if the customers would buy the slab and pan at a subsidized price from DPHE and rings only from the private manufacturer. In complementation, the production and sale of rings by DPHE would have to be reduced substantially in order to avoid demand distortions caused by the subsidies.

The current overall production capacity of the private sector (250,000 to 600,000 sets per year) is far too small to satisfy even parts of the potential future market demands. Therefore mechanisms and conditions must be created to enable more private producers to come into business and to allow incumbent to expand their production capacity if they intend to do so. Any meaningful expansion of the private production sector is at present dependent upon the availability of credit system and strategies which would allow the producers to enlarge their productive capacities, as well as upon the training of producers in small business management and marketing (see Section 1.2 and 3.3).

3.2 The Strengths of Private Producers and of DPHE, Complementary Roles

It is meritorious that DPHE/UNICEF to have set up over the past 15 years a country-wide infrastructure for the production and sale of latrine components. In the order of 600,000 latrines have so far been sold. This has not only served the households which have purchased a latrine, but has also brought with it a strong promotional effect: demand is being created among new potential customers who see latrines being installed and used within their neighbourhood or elsewhere. Part of this demand has prompted small cement-work entrepreneurs to enter into the production of latrine components. The government-run programme has thus helped to create jobs in the rural areas and to enlarge the latrine delivery network. A good number of private producers or privately employed craftsmen have learnt their skills and the latrine design as employees of DPHE production centres.

A considerable number (in the order of 1000; see Section 3.1) of private producers have been able to enter into business over the past years in spite of the heavily subsidized sale of latrine components by DPHE. So far, DPHE and the private producers have covered different market segments which has allowed the private sector to keep its market share. This "balance" might be at risk in future, as DPHE steps up its supply capacity by reducing the numbers of rings sold per set and by planning to introduce decentralized, mobile production of latrine components (see also Section 2.1 & 2.2).

Assuming that **consensus** exists among the responsible agencies, notably DPHE and UNICEF, **to involve the private sector** and to enhance its role in latrine delivery, then consideration should be given to the question how the two partners - government and private sector - could best complement each other. The following is an outline of what we consider to be the basic strengths and weakness of DPHE and private producers, respectively. The subject is further dealt with in Section 4.1.

	Private Producers	DPHE
Advantages	Flexibility in meeting customers' demands as regards product finish	Existence of a countrywide infrastructure for latrine production and sale
	SimpleUnbureaucratic procedures for delivery of services	Infrastructure for training craftsmen
	Able to quickly fill market niches where DPHE production centres	Development of standard designs and construction methods are lacking
	High productivity	Scope for R&D **and** health **promotion** activities
		Centrally directed structure allowing for relatively big external assistance

Disadvantages	Maximizing profits (possibly at the expense of product quality)	Bureaucratic procedures for customers
		Low productivity
		Inability to meet varying demands from customers

Giving due recognition to each sector's strength, the following emphases should be envisaged for the sharing of roles among the sectors:

- DPHE
  - Promotional activities for latrine delivery, health and hygiene education
  - Training of craftsmen for own production centres and for small entrepreneurs
  - R&D activities in latrine design and construction, standardization
  - Production of slabs + pans mainly or exclusively, selling them at subsidized price
- Private Producers
  - Production of mainly rings, but also of slabs + pans of special quality
  - Mobile production (through contract with DPHE or at own risk).

3.3 Promotion of Private Sector Participation

3.3.1 General

As has been stated earlier that for increasing the coverage of sanitation in Bangladesh it is necessary that the private sector participation is promoted in one form or the other so that the natural strength of the private sector is tapped and complemented with the strength of the nationwide infrastructure of the public sector.

Before further discussion it will be important to describe some relevant expressions concerning demand.

A. Potential Demand

This is an expression to convey the total possible demand of a particular item. It is based upon 100% coverage, in our case for the sanitary latrine components.

It will be interesting to make a rough estimate of the total potential demand of sanitary latrine by the rural population in Bangladesh. The calculation below can be theoretically improved at a number of points but is here included to give a general feeling regarding the total potential demand.

The present rural population	= 85 million
Population already served by sanitary latrines	= 5 million
Population growth rate	= 2.3% (1.96 million)
Latrine production capacity (Long-term average)	= 500,000 units per annum

Additional rural population served per year at present production rate assuming 6.5 persons per household = 3.25 million

Additional rural population served per year to increase the coverage beyond meeting the population growth = 1.29 million

Time required for full coverage = 62 years

Life of slab and rings etc. in use is however, limited by the following factors:

- Some people will buy an improved latrine over the period as a result of economic growth in the country.
- Many latrines may go out of use for laxity in emptying and for other reasons
- Obsolescence
- Breakage etc.

Considering the above the **life of latrine set** in use may not exceed 10 years which means multiplication of the total demand after every decade.

The above discussion leads one to think that the **total potential demand shall never be met** at the present rate of production and market structure. It may therefore necessary to ponder that the overall strategy should be based on involving the private producers together with the public sector institutionalized production through the DPHE production centres.

B. Stated Demand

The stated demand is the demand stated by those who have been interview during phase-II field survey of the current report. It takes into consideration that not every one is interested in procuring a sanitary latrine. Further with the stated demand like any other kind of demand differs with the change in price level. The survey during Phase II has attempted to chock-out this stated demand.

C. Projected Demand

The stated demand may not be the actual demand in practice because it is believed that the stated demand is inflated because of the following reasons:

- From the social status and aesthetic point of view it is better to have a latrine than not to have it.
- In Bangladesh particularly in the rural areas it is difficult to have individual interviews and there is an impact of "crowd pressure" towards stating higher price.
- Than there is always a difference between wish and financial capacity.

In this study we have considered a multiplication factor of 0.8 for computation of projected demand from the stated demand. This factor has been arbitrarily arrived at by consulting some key informants. It is understood that there can be other opinions about this.

D. Actual Demand

By actual demand we mean the demand that has been actually expenenced in the market situation. The actual demand is therefore, an expression of the past whereas the projected

demand is the expression for the demand in future. The projected demand is an attempt to foresee the actual demand to the best possible extend.

The total demand coverage has been divided into various segments to describe the nature of the various kinds of demand that exists.

3.3.2 Market Share met by DPHE Production

At present DPHE has over 700 production centres which cover all the 460 Upazilas of the country and besides this some of the Unions. The DPHE centres have contributed significantly in both meeting the rural sanitation demand and creating/promoting the total demand. In the near future there shall be 1000 DPHE Production Centres in the Country. In the various mission reports it has been stressed that DPHE should not expand beyond 1000 production centres and should instead consolidate its efforts in more efficient production, expansion of motivational efforts and facilitate integrated involvement of the private producers. The present years production target for the Upazilas is 650 slabs including pans and 1300 rings. The total achievement to date for the sanitary latrine coverage is still rather insignificant being of the order of 4%.

In the recent past there has been a constant shift from five numbers of rings per slab to a lesser number of rings per slab. The current year of ADP target is based upon an average ratio of 2 rings per slab. Customers are discouraged strongly to buy more than 3 rings per slab. This is based upon the concept that every slab makes a latrine. The idea is to use the available DPHE production capacity for increasing the sanitation coverage at the fastest rate possible. The decrease of number of rings per set has already increased the capacity of the DPHE centres from 40 sets to about 90 sets per month when there is no hold on the production for want of materials or release of budgetary targets.

3.3.3 Complementary Market Share for Private Producers

Although the present trend is towards utilization of lesser number of rings than 5 per set, the demand for higher number of rings is quite wide spread. This is based upon two different reasons:

1. Firstly the set has for years consisted of one slab and five rings. In the minds of the people this concept has been sold for a long time. They feel that anything less than 5 rings will not serve the purpose properly. This has recently lead to heavy stock piling of slabs in many DPHE production centres. This may turn out to be a temporary phenomenon but its present significance cannot be entirely ignored.
2. Secondly the soil conditions in different areas of the country and even in the different areas of the same Upazila and Union may require more than one ring per set. From the national perspective a differential policy may be too difficult to implement. At present an overriding policy of 1 slab 1 ring ratio is being advocated.

The above two aspects have created a potential complementary demand from the private producers in the various areas. Some of these producers are at a times now selling only rings without slab. Besides the market potential for sanitary latrines have other complementary requirements i.e. for superstructure materials.

3.3.4 Unmet Demand

DPHE production centres are not in a position to meet the entire demand of the sanitary components which has lead to a waiting queue (if one does not give too much emphasis on the present temporary stock piling because of shortage of rings at the DPHE centres). There is thus a scope for the private producers to address this potential demand. One has to be, however, clear that the total unmet demand for the DPHE centres will not be passed on to the private producers because of the higher pricing by the private producers and the presence of heavy subsidy extended by the DPHE products.

Besides for a potential buyer the transport cost is of a significant importance and effects his willingness or ability to buy a latrine. In many areas these distances can be rather long and in still others the distances may not be so long but latrine components are tedious to transport. Opening of the second centre in each Upazila reduces the transport costs for some of the buyers but there continues to exist a considerable share of market for the possibilities of producing latrine components in remote areas by fixed location production or by mobile production units with private sector participation. The concept of mobile production of latrine units by contracting this to the private producers offers a very promising avenue. The mission has specially visited Noakhali area and discussed in detail the experiments concerning mobile sale and mobile production and the lessons learnt thereby.

3.3.5 Cheaper Technological Choice

DPHE has a standard design of the various components for rural sanitation. Although different cost combination are being offered ranging from Tk. 70 - Tk. 250, the technology essentially remains the same. There is a segment of society in the order of 20-25% which can not afford even the minimum cost level of Tk. 70. For many of them the minimum cost choice of Tk. 70 is not an acceptable choice even if they are able to pay this much money; they are not quite convinced that 1 slab and 1 ring will suffice. There is a possibility of some price reduction by especially reducing the thickness of the ring(s). The action research programme undertaken is showing clear indications in that direction. The programme will also looking to other potentially promising a technologically improvements (see Chapter 5).

3.3.6 Market Requiring Better Service

On the other hand, there is another segment of the market which addresses to somewhat resourceful people. This segment requires better service. Although the buyers are aware of the cheaper sales price of the DPHE production centres, the buyers do not like the hassle of the rather complicated Government procedures. They have no patience to wait for their turn for the delivery and go to the private producers for a prompt delivery.

3.3.7 Market Requiring Improved Technology

Besides all the above options of the market share, there is still another demanding segment of society which is not satisfied with the present technology level of the DPHE products. This segment is ready to pay higher price for better products. The private sector has responded to meet this demand by offering improved technologies with following incremental improvements:

- Mosaic finished pans

- Mosaic finished pans, footrests and the entire top surface of the slab
- Greater diameter of rings and even more than 5 numbers per slab
- Twin pit options
- Porcelain pans connected with RCC slabs
- Other improved urban type of latrine sets

In fact the private producers are meeting custom-made requirements of the different buyers.

3.3.8 Market Expansion by Motivational Efforts

The entire demand will increase i.e. the demand curve will shift to the right if more people are interested in buying the sanitary latrine units. See figure 3.2. Without this full coverage cannot be reached even by theoretical conceptualization. This is shown in the preceding diagram. There should be a far greater emphasis on the motivational efforts that should be carried out by UNICEF/DPHE. Emphasis on this will lead to:

- Greater overall demand where both DPHE and the private sector can participate
- People will be more motivated for sanitation for its own purpose rather than the enforced link with water supply needs.

The promotional efforts have to be concentrated in the following forms of communication:

- Interpersonal communication carrying massages for improved sanitation, health and hygiene
- Use of printed materials like posters etc.
- Audio-visual means like screening of videos and cinema films carrying the necessary message
- Training and seminars for the various actors and agents in the communicational motivation exercise.

The mission feels that the audio-visual means will be of special significant importance in changing the behavioural pattern of the beneficiaries. The advantage of this media is that it carries a message by an entertainment media which people are themselves eager to participate in and therefore lesser coaxing is necessary.

Subjects covered should not only include health and hygiene but also address the more "catchy" items like:

- Privacy
- Comfort
- Status
- Durability
- Aesthetics

3.4 The Subsidy Issue

During the various missions and reviews of the sanitation programme the question of subsidy has always been considered rather important. Often it has been considered that the subsidy should be removed are at least reduced. The subsidy by nature is an artificial arrangement that intercepts the normal economic growth of demand and supply. No reviews have recommended an increase of the subsidy, however, the natural economic forces automatically increase the subsidy level because of the following reasons:

- The sales price is kept fixed over a long period of time generally 4-5 years corresponding to the PP period. The cost of production, however, goes up constantly due to increase of the cost of the construction materials and the wages. Besides considerable portion of these materials particularly cement and reinforcement that are imported are also subject to the fluctuations of the Taka value against foreign currencies and over the pass many years this fluctuation has not been in favour of Taka. The impact of this has been rather significant during the recent years. For example the cost of cement which remained almost constant between 1979-80 to 1986-87 (1% increase per year) has during the last three years gone up by almost 100%. The cost of cement constitutes about 40% of the cost of the materials forming the sanitation components. During May 1989 it was estimated that the subsidy level for the RCC slab latrine was from 52% to 73% depending on the number of rings in a set and the corresponding figures for FC slab latrines was 42% to 61%. These figures have now risen to a level of approximately 49% to 65% (with Khoa price of Tk. 20 per cubic ft.
- The subsidy is heavy on the slab and on the first ring. Recently the policy of 1 ring 1 slab is being strongly recommended but it has important repercussions on the subsidy both in terms of percentage as well as in absolute figures. Most costs concerning the sanitation programme are borne by the donor countries. Increased sale of one slab one ring latrines will offer greater amount of subsidy to the buyer per unit production capacity of the DPHE production centres. The amount of subsidy thus offered will increase from US$ 2.7 to US$ 3.0 million (see section 2) in absolute terms for the same production capacity of the DPHE production centres, if one ring one slab (instead of 5 ring/slab) strategy is followed.

Although no reviews have recommended elimination of subsidy altogether, a successive reduction has always been the ulterior motive. All effort should be made that the level of subsidy is not increased successively. It is recommended that the donor and GOB agree on a certain level of subsidy of the sanitation components and that the price of components is fixed nationwide every year after taking into account the price rise and the rise in wages. If this is not done the slow growth of the natural market which is served by the private producers will stagnate or even be eliminated to a large extent if the present trend continues. It will both cause a strain of donor resources and may hamper the increase in the coverage on the long term basis, if private enterprises are not able to come into the market or survive because of excessive subsidies offered by GoB. The creation of jobs in rural areas as one of the spin-offs of enhanced small enterprise involvement is also an important factor to consider.

3.5 Support to NGOs

The Survey carried out recently revealed that a number of NGOs, operating in this sector, have ceased to exist and, that of those still carrying out activities, information is rather incomplete (see Section 1.1). Many NGOs have received or are receiving financial and

technical support from UNICEF, but UNICEF, so far, has not had the capacity to monitor the respective NGOs' activities and the impact of its support to these organizations.

It is recommended that UNICEF considers the following when providing assistance to NGOs:

- To channel financial aid and/or technical assistance only to those NGOs which are serious in their commitments, have got a dependable project infrastructure and organizational set-up and which have got water supply, sanitation and hygiene as their active programme components. The total number of NGOs thus supported should be limited, possible to 10-15.
- To carry out regular monitoring of the NGOs' activities and achievements, evaluate the impact of these measures and periodically deliberate with the NGOs to exchange experience, to discuss problems and impacts and to jointly formulate new strategies where necessary and feasible.

4. Pilot Programme for Private Producers' Participation

4.1 The Central Question

While Bangladesh as a whole is the addressed market for rural sanitation products. There are at least three distinctly different channels for meeting this total demand namely:

- the formal sector through DPHE
- the NGOs
- the Private producers

The formal sector has certain specific advantages over the other delivery channels i.e.

- A nationwide structural organization providing sustained support over a long period of time
- Capability to introduce new country-wide standards in sanitation components
- An authorised Government agency to receive large foreign assistance in this sector

On the other hand the disadvantages with this delivery channel are:

- Inability to meet local flexibilities in demand
- Lack of incentives for improved performance
- Operational sluggishness because of the basic need of following strict government rules and regulations
- Difficulty in handling of cash by the staff
- It is rather difficult to direct subsidies to the poorer segment of society

The NGOs as a delivery channel are supposed to provide for a root level philanthropic organization. Some of the merits of the use of NGOs for sanitation components are given below:

- NGOs are able to set up dependable listing of vulnerable groups and can therefore function as a means of delivery to a selected target group of population.
- Many of the successful NGOs have a potential to function as good advisers before installation of latrines and good monitors afterwards.

The demerits on the other hand can be the following:

- Most of the NGOs are operational in limited areas and therefore one has to work with a number of different NGO organizations each with its own working environment and priorities in which sanitation has to be fitted-in.
- There are a number of NGOs which are not very serious and some amount of monitoring is necessary.
- Even if many of the NGOs are primarily philanthropic in their objectives, most of their personnel are not. So far the NGO performance in the field of sanitation has been rather unsatisfactory.

The private producers, on the other hand, have certain specific advantages of their own namely:

- The private producers provide a tremendous potential as a delivery channel because the technology involved is simple and is based on locally available materials.
- A number of private producers have already started operating in the field of rural sanitation component production and sale. They are gnawing at every available market niche. In the 16 upazilas which have been surveyed by this study there are 37 private producers. It is indeed surprising that some private producers have come up in spite of the fact that the DPHE channel provides for a heavy subsidy on the sanitation products.
- A highly motivated delivery channel providing a high level of flexibility for different areas and individuals.

The major weakness of the private producers originates from their basic motivation based on profit maximization.

In this report the authors consider that the role of the NGOs in the promotion of sanitation is interesting but will need some re-thinking in terms of its monitoring and that it is likely to remain as a limited channel for delivery. DPHE is the main delivery channel but it will never be able to meet the demand in the country. It is also understood that this channel can not be easily multiplied in size as it will lead to a very large scale bureaucratic set-up. The necessary complementary delivery channel should be a flexible one which can adopt itself quickly to the area based market requirements and changes in demand in need of better service. Although also included elsewhere, the above discussion is included here to keep the section 4 proposal complete in one section to enable section-wise discussion.

The central question therefore, is, whether we all concerned with sanitation promotion, want to involve the private producers or not. The strategies to follow entirely depend upon how we answer the above question. If the answer to the above question is yes then the strategies necessary to increase the sanitation coverage in Bangladesh should look at both the DPHE and the private producers as complementary channels for delivery of sanitation components and should aim at producing the total most optimum results.

4.2 Outlines of the Pilot Programme Proposal

So far the strategies followed for improved sanitation coverage have only concentrated on the use of the formal channel of delivery and only a minor attempt, with limited success, has been made to involve NGOs. No effort has been made in involving the private producers as a delivery channel for sanitation components.

If we now start attempting to actively think about and facilitate involving the private producers in the marketing of sanitation components, it will be interesting to first ponder about the kind of strategies that have negative or positive influence on the participation of the private producers. The following factors influence the private producers participation in the negative direction:

- Increase in the level of subsidy per set delivered through the formal sector.
- Further enlargement of the formal sector channel of delivery

- Reduction of number of rings per set delivered through the formal sector without complementary sale of additional rings from private producers.
- Convincing the rural population that the one slab one ring ratio is sufficient for a sanitary latrine.
- Involvement of the formal sector even in mobile sale and mobile production centres.

As we can see strategies have been followed to carry out to support all the above mentioned directions. In other words this has led to blocking of the private producers in the market rather than their increased participation. The only strategy that has helped the private producers is the increase of effort on the improved motivation of the rural population for need of a sanitary latrine.

The authors suggest that for the best possible sanitation coverage both the formal and the private sector participation has to be optimised in totality so that the natural strengths of the two delivery channels are used in a way to complement each other for a most efficient combination mix.

The sanitation programme covering the whole country has, by now, a very long-standing and accepted system. So as not to disturb the present practice without understanding all the elements of any new strategy applied, it is suggested that new strategy for involvement of the private producers should be pretested and evaluated in a limited area before its application on a wider scale.

The Pilot Programme for Private Producers' Participation (5-P) suggested below is based on the underlying principle that they should not be a reduction of the present level of organizational set-up of the DPHE channel of delivery which should be maintained at the planned level of 1,000 DPHE production centres in the country. This however, does not exclude that the DPHE delivery channel can not be improved in its production and delivery efficiencies to increase the sanitation coverage.

4.2.1 Objective

The objective will be to actively promote participation of private producers in order to increase the sanitation coverage in the selected area so that an optimal mix of strengths of the two delivery channels i.e. the DPHE channel and the private producers is strived at.

4.2.2 The Strategy

A limited area pilot programme is launched in which an effort is made to carry out the following:

- DPHE production centres carry out only the production of latrine slabs including pans.
- The entire subsidy on the sanitation component is concentrated on the latrine slabs only.
- All production of necessary rings is carried out by the private producers.
- To promote a system for mobile sale and mobile production through the involvement of private producers.
- To considerably increase efforts in motivational activities in the limited area.

The main item in the latrine components is the latrine slab which has no alternate use. Every slab is a latrine. This will mean that the entire DPHE production capacity is directed towards production of latrine slabs which in fact will entail in delivery of more latrines in comparison to any other strategy followed so far. The subsidy level on the sale of the recently nationwide introduced FC slab is already rather high (though less than the previous RCC slab) being of the order of 60%. This level of subsidy can be retained or even increased to include the subsidy now being offered on the sale of rings, if one stresses on the delivery of the same amount of subsidy as at present in terms of the absolute figure. The rings, however, have found even alternate uses. The present level of subsidy on the first ring is of the order of 70% whereas the subsequent rings are sold at a subsidy of about 35%. It is suggested that this subsidy on the rings is eliminated or at least not delivered in the form of subsidy on the rings. If more or less the total subsidy being offered presently is retained and given on the slab it will amount to sale of slab at a nominal token price.

The experience will show the exact working arrangement that may be most feasible for complementary operation of the public sector i.e. DPHE and the private sector.

4.2.3 The Programme Elements

The 5-P programme to adopt the above strategies in a limited area will consist of the following elements:

- Selection, enrollment and pre-selection of potential entrepreneurs for imparting training
- Training of the potential entrepreneurs. This will consist of three types of training:
  - Training in development of entrepreneurial skills
  - Training in production of proper latrine sets and marketing skills
  - Training in production of other complementary items for business promotion
- Extension of one time assistance to the selected entrepreneurs perhaps in the form of free moulds and tools and the extension of credit to set up private enterprises of both fixed location and mobile type. The need of credit has been strongly felt during the survey carried out under phase II. Refer section 1.2.
- Motivation of the rural population in use and procurement of sanitary latrines.
- Monitoring of the pilot programme to include the following aspects:
  - Monitoring of the use and repayments of credit funds
  - On going monitoring of the pilot programme to ensure that the intended path is being traversed and to carry out necessary immediate adjustments.
- Evaluation, reviews and reporting of the progress of the pilot programme.

The details of the working methodology of each of the above elements of the pilot programme and the interaction between the DPHE and the private producers shall be developed after the receipt of a comments on this report i.e. Phase IV exercise. There is a potential advantage of the use of the DPHE staff in imparting training in the production of latrine components and perhaps in licensing of the selected entrepreneurs.

4.2.4 Schedule of Activities

It is suggested that the pilot programme is carried out for a period of two years to refine the various elements on the basis of experience for an extended wide scale application.

The schedule of activities has not been attempted at this preliminary stage.

4.2.5 Selection of Geographical Area

It is suggested that for the pilot programme with a suitable monitoring of the intervention, three upazilas are selected on the basis of the following criteria:

- All the three upazilas should be adjoining to facilitate training, monitoring &evaluation and exposure to the motivational efforts.
- The selected upazilas are generally from the areas of sandy soil requiring greater number of rings for pit stability
- The selected upazilas should be large enough with not more than two DPHE production centres to provide advantages for mobile sale and production possibilities. This should naturally take into consideration not only the physical distance but also the logistics of the existing infrastructure in its purview.
- The area should preferably should not be the one already actively served by any NGOs.

4.2.6 Requirement of Resources

An introduction of the above will obviously require resource of various types namely:

- Financial resources to cover the cost of one time assistance, credit, training, motivational activities and personnel.
- Trained personnel both on long term and short term from within and outside the existing strength of DPHE and UNICEF to cover the elements like training, credit monitoring, programme monitoring etc.
- Equipment for necessary logistic support

4.2.7 Organizational Set-up

It is suggested that, as far as possible, the existing personnel resources are utilized to facilitate retention of sustained experience for the programme efforts. The exact interaction between DPHE, UNICEF and other organizations specializing in training and credit monitoring of small scale enterprises needs to be worked out.

4.3 Detailed Proposal

The above discussion under item 4.2 provides for an outline of the proposal only. Detailed comments from the various persons are expected as Phase IV of the study on Promotion of Rural Sanitation in Bangladesh through the Private Sector. After the receipt of these comments a detailed proposal in line with this chapter shall be prepared for final approval before embarkation of such a pilot programme. As already mentioned above this detailed proposal will cover the following areas:

Detailed modus operandi of each of the elements of the programme mentioned above like:

- Various kinds of training
- Credit programme including various sub-elements like size of loan, interest on fixed and working capitals, grace period, re- payment schedules, incentive for timely recovery and role of the bank etc.
- Equipment requirement
- Financial requirement
- Working schedule
- Selection of geographical area for intervention
- Suggested mix of medias for improved motivation
- Operational organization and manpower requirement etc.
- Monitoring, programme adjustments and reporting methodology

5. Action Research on Sanitation Technology

5.1 Rationale and Terms of Reference

5.1.1 Rationale and Background

During the Exploratory Mission, in Phase-I on Promotion of Sanitation in Bangladesh through the Private Sector during May-June 1989, it was felt that less costly technology options would make latrines more easily accessible to the poor people and therefore should be able to cause a better coverage of sanitation. It was understood that this is a rather difficult area for the action research but on the other hand it was also realized that even small savings will lead to an increased market share of significant importance. An attempt was made to find out the analytical documentation of the previously carried our work in this field. The preliminary findings showed that very little of technically analytical work was documented. It was also marked that whatever work had been done thus far had been done a number of years back and that since then new technological options have come up and have been tried elsewhere in the world.

In the light of the above a short-term programme concerning the action research was recommended. During Phase-II of the study the importance of action research was further emphasized during discussions with DPHE, UNICEF & SDC. The procedural formalities, however, took sometime and finally the action research exercise connected with this study started in January/February, 1990. It was agreed that the Mohakhali Sanitation Research Centre be used for preliminary workshop activities and DPHE Production Centre in Savar was initially suggested for the actual field testing of the proposed materials and dimensions. The material requirements are being provided from the materials under the programme and moulds modification and tools are provided by UNICEF and all other costs including personnel and travel etc. are provided by SDC.

5.1.2 Terms of Reference

It has been proposed to inquire into the following aspects of the design of the rural sanitation components.

A. Alternate Dimensions

Some of the dimensions of the latrine components are very sensitive to the overall costs. The most important dimension to be addressed is the **thickness of the ring**. Other dimensions may also be looked into. This will necessitate that new casting moulds are prepared for production of alternately dimensioned rings which will then be both field and lab tested for their functional strength. For carrying out this, assistance was requested from UNICEF and one of the nearby located DPHE centres. UNICEF WES Coordinator and the concerned Project Officer provided the necessary support.

B. Alternate Design and Materials

It is suggested that an inquiry is made into alternate materials in order to search for cheaper alternatives. Particularly **low quality plastics and plastic waste** has been thought to be of interest. This will require contracts with plastic manufacturers to see their technical capability

for manufacturing these components and an assessment of the cost of production particularly when looked through the economy of scale.

Reinforcement material for the slabs and the rings is quite a large component in the total cost. The quality of material supplied by UNICEF is very good whereas the private producers use quite inferior materials. At least one NGO **uses bamboo sticks for reinforcement**. The study should look into the cost versus material strength in order to arrive at economically most defendable material quality level.

To look into the possibilities of production of suitable **pans in plastics** to reduce breakage of water seals and **decrease the quantity of water required for flushing**. In some areas people resort to deliberate breaking of the water seals.

The water seal design at present requires considerable amount of water for flushing - a constraint in many areas. Alternate possibilities should be looked into.

Use of **hardpressed clay blocks** for lining of the latrine pits is emerging as a viable alternative which needs to be looked into.

Superstructure plays a very dominant part in the installation of latrines and the share of costs is significant in the total cost. Investigation should be carried out to suggest standard and easy-to-install materials and sizes to decrease the cost for the buyers.

C. Alternate Mix of Materials

Presently the standard civil engineering compositions of various materials like 1:2:4 or 1:3:6 are used in the manufacture of latrine components. Since in our present context every decrease of price in Taka has an impact on the size of the potential buyers, it is important that these standard mixes are inquired into and optimal mix levels are reached through laboratory tests.

D. Installation issues

- An inquiry into the number of rings required for different types of soils and their correlation with the depth of the pit and the likely impact of flood proneness.
- To analyse the reasons for the collapse of the latrine pits on the basis of the data collected during the survey (Phase-II) of the study.
- To analyse the safety and life expectancy of the latrines made purely from to-the-site local materials.

E. Miscellaneous

Any other issues not covered above but found recommendable during the action research period.

5.2 Detailed List of Potential Activities

5.2.1 Research Concerning Rings

After a brain-storming session during Phase-III, an attempt was made to reduce the number of variables for the trial to a practical limit. The following variables are suggested for investigation during the workshop-based action research:

- Ring thickness and height
- Ratio of mix
- Type, size and placement of reinforcement
- Size of khoa

As long as the five rings per set is the conception in the minds of the people, the ring thickness is the most cost sensitive single dimension in the entire set of latrine. As far as possible the height of the ring shall be kept 12" unless strongly prompted by the total economy concerning the ring in light of lesser thickness.

It is suggested to see the impact of **mixes** in ratios of 1:2.5:5, 1:3:6, 1:4:8, 1:5:7, 1:6:10 and 1:(2+2):0. The last being a mix of coarse and fine sand.

Concerning the **type of reinforcement** it is suggested to try to use the kind of reinforcement being presently used by DPHE, to use bamboo as reinforcement being used by NGOs, to use inferior type of reinforcement being used by the private sector and also to see the effect of no reinforcement at all.

Concerning the **spacing of the reinforcement** it is suggested to try out alternatives using **2** rings as compared to 3 reinforcement rings to be tested.

The above mentioned variables altogether generate 52 different types of rings.

Besides the above cement rings with **jute cuttings/jute cloth** as reinforcement have been suggested and shall be attempted during the extended phase of the action research exercise.

A. Testing of Rings

During discussions with various key informants it was realized that the real test of the rings lies in the actual **field handling** i.e. its durability during transport, loading and unloading. It is felt that the laboratory strength of the ring is of lesser practical value. The mission has noted that even earthen rings made by the potters have been used upto 20 numbers in depth and that these pits have been re-excavated and still these rings have been found to be healthy and intact suggesting the relative importance of the handling test. It is therefore suggested that 2 of each type of manufactured rings be tested by rolling on rough surface for a distance of 300 feet as a first test. The rings that fail during this test will be rejected for all further tests. The rings will be subject to loading, unloading and carriage through a distance of 10 kms. The selected types of rings shall be crash tested in the laboratory for their compression strength. Following testing procedure shall be followed in the laboratory:

The ring is placed horizontally in a steel box containing 5% moist sand in such a manner that 1/3rd segment of pipe shall be embeded in sand. The sand depth below the pipe shall be at least

to have a good, cutioning effect. The top of the pipe is also provided with a device to have it sand cushioned. The load is transmitted vertically through a steel plate on the top of the ring. It is applied parallel to and along a vertical plane passing through the axis of the ring. The load is increased gradually until the ring fails under the pressure applied.

For calculating the average compression strength 2 rings of each type shall be tested. Besides the three rings to be tested, one ring of each type shall be retained as a sample for demonstration. This will mean that 3 rings of each type will be manufactured.

The production cost of each type of ring, as likely in the field conditions, shall be calculated and cost vs. strength of the rings shall be analysed in graphs and 2 or 3 types of economically most viable rings shall be selected. These shall than be manufactured on large scale in 1 or 2 production centres only to find out their real practical success.

5.2.2 Research Concerning Slab

It is suggested not to attempt any experimentation with regard to slab thickness and that the discharge hole size is not changed from the one at present. However, following areas should be tested:

- See the suitability of the dome type of slab not needing any reinforcement (with and without first ring) which has been used with success in Mozambique.
- Attempt a split type of slab/pan (slab with a hole for insertion of separately produced collared pan) to reduce the cost during transport as the slab is the single heaviest item for transport.

5.2.3 Action Research Concerning Pan

To attempt the following:

- To improve the pan from the hydraulic flow point of view
- To make plastic pans with water seal in plastic
- To make plastic pan with offset pit, plastic pipe with flap
- To produce plastic water seal part
- Use of proper adhesive
- Smoothening of pan surface with some kind of lining

During discussions with UNICEF it was suggested that research pertaining to plastic components is carried out by MAUDS/UNICEF. It was also felt important that both types of research works are carried out inconformity and harmony with each other.

5.2.4 Alternate Lining for Pits

- To investigate into the use of cheap bricks for lining of the latrine pits
- Type and size of mix (pure clay, clay cement)
- Improvements in the mechanical device for pressure brick production
- Cost calculation taking into consideration cost of transport

Suitable lining for water logged and sandy areas is specially important.

5.2.5 Superstructure

As described in section 1.2.1 a substantial proportion (28%) of households will like to buy a superstructure rather than make it themselves.

DPHE has also emphasized the need of improved, cheaper and standardized superstructure as an optional sale item. It is important that the standard superstructure, as an example is exhibited at the DPHE centres for demonstration purposes. It is also necessary to make an initial assessment of the marketing possibilities of such a superstructure either through the DPHE production centre or through the private sector as a part of the private producers programme as suggested in section 4.

Proposals for standardized latrine superstructure components from cost effectiveness and from the ease of installation point of view.

Effort will be made on trial basis to manufacture superstructure materials at one of the divisional stores so that these can be transported along with other materials to the DPHE production centres. The actual demand of these elements will be thus field tested.

5.2.6 Improvements in Casting Technology

A mechanical casting device to facilitate lifting of the inner ring shall be tried out and its impact during production and on economy shall be analysed.

Other ideas concerning similar approaches shall be also tested.

5.2.7 Improved Technologies

An important segment of the market is interested in purchasing technologies of a higher standard than that marketed by DPHE. Therefore an effort should be made to improve the quality of the products like pans, water seal, slabs and superstructure. **It is understood that people are more interested in the improved quality of visible components and superstructure than the substructure.**

A number of applications of improved quality concerning mosaic and porcelain materials are being tried more on ad hoc basis rather than as a result of techno-economic effort. This work will involve contact with many production workshops in the private sector and some NGOs.

5.2.8 Type of Top Soil

The cohesiveness of the soil particularly under wet and rainy conditions is quite important for the use of the proper selection of the latrine technology. It is important that the latrine pit does not collapse. An area mapping will be attempted from secondary resources of data. Some monitoring effort will have to be carried out to analyse the life of about 40 one-pit latrines to be installed in sandy soil.

5.2.9 Reporting and Cost Analysis

All the works carried out shall be properly documented with technical and economic evaluation. Items recommended for elaborate field tests shall be presented in a summary.

5.2.10 Field Testing

All the selected items which will be recommendable through the workshop-based action research and accepted by UNICEF/DPHE shall be field tested under a well monitored geographic location. The results from these field tests shall also be documented in the reports.

5.3 Activities to be Carried Out Before End June 1990.

The activities during this phase shall concentrate on the experimentation concerning different dimensions, ratios and different types of reinforcements for RCC rings. The rings produced, as described above, shall be tested for handling under workshop conditions and lab tested for compressive strength.

Activities concerning manufacture of different kinds of rings carried out/planned before end June 1990 are presented in the table on the following three pages. No physical or laboratory tests have yet been undertaken but the indications are that it may well be possible to recommend reduction of ring thickness. If the expected results can be further substantiated during the field test , savings in millions of Taka can be the result.

A mechanical device developed for speedier manufacture of rings has also been tried with promising initial results. The work on this shall be carried out during the extended phase . A better quality pan with coating based upon a stone powder is also being tried out and looks attractive from aesthetic point of view.

Photographs on the following pages are indicative of some of the works undertaken so far.

The results of the workshop-based research upto end June 1990 shall be included in the Phase-V report.

5.4 Activities during Extended Phase for Action Research

All other activities not specifically described under 5.3 shall be carried out during the extended phase of action research. It is recommended that the current action research is upto October 1991 to include the 1991 rainy season for field test and durability.

A preliminary discussion on the contents of the action research was held with UNICEF and DPHE staff during Phase III. Detailed activity schedule shall be discussed with all partners before implementation.

The final report on the overall action research shall be presented during end 1991. It will be supported by cost calculations and technical data for finding out the economic viability of introduction in production.

ACTION RESEARCH ON VILLAGE SANITATION PROJECT

Alternate Design/Dimension for Sanitation Component

(Component: Latrine Rings (PCC & RCC)

Fixed Dimension: Internal Dia = 27", Height = 12"

Variables: Mix-proportion, Reinforcement Type.

Type variation by reinforcement:

Type - 1 - No Reinforcement

Type - 2 - Reinforcement as used by DPHE (3 Nos. SWG wires - 10 gauge)

Type - 3 - Bamboo Reinforcement (3 Nos.Bamboo splits approx. 7mm dia)

Type - 4 - Reinforcement as used by Private Producers (3 Nos. SWG wires - 16 gauge)

Type - 5 - Less Reinforcement than used by DPHE (2 Nos SWG wires - 10 gauge)

Type - 6 - Less Reinf. by than used by Private Producer(2 Nos.SWG wires - 16 gauge)

Manufacture Schedule for Group A:

1" thick rings manufactured by traditional vertical shutter mould

Variable by mixed proportion - 6 types, Variable by reinforcement - 6 types

Total number of samples - 36 ~~nos., Nos. of rings manufactured - 36x3=108~~ nos.

Sl. No.	Wall Thick	Type	Mix-Proportion	Manufacture Schedule								Remarks
				April 1990				May 1990				
				1	2	3	4	1	2	3	4	
1	1"	Type-1	1:2.5:5									
2	1"		1:3:6									
3	1"		1:4:8									
4	1"		1:5:7									
5	1"		1:6:10									
6	1"		1:4 (2+2)									
7	1"	Type-2	1:2.5:5									
8	1"		1:3:6									
9	1"		1:4:8									
10	1"		1:5:7									
11	1"		1:6:10									
12	1"		1:4 (2+2)									
13	1"	Type-3	1:2.5:5									
14	1"		1:3:6									
15	1"		1:4:8									
16	1"		1:5:7									
17	1"		1:6:10									
18	1"		1:4 (2+2)									
19	1"	Type-4	1:2.5:5									
20	1"		1:3:6									
21	1"		1:4:8									
22	1"		1:5:7									
23	1"		1:6:10									
24	1"		1:4 (2+2)									
25	1"	Type-5	1:2.5:5									
26	1"		1:3:6									
27	1"		1:4:8									
28	1"		1:5:7									
29	1"		1:6:10									
30	1"		1:4 (2+2)									
31	1"	Type-6	1:2.5:5									
32	1"		1:3:6									
33	1"		1:4:8									
34	1"		1:5:7									
35	1"		1:6:10									
36	1"		1:4 (2+2)									

ACTION RESEARCH ON VILLAGE SANITATION PROJECT

Alternate Design/Dimension for Sanitation Component

Component: Latrine Rings (PCC & RCC)

Fixed Dimensions: Internal Dia = 27", Height = 12"

Variables: Mix-proportion, Reinforcement Type.

Type variation by reinforcement:

Type - 1 - No Reinforcement

Type - 2 - Reinforcement as used by DPHE (3 Nos. SWG wires - 10 gauge)

Type - 3 - Bamboo Reinforcement(3 nos.Bamboo splits approx. 7mm dia)

Type - 4 - Reinforcement as used by Private Producers (3 Nos. SWG wires - 16 gauge)

Type - 5 - Less Reinforcement than used by DPHE (2 Nos SWG wires - 10 gauge)

Type - 6 - Less Reinf. by than used by Private Producer(2 Nos.SWG wires - 16 gauge)

Manufacture Schedule for Group B:

1" thick rings manufactured by mechanical shutter device

Variable by mixed proportion - 6 types. Variable by reinforcement - 6 types

Total number of samples - 36 nos., Nos. of rings manufactured - 36x **2 = 72** nos.

Sl. No.	Wall Thick	Type	Mix-Proportion	Manufacture Schedule								Remarks
				April 1990				May 1990				
				1	2	3	4	1	2	3	4	
1	1"	Type-1	1:2.5:5									
2	1"		1:3:6									
3	1"		1:4:8									
4	1"		1:5:7									
5	1"		1:6:10									
6	1"		1:4 (2+2)									
7	1"	Type-2	1:2.5:5									
8	1"		1:3:6									
9	1"		1:4:8									
10	1"		1:5:7									
11	1"		1:6:10									
12	1"		1:4 (2+2)									
13	1"	Type-3	1:2.5:5									
14	1"		1:3:6									
15	1"		1:4:8									
16	1"		1:5:7									
17	1"		1:6:10									
18	1"		1:4 (2+2)									
19	1"	Type-4	1:2.5:5									
20	1"		1:3:6									
21	1"		1:4:8									
22	1"		1:5:7									
23	1"		1:6:10									
24	1"		1:4 (2+2)									
25	1"	Type-5	1:2.5:5									
26	1"		1:3:6									
27	1"		1:4:8									
28	1"		1:5:7									
29	1"		1:6:10									
30			1:4 (2+2)									
31	1"	Type-6	1:2.5:5									
[illegible]			[illegible]									
33			1:4:8									
34			1:5:7									
[illegible]			[illegible]									

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ACTION RESEARCH ON VILLAGE SANITATION PROJECT

Alternate Design/Dimension for Sanitation Component

Component: Latrine Rings (PCC & RCC)

Fixed Dimensions:

Internal Dia = 27"
Height = 12"

Variables:

Mix-proportion
Reinforcement Type

Type variation by reinforcement:

Type - 1 - No Reinforcement
Type - 2 - Reinforcement as used by DPHE (3 Nos. SWG wires - 10 gauge)
Type - 3 - Bamboo Reinforcement (3 Nos. Bamboo splits approx. 7mm dia)
Type - 4 - Reinforcement as used by Private Producers (3 Nos. SWG wires - 16 gauge)
Type - 5 - Less Reinforcement than used by DPHE (2 Nos SWG wires - 10 gauge)
Type - 6 - Less Reinf. by than used by Private Producer(2 Nos.SWG wires - 16 gauge)

Manufacture Schedule for Group C:

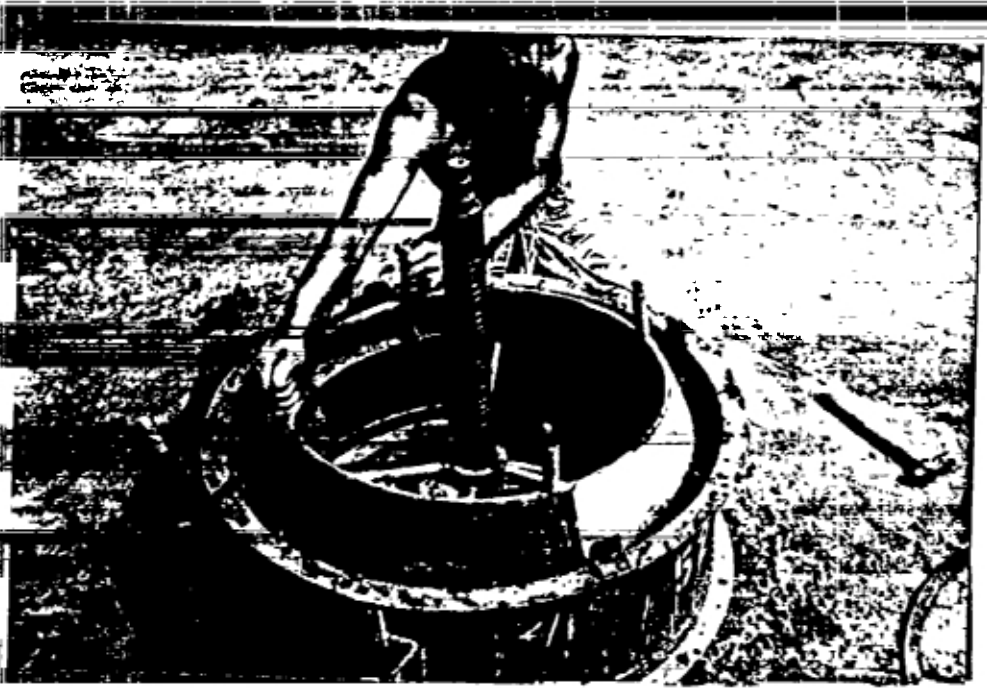
3/4" thick rings manufactured by mechanical shutter device
Variable by mixed proportion - 2 types
Variable by reinforcement - 6 types
Total number of samples = 12 nos.
Nos. of rings manufactured - 12x3=36 nos.

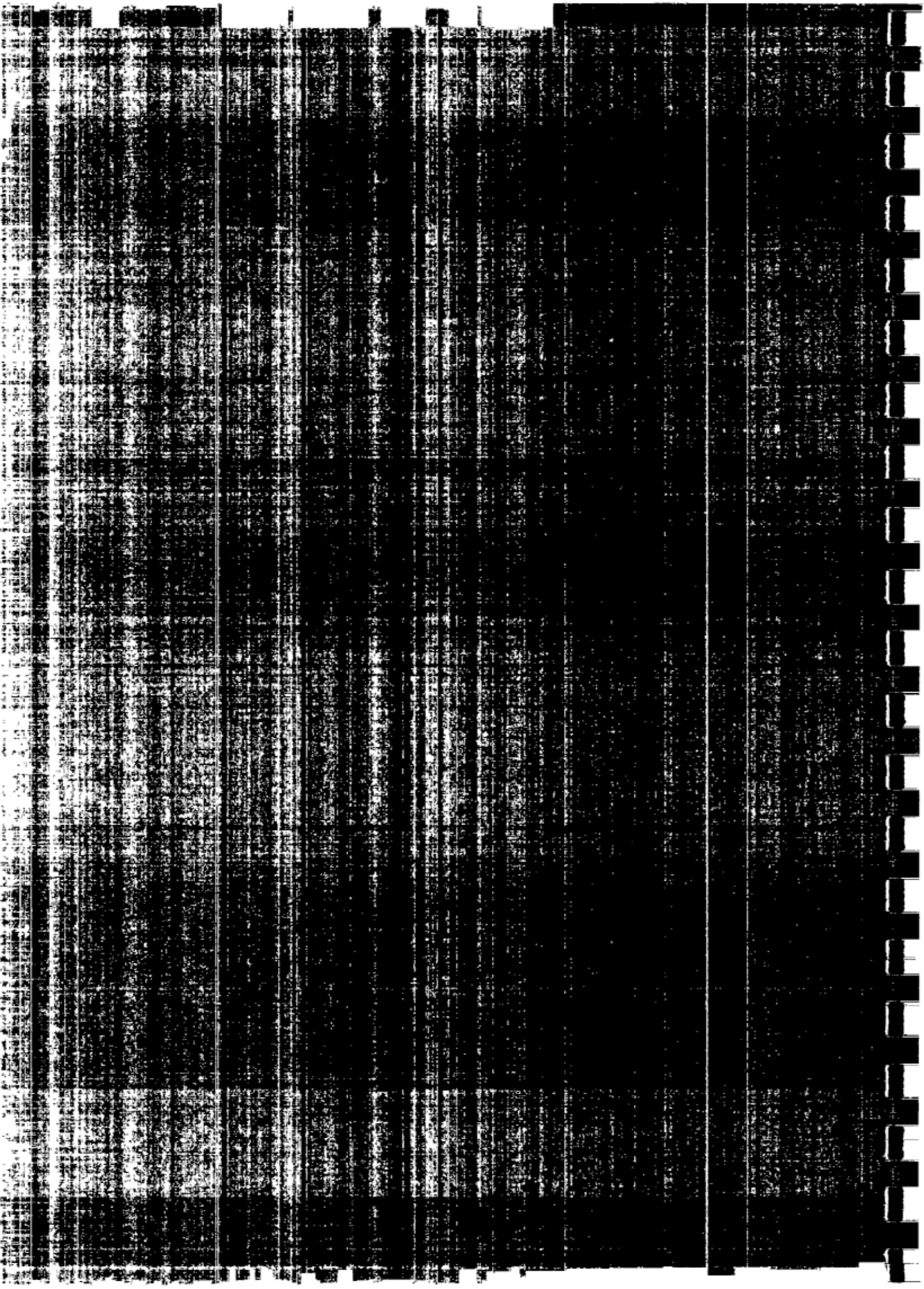
Sl. No.	Wall Thick	Type	Mix-Proportion	Manufacture Schedule								Remarks
				April 1990				May 1990				
				1	2	3	4	1	2	3	4	
1	3/4"	Type-1	1:2.5:5									
2	3/4"		1:3:6									
3	3/4"	Type-2	1:2.5:5									
4	3/4"		1:3:6									
5	3/4"	Type-3	1:2.5:5									
6	3/4"		1:3:6									
7	3/4"	Type-4	1:2.5:5									
8	3/4"		1:3:6									
9	3/4"	Type-5	1:2.5:5									
10	3/4"		1:3:6									
11	3/4"	Type-6	1:2.5:5									
12	3/4"		1:3:6									

Prepared by:

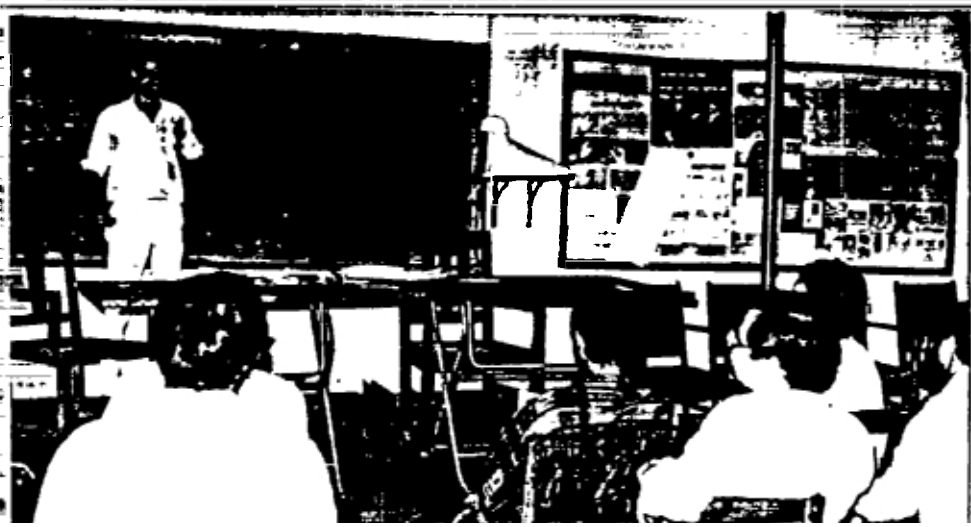
Rings produced with reference markings for type etc.

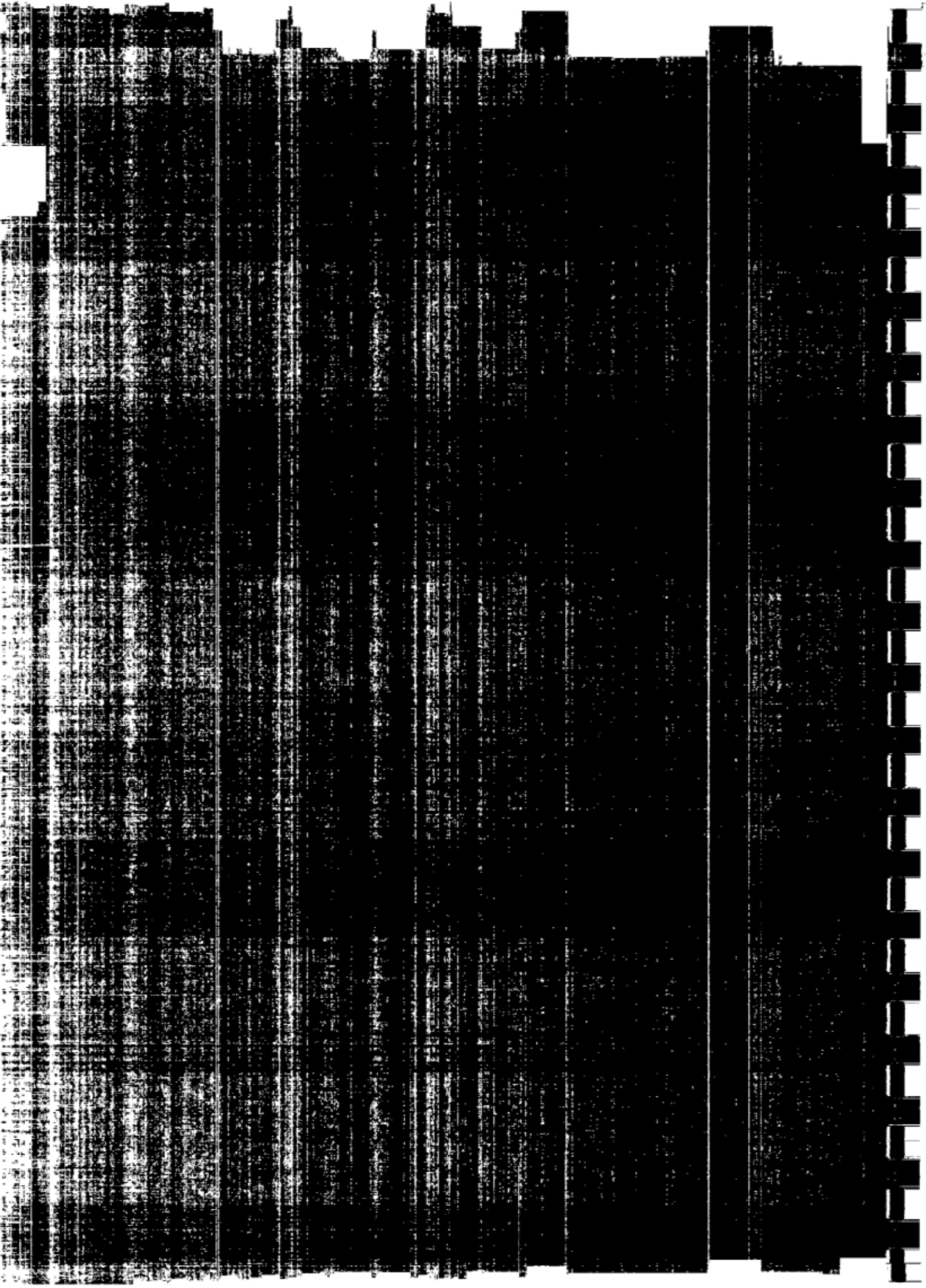
tCasting device for increasing production.





Discussions regarding Action Research ... UNICEF, DPHE, WHO and Interchain

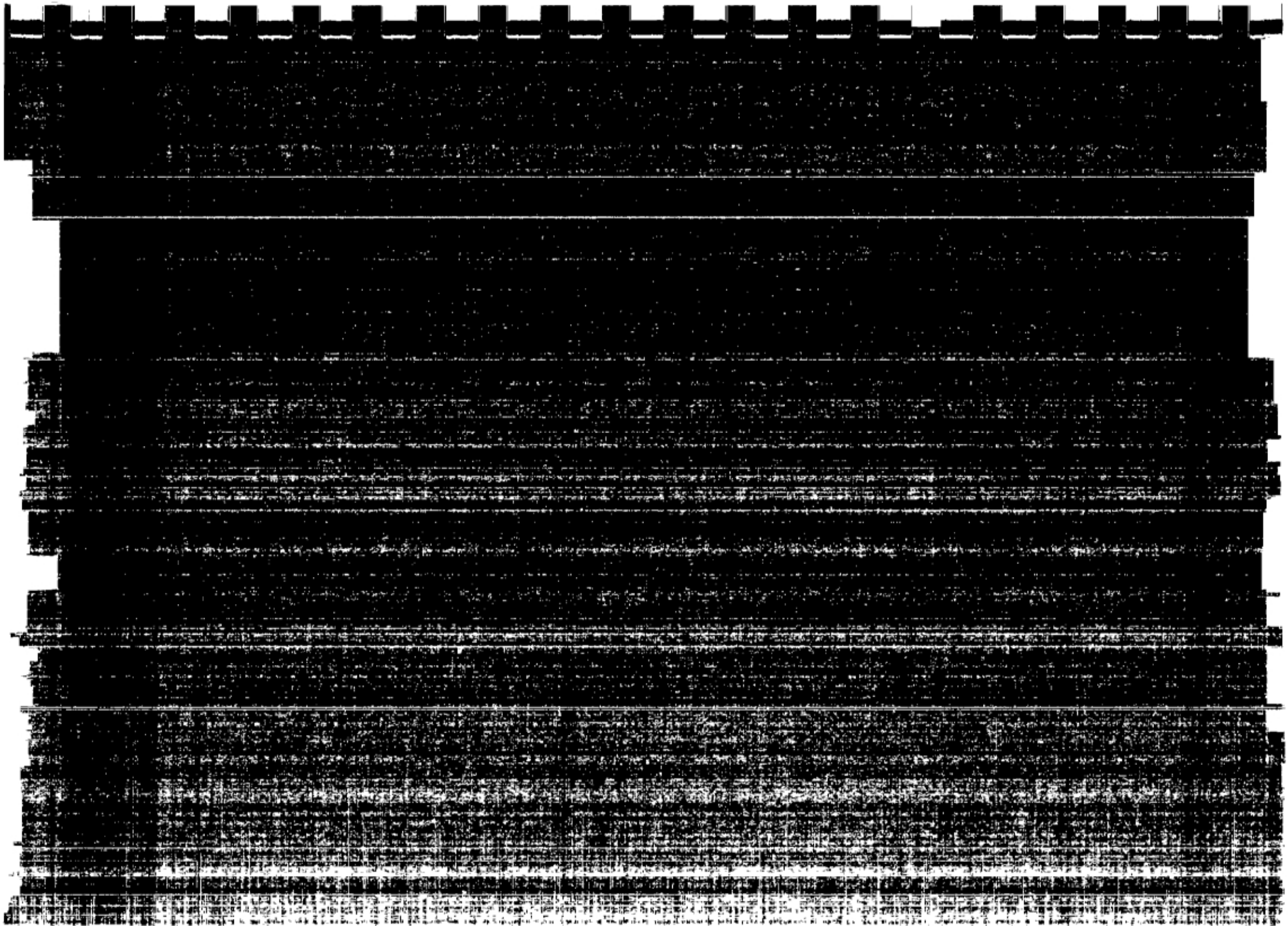




Getting ready to start the Rolling Test for Rings.

Start of Rolling Test

Lab Test for Compression Strength



Annexures

- Annexure 1 — Interim Findings and Proposals of Phase I of the Study
- Annexure 2 — TOR for the Survey
- Annexure 3 — TOR for Phase III
- Annexure 4 — Socio-economic categorization: criteria and methodology
- Annexure 5 — Data collected from Private Producers
- Annexure 6 — Production and sales in 40 DPHE centres.
- Annexure 7 — NGOs contacted by HCL
- Annexure 8 — Survey data collected from NGOs
- Annexure 9 — Phase III schedule of activities and persons met

Following annexures have only been added with a few master copies of this report

- Annexure 10 — Computerized tabulation of Survey Database
- Annexure 11 — Questionnaire 1 to 7 in English
- Annexure 12 — Questionnaire 1 to 3 in Bangla
- Annexure 13 — Questionnaire reply codes

Annexure 1

Summary of Exploratory Mission Phase I

Interim Findings and Proposals

Findings

The current situation

The Mission whose main tasks were to (1), investigate the constraints and possible ways of enhancing the production and sale of water-seal latrines by private enterprises and NGOs, (2), to identify suitable alternative methods of latrine construction and installation in order to make latrines affordable also to the poorest and (3), to identify possibilities for using excreta as a fertilizer, made the following findings:

a) It confirms the observation made by the joint DANIDA/SDC appraisal mission carried out in December 1987 that in spite of stepped up efforts on the side of DPHE/UNICEF and other agencies over the past years:

- sanitary latrine coverage in rural areas is still very low, i.e. approx. 4 % only
- the rate of production and sale of water-seal latrines by DPHE/UNICEF is still too low to meet the outstanding demand within foreseeable future,
- and that a large proportion of rural families is not able/willing to pay even the subsidized rate of at present Tk. 250 for a DPHE latrine with a slab and 5 rings. The general public is unaware of the newly offered option of lesser number of rings per slab.

b) There are indications that only about 10-20% of the rural households are able/willing to buy latrines from private producers at the currently observed price of Tk. 450 or more for a 1 slab + 5-ring latrine.

c) It appears that a significant proportion of latrines sold by the DPHE production centres at the subsidized rate is purchased by people who would be able to pay higher prices.

d) There are indications that many of those not being able to pay more than Tk. 250 miss the chance of buying a latrine from the DPHE centre. In a situation like this where the demand exceeds the supply, it appears common that the customers are willing to pay more than the official price to jump the queue or get a higher priority. The main reason for this is probably the fact that the current output of DPHE production centres is far below demand in the respective price range.

e) A practical delivery mechanism that delivers the subsidy to the poor low-income families is difficult to achieve. Some NGOs play a crucial role in covering this demand and have adopted such strategies (mainly through group formation and follow-up) which enable them to actually channel the subsidy to those who are in need of it.

f) There appears to be relatively little competition among the private producers for the sale of latrine components. In a more competitive situation, prices might therefore be somewhat lower. However, it appears that present profit margins of private producers are very modest.

g) Because of the promotional effect of latrine sales by the DPHE centres, the private producers do not mind their presence.

h) The market segment of private producers could be enlarged by increased ability/willingness to pay of potential users. This could be achieved by promotional activities aimed at users attaching higher priority to latrines. The Mission had indications that a payment system whereby customers can pay for latrines on an instalment basis could also increase the ability/willingness to buy a latrine. However, the extent to which demand can be increased among the rural population should not be overestimated.

i) Other means of widening the market segment for the private producers would be by devising cheaper technologies for the production of the standard latrine components and/or by continuing to promote further the idea that a latrine can also consist of a pit with less than 5, e.g. only 2 rings, a concept which has already been introduced by DPHE recently.

About strategies for the increase of coverage

k) With 2 DPHE production centres becoming established and functional in each Upazila in the near future, DPHE's production capacity for 5-ring latrine sets will become doubled over its 1985 capacity. All other elements of the present framework remaining the same, this increased capacity will still not significantly decrease the vast unsatisfied demand for latrines and it will take over 80 years to cover the total potential requirement.

l) A further increase of the number of government production centres could be thought of but it would have the disadvantage of providing growth to the government production sector at the expense of the private entrepreneurial sector. The private sector is more flexible in adapting to market demands and is usually more productive than government agencies, which have to follow strict laid out procedures.

m) The recently introduced approach of recommending the sale of latrine sets also with only a slab and optional number of rings from zero to five appears to be a feasible strategic tool:

(1) To widen the market segment for the private producers as they would now also sell to users who are able and willing to pay in the price range between Tk. 250, the current subsidized price for a full set and approx. Tk. 500, the current private market price for the full set.

(2) To provide access to latrine components through the subsidized sector (DPHE and NGOs) also to those who can not afford to pay as much as Tk. 250.

n) The waiving or reduction of subsidies, a strategic tool variously proposed in the past, would probably widen the market segment for the private sector to only a small extent. Altogether, those who can afford latrines for Tk. 450 or more are proportionally relatively few.

o) Lifting the subsidies would however leave a large proportion of the rural families outside the reach of components for an improved latrine as they are presently being sold. However, some people who can theoretically afford the subsidized price of latrine do not get it due to shortage in supply. The removal or reduction of subsidies will also increase the demand for the private sector. The size of these effects can only be decided upon after the planned survey (Phase II).

b) By judging the current situation and framework in rural sanitation, the Mission believes that a substantial increase of latrine coverage within a reasonable time span can only be achieved by a strategy which will combine in a suitable way the strengths of the subsidized sector as well as of the private producers. Such a strategy will include not only new strategic tools but also tools which are currently already being applied and have proven to be feasible to make a major contribution to the overall objective.

g) The use of stored excreta as a fertilizer has not been widely practised in Bangladesh to date although it is a common practice in many places in south-east Asia. Also, there seems to be a socio-cultural barrier against it. The Mission believes on the basis of accounts that in some places people are in fact practising reuse and on the basis of judgments of key informants, that this socio-cultural barrier is not absolute and that many might adopt the practice if they see it being done by others and leading to an economic benefit at no increased health risk.

r) The growth of duckweed in excreta-fertilized ponds and the use of duckweed for fish production is a promising experiment presently being carried out to devise a new excreta disposal strategy. Thereby, people who will cooperate with this new system of excreta management will be paid for the excreta which shall be put to economic use by fertilizing the ponds.

s) Several R&D efforts have been done in the past regarding alternative materials for latrine construction, notably burnt clay, plastic, jute plastic and bamboo. For various reasons, trials have either failed or had limited success. Proposals are made for extended and more systematic R&D activities.

Proposals

A) The Mission proposes that a **new overall strategy** in rural sanitation be considered which combines the following **major elements**:

- Involving the private producers in the production of latrine components for the subsidized sector by continuous tendering and contracting to genuine small enterprises with built-in procedural safeguards for proper selection. By this, production could be stepped up considerably. At the same time, such a strategy would be an excellent tool to enhance income generation in the rural areas through the small enterprises.
- Subsidies are retained but strategies will be developed which make them accessible mainly to those who are in true need of them. Alternative mechanisms like DPHE centres production of only slabs etc. shall be addressed in detail in a later mission.
- NGOs should play a leading role for the market segment of the poor, having already identified means of providing subsidized delivery of basic services to those income strata.
- DPHE/UNICEF will gradually shift their major role from production of latrine components to the management of production, distribution and monitoring of component supplies and to increased promotional activities. Training and licensing of private producers will also be a major task.
- Further specific measures of promoting small enterprise latrine production should be examined.

- The already chosen approach of incremental sanitation improvement by selling latrines composed of only a slab and 0 to 5 rings should be stepped up as it enables more people to install a latrine and because it widens the market segment for the private producers.

B) As an important supporting activity for the above new strategy, **systematic and prolonged R&D work** should be pursued as follows:

- Investigating the possibilities of reducing the cost of the currently used standard latrine components (e.g. thickness of RCC rings and FC slabs; use of plastic for slab, pan and rings; use of bamboo reinforcement, and others)
- Investigating the possibilities of digging pits substantially deeper than the rings installed
- Generating support for investigations looking into excreta use such as for duckweed and fish production

C) In order to be able to create a firm basis of judgment and to substantiate the proposed new strategy, **information and data** shall be collected about the following issues through a representative **survey**:

- On the demand (user) side: ability and willingness to pay for latrine components
- On the suppliers' side:

  Private producers:production costing structure and sales prices

  DPHE/Upazilas:recent production and sales; production costing structure

  NGOs: type of service delivery; latrine production and sales; delivery procedures

Annexure 2

TENDER INFORMATION ON:

SOCIO-ECONOMIC SURVEY ON DEMAND AND SUPPLY PARAMETERS OF RURAL SANITATION

Terms of Reference on Collection and Processing of Data to Support New Strategies for the Production and Sale of Water-seal Latrine Components in Rural Bangladesh

1. Objectives

- To collect and process data on the willingness/ability of the people to pay for latrine components.
- To collect and process data on the production of latrine components by private producers.
- To collect and process data on the production and supply by DPHE and NGOs.

2. Methodology

This work is by and large based upon structured questionnaire. However, the survey teams are encouraged to have informal discussions with the people at large and the personnel of DPHE, private producers and NGOs and observe the processes of interaction relevant to the topic under survey. These aspects can be stated as qualitative observations in the final report.

a) Data collection of demand side

The data on the demand side will be collected by conducting household interviews in different villages all over rural Bangladesh. For this purpose a questionnaire will be developed by the Surveyor in collaboration with the Consultant/mandater based on the list of the required information as mentioned below. The questionnaire will then be field tested and adapted accordingly to the experience made during the field test.

b) Data collection from private producers

The data collection from private producers in different parts of Bangladesh will be done accordingly. Again, a questionnaire will be developed in collaboration with the mandates and field tested.

c) Data collection from subsidized sector

Most of the relevant data to be collected from DPHE and other production centres are available at the respective central office in Dhaka. However, some field visit will be necessary, see item 4.3 below. The detail questionnaire will be set-up again in collaboration with the mandates.

d) Processing of data

The data collected will be put into a computer-system using a suitable software program. The processing will be done according to the specific requests given by the mandater. The output formats shall be supplied by the mandater.

3. Information and Data Required

3.1 Demand Side: The Users

It is intended that in all 2800 households are interviewed out of which 2400 shall belong to category A mentioned below and 400 will belong to category B. Sampling and selection of households shall be carried out in an analytical way so as the results represent the situation in Bangladesh at large in as representative way as possible. It is unlikely that the number of villages selected shall be more than 30. The number of households to be divided under category A and B mentioned below shall be discussed with the successful bidder.

Geographic Information

- Name of "Para", Union, Upazila
- Distance from Upazila headquarters
- Distance from nearest Village Sanitation Centre
- Distance from nearest private producer
- Distance to nearest ("pucca") road head
- Flood Levels
- Socio-economic information:
  - Land ownership
  - Small land holder-cum-labourer
  - Labourer (landless)
  - Share cropper
  - Formal education of husband/wife
  - Ever worked abroad?
- Relevant observations to estimate socio-economic status: type of house,

A - Those not having an improved latrine yet

- If the person were to install a latrine, yes/no, if yes will he go for:
  - home-made latrine
  - shall buy from outside, which type he will buy, give options with prices
- How much is the user willing and able to pay for an improved ("sanitary") latrine,
  - if he would have to pay the full price immediately?
  - if he could buy the latrine on a down payment/installment basis?
- What was the biggest single expense incurred by the family during the last one year and for what purpose?
- Has the person ever heard about the role of improved latrines? How? What?
- Has the person ever heard about the availability of improved latrines from either DPHE/Upazila or private producers, and does he know at what prices these are available? If yes,
  - how has he heard of it (health education messages, neighbours, seen a latrine himself, others)?
  - how would the usage practice be with a new latrine?
- What is the current excreta disposal practice (location, type of installations if any)?

- Importance of men and women using separate latrine (this question to be asked to the leading female of the household also):
  - current practice?
  - how would practice be with a new latrine?
- Would he want to make the superstructure himself or rather buy it if it would be available? How much would he be willing/able to pay?
- Would the family accept the use of a drop-hole type slab without any water-seal at a cover cost? If no, why not?
- Will the family accept improved sanitary latrine. If yes, which type, give options with prices
- Has the person ever applied for a latrine at the DPHE/Upazila production centre?
  - if so, how long ago?
  - did he try again?
  - why did he fail to get?
- Transportation cost from nearest VSC area or private producer by ox cart, push cart, rickshaw and boat? (specify)
- If the person had to build/buy a latrine to get a tubewell pump, what would he do?

The data collected shall be synthesized in an attempt to evaluate different approaches of hypothesis mentioned in this interim report.

- The **ability/willingness to pay** a specified amount for a latrine for the defined **socio-economic strata**, depending on
  - a - Distance to nearest road and Upazila centre
  - b - Prior contact/non-contact with health or latrine information messages
  - c - Prior knowledge/non-knowledge about availability of latrines at Upazila centre or private producer

B - Those who have already installed a sanitary latrine

- What was the biggest single expense incurred by the family during the last one year and for what purpose?
- Where was the latrine procured from?
  - from Village Sanitation Centre (VSC)?
  - from private producer?
  - from NGO?
- Did he install the latrine himself or employed someone else to do so?
- Why did he buy a latrine?
- If bought from the VSC, how long did he have to wait?
- How many rings were installed and how much did the whole latrine cost? (Year: ....)
  - cost of latrine components
  - mode and cost of transportation
  - cost of superstructure
  - cost of installation
- When was the latrine installed? How many times it filled up?
- Usage and experience:
  - Who is using the latrine? Why some do not use?
  - What was done/will be done when the latrine filled/fills up?
  - scavenging it?
  - build a second one and shift the superstructure?
  - resort to previous practices?
  - suitability of material of slab and pan for use and cleaning?
  - collapsing of pit?

flood level reaching pit?

- What was the source of the funds?, Own, from moneylender, suppliers credit, NGO's credit, others (specify)

These data should be synthesized to show:

- The **price** (corrected for time) **paid** for the latrine, transport, superstructure and installation for the defined **socio-economic strata** depending on
  - The distance to the nearest supplier (VSC or private producers)

3.2 Supply Side: Private Producers

It is intended that 40 private producers are interviewed from the approximately the same areas from which the selection of the above stated individual household is made.

- **Geographical information**
  - Name of village, union, Upazila, Zila, Division
  - Approximate population of village
  - Name and address of producers
- Size of the components (slab, rings)
- Mix of "khoa", sand and cement for slabs and rings; quality of reinforcement
- Type(s) of pan produced (cement mortar, mosaic)
- Structure of production cost as a function of distance to the nearest road head and overall geographical location:
  - material purchased
  - labour (daily wage and number employed)
  - daily output
  - investment cost or rent for premises
  - cost of tools used
  - source of investment funds, loan? Other business?
- Componentwise sales price
- Componentwise quarterly sales
- Is the water-seal properly constructed?
- Ratio number of rings/slabs sold
- Do they make house deliveries? If so, what is the transport cost from producer's site to buyers' home for ox carts, push carts, rickshaw, boat (specify mode of transport)
- What other products are made?
- What fraction of the producer's annual sales is from latrines?
- Why has the producer selected this location for setting up his enterprise?
- Distance to nearest DPHE/Upazila centre?
- Is DPHE a competitor for him? If yes, how? If not, why not?
- Distance to nearest private latrine producer? Is he competing? If not, why not?
- Took up latrine production in which year?
- Where did producer learn how to construct latrine components?
- Seasonal sales pattern
  - highest sales quantity? Month?
  - lowest sales quantity? Month?
- If the credit was available?
  - would it have helped him to start with? How?
  - will it help him now? How?
- Do they sell the latrine components on installments or on the payment of full value?

- If people could buy latrine components from loan (given by some other organisation) how much will it effect the sales in quantity?

3.3 Supply Side: DPHE/Upazilas

The following data will be collected from either UNICEF/Dhaka or DPHE Headquarters for **40 randomly selected Upazila production centres, 10 in each division:**

- Actual production and sale (separate for slabs and rings) in FY 1988/89

The above mentioned information is available with the UNICEF Dhaka office.

In a randomly selected Upazila production centres (2 in each division), which will be visited, the following data will be collected:

- Production cost structure:
  - quantities and unit cost of material used for pans, slabs and rings (UNICEF materials, local materials)
  - labour cost
- production and sale of latrine components (separately for slabs and rings) since revolving fund has been established
- material (sand and "khoa") purchasing over same period
- revolving fund development (all transactions since its start in 1988)

3.4 Supply Side: NGOs

The following information should be collected at the headquarters from the selected 20 NGOs (some assisted by UNICEF set-up kits and others not assisted by UNICEF) which produce and/or distribute latrine components (on subsidised or market price) and thus play an important role in rural sanitation:

- What is the geographical range of the NGO activities in Bangladesh?
- What are the activities of the organisation beside rural sanitation?
- How does the organisation's money lending and payment system work?
- Does the organisation produce latrine components itself, does it purchase them from another supplier or do beneficiary groups construct latrines for themselves for some income generating activity?
  - if self-produced; production cost structure and components specification
  - if purchased; from whom? at what price?
- Socio-economic level of the latrine buyers (range and % in each range)
- Sales price and sales volume over the past FY
- In what ratio have slabs and rings been sold in the past?
- Has the organisation worked with alternative, lower- cost latrine technologies and materials in the past? if so, what have been their experiences? Costs?
- How and why did he set up business for sanitation products?

Annexure 3

Terms of Reference for the Phase III Mission

Based on the overall study objectives, on the preliminary findings of Phase I and on the specific objectives formulated for Phase II, the terms of reference for Phase III were formulated and include the following tasks:

- Decide upon the final output requirements from the data base prepared through the survey during Phase II. The final design of the outputs shall be determined based on indications received through the collected data.
- Analyze, verify and evaluate the results of the countrywide willingness/ability-to-pay survey conducted in the study Phase II.
- Use the outcome of the survey and the tentative conceptual proposal made by the team in May 1989 to formulate a new latrine promotion-cum-delivery strategy, which, among others, is to enhance the role of the private production sector.
- Stay in close communication with the concerned government, non-government and donor agencies when formulating the new strategy. This is necessary in order to render the strategy compatible with the institutional and socio-economic boundary conditions.
- Integrate in the new strategy elements of the current latrine delivery strategy which have proven to be effective.
- Present in the report and make inferences from intermediate results of the action R & D activities and suggest further action.

Phase3\torp3-ah

Annexure No.4

Defining the Socio-Economic Categories(SECAT)

Criteria considered:

	Weighing factor
Landownership	1
Monthly expense	1
Type of house	0.8
Assets	0.6
Biggest single expense	0.4

Value		Monthly Expense (Tk.)	Land-ownership	Type of House/ Roof	Assets	Biggest single expense	Total
"Low"	1	0-1000	< 0.5 acre	other/other			min.3.8
-do-	2	1001-1700	< 1.5 acre	kaccha/kaccha			7.
"Medium"	3	1701-2400	< 2.5 acre	kaccha or tin/ tin			11.
"High"	4	2401-3000	< 7.5 acre	pucca/tin			15.
-do-	5	> 3000	> 7.5 acre	pucca/pucca			max.1

- < 0.5 acre = "landless"
- < 1.5 acre = "marginal farmer"
- < 2.5 acre = "small farmer"
- < 7.5 acre = "medium farmer"
- > 7.5 acre = "large farmer"

Final categorization on the basis of the value (1-5) scoring and the % frequencies in the 5 sub-classes:

Value	Score	Category	% Freq.
1+2	3.8 < x < 7.6	"Low"	47%
3	7.6 < x < 11.4	"Medium"	43%
4+5	11.4 < x	"High"	10%

DATA COLLECTED FROM 37 PRIVATE PRODUCERS

Annexure No. 5

YEAR OF ESTABLISHMENT

	NO. OF PP	% OF PP
1965 to 1971	3	8.11
1972 to 1978	4	10.81
1979 to 1985	8	21.62
1986 to 1989	22	59.46

PRODUCTION UNIT SOLELY FOR LATRINE COMPONENT

	NO. OF PP	% OF PP
Yes	4	10.81
No	33	89.19

If not solely for latrine component

OTHER PRODUCTS

	NO. OF PP	% OF PP
Drainge Pipe	26	78.79
Boundary Marker	28	84.85
Vantilator	18	54.55
Tub	7	21.21
Other	13	39.39

Single producer may produce various products.

SHARE OF LATRINE COMPONENT

	NO. OF PP	% OF PP
60% or more	29	78.38
40% - upto 60%	6	16.22
Up to 40%	2	5.41

LATRINE COMP. PRODUCED (88-89)

	NO. OF PP	% OF PP
Water-seal Pan	35	94.6
R.C.C. Slab	36	97.3
F.C. Slab	6	16.22
Concrete Ring	37	100

* Two Private Producers buy Water-seal from others.

5 Private Producers make both RCC & FC Slab and all the producers make RCC slab except one producer makes only FC slab.

All producer make concrete ring.

PREMISES

	NO. OF PP	% OF PP	AVG.COST OF WORKING SHED	AVERAGE RENT
Own	20	54.05	12000	0
Rent	17	45.95	0	466

QUALITY OF REINFORCEMENT

	NO. OF PP	% OF PP
Good Qlty.,Placed properly	29	78.38
Poor rusted, Placed propri	2	5.41
Good qlty., Placed scantily	6	16.21
Poor rusted,Placed scantily	0	0

SLAB+PAN SALE PRICE OF THE COMPONENT

	NO. OF PP	% OF PP
0 to 50	1	2.7
51 to 100	2	5.41
101 to 150	19	51.35
151 to 200	10	27.02
201 to 250	1	2.7
251 to 300	2	5.41
Above 300	2	5.41

Average : Taka 174
Slab+Pan Range Taka 50 - 400

RING

	NO. OF PP	% OF PP
30 to 40	8	21.62
41 to 50	14	37.84
51 to 60	5	13.51
61 to 70	3	8.11
71 to 80	1	2.7
Above 80	6	16.22

Average : Taka 59
Ring Range Taka 30 - 100

34(91.89%) PRIVATE PRODUCERS SALE SET, WHICH COMPRISES OF ONE SLAB, ONE PAN & FIVE RINGS

SET (1+1+5)	AVERAGE	MEDIAN	RANGE
Sale Price	469	425	320 to 900

SET SALE PRICE	NO. OF PP	% OF PP
320 to 400	13	35.14
401 to 500	16	43.24
501 to 600	2	5.41
601 to 700	1	2.7
701 to 800	4	10.1
801 to 900	1	2.7

NUMBER OF UNIT SOLD MONTHLY

	AVERAGE	RANGE
Slab+Pan	17	1 to 70
Ring	101	8 to 350

QUALITY OF WATER SEAL

	NO. OF PP	% OF PP
Proper	15	40.54
Improper	22	59.46

TOTAL INVESTMENT

	NO. OF PP	% OF PP
Upto 50000	25	67.56
Above 50000	12	32.44

Range of total investment from Tk. 6000 to Tk. 210000
Median Tk. 24000

LOAN TAKEN

	NO. OF PP	% OF PP	FORMAL	NFORMAL
Yes	13	35.14	2(15.38%)	11 (84.62%)
No	24	64.86	-	-

HOME DELIVERY

	NO. OF PP	% OF PP
Yes	20	54.05
No	17	45.95

MODE OF TRANSPORTATION

	AVG.COST/MILE (TAKA)
Ox Cart	15
Van	20
Boat	30
Porter	50
Push Cart	32
Rickshaw	11

ASSIST INSTALLING

	NO. OF PP	% OF PP
Yes	20	54.05
No	17	45.95

COST OF INSTALLING

	NO. OF PP	% OF PP
No money charged	1	5
40 to 70	8	40
100 to 200	9	45
250	1	5
915*	1	5

* Including superstructure

SELECTION OF LOCATION

	NO. OF PP	% OF PP
Close to owners Residence	14	37.84
Business Centre	5	13.51
No other latrine producer	2	5.41
Mixed Reason	11	29.73
Other Reason	5	13.51

COMPETITORS

	NO. OF PP	% OF PP
Yes	16	43.24
No	21	56.76

Some of the producers faces more than one competitors within three miles of area.

LEARN TO PRODUCER LATRINE FROM

	NO. OF PP	% OF PP
Own employee	11	30.56
Work as a mason	11	30.56
Relative Business	14	38.89
DPHE	3	8.33

Some producers learnt to make latrine from more than one sources.

PERIOD OF HIGH & LOW DEMAND

	NO. OF PP	% OF PP
No answer	1	2.7
No such period	3	8.11
No idea	1	2.7
Yes	32	86.49

HIGH DEMAND SEASON

	NO. OF PP	% OF PP
Winter	24	75
Rainy	4	12.5
Dry	4	12.5

LOW DEMAND SEASON

	NO. OF PP	% OF PP
Rainy	28	87.5
Dry	4	12.5

Credit Availability

(Mainly for working capital, Tk. 300 to 300000 for variable degres of expansion).

EFFECTS ON SALE

	NO. OF PP	% OF PP
Increase	35	94.59
No increase	1	2.7
No response	1	2.7

DEMAND FOR PURCHASE OF LATRINES ON INSTALLMENT

	NO. OF PP	% OF PP
Yes	29	78.38
No	7	18.92
No Response	1	2.7

INSTALLMENT SALE

	NO. OF PP	% OF PP
Yes	13	35.14
No	24	64.86

REASON

	NO. OF PP
Economical Condition	27
Ignorance/Illiteracy/Unexposed	16
Traditional view point	5
Short life span of component	1
Transport difficulties	1
Lack of supply	1
No response	3

More than one choices are given by some producers.

WHAT ADVERTISEMENT WILL HELP ?

	NO. OF PP
Door to door	12
Radio	7
Cenema *	3
Sign Board	19
Leaflets	21
Drum beating	5
Nothing would help	3

* People consider cinema as an expensive alternative.
(people are not exposed to video)

RESOURCES USED

WATER SEAL PAN	AVERAGE	RANGE(L)	RANGE(H)
Cement (kg)	3.82	2	7.5
Reinforcement (kg)	0.47	0.13	1.1

RCC SLAB	AVERAGE	RANGE(L)	RANGE(H)
Cement (kg)	5.48	2.33	8.5
Reinforcement (kg)	1.63	0.16	4.8

FC SLAB	AVERAGE	RANGE(L)	RANGE(H)
Cement (kg)	7.48	5.68	9.1
Reinforcement (kg)	2.75	0.5	6

CONCRETE RING	AVERAGE	RANGE(L)	RANGE(H)
Cement (kg)	5.62	4.1	8
Reinforcement (kg)	0.52	0.03	3

COST LIST	AVERAGE	RANGE(L)	RANGE(H)
Cement (kg)	3.31	3	3.6
Koha (cft)	13.39	2	20
Sand (cft)	3.72	1	10
MS rod (kg)	23	13	50
MS wire	32.77	20	50
Wire mesh	27.29	10	60

OVER HEAD COST (TK.)	AVERAGE	RANGE(L)	RANGE(H)
Monthly rent	466	42	1000
Cpos of working shed	12000	500	51000
Tools	11600	500	70000
Other repair	5312	100	90000

LOAN REQUIRED

	MEDIAN	RANGE(L)	RANGE(H)
Working capital	10000	550	150000
Fixed capital	18000	5000	160000

(Q-5): Head Quarter Information, DPHE

Annexure No. 6

Sl. No.	Name of Division	Name of Upazila	No. of Production			No. of Sale		
			Pan	Slab	Ring	Pan	Slab	Ring
1		Dhaka Sadar	377	377	1206	168	168	376
2		Manikganj	407	407	1097	206	206	713
3	Dhaka	Shibalay	233	233	1119	174	174	964
4		Daulatpur	312	312	1222	159	159	914
5		Joydebpur	84	84	221	23	23	97
6		Shreepur	200	200	469	167	167	456
7		Tangail	571	571	1529	190	190	867
8		Bashil	601	601	1408	400	400	1270
9		Monohardi	537	537	975	240	240	691
10		Shibpur	449	449	709	208	208	587
1		Comilla Sadar	308	308	942	277	277	755
2		Chandina	299	299	634	118	118	459
3		Daudkandi	267	267	785	148	148	716
4		Sharail	333	333	828	72	72	186
5	Chittagong	Nirocjamg	165	165	667	86	86	326
6		Chowddagram	368	368	1318	329	329	1308
7		Habiganj	195	195	726	147	147	544
8		Madhabpur	123	123	532	60	60	286
9		Maulavibazar	315	315	1180	95	95	822
10		Brahmanbaria	400	400	1105	179	179	378
1		Punchagarh	466	466	1554	298	298	1492
2		Thakurgaon	308	308	933	303	303	927
3		Nawabganj	560	560	1556	244	244	989
4		Rajshahi	495	495	1466	249	249	1021
5	Rajshahi	Puthia	563	563	1363	143	143	415
6		Galbandha	428	428	993	208	208	743
7		Gangachhara	226	226	734	131	131	614
8		Mithapukur	203	203	631	120	120	589
9		Fulbari	225	225	972	125	125	510
10		Birganj	308	308	1728	163	163	879
1		Gournadi	525	525	1240	453	453	1164
2		Bakergonj	466	466	1290	346	346	1273
3		Dumuria	308	308	657	297	297	654
4		Daulatpur	450	450	477	175	175	447
5	Khulna	Jessore Sadar	468	468	1324	332	332	1210
6		Jhikorgachha	617	617	1786	418	418	1617
7		Jhinaidah	267	267	1126	184	184	823
8		Kumarkhali	334	334	925	127	127	642
9		Bheramara	243	243	1151	214	214	828
10		Alamdanga	463	463	1483	338	338	1114
		Average:		362	1043			

sdc*40dpcntr

Remarks on the survey of NGOs by HCL

Sl. #	Name and Address Originally supplied by UNICEF/Interchain	# Visits	Remarks			
			Information Collected	Not Co-operated	Address Changed	Address not found
1.	Save the Children (USA) House #33A, Road #9/A Dhanmondi R/A, Dhaka	3	Y	-	-	-
2.	Technical Assistance for Rural Development (TARD) 21/9, Babar Road Mohammadpur, Dhaka-7	3	Y	-	1/15 Humayun Road Block B Dhaka-1207	-
3.	Terre-Des-Homes Road #11, House #670A Dhanmondi R/A, Dhaka	3	Y	-	-	-
4.	Rotary Club of Ramna & Dhaka House #68A, Road #5 DOHS, Banani, Dhaka	1	-	-	-	Y
5.	Service Civil International 59, Lake Circus Kalabagan Dhaka	5	Y	-	5/5 Iqbal Road Block A Mohammadpur Dhaka-1207	-
6.	For Those who have Less House #47, Road #16 Banani Dhaka	2	Y	-	5/8 Block C Lalmatia Dhaka	-
7.	Bangladesh Jatio Kallayan Samity Awlia Nagar, P.O.: Jhitkanagar Dhaka	1	-	Y	-	-
8.	CONCERN for Mirpur Settlement Project House # 63, Road #15A Dhanmondi R/A Dhaka	4	-	Y	-	-
9.	Centre for Mass Education in Science 57/C Adad Avenue Dhaka	1	Y	-	-	-

Sl.	Name and Address Originally supplied by UNICEF/Interchain	# Visits	Remarks			
			Information Collected	Not Co-operated	Address Changed	Address not found
10.	Save the Children (Australia)	2	Y	-	-	-
11.	Grameen Bank H.O. Mirpur-2 Dhaka	5	Y	-	-	-
12.	BARC Karnipura (Bus Terminal) Rangpur	1	Y	-	-	-
13.	Family Planning Association of Bangladesh Barisal	1	Y	-	-	-
14.	Bangladesh Unemployment Rehabilitation Organisation Natippara Bazar Delduar, Tangail	1	-	Y	-	-
15.	Community Development Char Alexander Rangati, Noakhali	1*				
16.	Sipnugul Mahila Samity Bishnupur, Gaibandha	1	-	Y	-	-
17.	Voluntary Paribar Association Kaibari, Faridpur	1	-	Y	-	-
18.	Comilla Proshika Centre for Development House #12, Road #12 Dhanmondi R/A, Dhaka	1	Y	-	-	-
19.	Dwip Unnayan Sangstha Chowrangibazar, Hatia	1*				
20.	Banchte Shekha Binaw Bandar Sarak Puraton Kashba Jessore	1	-	Y	-	-

Sl.	Name and Address Originally supplied by UNICEF/Interchain	# Visits	Remarks: Information Collected	Not Co-operated	Address Changed	Address not found
21.	RDRS (Rangpur Dinajpur Rural Service) House #62, Road #7A Dhanmondi R/A, Dhaka	1***				

Information Collected from Additional NGOs by HCL

1.	Gano Unnayan Prochesta 10/10 Iqbal Road Block A Mohammadpur, Dhaka	2	Y	-	-	-
2.	Forum for Drinking Water Supply & Sanitation	2	Y	-	-	-
3.	V. S. O. 8/13, Sir Sayed Road Mohammadpur, Dhaka	1**				

Note : Y = Yes

\- = To be completed

** = Not related with sanitation programme

*** = Informatin is not maintained in H/O

SURVEY DATA COLLECTED FROM NGOs

Annexure No. 8

Sl. No.	Name	Address	Geographical Area of Activities	Credit System for Benef.	Number of Client	Assd. by JMCEP	No. of latrine Unit Produced (88 - 89)		Purch. Latr. Compn.	Amount Lent	Amount Recovered	Recovery %	Why this Activity?
							Slab+Pan	Ring					
1	Grameen Bank	Mirpur-2 Dhaka Phone:801362	Dhaka, Tangail, Rangpur, Bogra, Patukhali, (35 spots)	Yes	12764	Yes	14238	59780	No	6332325	N/A		To make available of Samiary Latrine to the members & rural people at lower cost.
2	Bangladesh Rural Advancement Committee	66, Mohakhali Dhaka-1212 Phone:600161-4	Uttam, Horidevpur, Rajendrapur, Greater Rangpur Dist.	Yes	182	Yes	80	354	No	45995	39228	85 29	This NGO entred this business because DPHE cannot meet the demand.
3	Family Planning Association of Bangladesh	2, Nayapaltan Dhaka-1000 Phone: 416134-36	Karapur Union Sadar Upazila Barisal	Yes	2	Yes	60	300	No	10000	4000	40.00	To increase involvement of youth, women, disadvantageous & other specific group of Committee Units.
4	Save the Children(Aust.)	House # 97 Road # 11A DRA, Ph.:328324	Jamalpur Union Rajbari Dist.	No	N/A	Yes	Purchased from other NGOs		Yes				As a part of an MCH programme & relief activity.
5	Terre-Des-Hommes Netherland	House # 670/A, Road # 11(New) Dhanmondi R/A	Boamonia Upazila Burapal Upazila	No	N/A	Yes	106	543	No				To promote good personal & environmental hygine in prevention & control of diarrhoeal diseases.
6	For Those Who Have Less	5/8 Block C, Lalmatia Dhaka-1207 Phone: 317403	Tangail, Shakhipur Upazila	No	N/A	Yes	343	1715	No				To promote the overall health status of the people of Shakipur upazila (Tangail District).
7	Save the Children (USA)	House # 33A Road # 9A DRA, Ph.:317454	Kunda Brahamanbaria	No	N/A	Yes	35	175	No				To improve the quality of the sanitation in the area and make people aware of healthy environment of sanitation.
8	Centre for Mass Education in Science	37/C Asad Ave. Mohammadpur Dhaka	Sripur, Gazipur, Tangail, Sutbaria, Chittagong, Rangpur	No	N/A	Yes	1000	5000	No				Non-profit organization to develop rural community.
9	Gono Unnayan Prochesta	4/5 Iqbal Road Block A Mohammadpur Dhaka	Rawjon, Madaripur Shibpur	No	N/A	No	Purchase from Private Producer		Yes				Demand in the area where this NGO located is too high and the DPHE centre cannot supply according to the demand.
10	Technical Assistance for Rural Development	Anandapur, Savar Dhaka, Phone:149	Singair Upazila, Manikgonj	No	N/A	Yes	63	390	No				View to uplift the socio-economic status of below subsistance level people of the Community Health & Sanitation is one of the priorities.
11	NGO Forum for Drinking Water Supply & Samta.	3/14 Block E. Lalmadi, Dhaka Phone: 327424, 316184	Through out the Country (80 centres)	No	N/A	No	50386	251930	No				N/A
12	Service Civil Internation	5/5 Iqbal Road Dhaka, Phone:313623	Barabaadia Union	Yes	80	Yes	66	330	No	19560	13745	70.27	To implement primary health care.
13	Comilla Proshika Centre for Development	House # 12 Road # 12 Dhanmondi R/A Dhaka Phone:323088	Raozan, Patiya, Boalkhali, Sarail, Kaenua, Chandina, Chouddagram (8 centres)	Yes	5238	Yes	5328	26640	No	151732	147202	97.01	Ensure the health of targeted people.

Annexure 9A

Phase III Schedule of Activities, Persons Met and Main Documents Used 12 March - 11 June 1990

12 March:	Arrival of Martin Strauss, SDC consultant briefing with Dr. Chadha.
13 March:	Holiday; document reading
14 March:	Preparation of work plan; document reading
15 March:	Meetings at UNICEF (Mr. Azad and Mujtaba) and SDC (Dr. Heierli and Mr. Barua); analysis of survey data.
16-17 March:	Design of output formats and data analysis
18 March:	Meeting with HCL, the local survey consultants
19 March:	Briefing, discussions and demonstrations on Action Research at the Mohakhali Training Centre, Dhaka
20-23 March:	Data analysis; report writing
24-25 March:	Visit to Noakhali District, Chittagong Division, to assess experiences made with mobile sale and mobile production of latrines; Meeting with Dr. Heierli, SDC; report writing.
26 March:	Report writing
27 March:	Meeting with Chief Engineer DPHE, report writing
28 March:	Data analysis and report writing
29 March:	Briefing by Martin Strauss at SDC, demonstration on special ring production, Mohakhali, Dhaka, report writing
30-31 March:	Data processing; report writing
1 April.	Departure M. Strauss
18 April:	Meeting with Mr. J. Skoda, Co-ordinator, WES, UNICEF
8 May.	Meeting with Cole Dodge, Resident Representative and Mr. J. Skoda, WES, UNICEF

5 June:	Discussion with UNICEF, DPHE, WHO staff on Action Research and start of testing procedures for rings.
May:	Number of meetings with BUET staff
March-June:	Action Research Work
March-June:	Report writing

Annexure 9B

Persons Met

DPHE-Headquarters

Mr. M.A. Karim, Chief Engineer
Mr. A.B. Siddique, Superintending Engineer Planning
Mr. Rezaul Karim, Executive Engineer, Programme and Coordination
Mr. Mafuzzul Haque, XEN
Mr. Ahsan Rahman, AEN
Mr. Abdur Rahman, Assistant Engineer, VS-I
Mr. Mustafizur Rahman, SAE

DPHE-Noakhali

Mr. Kazi Khaja Baksh, Executive Engineer
Mr. Mohammed Mofiz Ullah, Sub-Divisional Engineer
Mr. Abdur Razzaq, Sub-Assistant Engineer

UNICEF

Mr. Cole Dodge, Resident Representative
Mr. John Skoda, Coordinator WES - April, 1990
Mr. A.S. Azad, Acting Coordinator WES
Mr. Taufique Mujtaba, Project Officer WES
Mr. Keith Mackenzie, Project Officer WES
Mr. Andrew Sayles, Project Officer WES
Mr. Jahangir Kabir, Assistant Programme Officer WES
Mr. Shahid Khan, Communication Officer, Chittagong
Mr. Habibul Islam, Field Officer, Chittagong

WHO

Mr. Mofazzal Haque

SDC

Dr. Urs Heierli, Head and Programme Coordinator
Mr Anish Barua, Senior Programme Officer

HCL

Dr. Sayeedul Huq, President
Mr. Mamunur Rashid, Survey Supervisor

Bangladesh University of Engineering and Technology

Dr. Jamilur R Chowdhury, Head of Civil Engineering Department
Dr. M Feroz Ahmed, Professor
Mr. A F M Abdur Rauf, Associate Professor
Dr. Habibur Rahman, Associate Professor

Freelance

Mr. Habibur Rahman (Ex-DPHE Officer)

Work Assistance in Bangladesh provided by:

Interchain Project Consultants AB

Mr. A.J.M. Shamsuddin, Project Executive Engineer (Action Research).
Mr. A.K.M. Rabiul Islam, Project Superintending Engineer
Mr. Nazmul Khan, Programmer
Mr. Reshad Khan, Project Officer (Survey work)
Mr. Rosemin Nazerali, Executive Secretary
Mr. Mohammad A. Hasib, Data Entry Operator

Annexure 9C

Documents Used

- Schertenleib, R., Strauss, M., Chadha, S. (1989). **Promotion of Sanitation in Bangladesh through the Private Sector.** Interim Report of Exploratory Mission, April/May 1989, for SDC, UNICEF and DPHE.
- Munch-Petersen, N.F. (1989). **Low Cost Sanitation in Bangladesh as Related to the Low Cost Sanitation Project (BGD/85/004) Covering 84 Pourashavas.** Hoff & Overgaard a/s, Copenhagen, July.
- Abdullah, T., Boot, M. (1989). **Progress Review of the Integrated Approach (IA), Rural Water Supply and Sanitation Programme, Bangladesh.** For DANIDA, UNICEF and DPHE.
- DPHE, WHO, UNICEF (1989). **Mid-Term Evaluation of Village Sanitation Scheme Phase III, Bangladesh,December.**
- Joint SDC/DANIDA Mission (January-March, 1990) (Jensen, Hvam, Daw, Walther & Chadha) **Review Report on Rural Water Supply & Sanitation Programme.**