APPENDICES OF

INFORMATION DOCUMENT

ON

CONVERSION OF DRY LATRINES, CONSTRUCTION OF POUR-FLUSH LATRINES, REHABILITATION OF SCAVENGERS, AND COMMUNITY AND PUBLIC TOILETS IN INDIA

Developed in the context of the Appraisal of the KfW-supported HUDCO -V Sanitation Project

The Hague
December 1993

APPENDICES

1. Sanitation Coverage figures 1981 and 1985. from Midterm Review of Decade Programme, Ministry of Urban Development, New Delhi, 1985

2. Evaluation Study of Low Cost Sanitation Programme in Madhya Pradesh 1991 by HUDCO

3. Operation and Maintenance of Sanitation Systems in Urban Low-Income Areas in India and Thailand, by HSMI et al (1993)

4. 'Environmental Classification of infections' and 'Ranking of excreta disposal technologies by ease of O&M, water needs and health benefits' from Feachem et al. 1983

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6. Evaluation Study of Low Cost Sanitation Programme in West Bengal 1990 by HUDCO

7. Guidelines for Integrated Scheme of Low Cost Sanitation for Liberation of Scavengers, by HUDCO

8. Latrine cost figure from Kanpur Mirzapur Under Ganga Action Plan (1988)

9.a Evaluation Study of Low Cost Sanitation Programme in Andrah Pradesh 1990 by HUDCO

9.b Evaluation Study of Low Cost Sanitation Programme in Maharashtra 1990 by HUDCO

10. 'Discussion points and recommendations' from Seminar on O&M of sanitation systems for low-income areas, IHS et al. 1993

11. Proceedings of Concluding Seminar on O&M aspects of sanitation systems in low-income shelter areas, HSMI/HUDCO New Delhi 1992

12. An alternative pit latrine emptying system, by Muller et al. (1993)

13.a 'Findings, comments and Conclusions and recommendations' of Use and Maintenance of LCS facilities study of Srinagar city; by Sarma et al. (1989)

13.b 'Findings, comments and Conclusions and recommendations' of Use and Maintenance of LCS facilities study of Malkapur; by Sarma et al. (1989)

14. parts from Evaluation of Sanitation ... Sinha and Gosh 1991

15. Abstracts of eight non-Indian publications relevant for this subject.

APPENDIX 1

SANITATION COVERAGE FIGURES 1981 AND 1985. FROM MIDTERM REVIEW OF DECADE PROGRAMME, MINISTRY OF URBAN DEVELOPMENT, NEW DELHI, 1985

Appendix 1

from : Water Supply & Sanitation in India BIJLANI & RAO
Sanitation Coverage

3

ACCESS TO SANITARY MEANS OF HUMAN EXCRETA DISPOSAL

Extent of Population Coverage

A preliminary idea of the extent to which people have access to sanitary means of human and other waste disposal in urban and rural areas could be obtained from Table 3.1. While in 1981, only 25.1 per cent of the urban population were covered, the situation improved marginally to 28.4 per cent by 1985. The improvement was of a similar nature

Table 3.1 Total Sanitation Coverage in India: 1981 and 1985

	Population served (in million)				
	1981		1985		
Category	Population	%	Population	%	Difference 1981-1985 +/- %
Sanitation					
Urban	40.03	25.1	49.56	28.4	+ 3.3
Rural	2.80	0.5	4.03	0.72	+ 0.22
Total	42.83	6.3	53.59	7.3	+ 1.0

Source: Government of India, Ministry of Urban Development, Mid-term Review of Decade Programme, The Ministry, New Delhi, 1985.

Table 3.2 State-wise Urban Sanitation Coverage in India· 1981 and 1985

(Population & Coverage in 000's)

State/UT	1981 (Census)			1985			Difference 1981–1985 +/–
	Urban population	Population coverage	%	Urban population	Population coverage	%	%
1. Andhra Pradesh	12,488	1,400	11.2	13,638	1,484	10.9	- 0.3
2. Assam	2,047	300	14.7	2,347	369	15.7	+ 1.02
3. Bihar	8,719	1,740	20.0	9,669	2,213	22.9	+ 2.9
4. Gujarat	10,602	4,370	41.2	11,602	4,408	38.0	+ 3.2
5. Haryana	2,827	350	12.4	3,097	879	28.4	+ 16.0
6. Himachal Pradesh	326	50	15.4	366	50	13.7	- 1.7
7. Jammu & Kashmir	1,260	100	8.0	1,420	110	7.7	- 0.3
8. Karnataka	10,730	3,620	33.7	11,740	4,506	38.4	+ 4.6
9. Kerala	4,771	300	6.3	5,271	1,485	28.2	+ 21.9
10. Madhya Pradesh	10,586	540	5.1	11,896	929	7.8	+ 2.7
11. Maharashtra	21,993	8,420	38.3	24,164	9,602	39.8	+ 1.5
12. Manipur	375	—	—	505	4	0.8	+ 0.8
13. Meghalaya	241	—	—	271	—	—	—

14. Nagaland	120	—	—	150	—	—	—
15. Orissa	31.10	290	9.3	3,480	328	9.5	+ 0.2
16. Punjab	4,648	1,640	35.3	5,078	2,461	48.5	+ 13.2
17. Rajasthan	7,210	300	4.2	7,250	695	9.6	+ 5.4
18. Sikkim	52	—	—	82	27	32.9	+ 32.9
19. Tamil Nadu	15,952	7,400	46.4	17,302	8,217	47.5	+ 1.10
20. Tripura	226	10	4.4	266	35	13.2	+ 8.8
21. Uttar Pradesh	19,899	2,560	12.9	21,329	2,990	14.1	+ 1.2
22. West Bengal	14,447	2,240	15.5	15,167	2,948	10.5	+ 4.0
23. A & N Islands	50	20	40.0	60	33	55.0	+15.0
24. Arunachal Pradesh	42	20	47.6	52	20	38.5	- 9.1
25. Chandigarh	510	480	94.1	563	563	100.0	+ 5.9
26. Delhi	5,768	,700	64.2	6,818	5,000	73.4	+ 1.2
27. Dadra & Nagar Haveli	7	—	—	17	—	—	—
28. Goa, Daman & Diu	352	60	17.1	452	60	13.3	- 3.8
29. Lakshadweep	19	—	—	21	—	—	—
30. Mizoram	122	—	—	132	2	1.5	+ 1.5
31. Pondicherry	316	120	38.0	346	138	39.9	+ 1.9
Total India	1,59,728	40,030	25.1	1,74,551	49,556	28.4	+ 3.3

Source: Government of India, Ministry of Urban Development, Mid-term Review of Decade Programme, The Ministry, New Delhi, 1985.

ANNEXURE I

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE
STATUS OF URBAN WATER SUPPLY AND SANITATION
POPULATION COVERAGE AS ON 31ST MARCH 1981, 85, 86-87 & 88

(POPULATION : '000)

Sl. No.	Name of State/UT	Coverage as on March 1986				Popln. as on March 1987	Coverage as on March 1987				Proj. Popln. as on March 1988	Coverage as on March 1988			
		Water Supply		Sanitation			Water Supply		Sanitation			Water Supply		Sanitation	
		Popln.	%	Popln.	%		Popln.	%	Popln.	%		Popln	%	Popln.	%
1	2	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1.	Andhra Pradesh	7127	60.14	872	7.358	121.50	7127	58.65	1050	8.641	12450	8210	65.94	1412	11.34
	Hyderabad	2440	100	1550	63.52	2500	2500	100	1550	62	2560	2560	100	1588	62.03
	TOTAL - A.P.										15010	10770	71.75	3000	19.98
2.	Arunachal Pradesh$	120	100	120	100	120	120	100	120	100	130	130	100	117	90
3.	Assam*	881	37.53	369	15.72	2347	881	37.53	369	15.72	2347	881	37.53	369	15.72
4.	Bihar	61.48	63.58	3713	38.40	11538	7693	66.67	4412	38.23	12011	8381	69.77	4660	38.79
5.	Goa$	370	79.91	110	23.75	480	391	81.45	136	28.33	480	400	83.33	138	28.75
6.	Gujarat	11967	93.36	10067	78.53	13146	12272	93.35	10415	79.22	13482	12386	91.87	104507	77.51
7.	Haryana?	3153	100	1004	31.84	3211	3211	100	1135	35.34	3270	3270	100	3270	100
8.	Himachal Pradesh	381	100	73	19.16	393	381	96.94	73	18.57	405	405	100	88	21.72
9.	Jammu & Kashmir	1478	94.98	111	7.133	1615	1534	94.98	111	6.873	1674	1600	95.57	118	7.048
10.	Karnataka	12090	94.88	7132	55.97	13319	12580	94.45	7628	57.27	9774	9720	99.44	5105	52.23
	Bangalore										4035	4035	100	2793	69.21
	TOTAL KARNATAKA										13809	13755	99.60	7898	57.19
11.	Kerala -	3440	63.81	1600	29.67	5495	3606	65.62	1627	29.60	5600	3820	68.21	1780	31.78
12.	Madhya Pradesh	9740	80.00	1152	9.462	12478	10043	80.48	1214	9.729	14716	11920	81.00	1520	10.32
13.	Maharashtra	22810	89.98	10140	40	26027	25951	99.70	16196	62.22	16900	16822	99.53	8943	52.91
	Bombay										9800	9800	100	7720	78.77
	TOTAL MAHARASHTRA										26700	26622	99.70	16663	62.40

1	2	14	15	16	17	18	19	20	21	22	23	24	25	26	27
14.	Manipur	400	75.47	50	9.433	556	400	71.94	50	8.992	584	400	68.49	50	8.561
15.	Meghalaya	54	19.35	60	21.50	287	142	49.47	60	20.90	296	142	47.97	63	21.28
16.	Mizoram	24.5	8.18	2	1.515	140	26	18.57	2	1.428	147	27	18.36	3	2.040
17.	Nagaland	70	45.66		0	161	70	43.47	10	6.211	161	70	43.47	10	6.211
18.	Orissa	1326	37.11	959	26.84	3573	1326	37.11	959	26.84	4602	1700	37.80	1555	33.78
19.	Punjab	3701	71.28	2651	51.05	5308	3778	71.17	2709	51.03	5427	3863	71.18	2842	52.36
20.	Rajasthan	4055	56.06	695	9.586	7667	4181	54.53	695	9.064	8352	8235	98.59	6366	76.22
21.	Sikkim	96	69.56	37	26.81	146	98	67.12	38	26.02	150	104	69.33	50	33.33
22.	Tamil Nadu (Including Madras)	15151	86.66	8217	47.00	17604	15534	88.24	8344	47.39	17710	15676	88.51	8463	47.78
23.	Tripura	183	53.19	39	11.33	344	183	53.19	39	11.33	344	183	53.19	39	11.33
24.	Uttar Pradesh	15029	69.29	3034	13.98	21687	15087	69.56	3047	14.04	21687	15087	69.56	3047	14.04
25.	West Bengal	10800	67.16	6351	39.49	5750	2578	44.83	995	17.30	5853	2718	46.43	1011	17.27
	Calcutta					10471	8500	81.17	4191	40.02	10540	8650	82.06	4256	40.37
	TOTAL W.BENGAL					16221	11078	68.29	5186	31.97	16393	11368	69.34	5267	32.12
	TOTAL FOR STATES	133044	76.77	60108	34.68	178513	140193	78.53	67175	37.63	185487	151235	81.53	77826	41.95
	UNION TERRITORIES														
26.	A. & N. Islands	69	100	69	100	69	69	100	69	100	80	80	100	80	100
27.	Chandigarh	581	100	581	100	613	613	100	613	100	655	655	100	655	100
28.	D & N Haveli	13	76.47	7	41.17	19	14	73.68	7	36.84	19	16	84.21	7	36.84
29.	Daman & Diu														
30.	Delhi	6690	97.08	5595	81.19	7166	6950	96.98	6195	86.44	7453	7242	97.16	6500	87.21
31.	Lakshadweep														
32.	Pondicherry	363	100	140	38.56	373	373	100	144	38.40	381	381	100	148	38.84
	TOTAL FOR U.Ts.	7716	97.41	6392	80.69	8240	8019	97.31	7028	85.99	8588	8374	97.50	7390	86.05
	GRAND TOTAL	140760	77.67	66500	36.69	186753	148212	79.36	7420	39.73	194075	159609	82.24	85216	43.90

APPENDIX 2

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME IN MADHYA PRADESH 1991 BY HUDCO

Appendix 2

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME

MADHYA PRADESH

MAY, 1991

URBAN INFRASTRUCTURE FINANCE WING
HOUSING & URBAN DEVELOPMENT CORPORATION
AND
INDIAN HUMAN SETTLEMENT PROGRAMME
HUMAN SETTLEMENT MANAGEMENT INSTITUTE
NEW DELHI

The evaluation study was done by the Sulabh International for Urban Infrastructure Finance Wing (UIFW), HUDCO

The study was however summerised by Shri G R Viswanathan and Shri D Ravi Shankar of UIFW, HUDCO, New Delhi.

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CONTENTS

Town Profile : Four towns namely Balaghat, Dewas, Durg and Sarni were selected in Madhya Pradesh. Population of these towns various from 60,000 in Sarni to 1,66,790 in Durg.

1 LOW COST SANITATION IN MADHYA PRADESH

Madhya Pradesh is the largest State of India occupying about one sixth area of the Country. Temperatures are generally 43 degree to 47.5 degree celcius in summer (April-June) and 7 degree to 9 degree in winter (December to February). Average rainfall ranges from 700 mm to 1,600 mm. As per 1981 census, 20% population was urban. About 4% state population comprise of Scheduled Caste and about 23% Scheduled Tribes. The average population density was 118 persons per sq. km. Literacy level in MP is low, in 1981 it was 21.22% in rural and 54.02% in urban area. As per the "Report of The Task Force" published by Planning Commission the no. of dry latrines as per 1981 census in MP is 1,00,380 and no. of scavengers involved is about 74,000.

The Technology Advisory Group (India) of the World Bank prepared a Feasibility Study Report on Low Cost Sanitation in 15 towns of Madhya Pradesh in May 1984.

The feasibility study set the ball rolling for taking up the programme in the State for converting bucket or dry laterines to PF water seal units and construction of new toilets in houses where none exists, if feasible.

Under this feasiblility study, about 100 demonstration units were put up in each study town; a few towns did not instal these units; one of such towns was Durg. Beneficiaries were given 50% loan and 50% grant to meet the full cost of PF latrine upto substructure level out of State Plan budget.

Low cost sanitation was one of the components in the World Bank assisted Madhya Pradesh Urban Development Project which covered 6 cities of the State (Bhilai, Dewas, Durg, Indore, Raipur and Ujjain), of which Dewas and Durg are included in the 4 towns selected for evaluation study. Under this project Rs. 203.50 lakhs were utilised on construction of 16,382 PF latrines in 6 towns and Rs. 3.40 lakhs on construction of one community latrine at Bhilai.

The average unit cost upto substructure level was Rs. 1,200. Each beneficiary was given Rs. 600 as grant and Rs. 600 as loan at 12% interest with 20 years repayment period. The World Bank had originally envisaged to give 100% loan but when the programme could bot take off, the financing pattern was changed to 50% grant and 50% loan. For the construction of community latrine, the full cost was covered by 100% loan to the local authority.

Superstructure over the latrine was to be provided by the beneficiary himself. It has been reported that majority of the beneficiaries did not construct the superstructure for want of funds, hence the latrines could not be used.

The Secretary, Local Self Government, Govt. of MP is the administrative head for this programme. Madhya Pradesh Slum Clearance Board has been nominated by the State Government as the nodal agency for channelling the subsidy provided by the Govt. of India and HUDCO loan for the integrated scheme of low cost sanitation for liberation of scavengers. The local authorities are responsible for implementing the programme under the supervision and control of the Director of Municipal Administration, Govt. of MP Almost all local authorities are getting the programme implemented through Sulabh International, a non-government organisation after entering into agreement with it.

Sulabh International is the main implementing agency for eradication of scavenging in Madhya Pradesh. Till to date it has converted/constructed 1,82,021 PF latrines in 188 towns.

By and large community latrines are maintained by the local authorities. After observing that the local authorities are not in a position to maintain them properly, now almost all the new community latrines are being constructed, operated and maintained by Sulabh International. Most of them are 'pay and use' type where every user except women and children has to pay a fixed charge and the local authority has not to pay anything to Sulabh to meet the operation and maintenance except the electricity and water charges. The other type is where the local authority charges the user ranging from Rs. 1 to 4 per family per month and fixed operation and maintenance charges are paid to Sulabh International. Third use is free and the local authority pays the operation and maintenance cost from its own budget. The payment made to Sulabh is Rs. 2,500 to 3,000 per community latrine. At present Sulabh is operating and maintaining 150 community latrines (Sulabh Complexes) in 37 towns in the State and many are under construction.

The number of scavengers relieved of scavenging in the State was not readily available. Since in most of the towns, the scavenging is done by the municipality employed scavengers, no problem of their rehabilitation has been faced. They are diverted by the local authority on other jobs like road and drain cleaning.

II. HOUSEHOLD LATRINES

1. Balaghat

Balaghat is the district headquarter and has a railway station on metre-gauge line. As per 1981 census, the population of the town was 49,561 with 7,905 households. The present population is reported to be nearly 62,000 with about 11,000 households. The town has piped water supply and is electrified. The town has no under ground sewerage system.

The municipality does not have a reliable data on status of latrines in the households. However, it reported that 818 households have water flush toilets connected to septic tanks and 816 two pit PF latrines. 345 houses have bucket or dry latrines and the remaining houses do not have latrines of any type. The scavenging is done by the municipal scavengers. Human excreta after collection is transported to trenching ground by tankers for composting with solid waste. In many houses surveyed 5/6 user capacity standard pits were constructed irrespective of the number of users in the house. Combined rectangular pits were provided. The NGO did not give any guarantee period for removal of construction defects if observed later. The municipality has also not set up a complaint cell where the beneficiaries could register their complaints. It is also not providing pit cleaning service to the beneficiaries. However, on request, it desludges the pit and charges Rs. 75.

Loan is being recovered from the beneficiaries. In 1986-87, Rs. 10,258, in 1987-88 Rs. 50,013 and in 1988-89 Rs. 79,300 were recovered. But in 1989-90, recovery came down to Rs. 33,419. Out of 800 households who had taken loan, 93 are defaulters. For loan recovery and billings etc. no additional staff has been engaged.

2. Dewas

Dewas is the district headquarter and lies on Agra-Bombay national highway at a distance of 37 km from Indore.

The Municipal Corporation does not have records to indicate the status of latrines in the town but it was reported that the number of pokes privies was 3,630 before the scavenging free scheme was taken up.

Schemes for eradication of scavenging was taken up in the town in 1989 with the assistance from the Ministry of Welfare, Govt. of India. The project was prepared by the Municipal Corporation and envisages conversion of 3,630 insanitary latrines. The project was implemented by constructing out of the grant (Rs. 21.78 lakh - 50% of the project cost) provided by the Welfare Ministry. The loan portion has not yet been made available to the local authority, hence the work has been stopped after completing 50% work.

The motivation and sanitation education were done by Sulabh International in the scavenging free scheme. In other programmes where the construction was done by contractors, the municipal staff did it. The NGO has given 2 year guarantee to rectify construction defects. The contractors did not give any such guarantee.

Recovery of loans advanced under various schemes has not yet been started.

3. Durg

Durg is the district headquarter at a distance of nearly 40 km from Raipur. Scavenging is done by the municipality employed scavengers.

Durg was included in 15 towns for which feasibility study on low cost sanitation was carried out by the Technology Advisory Group of the World Bank.

Sulabh International implemented the above project and has converted till date 2,653 bucket latrines utilising the full funds released so far. It charged 20% implementation charge. PF latrines with combined rectangualr pits of uniform size have been constructed, but in houses where number of users is large two latrines have been provided. Motivation and publicity were done through hand bills, newspapers and house to house contact. Sulabh educated the beneficiaries on use and maintenance of latrines and gave 5 years guarantee for removal of construction defects if noticed during this period.

At present no work is going on under this project due to want of funds.

Complaint cell has been set up in the municipal office under the control of Health Officer, where the complaints are registered and attended to as early as possible. Pit desludging service is also provided to the latrine adopters at a fixed charge of Rs. 80 per pit.

The bills for loan recovery are not sent regularly. The local authority has not engaged additional staff for loan recovery. The existing revenue staff carries out this job also.

4. Sarni

Sarni town is located in district Betul at a distance of about 175 km from Bhopal and 60 km from Betul.

The municipality has not set up a complaint cell to attend the complaint of beneficiaries. However it provides pit or septic tank cleaning service. A contractor is appointed to carry out this job by inviting tenders. The present rate is Rs. 70 per pit or septic tank.

Out of 135 beneficiaries, only one household has paid the loan dues in full, where as 59 have made partial payments and 75 have not paid any dues. In 1988-89, only Rs. 500 were recovered.

III. COMMUNITY LATRINES

Balaghat

There are 8 community latrines with 8 to 23 seats in each in Balaghat. All of them are operated and maintained by the municipality. None of them is of 'pay and use' type. All the latrines are water flush connected to septic tanks, some of them have soak pits for the disposal of effluent from the septic tanks but in most of the cases the effluent is discharged in open surface drains. it was reported that one sweeper is deputed on each community latrine, who remains on duty from 5 am to 1 pm. None of the latrines is electrified. At some of them even water connection is not there. The sweeper is expected to fill the surface tanks from nearby public stnad posts, hand pumps or wells.

Dewas

There are two 'pay and use' type community latrines in the town and one more is under construction. These were constructed by Sulabh International and the same organisation is operating and maintaining them. Users are charged 20 paise per use; the women, children and disabled persons are not charged. Use of urinals is free to all. All other community latrines are maintained by the Municipal Corporation. The users are not charged. All the latrines are waterflush connected to septic tanks.

Durg

There are 17 community latrines in the town; 13 of them are operated and maintained by the Municipal Corporation and the remaining 4 by Sulabh International.

Sulabh International operated the three complexes on 'pay and use' system, while one at Shopara Bajrang Nagar is 'non pay and use' type. The users are not charged at Shopara but the Municiapl Corporation pays Rs. 2500 per month to Sulabh for operating and maintaining it.

Sarni

There are no community latrines in the town.

MAINTENANCE OF COMMUNITY LATRINES

Study was carried out in Dewas and Durg towns where both types of community latrines operated and maintained by the Municipal Corporation and NGO are in use.

Pay and Use Type

At Durg Tahsil complex near courts was surveyed. It has 10 latrine seats and 5 bath rooms for men and 5 seats and equal number of bath rooms for women. Urinals at both the places have been provided on the outer side of the complexes. Water supply is maintained for all the 24 hours. In order that water in adequate quantity is available to the users, one storage tanks at ground level have been provided.

The complexes are electrified to facilitate their use in the night. For the disposal of human excreta, septic tanks with soak pits have been provided.

Non Pay and Use Type

The community latrine located at Sanjay Nagar, Dewas and the other at Millpara, Durg were selected for the study. The former latrine has 10 seats for men and equal number for women and the latter has 5 seats for men and equal number for women. The latrines do not provide bathing and urinal facilities.

COMMUNITY LATRINE - USERS SURVEY

Of the 25 persons interviewed who use the latrine facility, 56% also use bath and only 36% of them use the urinal facility provided in the community latrine.

It was reported that old men, women and children do not use the community latrines. Reasons given for all members of the family not using the latrine are 'latrine is far away', 'prefer open air defecation', 'can not afford to pay' etc. In case of 'non pay & use' type, 26% of the respondents also reported that since the latrines are not kept clean, other members of the family do not like to use them.

In case of 'pay and use' type, all the respondents expressed their satisfaction about the upkeep and cleanliness of the communinity latrines, 76% termed it as excellent and 24% as good.

In case of community latrines maintained by the municipal corporations, 95.7% of the respondents reported that the upkeep and cleanliness is bad, while 4.3% termed it as satisfactory Almost all the respondents were of the opinion that the latrines are not kept clean. All of them reported that no attendant remains at site

The respondents using the community latrines where no charge is levied on its use were asked whether they would be willing to pay if the latrine is kept clean. 59% of them showed their willingness to pay and 30% said that they can not afford to pay.

In order to study why the people who do not have latrine as much as the community latrines, some non-users were interviewed.

The distance of the nearest community latrine from the residence of 90 was reported to be less than 1 km. 'Prefer open air defecation' was given 57% of the respondents for not using the community latrine and the rem 13% said that the latrine is not kept clean.

IV. ROLE OF NGO IN IMPLEMENTATION OF LOW COST SAN IN MADHYA PRADESH

It was learnt that only three NGOs were involved in the sanitation. Suvidha, Bombay, Akhil Bhartiya Parivar Kalyan Parishad, Delhi and Sulabh International, Patna.

Sulabh International earlier known as Sulabh Souchalaya Sansthan was founded Padma Bhushan Dr. Bindeshwar Pathak, an action sociologist, internationally known expert on LCS and biogas. The organi in 1970 in Bihar under the Societies Registration Act-1860. It is voluntary social organisation having no capital resource of its own.

The Sulabh International has not accepted any grant either from Central Government, state governments or any national or international agencies. The only source of funding is the implementation charge which it charges for the design, survey, preparation of detailed project reports, motivation, sanitation education, construction, supervision and follow up. In Madhya Pradesh it is charging 20% of the estimated cost as implementation charges.

A team of highly qualified and eminent engineers and scientists having long and wide experience in research, environmental engineering, hydrogeology, sociology, health education, economics and administration is maintained to provide consultancy services to state governments and local authorities and to give technical guidance to Sulabh state branches in the field of low cost sanitation.

Methodology for Construction of Household Latrines

Project preparation

At the request of the state government or the local authority, detailed project report to make the town scavenging free is prepared by the Sulabh International.

Motivation

As soon as agreement is signed with the local authority and funds are made available to Sulabh International, suitable and trained staff is posted in the town as per need. House-to-house contact is made to motive the people. Information is disseminated on the technology, financial assistance which would be available to them and procedure of construction followed is explained to them. As soon as the household shows interest in getting his bucket/dry latrine converted or a new PF unit constructed, application is obtained from the householder and submitted to the local municipal office for its approval.

Construction

From the householder's angle, the ideal procedure for getting a PF latrine constructed is where a single agency takes care of all steps from the time of application upto the completion of the unit including follow up after construction, which otherwise will have to be taken by him involving time, trouble, botheration and expense. Sulabh International, when the work is entrusted to it, takes the entire responsibility.

The suitability and location of latrine are determined by taking into consideration the sub soil water level, soil characteristics, location of water sources, foundation and structural condition of the house.

The materials are collected and PF latrine is constructed. After construction, a certificate is obtained from the household that he is fully satisfied with the latrine constructed in his house.

The household is given 5 year gurantee; in case any construction defect is noticed within the guarantee period, the same is rectified free of cost by Sulabh.

Community Latrines

Community latrines constructed, operated and maintained by Sulabh International provides latrine, bathing, washing and urinal facilities. These latrines are popularly known as sulabh Complexes.

The design of the Sulabh Complex is prepared keeping in view the site conditions and expected number of users. Separate enclosures are provided for men and women. Sulabh is not a contractor; its main objective is that the community latrine is properly operated and maintained; hence it undertakes to take up the job on turn-key basis.

After the design and estimate are approved by the local authority, Sulabh enters into an agreement with the local authority. The Organisation undertakes to operate and maintain it for 30 years. Attendant's service is provided round the clock to keep the complex clean and sanitary soap powder is supplied to the latrine users free of charge for washing their hands.

Sulabh International advocates the operation of complexes on 'pay and use' system. Children and disabled persons are not charged. Use of urinal is free. Where it is possible to meet the operational and maintenance cost from the charges collected at the complex from the users, the local authority has not to incur any expenditure on its operation and maintenance except the electricity and water charges. However, the land required for the complex and the capital cost are provided by the local authority.

Where the local authority desires that the users should not be charged or where the local authority collects the charges itself on the basis of per family per month, the operation and maintenance cost is borne by the local authority and is paid to Sulabh at a fixed rate.

Terms of Payment

Since Sulabh International does not have funds of its own, the construction of complexes or implementation of eradication of scavenging programme is carried out after receiving 20% advance from the local authorities.

V. SUGGESTIONS AND RECOMMENDATIONS :

1. An advisory committee comprising concerened departments may be set up at Govt. of India level to lay down policies and plan of action to eradicate scavenging and rehabilitate scavengers and their dependants. Similar committees may be formed at state level. In these committees representative of a reputed NGO and a representative of scavengers should also be made as members.

2. There should be one nodal department responsible for implementing the LCS programme in the State. In case there are more than one department implementing the LCS under different programmes, the nodal department should coordinate.

3. Eradication of scavenging scheme should be included in the 'Minimum Needs Programme' so that the State Government may not be able to reduce or divert the allocation provided for LCS.

4. Sewerage should be given a 'Plan holiday' during the VIII Plan except the on-going schemes and extension and rehabilitation of existing systems where found absolutely essential. Funds proposed for sewerage should be diverted to LCS.

5. a) Financial assistance to the beneficiaries should be based on their capacity and affordability. If scavenging is aimed to be abolished within a time frame, the financing pattern should not contain beneficiaries' contribution because it is not forthcoming readily and it retards the progress.

   b) The rate of interest and repayment period of loan should be such that repayment instalment is within the affordable limit of the beneficiaries who mostly belong to economically weaker or low income groups.

6. a) Since local authorities do not have competent staff to prepare detailed project reports on eradication of scavenging, these should be got prepared through an agency which has the competence and experience in the field of low cost sanitation.

   b) The project should also include training and rehabilitation of scavengers who will be liberated after the conversion of dry or bucket latrines.

7. Methodology adopted for construction should be such that the house owner has not to run about but gets the latrine at his door-step. One agency takes the entire responsibility for pre-construction, construction and post-construction activities without bothering the house owner.

8. The superstructure over the latrine should be constructed simultaneously with the latrine to ensure its immediate use.

9. Guarantee for a few years say 5 years may be given to the beneficiary to remove any construction defects observed later free of cost. It will go a long way in fostering confidence in the technology and the organisation implementing the programme.

10. Community latrines should be properly designed, constructed, operated and maintained. To ensure cleanliness, round the clock attendants' service should be provided. As far as possible, these should be operated on 'pay and use' system.

11. Training institutes at regional level should be set up exclusively for the liberated scavengers and their wards with full training aids and equipment. Hostel facilities should also be provided.

12. Appropriate monitoring and feed back systems should be set up at district and state level to identify the problems and boutlenecks hampering the progress and solve them quickly.

VI. TRAINING AND REHABILITATION OF LIBERATED SCAVENGERS AND THEIR WARDS

Once the bucket or dry latrines are converted to pourflush, the scavengers become unemployed.

There are two categories of scavengers - one employees of the municipality and the other employed part time privately by householders. There is no problem of unemployment for those who are in employment of the municipality. The problem is of their wards as well as of privately employed scavengers and their dependents.

In none of the study towns, scavengers or their dependents have been trained in other vocations. Since the respondents were in the municipal service, none of them became unemployed after conversion of bucket or dry latrines; they were assigned some other work by the municipalities.

All except 28.5% have liked the change in their profession. 82.9% of the liberated scavengers have reported that the change has improved their social status. However, 17.1% feel it has made no difference.

The study shows that though socio-economic conditions of the liberated scavengers has improved but general observation of the area where they live reveals that if viewed in broader perspective, their living conditions have not improved.

APPENDIX 3

OPERATION AND MAINTENANCE OF SANITATION SYSTEMS IN URBAN LOW-INCOME AREAS IN INDIA AND THAILAND, BY HSMI ET AL (1993)

Appendix 3

OPERATION AND MAINTENANCE OF SANITATION SYSTEMS IN URBAN LOW-INCOME AREAS IN INDIA AND THAILAND

A research project carried out by:

hsmi
Human Settlement Management Institute

การเคหะแห่งชาติ
NATIONAL HOUSING AUTHORITY

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iHS

I R C
International Water and Sanitation Centre
Centre International de l'eau et l'assainissement

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CHAPTER 2: INSTITUTIONS INVOLVED IN SANITATION SYSTEMS IN INDIA

In India the increase in coverage of sanitation facilities in low-income areas is considered a public affair. On-site sanitation technologies are being promoted as the only feasible technology for cities and towns with a population below 100,000 people, because conventional sewerage is not affordable for either the government or the individual households. Government agencies at national, state and municipal level, each have distinct roles in the planning and implementation of sanitation schemes. It needs to be realized that the programmes that cover low-cost sanitation schemes and the division of responsibilities among involved institutions at national and state level change regularly. The description below is mainly confined to the period when the studied schemes were implemented. Table 2.1 gives a short overview of the different agencies and their responsibilities. A detailed description of these agencies is given in sections 2.1 to 2.4, followed by an overview of the sanitation schemes carried out in the research towns in section 2.5.

2.1 NATIONAL AGENCIES

The **Ministry of Urban Development** has two distinct sets of responsibilities. One pertains to the construction and maintenance of government buildings and the management of central government land and property. The other responsibility is the broad policy formulation and monitoring of programmes in the area of housing, urban development, urban poverty alleviation and urban water supply. These are essentially state subjects, but the Government of India plays a coordinating and monitoring role and also supports these programmes through central sector schemes, institutional finance and expertise.

It is in this realm that the Ministry is involved in sanitation schemes. Targets for schemes are determined, funds are allocated to the different States and the division of loans and grants determined. These loans are to a large extent channelled through the Town and Country Planning Organization, which is also involved in planning, monitoring and evaluation of the schemes for which it provides funds. Recently, the Housing and Urban Development Corporation (HUDCO, see below), has taken over part of the responsibilities for sanitation from the Town and Country Planning Organization.

The **Ministry of Welfare** is entrusted with the responsibility to ensure the welfare of the general public with a special attention to the poorer and other deprived groups of society. The Ministry formulates the policy for improving the living conditions of the scheduled castes, the scheduled tribes and other backward classes. It also has the responsibility for implementation of the formulated programmes, while it promotes and supports programmes of other government and non-government agencies pertaining to their target group. The major sanitation scheme developed by this Ministry is the **Scavenger** Liberation Scheme. The Ministry determines the policy for conversion of bucket latrines, construction of new latrines and the rehabilitation of scavengers. The targets per State are determined as well as the number of towns where conversion will be carried out. The financing of the scheme at State level is planned and financial allocation and division of loans and grants are determined. The loans are channelled through HUDCO or State government agencies.

Table 2.1: Overview of agencies and their responsibilities for sanitation programmes

	Planning	*Implementation*	*Operation & Maintenance*
Ministry of Urban Development	- Determination of number of towns to be reached by sanitation programmes - Allocation of funds to different states for sanitation programmes - Determination of funds covered by grants and funds available for loans	- Loans channelled through the Town and Country Planning organization and/or HUDCO - Subsidy channelled through State Government agency	
Ministry of Welfare	- Determination of policy for: . conversion of dry latrines . construction of new latrines . liberation of scavengers . financing at State level - Determination of overall and townwise targets for sanitation programme - Preparation of guidelines for implementation	- Loans channelled through HUDCO and/or State Government agency - Implementation through State or selected NGO - Subsidy channelled through State Government agency	
HUDCO	- Preparation of guidelines for financing of . conversion of dry latrines . construction of new latrines . construction of public latrines - Assess loans application from authorized institutions - Formulate loan agreements	- Release of funds for implementation - Monitoring of progress and release of loan instalments if progress according to agreement	- Ensure repayment of loan by Directorate of Municipal Administration or Municipalities
Directorate of Municipal Administration	- Identification of towns for sanitation programmes - Determination of allocation of funds (loan & grants) - Directives for loan recovery - Planning for implementation at municipal level	- Supervision of implementation through municipal authority or private organization - Monitoring of proper utilization of funds	- Release of funds for maintenance - Ensure repayment of loan by municipality

	Planning	*Implementation*	*Operation & Maintenance*
State Water & Sewage Board	- Project planning - Preparation of engineering details - Preparation of budget	- Responsibility for project implementation - Selection and supervision of contractors - Technical guidance	- After implementation handing of responsibility for operation and maintenance to municipal authorities - Ensure repayment of loan by municipality
Municipal Authority	- Planning of projects at local level - Training of staff - Selection of beneficiaries - Planning for motivation and education of beneficiaries - Preparation of loan agreement with beneficiaries	- Implementation of work - Selection of contractors - Supervision of contractors - Motivation and education of beneficiaries - Site selection of public latrines - Monitoring of implementation	- Provision of services for operation and maintenance of public latrines - Provision of services for private latrines if requested - Provision of pit emptying services - Recovery and repayment of loans
Non Governmental Organizations	- Assist municipal authorities or State level organizations in project planning - Planning for motivation and education - Planning for training of local municipal staff and contractors	- Construction of latrines - Technical guidance - Selection of contractors - Motivation and education of beneficiaries - Training of local municipal staff and contractors	- Provision of services for operation and maintenance (if guarantee period is included) - (Usually) handing over of responsibilities to municipal authority

The **Housing and Urban Development Corporation** (HUDCO) is a subsidiary institution of the Ministry of Urban Development and is responsible for the financing of many of the sanitation schemes being carried out in the country. HUDCO considers loan applications from housing boards, slum clearance boards, improvement trusts, municipal authorities and any other agencies who are authorized by the State government to carry out sanitation programmes. Financial assistance is available for conversion of dry pit latrines to water seal pour-flush latrines, construction of new latrines in houses where no latrines existed and the construction of community latrines. HUDCO finances up to 50% of the total project cost. The first instalment is released after the loan agreement and other formalities have been completed. The subsequent instalments are released depending on the progress of work and satisfactory utilization of the amounts previously advanced. Thus HUDCO is involved in monitoring of the progress of the schemes and can intervene if repayments are not made in time or agreements are not carried out. They ensure repayment of loans after implementation through the Directorate of Municipal Administration or by the municipalities.

2.2 STATE AGENCIES

The **Directorates of Municipal Administration** are the key organizations at state level to coordinate and monitor the activities of the municipalities within a state. Identification of projects and resources is done through this body, which also has the responsibility for all State/Central grants and loans and project funds. The Directorate channels the resources and manpower to the different municipalities and has to ascertain the progress, implementation and proper utilization of funds at municipal level. The Directorates are involved in the planning of sanitation schemes at the municipal level and in the supervision of implementation, which is carried out either at municipal level or by a private organization (NGO or contractor) contracted by the Directorate. After implementation of the schemes, they have to ensure repayment of loans by the municipalities.

State Water and Sewerage Boards are created in some states to share the responsibility of the municipalities in the implementation of new projects and programmes in the field of water supply and sewerage/drainage. The boards are involved in project planning, the preparation of engineering details, planning for implementation and preparation of the budget. They have the responsibility for the implementation of the scheme and select and supervise the contractors. In some states, this responsibility has been extended to low-cost sanitation programmes. After implementation, the facilities are handed over to the municipalities for operation and maintenance.

2.3 MUNICIPAL AGENCIES

Municipal bodies are the key institutions in implementation and operation and maintenance of sanitation systems in low-income areas. They are formed and regulated by the State Municipal Acts, which specify their functions and their resource raising powers. The status of the body depends on the number of residents and the State Municipal Act.

Departments of importance for sanitation are the Public Health Department, the Public Works Department and the Revenue Department. The Public Health Department is headed

by a Health Officer assisted by a Sanitary/Health Inspector. The sanitation branch, headed by a sanitary/health inspector is responsible for sanitation (cleanliness of roads, drains, public latrines, desludging and provision of food supplies). The staff of this branch consists of sanitary supervisors and sanitation labourers/sweepers. The health branch, headed by a health inspector is responsible for vaccination and prevention of epidemics. The staff consists of health workers.

The Public Works Department is headed by a Municipal Engineer, while each of the three branches (water, electricity and public works) is headed by an Assistant Engineer. It is their task to maintain the water supply, to construct and maintain roads and municipal properties, to approve building plans and to prevent encroachments. Sometimes, the responsibilities of the sanitation branch fall under the assistant engineer.

The Revenue Department is headed by a Revenue Officer/Inspector and is responsible for bill and tax collection. The organizational set-up may, however, vary and departments may be merged or have additional sections.

In the sanitation schemes, the municipal authorities are always responsible for the selection and motivation/education of beneficiaries and the preparation of loan agreements with the beneficiaries. In some schemes, they are also involved in planning and implementation. In that case, they receive the funds for implementation from the state and are responsible for selection of contractors, training of masons and supervision of the construction. Responsibility for repayment of loans to the state and cost recovery from the beneficiaries is always given to the municipalities. They also have the responsibility for operation and maintenance of public latrines and to provide services to the households for the operation and maintenance of their latrines.

2.4 NON-GOVERNMENTAL ORGANIZATIONS

In some states, the implementing agencies at state level, request a non-governmental organisation to implement the project at municipal level. NGOs like Sulabh International, Safai Vidhalaya and Rajastan Institute for Local Self Government have been involved in the implementation of sanitation schemes. Especially Sulabh International has carried out construction of public and private latrines in different states all over India. The task of the NGOs may be to assist the municipality in project planning and implementation, in motivation and education and to provide training for staff, masons and contractors. But they may also have the responsibility for implementation and execution of the scheme, procurement of materials and monitoring of progress. The organization of services for operation and maintenance is generally the task of the municipality, but sometimes the services required during the first five years of operation are provided by the NGO under a guarantee clause.

2.5 SANITATION SCHEMES COVERED IN THE RESEARCH

The sanitation schemes carried out in India may be part of larger programmes aimed at ameliorating living conditions in urban areas or may be just sanitation related programmes. In the research two schemes form part of a larger programme, that is the Integrated Development of Small and Medium Towns (IDSMT) and the Urban Basic Services (UBS)

programme. The other schemes covered are the Scavenger Liberated Scheme, the Basic Sanitation Scheme and the UNDP/World Bank Scheme. Table 2.2 gives an overview of the different schemes and the agencies responsible for respectively planning, implementation and operation and maintenance.

Integrated Development of Small and Medium Towns (IDSMT)

The Integrated Development of Small and Medium Towns is a centrally sponsored scheme initiated during the Sixth Five Year Plan ('80-'85) with the aim to promote integrated development of small and medium large towns with a population below 100.000 to reduce migration to larger cities. The programme covers 235 towns and is implemented with 50% central government funding and 50% funding from the state governments. Central funding on a 50-50 matching basis is available for land acquisition and development, traffic and transportation and market development. All other developments including sanitation have to be funded by the states, but form a part of the integrated development plans.

Single pit latrines, double pit latrines and community latrines are part of the programme. Implementation is usually carried out through a state agency such as the Water and Sanitation Development Board. There is no standard funding arrangement for subsidies, loans and beneficiary contribution. This differs per state (and even per town within the same state). After construction, the responsibility for operation and maintenance for the latrines is handed over to the municipal body for which no extra funds are made available.

Scavenger Liberation Scheme

The Scavenger Liberation Scheme is a scheme of the Ministry of Welfare, initiated in 1980 and is ongoing. It seeks to eliminate scavenging by conversion of bucket latrines into double pit pour-flush latrines in selected project towns. In addition, a major component of the scheme is the rehabilitation of the scavengers through training and financial assistance. A condition of the scheme is the whole town approach whereby all bucket latrines have to be converted and a law established to prevent the existence of bucket latrines.

Initially, beneficiaries were given a 50% grant and 50% loan for the conversion of their bucket latrines. But loan conditions differed in all states. The loan component was to become a revolving fund after recovery of the loans from the first beneficiaries in a 5-10 year period. The funds for the loan were provided by HUDCO. These funding arrangements were changed in '89. The central grant of the Ministry of Welfare and the loan from HUDCO are now handed over directly to the state for conversion/construction up to plinth level. At least 15% of the loan is earmarked for construction of community latrines on pay and use basis, both for residential use and general public use.

Table 2.2: Overview of sanitation schemes and responsible agencies

	Planning	*Implementation*	*Operation and Maintenance*
IDSMT	Ministry of Urban Development	State or District Development agency	Responsibility of householders and local bodies
Scavenger Liberation Scheme	Ministry of Welfare	State	Responsibility of householders and local bodies
Basic Sanitation Scheme	State agency or Municipal body	State agency or Municipal body	Responsibility of householders and local bodies
UNDP/World Bank Scheme	State with UNDP/WB	State	Responsibility of householders and local bodies
Urban Basic Services	UNICEF with Municipal body	Municipal body	Responsibility of householders and local bodies

Basic Sanitation Scheme

In the Basic Sanitation Scheme HUDCO finances programmes and projects for sanitation improvements which are proposed by state agencies or municipal bodies. The financial assistance is available for conversion of dry latrines, for construction of new latrines in houses where no latrine existed and for construction of community and public latrines. HUDCO provides a loan for 50% of the cost of the latrines, the other 50% has to be borne by either central or state agencies or directly by the beneficiaries.

UNDP/World Bank Scheme

The UNDP/World Bank Scheme started in '79 and is ongoing. The objectives are to convert existing bucket latrines, to provide latrines where no latrines were present and to provide community facilities where individual latrines are not feasible. The selection of towns to be included in the scheme is carried out by the state governments based on criteria set by the Government of India. These criteria include population (below 100,000), presence of a piped water supply, absence of a sewer system, representation of different socio-economic and physical conditions. The scheme promotes the double pit pour-flush latrine and is being carried out in 110 small and medium large towns in India.

The financing of the scheme varies in the different towns, depending on the arrangements per State and may or may not include a grant or a loan or both. Planning for the sanitation scheme is carried out at state level and implementation is also coordinated at state level. In this scheme, demonstration latrines are constructed in each town while construction of the latrines is checked by the funding agency. After construction, the responsibility for operation and maintenance service is handed over to the municipal body.

Urban Basic Services

The Urban Basic Services (UBS) programme was implemented during the period 1986-1990 on a pilot basis as a centrally sponsored scheme with UNICEF assistance. Since 1990, the programme has become the Urban Basic Services for the Poor (UBSP), in which the sanitation component has not been changed from the UBS programme. This programme is the only low-cost sanitation programme in which the local bodies are directly involved in planning and implementation.

The programme assists to upgrade basic services for the urban poor, especially women and children. Among the components of the programme is low-cost sanitation: the construction of low-cost pour-flush latrines; an intensive awareness creation and education programme to precede the provision of sanitation facilities; technical guidance, monitoring, supervision and training to be provided by UNICEF zonal offices.

A grant of 40% of the cost of the substructure, but not exceeding Rs 500 per latrine, is provided as well as a 60% grant for latrines at schools. Full cost is provided for the training of masons and motivation and awareness programmes.

The UBSP programme emphasizes community participation and people's involvement in the development efforts. The programme is implemented in 168 towns and financial

responsibility is shared between central government, state governments, municipalities, the beneficiaries and UNICEF. Planning for the programmes is done at central and state level, implementation at local level with UNICEF assistance. Municipal bodies and beneficiaries are responsible for operation and maintenance of the latrines.

CHAPTER 3: PERFORMANCE AND USE OF SANITATION SYSTEMS IN INDIA

In this chapter, the results are given of the research carried out in ten towns in India. The location and conditions in these towns are described in the first section and basic information on the research population is given. Different sanitation systems are found in the towns covered and these are described in section 3.2. The research focused on sanitation systems which are constructed as part of a sanitation scheme and the condition and performance of these latrines is described in section 3.3, followed by an assessment of operation and maintenance requirements of the latrines in section 3.4. Section 3.5 deals with the user attitudes and practices in maintaining the latrines. Public latrines are another common sanitation system in the towns studied. The condition and maintenance status and the attitudes of the users of these latrines are described in section 3.6. The organization of the sanitation schemes at local level is the responsibility of the municipal authorities, their management and their services for maintenance of the latrines are discussed in section 3.7.

3.1 RESEARCH TOWNS AND RESEARCH POPULATION

Of the ten towns covered in the research, seven have a population below 100,000. The towns are located in different parts in India (figure 3.1) with different climatic conditions and annual rainfall.

Basically three types of soil are found: sandy, sandy clay and clayey. Eight of the towns have a groundwater table below 3 meters and exceptionally high water tables are found in the central areas of Agartala (1-2m) and Silchar (0.7-1m). The densities vary from 1,775 to 9,915 persons per square kilometre. Most of the towns are rural in character except Hosur which has some industrial importance and Agartala and Silchar which are more urbanized regional centres. An overview of the general characteristics of the ten towns is given in table 3.1.

All towns have a piped water supply system which provides an intermittent supply ranging from 1-5 hours a day. In addition, handpumps and wells are found everywhere. The sanitation scenario in all towns contains a variety of systems including open air defecation, defecation into ponds/canals/rivers, single pit latrines, septic tanks, two-pit pour-flush latrines and public latrines. The stormwater drainage is generally through open surface drains with some exceptions for central areas where the drains are covered with stone or reinforced concrete (RCC) slabs.

A total number of 1322 households was surveyed, selected on the basis of the sanitation system in use. Because of the preference of the sanitation programmes for double pit pour-flush latrines, most households covered in the research have this type of latrine (973 households). The other systems covered in the research are single pit latrines (115 households) and septic tanks (198 households). As non-use after construction appeared to be significant, a separate survey was carried out in six of the towns to assess whether there exists a relationship between non-use of the latrines and aspects of operation and

Figure 3.1 *Location of research towns*

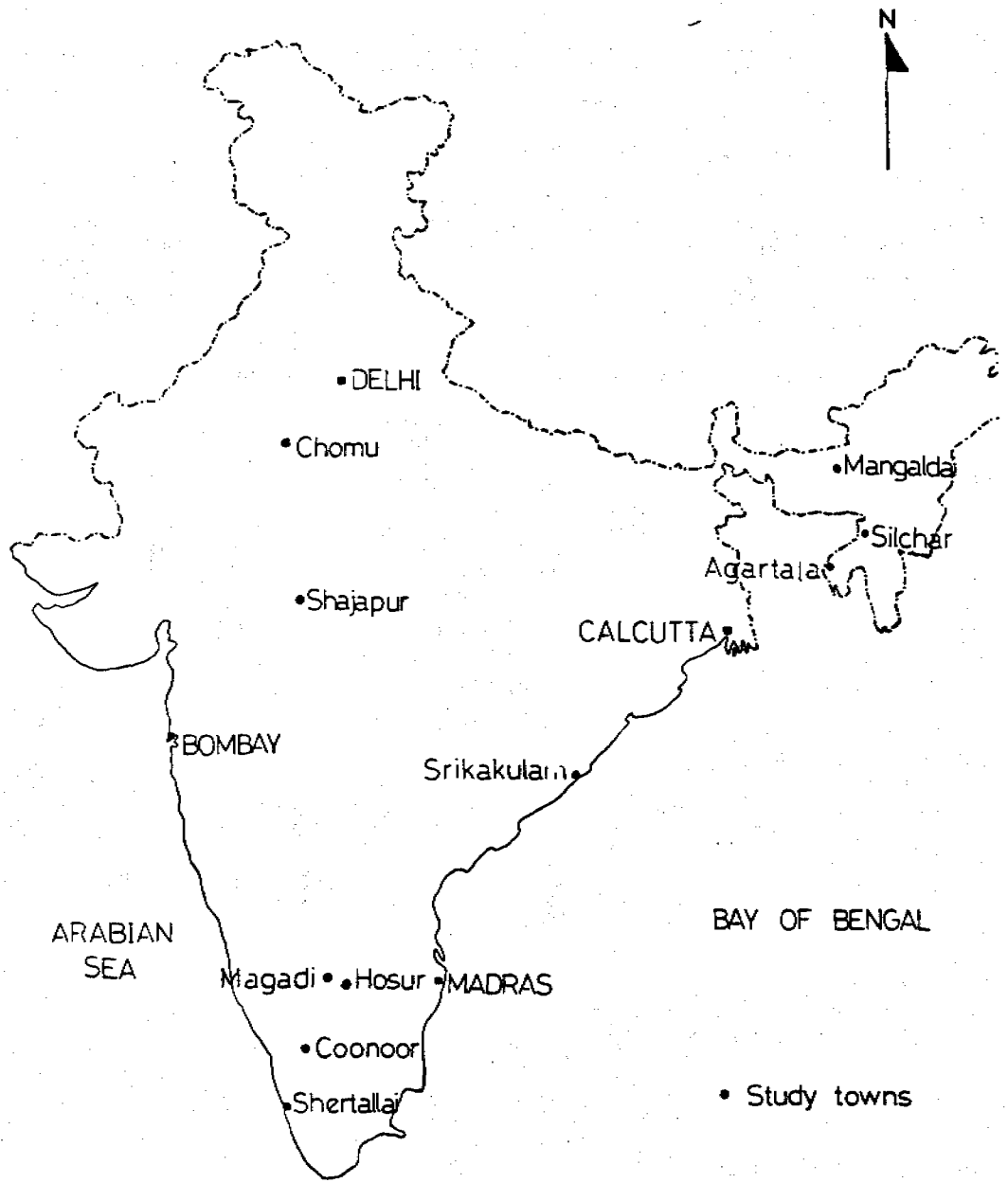


Table 3.1 *General characteristics of the towns*

	CHOMU	SHAJAPUR	SILCHAR	MANGALDAI	AGARTALA	SHERTALLAI	COONOOR	MAGADI	HOSUR	SRIKAKULAM
State	*Rajasthan*	*Madhya Pradesh*	*Assam*	*Assam*	*Tripura*	*Kerala*	*Tamil Nadu*	*Karnataka*	*Tamil Nadu*	*Andhra Pradesh*
Total population	40,000	50,000	138,000	40,000	156,700	44,000	53,000	24,000	100,000	88,864
Density population per square kms	1775	8291	8814	4444	9915	2719	3541	8888	7924	6293
Annual rainfall (mm)	589.3	1047.6	3225	1992	2023.4	3274.4	1549.2	1269.7	787.6	938
No. of House connections/1000 P	59	74	79	22	114	16	43	38	19	32
No. of public tapstands/1000 P	0.5	33	3	0.4	2	23	3	8	0.8	0.6
Water distribution in lpcd	65	85	118	34	101	38	47	11	40	80
Hours of supply per day	3-4	3-4	3-4	2	3-4	2-3	4-5	1-2	1-2	2-3
No. of primary schools/1000 P	0.2	0.7	0.34	0.22	0.33	0.18	0.26	0.37	0.12	0.25
No. of hospitals/1000 P	0.02	0.02	0.01	0.07	0.19	0.06	0.18	0.04	0.01	0.01

Source: Census of India 1981

maintenance. It was found that of the 302 households surveyed, 113 (37%) were not using the latrines. A detailed discussion on this issue is given in section 3.5. Information on aspects not directly related to operation and maintenance of the latrines at household level was gathered through interviews with the municipalities, the health officer, local leaders, contractors and sweepers and through observation.

The majority of the respondents own their houses (88%) and were resident before the latrine was constructed (91%). The average household size is 6 to 7 members. The household income varies from Rs. 745 (Shertallai) to Rs. 2284 (Chomu), the average being Rs. 1503. In the whole sample only 5% have no literate members in the household, while 46% have at least one member of the household with a college education. Most households are Hindu (83%), while 10% is Muslim and 6% Christian. For water supply, 40% have a private piped connection, 30 % a private well or handpump and 30% fetches water from a communal supply (see table 3.2).

Table 3.2 General characteristics of research population

	CHOMU	SHAJAPUR	BILCHAR	MANGALDAI	AGARTALA	SHERTALLAI	COONOOR	MAGADI	HOSUR	SRIKAKULAM
Number of respondents	122	199	109	132	144	200	162	121	127	160
Average Household Size	9	8	6	7	7	5	6	5	6	6
Religion										
Hindu (%)	93.5	67.7	90.8	68.2	97.6	88.5	47.5	46.7	67.4	96.4
Muslim (%)	6.3	32.3	9.2	26.8	2.4	2.5	3.3	1.7	6.7	2.9
Others/Christians (%)	--	--	--	3.1	--	9.0	49.2	1.6	3.9	0.7
Education										
Illiterate (%)	1.3	8.9	7.3	4.5	2.4	0	2.5	1.7	9.4	2.9
School (%)	45.6	47.5	35.8	50.0	46.8	50.5	73.6	26.4	82.7	38.2
College (%)	53.2	43.7	56.9	45.5	50.8	49.5	23.8	71.9	7.9	58.8
Average household income (Rs.)	2284	1280	2095	1634	2302	745	892	1517	1160	1126
No. of Earners/family	1.6	2.1	1.7	1.5	1.6	1.6	1.5	1.2	1.5	1.3
House ownership (%)	94.3	97.5	88.1	87.9	95.2	99.0	73.0	75.2	81.9	90.3
Water supply										
House tap (%)	100	79.1	55.0	23.5	43.5	6.0	36.1	24.8	22.8	10.9
House Handpump (%)	0	0.6	5.5	53.0	17.7	0.5	0	0	0.8	2.2
House well (%)	0	3.8	1.8	5.3	0	31.5	1.6	1.7	7.1	10.9
Communal Tap/HP/Well (%)	0	16.4	33.0	13.6	24.1	48.5	59.1	5.8	67.8	34.3

Source: Primary Survey

3.2 SANITATION SYSTEMS IN THE RESEARCH TOWNS

Most of the sanitation systems in the research towns are on-site systems and include sanitary and non-sanitary types. Also bucket latrines and overhang latrines are found, which cannot be categorized as on-site system. A description of each of these systems is given below, including systems constructed and paid for by users themselves and systems which are constructed as part of a government programme.

Bucket latrines

Bucket latrines are also described as dry latrines because no water is used to flush the excreta. To avoid confusion with other types of dry latrines such as the VIP latrine, the term bucket latrine is used in this document. The bucket latrines have a bucket or any other receptacle such as an empty battery case for retention of faeces and sometimes urine and anal cleansing materials. The container is placed either on the floor in between footrests or in a small vault under the floor of the latrine cubicle. The receptacle is periodically emptied for disposal. Often, the emptying of the bucket can be done from outside through an opening in the wall, without having to enter the latrine. The removal is done by scavengers who collect the waste in larger containers and dump it either in a

trenching ground or in an open area nearby. Collection is a health hazard and physically, socially and culturally unacceptable. Nearly 25% of the urban population is presently served by this system.

Overhang latrines

Overhang latrines are found in low-income communities located near water or marshy lands. They consist of a bamboo platform with a hole in the centre supported by stilts and sited directly over the water. The superstructure is made of split bamboo, tree branches and leaves. The user has to squat on the platform and the excreta falls directly in the water.

Single pit latrines

Single pit latrines of various types are found in all towns. Most are constructed by the users with locally available materials. The pit is usually unlined with a diameter of 1m and a depth of about 1.5m. If there is no pan, an improvised piece of sheet metal is put over a bamboo or wooden floor and formed into a shute leading to the pit. In the better versions, a standard ceramic pan with a waterseal is found, with a pipe connection to the pit. Bricks are used as footrests and both floor and footrests are plastered and finished with cement. If the pit is lined, this is done with honeycombed brickwork and a reinforced cement cover.

The superstructures are made from local materials like bamboo, straw, jute matting or wood and sometimes included a corrugated tin/asbestos sheet for roofing or polythene sheets for walls. When the pit is full, it is either emptied by hired scavengers or a new pit is dug. In the latter case, the superstructure is either moved to the new pit or a new superstructure is constructed. In the first case, when the contents of the pit are taken out, they are disposed of on nearby vacant areas.

Apart from this type of single pit latrine, two other indigenous types of latrines were found. The bottle type latrine is constructed in parts of Rajasthan and Gujarat and consists of a ceramic pan with waterseal connected with a pipe to a single bottle-shaped pit (narrow at the top, wide at the bottom) with a depth of about 10m. The bottle shape and the stability of the soil make digging of the pit at such depth possible. Local people claim that the system lasts almost indefinitely. Because of the very low groundwater tables, there is no risk of groundwater pollution.

In the north-eastern states, a tyre type latrine is popular with low-income households. It consists of a single offset pit with a depth of 1.5 to 2 meter, lined with several layers of truck tyres. The tyres prevent the pit walls from collapsing and the liquid leaches away through the bottom of the pit. Generally the pan is made of sheet metal with a shute towards the pit. When the pit is full, it is either excavated by scavengers or a new pit is dug. The superstructure is constructed of local materials, usually split bamboo or matting from dried tall grass.

In two schemes, the Urban Basic Services programme (UBS) and the Integrated Development of Small and Medium Towns programme (IDSMT), single pits were also

constructed. In the technology used, the pan is located directly over the pit, which is unlined with a diameter slightly less than 1m and a depth of 1-1.25m. A reinforced concrete ring of 1m diameter and 45cm high is placed on top of the dug pit. This is capped with a prefabricated circular reinforced concrete slab with a built-in pan with waterseal. Footrests are also part of the slab. A ventpipe is erected through a small hole in the slab and extends to above the roof of the superstructure. When the pit is full, the concrete ring and slab are moved to a newly dug pit and the old one is covered with soil.

Septic tanks

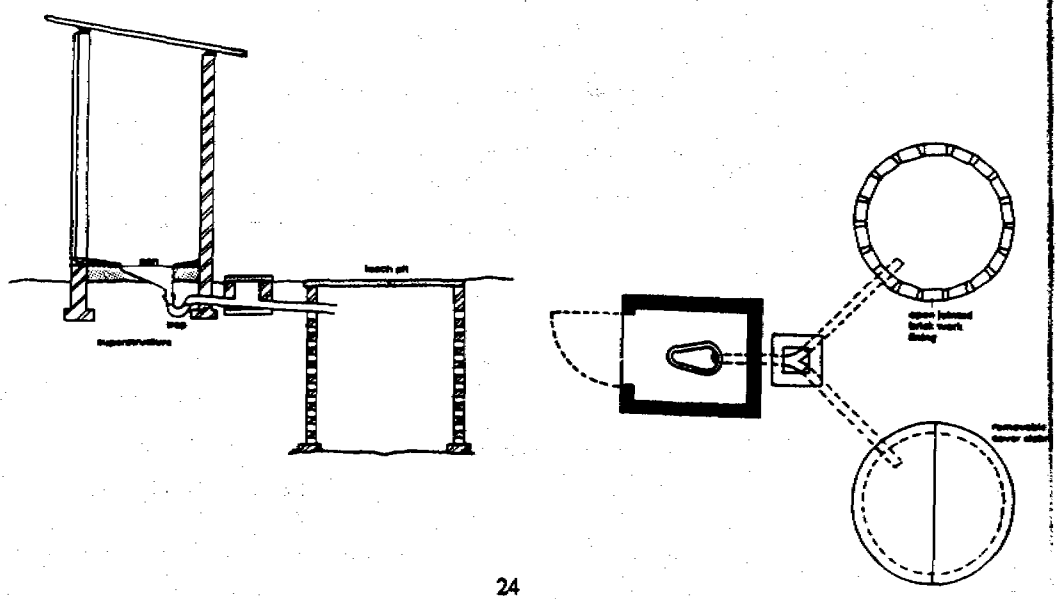
The septic tank system is found popular with the more affluent families. Expertise for construction is commonly available, even in smaller towns and such systems are invariably private contractor built.

The septic tank consists of an underground concrete or brick tank separated by a suspended baffle wall. Excreta is digested anaerobically and settles to the bottom. Methane gas produced in the tank is removed through a ventpipe which releases the gas high enough to avoid nuisance from smell. The liquid effluent flows to an adjoining soakage pit.

Two pit pour-flush latrines

This system is propagated in most government sanitation programmes and therefore the research focuses largely on this system (figure 3.2).

Figure 3.2 Two pit pour-flush latrine



The latrine consists of a waterseal squatting pan connected to a junction box outside the latrine, further leading to two underground leaching pits. The pan has a steep bottom slope of 30 degree, a narrow neck of 70mm and a 20mm waterseal trap set into the floor of the latrine. This construction enables complete flushing with only 2 litres of water.

The junction box has a Y-junction so that the flow can be directed to one pit at the time by blocking one branch of the Y-junction. It has a removable cover for easy inspection. The junction box is connected through a pipe or drain to two brick-lined leaching pits with the bricks laid in a honeycomb pattern. The bottom of the pit is left unlined. The pits are either square or circular and are fitted with reinforced concrete slabs.

The pans and traps are made of different kinds of materials such as glassfibre reinforced plastic (GRP), polyvinyl chloride (PVC), high density poly-ethylene (HDPE), ceramic, mosaic or cement concrete. The footrests are ceramic, concrete with mosaic finish, brick or stone. The connecting pipe or drain is made of non-pressure asbestos cement (AC) or a drain made of brick or stone. The drain bottom has to be semi-circular. The inlet pipe or drain has to enter at least 100mm into the pits. Within the pits the top 200-250mm are solid brickwork, below this the honeycomb brickwork starts down to the bottom.

There are three pit volumes, designed for 5, 10 or 15 users on the basis of an effective pit volume of respectively 0.68, 1.36, 2.04 cubic meter in dry condition or 1.0, 2.0 and 3.0 cubic meter in wet condition which is sufficient for three years of use.

When the pan is flushed, the excreta passes through the junction box into one of the pits. The liquid percolates out into the surrounding soil through the honeycomb openings and down through the open bottom of the pit. Only the solids accumulate in the pit. Each pit is designed to last for about three years. When one pit is full, the connection in the junction box is switched so the excreta passes into the second pit. The full pit is left for 18 months or longer after which all pathogens have died and the contents become a rich organic humus which is safe to handle and can be used as fertilizer. After this period, the pit can be opened and the contents removed, after which the pit can be used again.

The complete system can be located on the plot, the pit covers can be used as floor of a room in case there is not sufficient space outside.

Public latrines

Communal or public latrines are complexes containing a number of cubicles with toilets. The squatting pans are made of ceramic, fibre-glass, high density poly-ethylene (HDPE) or mosaic with footrests. The pans have a waterseal leading to twin leaching pits or septic tanks. In the larger cities, they may be connected to an underground sewer. In smaller cities also bucket latrines are found. The complexes are designed to have separate sections for men and women, a waterpoint where water for flushing and cleaning can be taken, electricity points in each cubicle for visits at night, a room where cleaning/maintenance equipment and tools may be kept safely and an attendant to ensure proper operation and maintenance of the facility.

3.3 CONDITION AND PERFORMANCE OF PRIVATE LATRINES

Table 3.3 gives an overview of the technical status of the sanitation systems covered in the research. In this section a systematic overview is given of the status and performance of the various latrine parts.

Table 3.3 Technical status of sanitation systems

	CHOMU	SHAJAPUR	SILCHAR	MANGALDAI	AGARTALA	SHERTALLAI	COONOOR	MAGADI	HOSUR	IKINAKOLAN
Type of soil	*Sandy*	*Black Cotton*	*Clayey Sandy*	*Clayey Sandy*	*Clayey Sandy*	*Sandy*	*Clayey Sandy*	*Red Clay*	*Clayey*	*Clayey Sandy*
Depth of ground water (m)	18-22	7-13	0.7-1	2-3	1-2	3-10	15-20	15-20	5-15	3-5
Location of latrine inside the house (%)	41.3	44.6	7.3	4.5	0.8	19.0	10.7	0	2.4	2.2
Adjacent (%)	4.3	-	50.5	12.9	6.5	1.5	5.7	23.1	22.8	31.4
In courtyard (%)	33.7	29.3	41.3	76.5	92.7	78.5	80.3	69.4	37.0	58.4
Outside the house	20.7	26.1	0.9	6.1	-	1.0	3.3	7.4	37.8	8.0
Completed superstructure										
Single Pit (%)	89.5	-	28.6	30	75	40	-	41.9	31.6	10.0
Double Pit (%)	82.4	63.3	75.3	76.4	88.5	32.8	81.1	67.8	34.8	72.3
Spetic Tank (%)	100	90.9	89.9	100	100	92.7	100	-	41.1	100
Superstrucure material permanent										
Single Pit (%)	94.7	-	7.1	-	12.5	-	-	74.2	64.7	0.0
Double Pit (%)	90.2	62.0	48.1	65.5	76.9	21.0	100	100	69.6	100
Septic Tank (%)	100	90.9	94.4	91.7	91.7	100	100	-	94.7	100
In the house (%)	96.6	79.1	55.0	23.5	43.5	19.5	36.6	24.8	24.4	10.9
Pit cover in good condition (%)	95.7	47.6	51.6	68.3	81.7	82.4	81.1	82.2	46.7	46.2
Septic tank cover in good condition (%)	100	100	100	83.3	100	100	90.6	-	60.0	100
Sullage/Rain water entering pit/tank (%)	1.1	8.9	28.0	16.7	8.1	54.5	25.8	31.7	45.2	18.2
For double pit only										
Pour-flush pans (%)	94.1	57.1	100	91.8	0	86.6	98.9	35.6	79.8	80.2
Tap inside toilet (%)	16.7	5.4	14.9	2.7	0	25	5.8	7.5	52.4	54.2
Distribution Box well connected (%)	35.4	21.1	35.1	65.5	76.0	91.6	68.9	92.2	51.7	75.0
Vent pipe installed (%)	66.7	8.9	3.9	15.5	10.6	-	-	55.6	3.4	-

Location

Most households have their latrines on the plot, but often located as far away from the house as possible, irrespective of the size of the plot or type of system. Where houses are surrounded by a wall, the latrine is usually located against the wall. 11% of the respondents has constructed the latrines outside the plot. It was observed by the researchers that where no walls surround the plot or if the facility is constructed outside the plot boundary, the latrine is often not used, because people do not want to make the investment needed for a complete separate superstructure. The decision on the location of the latrine was usually taken by the household and the contractor together.

Pits

The designs of double pits are standardized at state level and all contractors are given the details of the design to be followed. The adherence to the standardized design, is not always positive as soil conditions sometimes require an adaptation. Although designs do exist for different soil conditions, these are generally not applied by the contractors, most probably because they are not aware of the existence of these specific designs.

> *In Shajapur, the clayey black cotton soil does not have much leaching capacity. This was known to the contractors and households and they modified the design by themselves without any technical guidance of the implementing agency. The result is a fully plastered double pit with the dividing wall slightly suspended to act as a septic tank with an overflow into the open drain. Technically, the modification does not lead to an improvement, while also environmental conditions are threatened by the overflow of contaminated waste water into the open drain.*

In Silchar, Mangaldai and Agartala, the high water tables are not accounted for in the design, with the result that the leaching capacity of the pits is insufficient and during rains the pits (and sometimes pans) become submerged. In Mangaldai the texture of the soil and the pressure surrounding the pit also proves to be a problem as the soil enters the pits through the honeycombs. In addition, the area is prone to earthquakes and many of the pits have collapsed as a consequence of the earthquakes.

It is remarkable that almost 70% of the first pits had not yet been filled, although more than half the double pit latrines were more than 5 years in use and the volume is based on calculations of a pit filling up in two years. The pits which had been full and were already switched generally took between 2 and 5 years to fill.

Most single pits, 151 in number, are constructed on the initiative of the householders themselves and have different sizes and forms. Half of the households does not have any problems with the pits. Where problems are experienced, this usually is a result of overflowing of pits or pans when the pits are full or the ground is flooded. Almost all single pits are emptied when they are full, usually by scavengers.

Only in Shertallai single pits are constructed under the IDSMT programme. Although the performance of these single pits is good, a number of them has been converted into double pits at a later stage, because people preferred the double pit system.

There is no control over the construction of septic tanks, as this is all done on the initiative of the households themselves. The septic tanks covered in the research, have in 60% of the cases no soakage pit and the overflow is directly led into the drains. From the perspective of the households, the performance of the septic tanks is very good. The absence of a soakage pit does not affect the functioning of the septic tank and it reduces the cost of construction. From the point of view of environmental sanitation, the picture is different as the effluent constitutes a health hazard if led to an open drain or left to soak in the ground. In none of the towns, the municipal authorities take any action against this problem. The health officers are mainly concerned with curative aspects of health and not with environmental degradation through sanitation.

Pit covers

In six of the towns, the covers of the double pits were generally in good condition. In Shahjapur, Silchar, Hosur and Srikakulam about half of the pit covers were cracked or broken, probably because not sufficient cement was used in the concrete. The covers have handles made of reinforced rods of 10mm diameter, which invariably get rusted and break easily. The covers of the septic tanks were in good condition everywhere.

Junction box

The junction box is the component of the latrine which needs the most technical expertise as proper functioning of the latrine depends to a large extent on the performance of the junction box. If not well connected, the junction box gets blocked and if pipes are used instead of drains, the pipes have to be broken to remove the blockage. Often these broken pipes are not replaced.

In more than a fourth of the latrines, the junction box was not visible because it had been cemented over. Therefore the condition could not be ascertained, but the fact that it was impossible to open the box already indicates that there will be a problem when one of the pits gets filled and switching needs to be done.

Where the junction box was visible, it was generally found to be well constructed and connected, except in Chomu, Shajapur, Silchar and to some extent in Hosur. One of the deficiencies was the difficulty to remove the block of the Y-junction for switching, necessitating damage to the pipe connection.

Another element causing problems was the cover which was often found badly constructed, consisting of two bricks cemented into place or a stone slab which was not large enough. In such cases, dust and waste can easily enter the box and the chance that the connection into the pit gets blocked is high. Only in some towns, the box covers fit exactly into grooves and can be easily lifted.

Pans and footrests

Different types of pans were found in all towns and most (80%) were in good condition and to a lesser extent clean on inspection (66%). In all schemes, the pans are supplied as part of the latrine programme and usually the same type is supplied for all latrines within

a town. If people do not like the pans supplied, they are allowed to buy their own pans. The mosaic pans, which are cheapest at less than Rs 100 are not much liked by the users because of their dark colour and lack of smoothness, which makes cleaning difficult. The fibreglass pour-flush pans at a cost of about Rs 100, are not available everywhere. Although they are easy to clean, they are not much liked because they discolour over time and are prone to damage from burning cigarette/bidi butts. Although much more expensive at Rs 350, the ceramic pans are preferred because they are easy to clean and not prone to damage. Full-flush ceramic pans are frequently found, installed by the households themselves, but these pans require more water for flushing; the pour-flush ceramic types are only obtainable in Coonoor and Hosur.

The alignment of the U-trap to the pan and the functioning of the U-trap do not pose much problem except in those towns which have a water shortage. The footrests are separate from the pans and made of ceramic, brick or stone. They were found well placed and in good condition in most cases (87%).

Ventpipes

In 200 houses with single and double pit latrines ventpipes were found. In Chomu and Magadi, the percentage of double pit latrines with ventpipes were 67% and 56% respectively. The pour-flush latrines do not require a ventpipe because the smell is blocked by the waterseal and the gasses evaporate through the leaching pit, but at the request of the households, ventpipes are installed in many places. Apparently, people are aware of the need to include a ventpipe in other types of latrines and do not want to run the risk of having a defective latrine because of the absence of a ventpipe. It had been noticed that if ventpipes are not included in the latrine, the users are likely to add a ventpipe by themselves, thereby damaging the latrine slab or pit cover. Thus to avoid this happening, ventpipes are included if people insist on it.

Superstructures

In three of the towns covered in the research, Srikakulam, Coonoor and Magadi, the latrine programme included the superstructure. These superstructures are all made of permanent material and in good condition. However, many of the latrines in these towns are not used as a latrine, but for other purposes such as storeroom or bathroom. To have a separate lockable room is apparently a higher priority than to have a latrine.

In all other towns, the latrine programmes provided the latrine up to plinth level and the people themselves had to construct a superstructure. In some towns, many of the people did not construct a superstructure and consequently did not use the latrine. The pans of these latrines were soon filled with dust, sand and leaves and beyond the possibility of being used. The extent of non-use of the latrines is discussed in section 3.5.

In the households covered in the survey, many have a superstructure made of permanent materials (70%). Divided over the different types of latrines, the best superstructures are found with the septic tanks (98% permanent), followed by double pit (70%) and single pit (35%). The superstructures are generally also complete, that is with walls, a lockable door and a roof. Where the superstructure was not listed complete, this was mostly because

either the door was missing (7%) or the door was not lockable (9%). The single pits have the least permanent type of superstructures, except in Chomu, where the very deep bottle type pits are found which last 'forever' and therefore the superstructures are also made to last long. The other exception is Agartala where 75% of the single pits have a permanent superstructure. Here, the concept of an individual household latrine commonly includes a superstructure, irrespective of technology used. Moreover, the high annual rainfall probably has an influence on the need for a permanent superstructure.

If superstructures are not made of permanent material, this does not imply that they are not being used. In fact in the town of Shertallai, where latrine usage and user awareness are exceptionally high as a consequence of the awareness creation programmes conducted under the UBS scheme by UNICEF, only 21% of the superstructures are made of permanent material. The UBS scheme has promoted the use of local materials to ensure that all people could afford to construct a superstructure. At a later stage these could be improved.

Cost of the latrines

It is very difficult to ascertain the cost of the latrines because the respondents were often not aware of the cost of the material and labour which were provided by the programme. On the other hand, the cost of the latrines as given by the municipalities does not include the cost of the superstructures if they are not included in the programme. Moreover, for the double pit latrines, the cost for the latrines for different number of users also differs and was not indicated separately in all cases. The research findings have therefore only to be seen as indicative. The cost of the latrines as provided by the programmes is given in table 3.4.

The cost of the single pit latrines with superstructure varies from Rs 2.847 in Chomu for the very deep bottle shaped pits with permanent superstructure to Rs 236 in Srikakulam for the pits with a cement ring and a superstructure made of bamboo and wood. The average cost of the single pit latrine is Rs 950. Except in Shertallai where the single pits were part of a latrine programme, all cost are borne by the users.

The cost of the septic tanks varies from Rs 2.861 to Rs 11.667 with an average of Rs 5.812, including superstructure. The variation in cost can be explained by the presence or absence of the soakage pit and the quality of the superstructure. It was observed that some of the superstructures of the latrines having a septic tank included a bathing area as well. The cost of the septic tanks is always borne by the users.

The cost of the double pit latrines also varies considerably from Rs 870 in Shertallai to Rs 3.079 in Mangaldai, without superstructure. An average of Rs 2.188 for latrines up to plinth level is found. The cost for the latrines in the earlier schemes is lower than that of later schemes because the price of the material increased considerably over time, this explains the low cost in Shertallai. The high cost in Mangaldai can be explained because all construction materials have to be brought in from outside the State.

Table 3.4: Sanitation schemes in research towns

	CHOMU	RAJAPUR	SILCHAR	MANGALDAI	AGARTALA	SHERTALLAI	CUDDALORE	MADURAI	INDORE	SRIKAKULAM
Programme	UNDP/WB	Liberation of Scavengers	UNDP/WB	UNDP/WB	Liberation of Scavengers	IDSMT & UBS	UNDP/ WB	IDSMT	IDSMT	LCS/UBS
Year of completion	1985	1986	1989	1986	1985	1988 IDSMT 1990 UBS	1991	Not yet	1988	1986 LCS 1987 UBS
Cost of latrine	2500-2800	1100-1625	2000-2800	2300-3100	2020-3425	350-450 1 Pit 800-900 2 Pit	3700-4700	3400-3600	Unknown	900-1750 2 pit 350 1 pit
Financing	Grant 300-500	Grant 50% Loan 50%	Loan 100%	Loan 100%	Grant 50% Loan 50%	Grant 200-450 IDSMT 500-650 UBS	Grant/Loan depending on income	Grant 50% Loan 50%	Grant 50% Loan 50%	Grant 50% LCS 900 UBS
Interest	-	10%	10.5%	8.6%	-	-	6.5%	9.7%	7.6%	-
Repayment period	-	5 yrs	10 yrs	25 yrs	10 instalments	-	10 yrs	25 yrs	25 yrs	-
% Recovery upto 1990	-	21.6%	9.1%	2.9%	15.6%	-	1.8%	Not yet started	Not yet started	-
Superstructure included	No	No	No	No	No	No	Yes	Yes	No	Yes (LCS)
Implementing agency	Private contractor (municipal body)	Sulabh	Private contractor and Sulabh (municipal body)	Private contractor (municipal body)	Sulabh	Private contractor (municipal body)	TNWS&DB	KUWS&DB	District Development Agency	Private contractor (municipal body)
Instructions received by beneficiaries	67%	18%	30%	49%	59%	100%	50%	57%	68%	74%
First pit full %	18%	40%	57%	12%	29%	64%	1%	17%	32%	10%

3.4 OPERATION AND MAINTENANCE OF PRIVATE LATRINES

Water use

Availability of water is a problem in a number of towns, especially in low-income areas where sanitation programmes are carried out. In Coonoor, Magadi, Hosur and Srikakulam it was observed that many latrines are not being used as a consequence of water scarcity. Also in the survey, 80% of the respondents who are using the latrines in these towns experienced water shortage for latrine use.

> *In Coonoor people often have to walk a distance of more than a kilometre over hilly terrain to get water. The water obtained with such difficulty is not used to flush and clean the latrines.*

Despite this, 56% of the respondents said they use more than two litres of water per flush and 22% even more than four litres, regardless of whether they have a piped water supply or obtain water from a communal tap. This high use of water for flushing is probably a consequence of the fact that 40% of all respondents have a full-flush pan which requires more water for flushing. Most families also use about one or more buckets of water for cleaning their latrines.

Cleaning of pans

Almost 85% of the households said they clean their pans at least once a week. Three out of four households use detergents or acid as cleaning agents. Regarding the cleaning of pans of septic tanks, only households in Coonoor and Shertallai make restricted use of chemicals in order not to disturb the bio-chemical process in the tanks.

Pit switching

Of the double pit latrines, in more than 70% of the cases, the first pit has not yet filled and switching has not yet taken place. Where the pit has been switched, half of the users have called scavengers to do this for them while the other half did the job themselves. Switching was often difficult because the junction box was covered with bricks cemented into place or completely covered with soil. Also, the plug of the pit not in use was often made of cement which was difficult to remove.

In Agartala where the latrine programme is implemented by Sulabh International, a guarantee for five years is given to the users that Sulabh will carry out the switching and first time emptying. In two other towns where Sulabh also implemented the scheme, this service is not given.

Pit emptying

Of the single pits covered in the survey, 60% had been full. These pits had almost all (95%) been emptied. This was mainly done by private scavengers (62%), but also by the household themselves or by the municipality. The equipment used for emptying is usually

bucket and rope or bucket and spade, although pit contents are unsafe for handling. The price for emptying varies from no charges at all (28%) to Rs 350 in one case. The price paid most often is Rs 100 (31%), followed by Rs 150 in 20% of the cases.

Septic tanks had been emptied in 34% of the cases by either private scavengers (87%) or the municipality (12%). This too is almost always done with bucket and rope. Charges for emptying are higher than those for single pits, in half the cases Rs 200-Rs 250, but varying from Rs 50 to Rs 800.

From the double pit latrines only 137 (14%) had actually emptied one pit. This could have been done by the households themselves, but only in 17 cases this happened. Apparently people prefer to pay private scavengers (53%) or the municipality (16%) to carry out this task. Usually the equipment used is bucket and spade, bucket and rope or spade and shovel. The prices paid for this service vary from no charges to Rs 800, with Rs 100 paid most often, followed by Rs 150 and Rs 200.

Interviews with private scavengers in the towns revealed that generally the liquid from the pits is dumped in the open drains while the solids are either brought to a compost yard, the trenching ground or buried on the plot. Apparently no distinction is made between pathogenic waste from single pits and septic tanks and pathogen free waste from the double pits. No control over the dumping sites is carried out by the municipalities. In none of the towns does a demand exist for the dry pit contents for use as fertilizer, although in Magadi farmers sometimes empty the pits for free in exchange for the use of the contents as manure.

In Chomu, people experience problems in arranging scavengers to empty their double pits because the local sweepers ask very high prices of up to Rs 400 for emptying. People therefore have to find scavengers from other places to carry out the emptying. A similar kind of problem was noted in Shajapur.

> *In this town the "jamindari" system is prevalent under which only one particular group is entitled to carry out cleaning operations in a locality and neither the municipality or any other agency can perform these services without their help in that area. The jamindars ask Rs300-Rs450 for double pit latrines and Rs850 to Rs1000 for septic tanks. The reason for these high prices is the fact that the low-cost sanitation programme has jeopardized the regular monthly income from servicing of dry latrines, while the jamindar system ensures that nobody else can carry out the job at lower rates. The result of this situation is that many of the latrines are abandoned when the pits are filled.*

3.5 USER ATTITUDES AND PRACTICES RELATED TO PRIVATE LATRINES

Motivation campaigns for latrine programmes

Although municipalities are expected to carry out awareness campaigns to motivate people for sanitation programmes, no funds are provided for this nor is staff trained for this purpose. In three towns local leaders were approached to help identify beneficiaries, but

they were not involved in motivation except in Shertallai. Here an extensive user awareness campaign was conducted as part of the UBS programme before the sanitation scheme was implemented. Interviews with local leaders in all other towns revealed that they had not been given an explanation of the technology and the programme and therefore felt reluctant to become involved in motivation. In some towns they felt that there were other problems such as water supply and drainage which required more attention than latrines.

> *A local leader interviewed in Magadi was very much against the sanitation programme. He found the construction substandard and often incomplete and government money being wasted. He felt that people had to be educated and motivated before construction was started, but that anyway people's basic needs were not being addressed in the programme.*

Involvement of women through women organizations has not been carried out at all although women are generally more motivated to have a latrine than men, because it is more difficult for them to go for outside defecation. Also NGOs have not been involved in promotion and user awareness programmes before or after construction of the latrines in any of the towns.

Reasons for having a latrine

The reasons for having a latrine differ considerably per town, but on average, health reasons are cited most often (28%). This percentage is relatively high because of the fact that in Shertallai all people cited health as a reason for having a latrine.

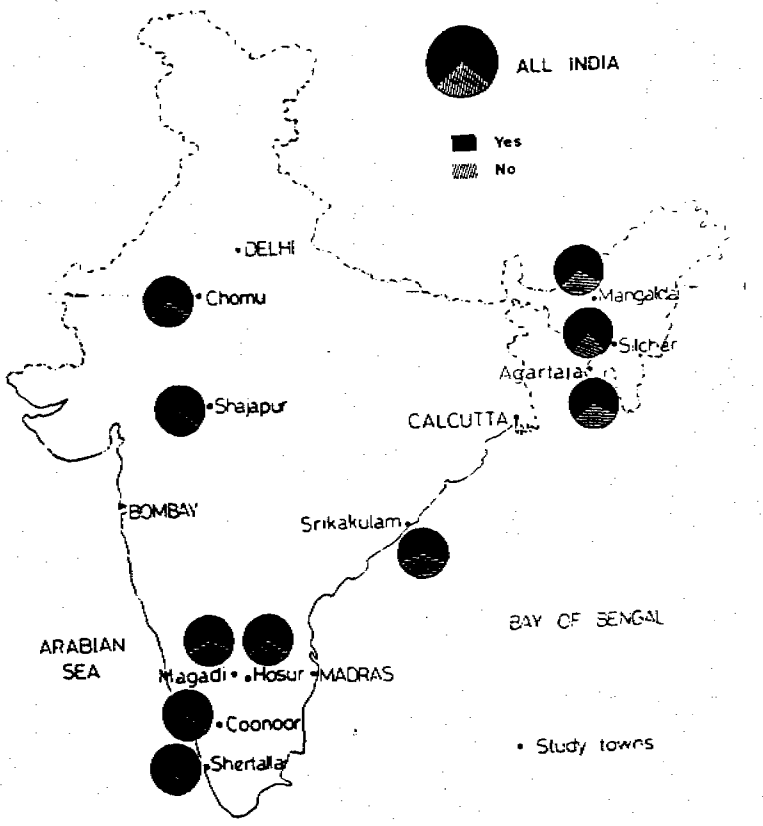
> *It should be noted that Shertallai is markedly different from all other towns in aspects of user attitudes and awareness. Not only are health considerations the reason for having a toilet in almost all cases, but also the use of the latrine by all family members is higher than average as well as the awareness of the operation of the system. In this town awareness creation programmes were conducted by voluntary agencies under the UBS programme. Also local leaders were fully involved in the implementation of the scheme and UBS volunteers were identified at neighbourhood level to motivate the community.*

Other reasons cited for participating in the latrine programme are dissatisfaction with existing dry latrines and public latrines (26%) or not having access to a latrine at all (21%). Motivation from the municipalities is cited by only 7% of the households while another 4% said they had been forced by the authorities to accept a latrine.

Latrine use

Because of the focus of the research on operation and maintenance, the household interviews were only carried out in houses where there was a long term experience with use and maintenance of the latrines. Hence almost all households in the survey use their latrines (98%). However, in 30% of the cases, rather evenly divided over the different towns, not all members of the household make use of the latrine, this included children over five years of age (figure 3.3).

Figure 3.3 Extent of latrine use by all family members



The younger ones rarely use the latrine at all and in 70% of the cases their faeces is disposed of in an unhygienic way although adults often are aware (68%) that also children faeces is harmful. Of the children over five years of age almost half have difficulties in using the latrines for reasons such as the pan being too large, not being able to squat properly, not being used to a latrine or disliking the interior.

Non-use of the latrines

Information regarding the extent of non-use of latrines provided under the various sanitation programmes was gathered through an additional survey carried out in six of the towns. Table 3.5 gives an overview of the extent of non-use of latrines in the different towns. For the households not using the latrine, a division is made between those who never used the latrine and those who abandoned the latrine after some time.

Table 3.5 Extent of non-use of latrines per town

	Number of households surveyed	Number of households using facilities	Number of households who never used facilities	Number of household who abandoned facilities	Percentage of non-use
Shajapur	51	22	17	12	57%
Mangaldai	50	42	2	6	16%
Silchar	50	41	3	6	18%
Magadi	50	34	9	7	32%
Hosur	50	23	18	9	54%
Srikakulam	51	27	14	10	47%
Total	302	189	63	50	

Of a total of 302 households, 113 households (37%) do not use the latrine. Of these, 63 (55%) never used the latrine at all. The reason given for non-use in this group is most frequently (40%) connected to absence of a superstructure. This absence is due to lack of funds or because of preference for open air defecation. Other reasons mentioned are unfinished construction of the substructure, undesirable location of the latrine or the fact that the households thought that emptying of the latrine would be too difficult.

A second category of 50 households (45%) have abandoned the latrines after some time. In almost half of the cases this occurred within one year after construction, a quarter within four years and the rest at a later time. The main reasons given for abandonment are collapse (32%) and frequent blockages (24%). Other reasons mentioned include damage to the latrine structure and the difficulty of emptying the pit.

Awareness of operation of the system

Less than half of the users of septic tanks knew that without a connection to a sewer network, septic tanks should be provided with a soakaway pit for the effluent (84 respondents out of a total of 198). Also less than half considered the effluent or even the contents at the time of desludging to be harmful. Only a third of the users was aware of the fact that the use of chemical detergents negatively affects the bio-chemical degradation of the pit contents.

For the double pit latrines (973 in total), less than half of the respondents was aware that the pit contents are only safe to handle after a period of 1-2 years and that the technology of double pits is especially designed for this reason. Only 8% of the people kept a record of pit changing dates. The lack of understanding of the technology also becomes evident in the fact that a fourth of the respondents thought that the pits could be used simultaneously and in the fact that in many towns both pits are emptied at the same time after the second pit is filled.

Because the users are responsible for the operation and maintenance of their latrines, it is crucial that proper instructions are given to prepare them for this task. Only half of the respondents received such instructions and consequently less than half of the respondents was able to switch the pits themselves and the emptying of the pits was mostly done by private scavengers. Indication that a pit is full, is either by overflowing pans or overflowing pits, because there is no system for finding out if a pit is full before it starts to overflow. Half of the households indicated that they would need periodic municipal checking to monitor the filling of the pits and to check whether the system works properly. But also municipal agencies do not have any system for checking.

User contribution and loan repayment

For all septic tanks and most single pits, all cost were borne by the users themselves and no loans were given. For single pit latrines in the sanitation programme in Shertallai and Srikakulam no loans were given either, but the materials for the construction of the latrine were provided and a small subsidy of about Rs 200-250 for the construction of a superstructure. The users spent on average Rs 100 in Shertallai and Rs 42 in Srikakulam for their single pit latrines.

The direct user contribution for the double pits varied per scheme, but in most schemes a direct user contribution was only required for the construction of the superstructure. Where the superstructures were included in the scheme, in Coonoor, Magadi and part of the latrines in Srikakulam, the own contribution was generally low, from Rs 15 in Coonoor to Rs 466 in Magadi.

In Chomu, the direct user contribution was highest with an average of Rs 1774, which is caused by the fact that the UNDP/WB scheme in this town only gave a Rs 300-500 grant for the latrine and all other cost had to be borne by the users. In all other towns, the direct user contribution was on average between Rs 1000 to Rs 1500.

Of the 752 respondents who had taken a loan for the construction of their latrine, 483 (64%) did not repay any amount of money (see table 3.4). Of the remainder, 108 (14%) said they paid their instalments and 161 (22%) said they sometimes did.

3.6 CONDITION, USE AND MAINTENANCE OF PUBLIC LATRINES

Public latrines are common in the towns studied, except in Magadi where no public latrine is present. The numbers vary from one only in Silchar and Mangaldai to 29 in Coonoor.

However, many of these latrines are officially closed down because they have deteriorated beyond use and are therefore not included in the survey. The pay-and-use complexes of Sulabh International are also not included because in the towns surveyed they are located in public places such as markets and bus-stands and are not specifically meant for use by local residents. A total of thirteen public latrine complexes, which serve for use by local residents in five towns are covered in the survey.

Technical system

The technical systems used for the public latrines are bucket latrines (3), double pits (1) or septic tanks (9). A special design was found in Coonoor where a latrine complex is connected to four leaching pits of which two are in operation at a time. Owing to the hilly terrain the pits are located at different levels with a separation of up to 5 meters from the latrine. Where septic tanks are used, six of the septic tanks do not have a soakage pit which results in raw sewage in the drains or ponding of sewage effluent. Even where soakage pits are present, half have an insufficient capacity. The discharge pipes to the septic tanks and pits are in many cases badly constructed or broken. Discharge of sullage is either to open drains, soakage pits, septic tanks or into the open street.

All public latrines with the double pit and septic tank systems have full flush pans, except one complex in Coonoor which has pour-flush pans. This means that at least 3 litres of water are needed for flushing. However, seven of the complexes have no water source at all, three have a piped supply with a tank at ground level and the remainder has handpumps without a collection tank. Thus water is hand carried by the users in tins or small buckets, the amount of water being insufficient for both ablution and flushing. The result is blocked waterseals, choked pipes and drainage channels, in many cases leading to such conditions that the complexes are abandoned. Often, the bucket latrines are in better condition because at least the problem of blocked waterseals and choked pipes does not exist. On the other hand, these latrines have a problem with bad smell and fly nuisance in addition to high health risks for the municipal scavengers who have to serve the complexes.

Superstructures

Only in six cases out of thirteen separate sections for men and women exist and only one has handwashing facilities. None of the complexes has a facility for bathing or washing. Doors are missing altogether in five complexes, while in another four the doors are broken. Walls and roofs are often in poor condition.

> *In Srikakulam, the municipality spent an amount of about Rs 1,000,000 for the renovation of twelve public latrines in 1986. But the latrines were getting choked due to improper use even before the work was completed. Because of theft of doors, taps and septic tank covers, the latrines were soon again beyond repair.*

Ventilation is no problem mainly due to the absence of doors. For the same reason light is not a problem, at least during the day. Electric light is only functioning in one complex, while some complexes have light fixtures but no electric connection or bulbs.

Environmental hygiene

The overall cleanliness of the complexes and their surroundings is poor in all cases. Stagnant water is found in and around half the complexes and surrounding areas are prone to flooding during rain. Waste water drains both inside and outside are choked and dirty. Animals like dogs, cows and pigs are roaming everywhere. Flies are also a marked problem in all complexes.

Operation and maintenance of public latrines

None of the latrines investigated has permanent attendants. Sweepers to clean the complex are present in five of the complexes during the whole day, for the remainder the sweepers only come during specific hours, twice daily. Their presence does not always lead to better hygienic conditions, as the respondents all complained about improper cleaning and upkeep. There is no supervision from the part of the local authorities. In only two complexes the cleaning is done with the use of detergents. Cleaning and repair tools are not available in any of the complexes, nor is there a storage place to keep equipment. No records for cleaning, repair or pit emptying are kept at any place.

The users do not have to pay for the latrines and also do not receive any instruction on the correct operational procedures for the latrines.

User attitudes towards public latrines

A total of 153 people were interviewed who make use of the public latrines. Half of the respondents use the facility more than once a day. About 70% of them live within 100m of the facility. Of those who use the latrine only once a day, half lives within 100m, the rest further away, but generally within 200m distance. Most people use the latrine because they do not have a private latrine and they generally belong to the lowest income groups. However, 30% of the people do not always actually use the facility itself, but the area directly surrounding it, because they consider the latrines to be too dirty. If people have small children, they do not take them to use the public latrine but let them defecate in their courtyards, the drain or in the street.

A majority of the respondents feels that the latrines are not safe for women, even if there is a separate section for women. The reason most probably being that the doors cannot be locked.

The users have not been consulted in the planning for the latrine in most cases (80%) although they almost all were living in the neighbourhood before the latrine complex was constructed. Common problems experienced with the latrines include non availability of water, no lights, no cleaning and flooding during the rain. Half of the users said that the public latrines are the responsibility of the municipality and they were unwilling to make any contribution towards the maintenance cost of the latrines.

Within the neighbourhoods, often latrine complexes are not liked because of the pollution and health risks they cause. In Shertallai, people forced the municipality to close a public latrine because sewage effluent was polluting a nearby water canal which was regularly

used as an auxiliary water source. In Silchar a latrine complex was dismantled by the people because it was polluting the surroundings and was a source of insect breeding and stench. The households in the area which did not have any latrine, thereafter constructed their own latrines.

In Hosur, a latrine complex was found where a family had padlocked one cubicle for private use.

3.7 INSTITUTIONAL MANAGEMENT FOR OPERATION AND MAINTENANCE

Documents reviewed in the municipalities of the research towns show, that no special funds are earmarked for operation and maintenance of low cost sanitation schemes. In most towns, sanitation resorts under the department of public health and it was impossible to separate the budget for sanitation from the other budgets in this department. Moreover, owing to frequent transfers of municipal staff and non-existence of official records which show expenditures for operation and maintenance of sanitation systems, it was not possible to get an insight on these expenditures. From interviews it becomes clear that budgets from the department of public health for sanitation only cover the salaries of municipal sweepers (80%-95% of the budget) and (at best) recurrent cost for maintenance of the equipment used and expenditures on chemicals (for public latrines).

Since there is no budget for operation and maintenance, there is no specific organization for it either. Most municipal authorities are not even aware of the requirements for operation and maintenance. This is probably to a large extent due to the fact that they are usually not involved in planning and/or implementation of the low-cost sanitation programmes and not conversant with the technology of the double pit latrine. In most programmes, the state level agencies are responsible for implementation and supervision. They select the contractors to carry out the work, and sometimes these contractors do not come from the town itself and leave after the work is done. The selection of contactors is often arbitrary and does not include experience in the two-pit technology as a criterion. Moreover, the contractors selected often contract out to sub-contractors. No specific training is given to the contractors to ensure that they are able to carry out the construction according to standard. This not only affects the construction of the pits, but in some cases led to adaptations in the design which are technically unsound. Only in the case of Sulabh International, a guarantee period is sometimes included for the functioning of the latrines.

Where the municipal authorities are responsible for implementation and supervision, the municipal engineers do not always receive a special training in low-cost sanitation. Yet, they often lack knowledge about the technology and are sceptical about such a low-cost technology. Only in Srikakulam and Shertallai, did the municipal engineer train the contractors, while in Agartala the municipal authorities hired Sulabh to implement the programme.

In none of the programme documents any mention is made of the activities expected from the municipalities for operation and maintenance of the latrines installed. The health officer who usually heads the sanitation department is responsible for the management of

septic tank cleaning and checking of public health hazards. The sweepers are responsible for cleaning drains, tank desludging, pit emptying operations and the cleaning of public latrines. They are supervised by the sanitary supervisors. Due to lack of regular personnel, temporary labourers are specifically hired for drain cleaning and desludging operations by the municipalities. Neither the regular personnel nor the labourers receive any specific training for their tasks.

Basic equipment for operation and maintenance such as wheel barrows, spades, buckets and baskets are available in all towns, be it not in sufficient quantities. The more elaborate equipment needed for safely desludging septic tanks and single pits, such as vacuum tankers, tractor trailers and vacuum tankers are only found in Silchar, Agartala and Shertallai.

The municipalities do not provide safety measures for the labourers who have to directly handle excreta while emptying pits and tanks with spades and buckets. This results in lack of motivation of the labourers to perform their tasks well, while at the same time supervision is also not carried out sufficiently.

Apart from the responsibility for operation and maintenance, the municipal authorities also have the responsibility for the collection of loan repayments. Table 3.4 gives an overview of the cost recovery in the different towns. The table indicates that the collection of loan repayments is very weak indeed. In none of the towns a schedule for collection exists and many authorities feel that it is too much trouble to collect the dues, which they cannot keep themselves but have to channel to the state authorities. The table also indicates that there is no relationship between either repayment period or rate of interest and repayment from the beneficiaries. The beneficiaries often are not even aware that they have to pay back the loan. Collection methods, motivation of the municipal authorities and motivation and awareness of the beneficiaries probably have more influence on loan repayments than the rate of interest or repayment period.

CHAPTER 4: INTERPRETATION OF FINDINGS AND OPERATIONAL RECOMMENDATIONS FOR INDIA

The conclusions and recommendations in this chapter are based on the findings of the research, including references found in the literature collected by the collaborating research institutions. The discussions held during the national workshop and the inter-country seminar in India in April 1992, are also taken into account.

4.1 TECHNICAL ASPECTS

Standardization of design to be adapted to local environmental conditions

Although technical adaptations of the standard double pit design exist for different soil conditions, all double pit systems constructed under the different programmes follow the same standard design. While this has certain advantages such as facilitating planning, cost calculation and supervision of technical construction, it also has a number of distinct disadvantages.

First of all, local soil conditions are not sufficiently taken into account. In Shajapur, the clayey black cotton soil does not have a sufficient leaching capacity, with the result that the pits fill up quickly. Both local contractors and beneficiaries were aware of the conditions of the soil, but did not have the technical knowledge to improve the design in such a way that hygienic standards are ensured. Experiments with the design should have been carried out on location by technical experts and local contractors before starting the programme on a large scale.

In Silchar, Mangaldai and Agartala, high groundwater tables lead to submersion of the pits during the monsoon time. Although high groundwater tables do not necessarily negatively affect the process of decomposition in the pits, the overflowing of pit contents when the pits get submerged is definitely not desirable. Moreover, construction of latrines becomes more difficult and where groundwater is used for water supply, this supply will become polluted. The contents of the pit also do not dry and cannot be shovelled out. This proved to be a problem also faced in Sri Lanka (personal communication from Chief Medical Officer of Health, Colombo) and other parts of India (Sarma and Jansen, 1989). The raising of the pits should be indicated in towns where groundwater levels are high and concrete rings could be used for pit lining to facilitate construction.

Standardization usually not only applies to design, but also to construction materials used for the pits. Even in areas where natural stone cut from rock is cheap and abundant, bricks are used for the pit lining. These are always more expensive than stone and where they are not readily available, extra cost for transportation is added. Apart from stones as a material for pit lining, other local materials may well be suitable, such as impregnated bamboo or logs.

Standardization does not promote experimenting with design and materials used. This not only applies to adaptations to local soil conditions and materials used, but also to the dimensions and the shape of the pits. The fact that in 70% of the double pits in the sample, the first pit had not even been filled after 5 years, indicates that the capacity of the pits may be too large. Similar results were found in other studies in India (HUDCO and HSMI, 1991). However, it was pointed out in the seminar that the pits are likely to fill up faster after the first emptying because of a gradual reduction of the leaching capacity of the soil surrounding the pit. Also, the number of actual users may be less than the pits are designed for, explaining the low pit filling rate. A minimum acceptable design interval between successive manual desludging could be one year. But to provide flexibility in removing the pit contents, it is advisable to keep this interval at two years (Roy, 1989).

Cost reductions could be attained by reducing the size of the pits, specifically where the soil has a high permeability, as was done in the Baldia Soakpit Pilot Project in Karachi, Pakistan. Here, adaptations in design and materials used for construction led to a reduction in costs from Rs 2000 per latrine to Rs 800 per latrine (Bakhteari and Wegelin-Schuringa, 1992). From a financial point of view, the optimal size of a leach pit should be decided when the decision on type of lining and material for the pit cover has been made. These two items are the most expensive in the substructure of the latrine (Roy, 1989).

The negative factors of standardization , however, should not lead to an abandoning of standards as this would make supervision of construction difficult and lead to a low technical quality of latrines. Thus, per town, field demonstration/pilot units should be constructed, taking into account local conditions, both of soil types and of construction materials. Where different types of soil exist within one town, it may be necessary to have more than one type of latrine. The demonstration models not only ensure adaptation to local conditions, but also serve as an example for contractors, supervisors and beneficiaries. The design which is chosen after the pilot latrines have been constructed, should be adhered to per town.

Handles of pit covers need improvement

Problems were experienced with the handles of the pit covers. These are generally made of 10mm steel bars which become rusty with time and easily break when the covers are lifted. A possible solution to this problem would be to have 15-20mm steel bars which are painted or oiled yearly to prevent rusting. Other solutions could be experimented with, even with local specific materials.

Cover and alignment of junction boxes require more attention

The biggest problem experienced with the junction boxes is that they are often cemented over or permanently sealed and therefore difficult to open. Thus people are not able to check regularly if everything functions properly and in case of blockage they have to call somebody to assist in opening of the junction box. After opening, often the cover is not always sealed back in position leaving the junction box half open, which increases the risk of blockage. In some towns the box covers fit exactly into grooves facilitating inspection and placement. Local construction standards should include the junction box cover,

avoiding total embedding in the soil and the use of separate bricks, and promoting either stone slabs or reinforced concrete covers.

If the Y-junction is constructed with an open drain channel and the alignment is not smoothly finished, faeces is likely to pile up in the junction box. If the blockage of the pit not in use is not properly sealed, the result may be that both pits get filled at the same time. More attention should therefore be given to the training of contractors and masons in these specific aspects.

Selection and availability of pour-flush pans requires action

Pour-flush pans requiring less water than full flush pans are recommended for double pit latrines and supplied with all programmes. These pans are made of glass fibre, mosaic cement or ceramic. The ceramic pans are liked best, but the pour- flush type is only fabricated in two places in India and therefore not available everywhere. The users are allowed to buy their own preferred type of pans and usually buy the expensive ceramic full-flush pans which require more water for flushing, thereby risking the hydraulic overloading of the pits. The production of pour-flush ceramic pans should be made more widespread to fulfil demand in all towns where low-cost sanitation schemes are being carried out.

Sufficient water availability to be ensured

The majority of the respondents use more than two litres of water per flush and most use one or more buckets of water to clean their latrines. In four towns more than half of the respondents professed to have shortage of water for flushing of their latrines. Although most towns officially have an average production of water of more than 40 lpcd, this amount is obviously not available in all parts of the towns, and specifically not in the low-income areas where the sanitation programmes are carried out. In a number of towns this shortage of water leads to non-use of the latrines. The use of grey water (without detergents and chemicals) for flushing could be promoted in these towns, as was done in Karachi, Pakistan (Bakhteari and Wegelin-Schuringa, 1992). Where availability is too low even for that, it may be necessary to discontinue promotion of pour-flush latrines and promote a dry technology such as VIP-latrines instead.

Superstructures to be provided or not?

The division of superstructures to type of system in the research shows that latrines with septic tanks almost all have a complete superstructure, generally made of permanent materials, while for single pits this is far less likely. For the double pit latrines, the picture is more diverse. In three towns, Coonoor and Magadi and part of Srikakulam, the superstructures were provided as part of the programme and all superstructures are made of permanent material. But many latrines are used for other purposes than intended. In Shertallai, the percentage of permanent superstructures is lowest, but latrine use is the highest in the whole research.

There is a discussion going on whether or not superstructures should be included in all low-cost sanitation schemes. The extent of non-use of latrines found in the follow-up

survey, supports the importance of this discussion. Those in favour maintain that if superstructures are included, the latrines are more likely to be used and less likely to get choked by dust, leaves or other debris, eventually leading to non-use. So far, the superstructures which are constructed as part of the programmes are all made of permanent materials, which has the advantage that they last long, but also has certain disadvantages.

First of all, permanent superstructures are expensive, thus increasing the overall cost to the government or the beneficiary (if loans are paid back). Secondly, if the superstructures are much better than the houses of the beneficiaries, they may well not be used as latrines but for other purposes such as storeroom or bathroom. This situation was observed in Magadi and Coonoor and is also mentioned in the literature (Roy, 1989). To reduce costs and avoid the latrines being used for other purposes, it may be possible to include superstructures of less permanent materials, which the beneficiaries can upgrade themselves at a later stage.

Those against including superstructures argue that the latrines are already subsidized to such an extent that the least the beneficiaries can be expected to do, is to construct a superstructure. This would not only reduce the costs to the government, but could also be used as a yardstick to ensure that those receiving a latrine are indeed motivated to have one. If awareness campaigns have not been carried out and motivation is low, the superstructure may not be constructed at all because beneficiaries are not willing to invest in a latrine. This was indeed the case for 40% of the households, covered in the follow-up survey on the extent of non-use, who did not use their latrine.

> *In a evaluation study on low-cost sanitation in West Bengal, households indicated that selection of beneficiaries should be made on the basis of capability to invest in a superstructure. In this town, many people who applied for a latrine could not be included in the scheme, while at the same time many who received a latrine did not construct a superstructure (HUDCO and HSMI, 1991).*

However, the type of material used for the superstructure does not need to be expensive and permanent, as long as the superstructure gives sufficient privacy and protection against rainwater and debris entering the pans, as has been done in the sanitation programme in Shertallai. If demonstration latrines are being built in the town to ensure a technical design adapted to local conditions, superstructures of local specific materials should also be included as an example. The beneficiaries could be requested to have materials for the superstructure in their possession before work on the substructure is started, in order to assure that the superstructure is indeed built.

4.2 USER RELATED ASPECTS

Motivation campaigns and user involvement increase success

The main issue with respect to the beneficiaries of latrine programmes, is the lack of awareness creation campaigns and involvement of the communities in the implementation of the schemes. Only in Shertallai, a systematic effort was taken to involve the

community. This resulted in a successful sanitation programme. The community leaders interviewed in the other towns generally feel that they have been insufficiently informed, which in turn is reflected in the lack of interest in the sanitation schemes in the community at large. Yet, in programmes in other places in India or elsewhere where the community has been involved from the start, either through the local leaders, through existing organizations or through a newly established sanitation committee, motivation for latrines is much higher. Promotion through these channels has proven more effective because people have confidence in their own community leaders. But it is necessary to first convince these leaders of the advantages of the schemes. This requires time and concerted effort from the municipal authorities who are usually responsible for this aspect of the sanitation schemes.

> *It was mentioned in the seminar that motivation should be done on the basis of aspects of convenience, privacy and status rather than on health aspects. Although sanitation does improve environmental conditions, large scale health benefits can only come about in combination with a number of other interventions such as improved water supply, drainage and solid waste. In addition, health is usually not the most important factor why people in low income areas are motivated to have a latrine.*

The results of the survey indicate that about half the respondents had never been attending any health or hygiene related awareness creation programmes and that no activities relating to sanitation awareness are being carried out in schools. The potential of schools in promoting hygiene awareness and latrine use was stressed during the national seminar. Schools can be suitable places for demonstration latrines, while teachers and children can be an entrance point for the promotion of low cost sanitation within a community.

Effective demand for latrines to be created

Both at the national Indian workshop and the inter-country seminar in April 1992, discussions were held on the need for effective demand for latrines before a sanitation scheme can succeed. It was stressed that a distinction has to be made between the approach for conversion of bucket latrines and completely new construction of latrines. Where latrines are converted, people are already motivated to use a latrine and often the superstructures already exist. Thus emphasis should be put on operation and maintenance aspects of the new technology. Where the scheme involves first introduction and new construction, efforts should first be directed towards awareness and motivation to create an effective demand.

Knowledge on technical operation of the systems to be increased

The daily or weekly requirements for operation and maintenance of the latrines such as using water for flushing and regularly cleaning of the pan and latrine slab are professed to be carried out by almost all latrine users and generally do not pose problems if there is sufficient water available. Most people who are using the latrines are very satisfied with the technology. But this does not imply that they understand how the latrine system functions. This is understandable because almost half of the respondents has not received any instructions on operation and maintenance of their latrines. Even if instruction was given, quite often people had forgotten these instructions by the time they had to do the

first switching. Most people are not aware that the contents of the pit are safe to handle after a year and that there is no need to empty two pits at the same time.

Since the persons responsible for operation and maintenance of the latrines are usually women, it is imperative that education on requirements for operation and maintenance and on technical aspects of the systems is specifically directed towards women. This may imply that special measures to reach these women have to be taken.

Organized support needed for emptying and service

The double pit system is promoted as a system which can be maintained by the householder themselves, but the research outcome indicates that people may not be willing to do this because it is culturally unacceptable. Contact with excreta, even if dry, is traditionally confined to distinct groups in society. This in itself is no problem, because at least the scavengers do not run a health risk when emptying the pits. But it stresses the need for organized service support. This could be carried out by municipal sweepers or by private scavengers. They should however be trained to understand the technology, not only for switching and emptying, but also to help when there are other problems such as blockages. Similar findings and suggestions were done in an evaluation of a low cost sanitation programme in Bangladesh (UNDP/World Bank, 1989)

Alternatively, a guarantee system, such as Sulabh International is giving in Agartala for the first five years after construction, could be required from all implementing agencies. It is obvious that in Agartala where this guarantee exists, it has an impact on the motivation of people to have a latrine.

Clear communication channels increase efficiency

With the organization of a service system, attention has to be given to communication. Not only this research, but also others (Sinha and Gosh, 1989 and Sarma and Jansen, 1989), indicate that users often do not know where to go if they face problems with their latrines. Sinha and Gosh (1989) found that users with guarantee cards from Sulabh International would go to the municipality for service. The municipality did not convey the message to Sulabh International and also gave no service. Sinha and Gosh suggested that a community representative would be selected to act as a mediator between users, municipality and Sulabh International.

Mechanical equipment necessary for the desludging of septic tanks

Awareness of the owners of septic tanks on the functioning of this system is not very high either. Less than half of the respondents were aware of the need for a soakage pit or the fact that the pit contents are harmful. Because septic tanks are all constructed on private initiative, it will be more difficult to reach the users with information. All septic tanks are emptied by scavengers or the municipal services, but only in Srikakulam mechanical pit emptying equipment is available. In all other towns tank emptying is done manually. In the seminar it was discussed that for this reason the construction of septic tanks should be prohibited in those towns where mechanical equipment for desludging is not available.

4.3 INSTITUTIONAL ASPECTS

Local bodies to be more involved in planning and implementation

In almost all towns, the local bodies do not have an adequate organization for operation and maintenance activities. This issue was discussed at length in the workshop and the seminar and is reflected in the literature (Sarma, Suresh and Jansen, 1989; HUDCO and HSMI, 1991). It is felt that this situation is largely due to the fact that local bodies are not enough involved in planning and implementation of the low cost sanitation schemes. Usually, the state level organizations are responsible for implementation and supervision. Because engineers at local level are not involved in implementation or trained in the technology, they are often not aware of the technical and other requirements needed to sustain the schemes. This not only concerns the technology, but also possible approaches to carry out motivation and awareness creation programmes. It also results in lack of motivation with the local bodies to carry out the responsibilities for operation and maintenance at a later stage. Generally local bodies are treated as weak, incompetent and ill-equipped and the tendency exists to strengthen the nodal agencies at state level to make up for the deficiencies at local level. It was stressed that this trend needs to be reversed and local bodies should become involved in all stages of planning, implementation and post installation phases of low cost sanitation schemes.

Responsibilities for operation and maintenance need to be clearly defined

Another reason for inadequate support for operation and maintenance by the local bodies is the fact that responsibilities are usually not clearly defined. Within the local bodies different departments may be involved in sanitation, such as health, public works and water supply. They each have their own role, but coordination between the departments is lacking, resulting in an inefficient organization where activities are overlapping or not being carried out at all. This issue was also mentioned in the literature (UNCHS, 1989) and it was stressed that operation and maintenance problems always have to be seen in a broader urban context, taking into account the linkages between the different departments. Interventions in the past usually focused too much on the individual infrastructure sectors and consequently did not lead to an improvement.

Need for capacity building at local level

Within local bodies training activities will have to be conducted to enable the staff to carry out their tasks in planning and implementation of low-cost sanitation and post construction operation and maintenance. Municipal engineers need to get a better understanding of low cost sanitation technologies in order for them to instruct contractors, masons and sanitation staff at local level and to be able to supervise construction. Other staff needs to be equipped with skills for the administration of loan applications and management of large sanitation schemes. In addition staff, male and female, has to be trained on how to promote low cost sanitation and how to conduct awareness creation programmes. If such staff is not available and/or outside support is needed, local non-governmental organizations should be encouraged to become involved. At community level, local leaders and/or community based organizations, should be approached to assist

in motivation and promotion. Funds for training and promotion need to be part of the funds earmarked for low cost sanitation at state level.

Procedures for selection of contractors need reassessment

The selection of contractors is a problem not only identified in this research, but in many other researches as well (Sarma, Suresh and Jansen, 1989; Sinha and Gosh 1989; HUDCO and HSMI, 1991). At present, contractors get paid after completion of construction of the latrines and it often takes a long time before payment takes place. Small contractors or individual masons do not have the capacity to pre-finance such contracts. Thus, only large contractors are interested in sanitation schemes and very often experience with low cost sanitation is not considered in the selection. These large contractors cannot be found in all towns and therefore they often come from outside. This has the disadvantage that experience with the technology is not available in the town itself when problems arise with the latrines at a later stage. Even if a guarantee clause is included in the contract, it is difficult to get hold of the contractors if they come from outside. The contractors are aware that it is difficult to call them if there are technical defaults in the construction and this can have an influence on the quality of construction. In the research this was experienced in Shajapur and Coonoor. To avoid this problem, masons from the neighbourhood should be hired for the construction and be given a training, as was successfully done in Quetta, Pakistan.

Sub-contracting may lead to low technical standards

Another issue with contractor selection is that large contractors give sub-contracts to small local contractors. These are often not familiar with the technology and are not trained by the main contractor, nor are they properly supervised. This may result in latrines of a low quality or in adaptations of the design which are technically unsound. Large contractors and small contractors alike are often only provided with the standard design specifications and not aware of existing variations in design to suit local conditions, such as raised pits for high groundwater tables.

Demand driven approach required for loans and grants

The funds available for a sanitation scheme and the number of latrines to be constructed are determined at state level. They also decide the division between grant and loan, the interest rate for the loan component and the repayment period. These decisions are not based on demand for sanitation programmes from the municipalities nor on income level of the intended beneficiaries. Little effort is directed to raise the interest of the local bodies or the beneficiaries who they represent. Yet, the administration of the loans and repayment schedules is the responsibility of the local body. Many of the local bodies were found not to be aware of the procedures involved in the low-cost sanitation schemes and this led to a number of problems. For instance, if the loan is channelled through HUDCO, the application for the loan has to be processed through the municipal body. Because they are not sufficiently informed on the schemes, it often takes a very long time before all formalities are fulfilled, leading to a delay in the scheme. When the funds are finally transferred, they may be insufficient due to interim price rises.

Unit cost need to reflect cost at local level

The unit cost of the latrines is determined by the state and does not take variations in material cost and labour cost into account. Very often, the amount is not sufficient to cover the cost per latrine, for instance if construction materials have to be brought in from elsewhere. This makes it difficult to find contractors who are interested in the scheme, but also implies that only large scale contracting is attractive. In addition, there is no price rise clause in the contracts, while it takes at least a year and often longer to construct all latrines for the scheme. By that time the price of materials may have risen. The result is that fewer latrines are constructed than planned. Where the scheme is planned as a whole town approach to eradicate scavenging, the obvious result is that not all dry latrines are converted and the town does not become scavenger free.

Uniformity needed with regard to subsidies and loans provision

There is a lack of uniformity in the low-cost sanitation schemes, not only between states, but within the state and even within the towns if more than one scheme is being carried out. This makes monitoring of the schemes extremely difficult. At town level, it may lead to refusal of beneficiaries to pay back loans if they are aware that other sanitation schemes are provided with a full grant.

Loan recovery in all cases is very poor. Part of the problem may be that the payments collected cannot be kept by the municipal authorities, but have to be channelled to the state. This reduces incentive for the municipalities to collect the repayments. Both in the national workshop and at the inter country seminar it was suggested that a percentage of the loans recovered should be given to the municipal authorities on the condition that a proper loan recovery system is set up. In some towns, loans are collected as part of a sanitation tax, in other towns they are collected together with other taxes or separately. In any case, loan recovery should begin immediately after construction is completed and not long afterwards as is now the case. Moreover, beneficiaries have to be made aware of the obligation of loan repayment, while sanctions should be determined and adhered to in case of default.

4.4 PUBLIC LATRINES

Privatization a possible alternative for effective operation and maintenance

The outcome of the research shows that public latrines for which the municipality has the responsibility for operation and maintenance do not function under the current system. At the same time, experience in many parts of India, where public latrines for use by local residents have the pay-and-use system and are operated and maintained by an NGO, shows that public latrines can be feasible. During the inter-country seminar it was mentioned that even with the existing low-cost sanitation schemes for private household latrines, there is a need for community latrines for about 60% of the low-income urban residents.

Because of this need, private initiatives are taking place to avoid the use of badly maintained public latrines. In Silchar, the research team came across some latrines which

were shared between a number of families on their own initiative. In Hosur, one cubicle of a public latrine was padlocked by a single family for private use. More examples may be available of specific solutions for community level latrines. There is a need for research into this issue.

Deficient technology, construction and management leading to problems

Most of the problems experienced with the public latrine complexes in the research can be attributed to bad construction and bad management. The technology selected is inappropriate in many cases, such as septic tanks without a soakage pit and/or location in flood prone areas leading to ponding of the effluent. In towns where no mechanical desludging equipment is available, the use of septic tanks for public latrine complexes should be prohibited, because they cannot be emptied in a hygienically safe manner. Similarly, the use of bucket latrines should also be prohibited and towns considered for low-cost sanitation schemes should be required to convert the bucket public latrines, if they are still needed after the household scheme is implemented.

The construction of the superstructures of the complexes is also deficient because many of the complexes have no separate section for women. During the seminar the necessity of separate sections was discussed as well as the size of each section. These should be the same for the male and female sections and construction standards have to include lockable doors, ventilation, sufficient space for bathing and washing and a guarded space for storing tools and cleaning equipment. Moreover, water availability should be guaranteed, either through the presence of a handpump or through the presence of a storage tank. A public latrine cannot function without this because absence of water invariably leads to blockage of the pans.

Incentives needed to keep latrines clean and functioning

Municipal attendants and sweepers get paid regardless of their performance. Therefore no incentive exists for proper operation and maintenance from their part. Moreover, funds needed for operation and maintenance are often not available within the municipalities with the result that blockages are not removed, broken or stolen parts not replaced, and septic tanks not desludged. One of the reasons why the pay-and-use latrines function so well, is that there is an immediate benefit for keeping the complexes clean because more people will use them and more income will be earned. This income is usually more than sufficient to cover all cost for operation and maintenance. It may be possible to propagate a system for the municipal attendants in all public latrines with an incentive for proper maintenance or to privatize operation and maintenance of the complexes. In addition, planning for operation and maintenance of the existing complexes should be done together with the community, and especially with those residents who do not have their own latrine to ensure a sense of responsibility from their part as well.

Where public latrines do not exist, but there is a need for latrine provision above household level, possibilities should be explored together with the community to assess options of shared latrines, private cubicles within complexes or other alternatives such as community managed complexes.

APPENDIX 4

'ENVIRONMENTAL CLASSIFICATION OF INFECTIONS' AND 'RANKING OF EXCRETA DISPOSAL TECHNOLOGIES BY EASE OF O&M, WATER NEEDS AND HEALTH BENEFITS' FROM FEACHEM ET AL. 1983

Table 2-2. *Environmental classification of excreted infections*

Category and epidemiological features[a]	*Infection*	*Environmental transmission focus*	*Major control measure*
I. Non-latent; low infective dose	Amebiasis Balantidiasis Enterobiasis Enteroviral infections[b] Giardiasis Hymenolepiasis Infectious hepatitis Rotavirus infection	Personal Domestic	Domestic water supply Health education Improved housing Provision of toilets
II. Non-latent; medium or high infective dose; moderately persistent; able to multiply	*Campylobacter* infection Cholera Pathogenic *Escherichia coli* infection[c] Salmonellosis Shigellosis Typhoid Yersiniosis	Personal Domestic Water Crop	Domestic water supply Health education Improved housing Provision of toilets Treatment of excreta prior to discharge or reuse
III. Latent and persistent; no intermediate host	Ascariasis Hookworm infection[d] Strongyloidiasis Trichuriasis	Yard Field Crop	Provisions of toilets Treatment of excreta prior to land application
IV. Latent and persistent; cow or pig as intermediate host	Taeniasis	Yard Field Fodder	Provision of toilets Treatment of excreta prior to land application Cooking, meat inspection
V. Latent and persistent; aquatic intermediate host(s)	Clonorchiasis Diphyllobothriasis Fascioliasis Fasciolopsiasis Gastrodiscoidiasis Heterophyiasis *Metagonimiasis* Opisthorchiasis Paragonimiasis Schistosomiasis	Water	Provision of toilets Treatment of excreta prior to discharge Control of animal reservoirs Control of intermediate hosts Cooking of water plants and fish Reducing water contact
IV. Spread by excreta-related insects	Bancroftian filariasis (transmitted by *Culex pipiens*) All the infections in I-V able to be transmitted mechanically by flies and cockroaches	Various fecally contaminated sites in which insects breed	Identification and elimination of suitable insect breeding sites

a. See table 2-3 for data on additional epidemiological features by pathogen.
b. Includes polio-, echo-, and coxsackievirus infections.
c. Includes enterotoxigenic, enteroinvasive, and enteropathogenic *E. coli* infections.
d. *Ancylostoma duodenale* and *Necator americanus*.

Table 3-2. *Ranking of excreta disposal technologies by ease of operation and maintenance, water needs, and health benefits*
(scale of 10)

Technology	*Lack of effort required*[a]		*Water needs*	*Health benefits*[b]	
	By user	*By municipality*		*Ideal*	*Actual*
Flush toilet/ sewers/oxidation ponds	10	4	H	10	9
Vault/vacuum truck	8	0	L	8	6
Pit latrine	8	5	L	9	6
Septic tank	6	5	H	8	7
Aquaprivy	5	5	M	9	6
Bucket latrine	3	1	L	5	1
Batch composter (double vault)	1	10	L	8	5
Continuous composter (multrum)	0	10	L	7	3

L Low; M medium; H high.
a. 0 = maximum effort; 10 = minimum effort.
b. 0 = no benefits; 10 = maximum benefits.

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APPENDIX 5

PARTS OF "ROAD TO FREEDOM" BY PATHAK 1991

pits has been the subject of research. Dr. T.R. Bhaskaran and Sampathkumaran (1966:28), have made the following observations:

'If the soil at the bottom of the pit is composed of clay or sand with an effective size of 0.2 mm or less and the velocity of flow of ground water is up to 3 ft. per day, the latrine can be constructed even as close as 20 ft. from the well. If the soil is coarser than 0.2 mm, but less than 0.3 mm of effective size and the sub-soil velocity is greater than 3 ft. per day, a careful study of the conditions must be made in deciding the distance between the latrine and the well. In such extreme cases, one feet to two ft. envelop of fine sand of effective size (0.2 mm) can be placed all round the latrine pit and at the bottom to prevent the ground-water pollution resulting from the flow from the latrine.'

Recently systematic studies have been conducted on the above subject by the World Bank through the UNDP and in collaboration with the Water Pollution Prevention and Control Boards of the concerned States, National Environmental Engineering Research Institute, Nagpur, through their zonal laboratories and State Public Health Research Laboratories. Experiments were conducted in Patna (Bihar) at two sites, where the soil contained an appreciable quantity of silt and the permeability was of the order of 0.032 to 290.5×10^{-5} cm/sec. The study shows that there is no evidence of pollution even in wells eight metres away from the hand-flush latrine pit (UNDP, 1982:2).

It is evident from this analysis that *Sulabh Shauchalaya* is the only low-cost scheme of sanitation. Moreover, as discussed above, the most noteworthy characteristic of the *Sulabh* system is that it neither contaminates the atmosphere nor is there any question of pollution of either the surface or underground water. The *Sulabh* system is also the cheapest among the prevalent conventional systems. It is also easy to maintain. For these qualities *Sulabh Shauchalaya* is the most suited for the Indian conditions and also for other developing countries. The *Sulabh* system also completely liberates the scavengers from the demeaning job of cleaning and carrying night-soil on the head. For that matter, *Sulabh Shauchalaya* is not only a breakthrough in sanitation technology, but a great movement for the liberation of scavengers which is very necessary to achieve for any civilized society.

CHAPTER 5

Efforts Made by National and International Organizations

THE FACTS ANALYSED in Chapter 2 presented a brief account of the social status and pathetic conditions of scavengers in Indian society where it has not only been an occupation, but also a social institution marked by social taboos, religious ostracism and social degradation. The social disabilities pushed scavengers down to the lowest level to get only sub-human treatment. The practices associated with untouchability, in general, and with scavengers, in particular, amounted to a denial of social justice. In an age of rising consciousness for human rights, social sanctions against *Bhangis* cannot have defence. Moreover, the norms of a democratic society and a Welfare State demanded end to such inhuman and unjust discriminations.

Hence, in the post-independence era, social reformers, welfare agencies and the State and Central Governments paid special attention to this problem and made sincere efforts to abolish untouchability and to liberate scavengers from the job of cleaning night-soil; for it was realised that the end of the job of disposing of human excreta and involvement of the people of this section in different jobs will help in improving their social and economic conditions. Various agencies, national as well as international, have been working in the field of sanitation. Although their efforts are aimed at providing good sanitation and not at the liberation of scavengers, yet the consequences of providing sanitary toilets in place of service latrines help in liberating the scavengers. The following account presents, in brief, the efforts made by various organizations and agencies.

NATIONAL ORGANIZATIONS

Perhaps the first organized effort for conducting the latrine

construction programme in and around India began with the establishment of health units which were set up first in Ceylon and then in India by the Rockefeller Foundation in 1930. Bore-hole latrines with pre-cast squating slabs were tried at these health centres in Bengal, Uttar Pradesh, Punjab, Bombay, Mysore (then a province) and Madras (then a presidency). These efforts, of course, met with some success, but there were some practical difficulties in getting them installed inside houses and removing the latrines to new locations after the bored hole was filled up. There were also problems of foul smell and fly breeding with this type of latrine as it did not have any water-seal.

After preliminary experiences, the concept of placing a simple water-seal pan directly over a dug pit was developed in Bengal at the Singur health centre. This was certainly an improvement, but the main complaints against the design were that water splashed upon the user and a large quantity of water was needed to flush it. After a few years of trial with this type of water-seal, the Friends Rural Service Project in Orissa thought of making improvements on this design. The shape was modified and the water-seal was reduced. At the same time the construction cost was reduced. The improved design became more successful.

When the Community Projects Administration launched the first Five-year Plan, the bore-hole squatting plates and the dug-pit latrines were officially recommended for rural areas. But, in spite of the efforts made to instal these latrines in the National Extension and Community Development Blocks, the sanitation programme could not be adopted on a large scale.

Although the All-India Institute of Hygiene & Public Health, Calcutta, Environmental Engineering Research Institute, Nagpur, Research-cum-Action Project, Singur, Najafgarh, Delhi and Poonamallee Institute, Tamil Nadu, tried in their own ways to find ways for the proper, safe and hygienic disposal of night-soil, the credit goes to the Planning Research Action Institute, (PRAI), Lucknow, which started its research in 1956 and, finally, got some result. The PRAI, obtained nine designs and carried on its research work. Finally, it developed a separate design of its own having water-seal, squatting plate and two-pit provisions to suit all economic and hygienic conditions. But, the only thing it lacked was that it was recommended for rural areas and instead of two

pits it suggested construction of only one pit initially to save the cost and to get the other pit constructed when the first one got filled up. Therefore, the adoption of the PRAI latrine remained confined mostly to rural areas and, as the construction of only one pit was recommended it could not be adopted on a large scale. When the first pit became full, most house-owners dropped the idea of getting constructed the other one. The installation of the PRAI latrine has been done on a large scale in Gujarat, but, mostly in rural areas.

Role of Voluntary Agencies

Before the emergence of Sulabh International as the most effective and dynamic voluntary organization contributing to the liberation of scavengers, a few voluntary agencies did pioneer work in this context in the country. The important among them are the Harijan Sevak Sangh, the Maharashtra Gandhi Smarak Nidhi, Pune, and the Safai Vidyalaya of Ahmedabad. A brief mention of these agencies is also desirable to understand the movement for the liberation of scavengers.

Harijan Sevak Sangh

The national organization of the Harijan Sevak Sangh came into existence in 1932 after Mahatma Gandhi's epic fast in Yarvada prison against the decision of the British Government to separate the so-called untouchables from the Hindus by granting them separate electorates. Gandhiji broke his fast on September 26, 1932 after the British Government's revision of the Communal Award in which the clause of separate electorates for untouchables was deleted. The crisis was resolved, but it made Gandhiji to realise that some concrete steps should be taken to remove the evil of untouchability for saving the Hindu society from disintegration.

On September 30, the same year, it was resolved in Bombay under the presidentship of Pandit Madan Mohan Malaviya that untouchability should be eradicated in all its forms from the Hindu society. To implement this resolution a new-organization named 'Anti-untouchability League' was formed in October 1932, which was later on called the Harijan Sevak Sangh. The entire nation stood in support of this move, morally and politically. Desh-

bandhu Thakkar Bapa tried to turn it into a national movement and within a few days of its inception, he spread it throughout the country with utmost zeal and devotion.

After some time, Gandhiji made a country-wide tour at the request of Thakkar Bapa, travelling about 12,500 miles between November 1933 and July 1934. This produced great impact on the masses. Millions of people heard the speeches of Gandhiji; thousands of them, inspired by his thought, stopped the practice of treating Harijans as untouchables and started fraternizing with them. The Sangh, constructed schools and hostels throughout the country for Harijan boys and girls and thousands of them were given scholarships. The Harijans secured admission to famous temples, specially in the south, where people practised untouchability in cruel ways. These efforts of the Harijan Sevak Sangh were for the Harijan community as a whole and not particularly for scavengers.

The Harijan Sevak Sangh also struggled for restoring human rights to the untouchables of society. It was realised that for the uplift of the Harijans, improvement in the level of literacy was necessary. It was also planned to educate Harijan youths and training them in technical skills.

Later, moved by extreme poverty, social inequality, inhuman working and living conditions of the scavengers, the Harijan Sevak Sangh took up the work of *Bhangi Kashta Mukti*, which implies betterment of their economic and living conditions, with the ultimate objective of *Bhangi Mukti* which is meant to stop the practice of cleaning the dry latrines manually and carrying the night-soil on the head. This is a revolutionary programme which envisages a society where a particular caste will not be compelled by circumstances to serve as scavengers. The institution has 59 *Sewaks* working under this programme, which includes supply of better implements to scavengers by the municipalities like scrappers buckets, wheel barrows, hand gloves and rubber shoes etc. as also improvement of dry latrines by providing receptacles.

Besides, the Sangh runs a *Safai Vidyalaya* at the Harijan Ashram, Ahmedabad, for imparting training to the *Bhangi Kashta Mukti* sevaks in modern and scientific methods of scavenging, construction of improved models of latrines and other allied subjects pertaining to cleanliness and hygiene. These persistent

efforts of this voluntary organization were a move towards liberation of scavengers. It cannot be claimed that the evil has been eradicated completely, but root had been shaken as was evident in the decline in the intensity of atrocities against this weaker section of the society. Moreover, the reform movement by Sevak Sangh also aroused the social consciousness among the Harijans themselves, in general, and among the *Bhangis* in particular, facilitating the process of liberation.

Maharashtra Gandhi Smarak Nidhi, Pune

The Central Gandhi Smarak Nidhi was established in Delhi in 1956 under the chairmanship of the late Appa Saheb Patwardhan. He was also the founder chairman of the *Bhangi Mukti Samitee* of the *Central Gandhi Smarak Nidhi* set up in the same year for the liberation of scavengers throughout India. Later in 1962, the *Maharashtra Gandhi Smarak Nidhi* (MGSN) was set up as a separate unit. But in the beginning, this State branch tagged its activities with the *Central Gandhi Smarak Nidhi*. The Founder Chairman of this unit was late Mamasaheb Deoginkar. After the Gandhi Centenary celebrations in 1969, the State branch started working as an independent unit. It was engaged in village uplift, propagation of Gandhian philosophy, publication of Gandhian literature and in launching the *Bhangi Mukti Scheme* (liberation of scavengers). The Nidhi has been working to abolish scavenging by converting the service latrines into pour-flush sanitary latrines of *Sulabh Shauchalaya* type and also by constructing new latrines which do not require the services of scavengers. Pioneering experiments in this field were done by the late Appa Saheb Patwardhan in Gopuri Ashram in Ratnagiri district of Maharashtra. Based on his work, the *Nidhi* decided to encourage the construction of two types of latrines, one the *Sopa type* in which the pan is not water sealed, but is provided at the delivery end with a hinged metal plate. The other one is *Naigaon* latrine, which is a modified aqua privy, in which arrangements are made to collect the effluent in containers for use as fertilizer in farms.

The *Nidhi* has established a separate cell, called *Bhangi Mukti Yojna*, for the purpose of propagation and construction of sanitary latrines. The tasks of extension, persuasion and also the construction of sanitary latrines have been undertaken by this cell

in a systematic and organized way. The cell launches schemes for motivating the people in rural areas to adopt the programme of latrine construction. For this purpose, different methods like audio-visual methods, films and slide shows, group meetings, exhibitions, *Bhajans*, Kirtans, posters and leaflet distribution were adopted to popularise the scheme in order to achieve the objective of *Bhangi Mukti*.

The *Nidhi* has under its control two-pan manufacturing workshops where pans are manufactured, and water-seal traps cast from cement mortar and marble chips. Training programmes are organised by MGSN for social and municipal workers on its ongoing projects. Each project runs for a week. Regular training camps and lectures are arranged for Govt., municipal and *Zila Parishad* staff at various levels. Besides, the *Nidhi* imparts 15 days' training for latrine construction and 10 days' training for biogas plant construction to local technicians. Stipend is also given to the trainees for the training period.

The *Nidhi* has included in its programme the construction of biogas plants and in this work Dr. Mapuskar has rendered a very valuable service to this organization as an honorary adviser. Initially, the *Nidhi* gave 50 per cent subsidy to farmers. It also has taken up the work of propagating and constructing biogas plants, based exclusively on human excreta (night-soil). Unfortunately, the progress of biogas plants is not as fast as expected. This is due mainly to high initial cost and absence of immediate monetary gain. Repayment of loan also presents a lot of difficulty. Hence, this institution has plans to conduct experiments for low-cost biogas plants.

By 1987 the MGSN constructed 70,000 latrines in 27 districts of Maharashtra and also 500 biogas plants, besides training a large number of field staff of various *Zila Parishads*. Hundreds of training camps had been organised for social workers engaged in different voluntary organizations. A large number of masons and technicians had been given training. The Government of Maharashtra, municipalities and *Zila Parishads* had been rendering full co-operation to the *Nidhi*. They had been directing their administrative and field staff to take up latrine construction work vigorously. Some of them are now subsidizing the cost of construction to the villagers if they adopt the design prepared by the *Nidhi*. The Government of Maharashtra has started giving mosaic pans free of cost to the adopters through *Zila Parishads*.

Safai Vidyalaya, Sabarmati Ashram, Ahmedabad

Safai Vidyalaya, Ahmedabad, a sanitation institution, was set up by the *Harijan Sevak Sangh* at Sabarmati Ashram in 1963 under the charge of Mr. Ishwarbhai Patel. The building in which the institute is accommodated is named as *Parixit Sadan* to commemorate the memory of late Parixitlal Mazumdar who was one of the pioneers of the Harijan movement in Gujarat. The *Vidyalaya*, in keeping with the objectives of he *Harijan Sevak Sangh*, took up the programmes touching all aspects of scavengers' life—social, economic and educational. Its activity includes training programmes in respect of the method, approach, use of improved implements for cleaning latrines etc., for all concerned, namely junior and senior engineers, mansons, sweepers and scavengers besides sanitary inspectors of primary health centres in rural areas and social workers engaged in the programme of *Bhangi Kashta Mukti*.

Short-term courses for policy-makers and administrators are also arranged at various levels to convince them of the importance of sanitation. The training programme comprised practical demonstration on cleanliness, technique of conversion of dry latrines into water-borne types, construction of new hand-flush sanitary latrines needing no scavenger service, modification of by-laws of local bodies and use of improved implements for sanitation etc. Such training programmes promoted the low-cost sanitation schemes.

The syllabus for training programmes included the methods for improvement of working and living conditions of sweepers and scavengers, their economic, social and cultural development, various types of latrine designs and use of sanitary equipments etc. The *Vidyalaya* has a demonstration plot with various types of sanitary latrines and biogas plants.

Students visit the *Vidyalaya* as a part of their study tours. They are taken round the models and exhibits displayed in the *Vidyalaya*. Films on sanitation and biogas plants are also shown to them. Youths of various organizations like N.S.S are trained in the construction of pour-flush sanitary latrines, soakpits and

smokeless ovens. The 1987 figures indicate that about 250 camps were held in villages of various districts of the State which were attended by about 3,000 college students and youths under the National Social Service Scheme.

This institution has been helpful in getting various bye-laws changed and subsidies granted by the local bodies and panchayats for conversion of dry latrines into pour-flush sanitary ones to eradicate the sub-human practice of carrying night-soil as head load by scavengers. There were about 1,70,000 dry latrines when the programme was launched in 1964. Almost all the dry latrines had been converted into pour-flush types in municipal areas with financial assistance of the State Government, municipalities, district panchayats and the contribution by the house-owners themselves. During the conversion, however, two pits were not provided at a large number of places where drainage facilities were available. And, in such cases, the pour-flush latrines were directly connected to the underground drains to facilitate the removal of the night-soil. In this manner, the State has been made almost free from dry latrines and all the scavengers, (about 5,000 in all) were absorbed in other jobs by the municipalities.

The utility of the *Vidyalaya* has been recognised by the State Government, municipalities, district and taluka panchayats and educational institutions, mainly the universities and people in general. They have often been calling on the *Vidyalaya* for organising camps, seminars and conferences. Various national and international agencies and organizations had taken note of the valuable contributions by this institute in the field of low-cost pour-flush latrines and in rural sanitation. For instance, the World Health Organization (WHO), UNICEF, the World Bank and the Government of India have been sending their representatives to study the working of its different wings particularly the training facilities and the methods adopted for implementation of sanitation programmes. Delegations from different countries, like Bangladesh, Sri Lanka, Bhutan, Nepal and Tanzania paid visits to the Safai Vidyalaya and discussed the low-cost sanitation and other related matters.

The impact of the Vidyalaya had been very positive and there was a general acceptability of the technical expertise made available by it to all concerned ranging from community workers

to Government employees and engineers working in municipalities, panchayats and government departments. About 1,200 panchayat workers and dozens of chairmen of district and taluka panchayats had already taken advantage of the training programme organised by the *Safai Vidyalaya*. UNICEF has responded favourably to the health and sanitation programme of the *Vidyalaya* by providing a mobile van to the institution with models, charts and arrangement for showing films to be used in rural areas of the State for educating the masses.

In order to help the trainees understand the technical aspects of sanitation, 10 posters on sanitation and *Bhangi Kashta Mukti*, 13 folders on various types of latrines and sanitation guides have been published by the *Vidyalaya*. A booklet on sanitation in Gujarati, coloured posters and folders have been printed with the financial assistance of the State Government. With the help of the Social Welfare Department, a Gujarati version of three important committee reports, namely *Malkani Committee, Barve Committee* and Viyas Committee, have been brought out in which recommendations had been made to improve the condition of scavengers. The Vidyalaya had also helped the Gandhi Centenary Committee in preparing a documentary film *Abhishap*, depicting the plight of scavengers which had tremendous impact on the people.

Government Efforts in Liberating Scavengers

Although during Gandhiji's lifetime efforts were made for liberating scavengers, yet no tangible results could be achieved. First, because India was under foreign rule and the Government did not make any sincere effort at liberating scavengers and, secondly, because there was no technology available to replace the sewerage and septic tank systems.

After independence, the Central and many State Governments started work on liberating scavengers; and they appointed committees to analyse the working and living conditions of scavengers and suggest ways for improving them. The following committees are worth mentioning:

1. The Scavengers' Living Conditions Enquiry Committee constituted by the Govt. of Bombay in 1949, headed by B.N.

Barve (1949-51).
2. The Scavenging Conditions Enquiry Committee, constituted by the Ministry of Home Affairs, Govt. of India, in 1957, chaired by Prof. N.R. Malkani (1957-60).
3. The Committee on Customary Rights to Scavengers, 1969, headed by Prof. N.R. Malkani.
4. Committee on Conditions of Sweepers and Scavengers, appointed by the National Commission on Labour and chaired by Bhanu Prasad Pandya (1967-69).
5. Wage Board for municipal workers constituted by the Government of Kerala in 1971 under the chairmanship of Mr. A.S. Menon.
6. Commission to Enquire into the living conditions of *Safai Mazdoors* employed by local bodies and private scavengers working in Haryana State, appointed in 1969 by the Haryana Government (1969-72).
7. Committee on Improvement of Living and Working Conditions of Sweepers and Scavengers appointed by the Government of Karnataka under the chairmanship of Mr. I.P.D. Salappa (1976).

Although the reports by these committees were important in their own ways, yet the one presented by the Malkani Committee found special favour with the Government. Out of so many recommendations of the Malkani Committee, the following two were very important:

1. *Bhangi Kashta Mukti,*
2. *Bhangi Mukti.*

The Malkani Committee suggested that since it would take time to get all the existing bucket privies converted into sanitary latrines, a programme of *Bhangi Kashta Mukti* should be launched and the scavengers should be provided with gloves, gum-boots and scrapers so that they could be saved from having to touch night-soil. It was also suggested that houseowners be required to have good receptacles so that the night-soil could not disperse over the ground and it could be easy to pour the excreta from receptacles into buckets (containers). It was also recommended that scavengers should be provided proper buckets with trolleys, so that they may not have to carry night-soil on the head.

Various State Governments, including the Government of Bihar, implemented the suggestion of *Bhangi Kashta Mukti* of the Malkani Committee and asked local bodies to purchase gum-boots and trolleys. These were purchased in large numbers by the local bodies, but they vanished soon, as most scavengers sold their gum-boots and the trolleys having rubber covers on their wheels, became dysfunctional. Nor was there any facility to replace and repair them. Due to the miserable condition of the roads, the rubber of the wheels got damaged, making it difficult to push them without the wheel-rubber. Consequently, most scavengers left their trolleys and reverted to the practice of carrying night-soil on the head. A very small number of trolleys are seen in Patna these days.

The next suggestion of the Malkani Committee, (to get the existing number of dry latrines converted into sanitary ones and to ban the construction of new ones) had found favour with Bihar, Gujarat and Kerala Governments but today almost all the States and Union Territories of the country have started making efforts at liberating scavengers from the sub-human practice of carrying night-soil and rehabilitating them and their wards in other occupations after training.

Ministry of Works and Housing

The Ministry of Works and Housing, Government of India, which was earlier a part of the Health and Family Planning Ministry, issued a circular in 1968 directing all the State Governments to get the bucket privies converted into water-borne latrines and to connect them to sewers wherever available; or to a disposal system at the earliest so that scavengers could be freed during the Gandhi Centenary period. It said that it would be the best tribute to *Rashtrapita* Mahatma Gandhi.

Three States, Bihar, Gujarat and Kerala, took up this programme in right earnest. As the number of service latrines was too small in Kerala, almost all the dry latrines were converted there. Only a small number of service latrines were left on.

Gujarat took up the programme of liberating scavengers in a big way and it had tremendous impact. Bihar's programme topped in

the country. The Central Ministry of Works and Housing, had the following seminars organised in collaboration of WHO, UNICEF, UNDP and the Governments of Bihar, Rajasthan and Tamil Nadu:

1. National seminar on conversion of bucket privies into sanitary water-borne latrines organised by the Government of India in collaboration with the UNICEF, Patna, May 1978.
2. International seminar on low-cost techniques for disposal of human wastes in urban communities, sponsored by UNDP, Government Project and Government of India, Calcutta, February 1980.
3. Regional conference on low-cost pour-flush latrines, sponsored by the Government of India and the Government of Rajasthan in collaboration with UNDP, Udaipur, August 1982.
4. Regional seminar on low-cost sanitation, organised by the Ministry of Works and Housing, Government of India and UNDP, October 1982.
5. National seminar on integrated development of small and medium towns in New Delhi, 1982.

These seminars not only created an immense impact on the people but also motivated the State Governments to take up the programme for the liberation of scavengers. Now the Ministry of Works and Housing, Government of India, has also started giving loans to small and medium towns under its IDSMT (Integrated Development of Small and Medium Towns) project for the conversion of dry latrines into hand-flush water-seal ones.

The National Building Organization (NBO), under the Central Ministry of Works and Housing, is making experiments on various designs of low-cost sanitation, trying hard to make them popular through the media so that the people may be benefitted and they could be able to adopt the low-cost sanitation programme.

Ministry of Home Affairs

Seeing the success of the liberation of scavengers' programme in Bihar, the Ministry of Home Affairs, Government of India, also took up the programme under the Protection of Civil Rights Act 1955 in 1980-81. The ministry viewed that out of so many cruelties meted out to Harijans, carrying headloads of night-soil by a particular caste, called scavengers (*Bhangis*) after 37 years of independence, was the most heinous. This was a blot on human civilization. Therefore, the ministry carried on this programme on the 'whole-town-approach' basis, which means that one town should be wholly freed from scavenging and then another should be taken up. Under this programme, the Ministry started giving assistance to the State Governments on the 50:50 basis. The Ministry of Home Affairs is giving matching assistance to the State Governments, i.e. 50 per cent cost of the total project of a town to liberate the scavengers and the rest 50 per cent expenditure has to be met by the State Government. On this pattern, the Ministry of Home Affairs (now Ministry of Welfare) has provided assistance to 19 States and Bihar is one of the beneficiaries of the programme. The Ministry of Welfare is providing financial assistance to the State Governments for making the towns scavenging free. A sum of Rs. 43 crore was released up to March 1989. In all 32 towns out of 166 selected under this programme and were freed from scavenging up to March 1989. In 1989-90 there is a target of 300 towns to be freed from scavenging out of which 130 towns have already been sanctioned. A massive programme for the rehabilitation of liberated scavengers and their wards has been taken up in Bihar and also in other States.

HUDCO Role

The Housing and Urban Development Corporation (HUDCO), set up by the Government of India in 1970 is a premier techno-financing institute in the field of housing and urban development. Primarily moved by the continuing sub-human practice of carrying night-soil as head-load, in 1983 it started financing basic sanitation schemes facilitating the eradication of the evil practice of manual scavenging and leading to the liberation of scavengers. Since then it has been promoting the adoption of two-pit leaching system (*Sulabh Shauchalaya*) for low-cost sanitation. This will help

in achieving the targets fixed by the Govt. of India during the current decade declared as 'International Drinking Water Supply and Sanitation Decade'.

According to the arrangement of financing followed so far HUDCO has been extending financial assistance to the extent of 50 per cent of the cost of a latrine unit at 6 per cent interest repayable in 12 years and the balance 50 per cent is arranged by the borrowing agency from its own resources. For the same purpose, the Ministry of Welfare has been separately extending grants to the State Governments for the conversion of dry latrines.

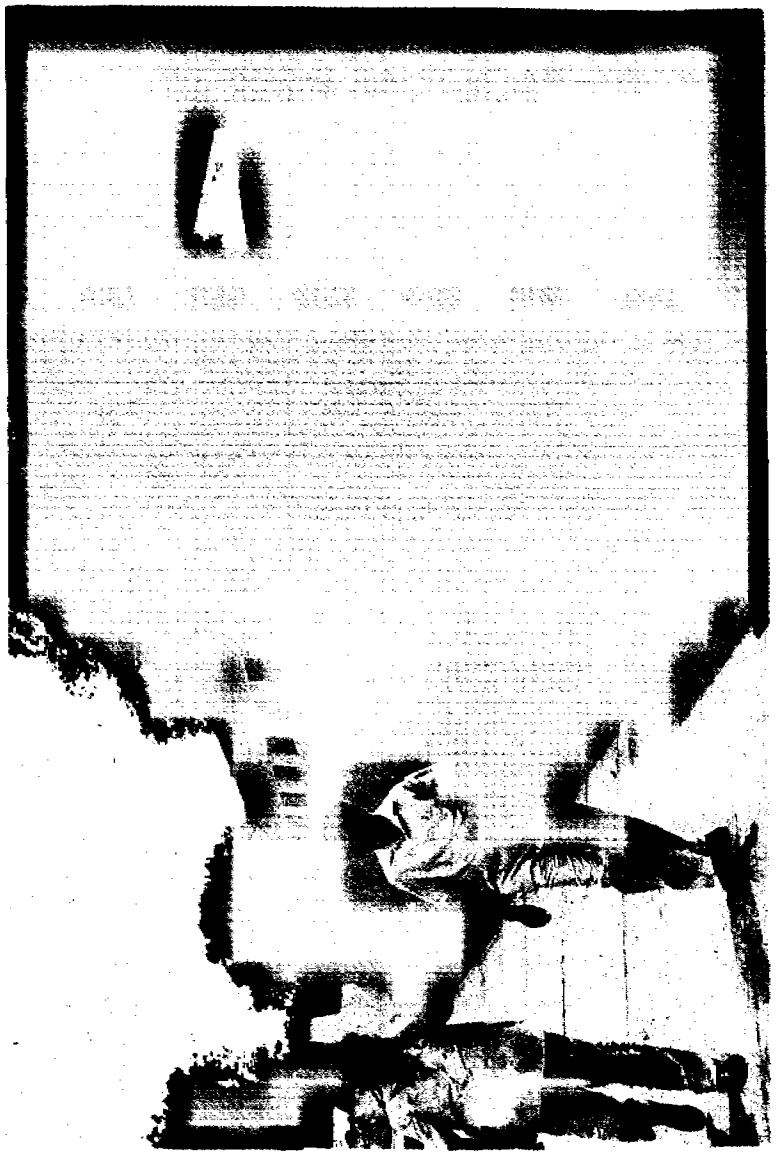
As a special effort towards the elimination of manual scavenging and improving sanitation conditions, it has now been decided to integrate schemes floated by the Ministry of Welfare and HUDCO for better coordination and results. It has been decided that this scheme may be taken up in 300 small and medium towns with less than 5 lakhs population and on a 'whole town' basis in the current financial year. The approach would be through the conversion of dry latrines into low cost water-seal pour-flush latrines and rehabilitation of the scavengers liberated or their dependents through alternative employment and training.

The current system of grants from the Ministry of Welfare to the State Governments for liberation of scavengers is being dovetailed with the HUDCO's loans so that the local body is in a position to extend loans and subsidies for conversion or construction of low-cost sanitation units up to plinth level. The loan and subsidy portion would be based on the income of the beneficiaries as follows:

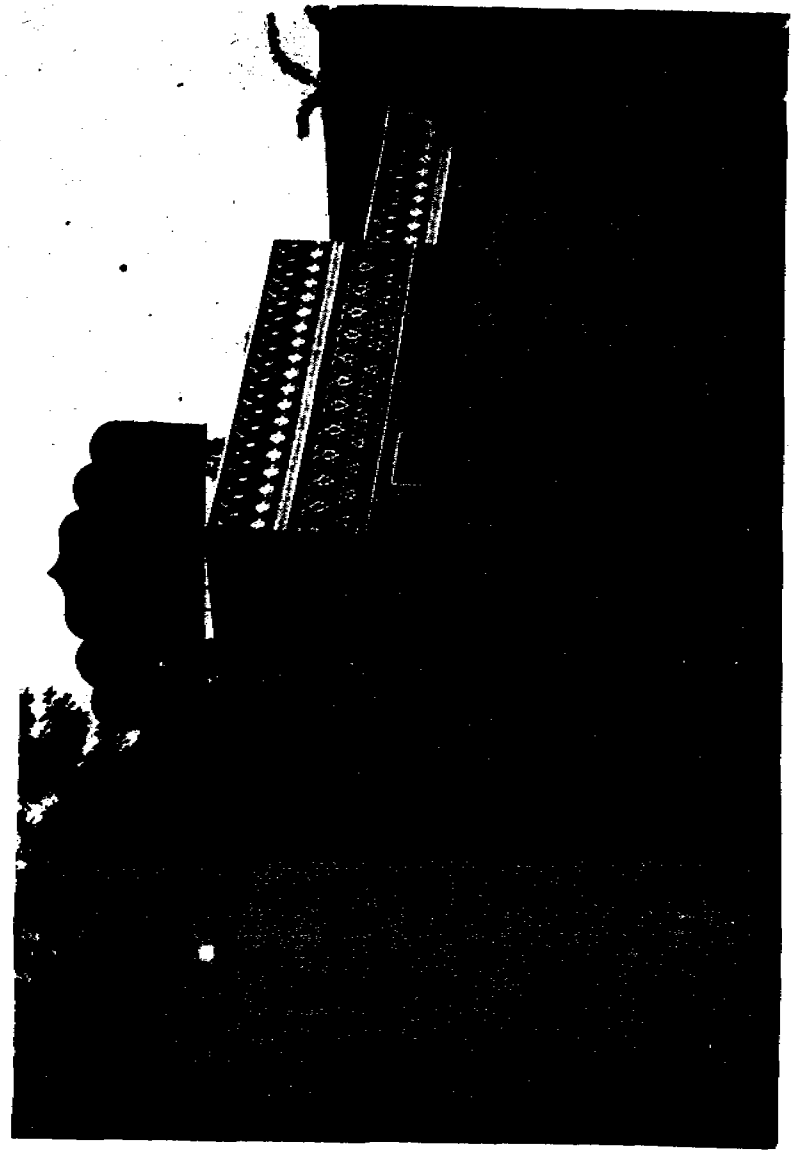
EWS	— 45% subsidy and 55% loan.
LIG	— 25% subsidy, 60% loan and 15% beneficiary's contribution.
MIG and HIG	— Nil subsidy, 75% loan and 25% beneficiary's contribution.

For all categories, additional loan for the superstructure can be extended by HUDCO to the extent of 50 per cent of the cost not exceeding Rs. 1,000, the balance would have to be met either by the beneficiary or by the concerned State Government.

As to the modus operandi, the HUDCO receives and considers



A Sulabh community complex at Buddhaghat, Patna.



The motif and architectural profile merge with Rajasthan style of house-building in the Sulabh complex at Ja pur.

applications from agencies authorised by the Government to carry out programmes for undertaking basic sanitation facilities schemes like housi g boards, slum clearance boards, development authorities, improver nt trusts and local bodies etc. The financial assistance is available r the projects for conversion of dry-pit latrines into water-se pour-flush latrines *(Sulabh Shauchalayas)* or construction of new l rines in the existing houses which do not have such facilities, mmunity latrines, public baths and urinals in the areas where su facilities are not available are also financed under the scheme. T e intending borrowers are required to prepare detailed project r orts containing description of the proposals like the location, roposed system of sewage disposal supported with drawings, pecifications, cost estimates, implementation period and the sy em of post-implementation maintenance. The proposal for provision of individual latrines or community latrines with disposal a rangements has to conform to guidelines prepared by the Govt f India.

Up to October 31st, 1989 a loan assistance of Rs. 41.95 crores has been sanc ioned for the low-cost sanitation projects, including new cons uctions, conversion of dry latrines into low-cost pour-flush wate -seal latrines with two leaching pits and construction conversio of community latrines. These schemes cover 212 towns in ten stat s of Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Orissa, Punjab, Uttar Pradesh and West Bengal. After successful completion of these shcemes, 146 towns are likely to be free from scavenging.

International Agencies

International agencies like WHO, UNICEF and UNDP have played an important role in sanitation programmes. Although they have worked for low-cost sanitation, the national objective of liberating scavengers was also served.

World Health Organization (WHO)

When in Bihar a controversy was raised by the Public Health Engineering Department on the pollution of the drinking water source, the WHO came to the rescue of the programme; otherwise there was a chance of the whole programme falling flat.

WHO, with the help of the Ministry of Works and housing, Government of India, and UNICEF organized a national seminar in Patna on the conversion of bucket privies into water-seal latrines in 1978, at which, apart from the secretaries of Urban Development Departments and the chief engineers of almost all the State Government, representatives from the *All-India Institute of Hygiene and Public Health, Calcutta,* Environmental Engineering Research Institute, Nagpur, Planning Commission, Director-General of Health Services, World Bank, WHO and UNICEF participated.

The seminar recommended that a two-pit system should be adopted in the hand-flush water-seal toilets. This was a historical seminar and the idea of conversion of dry latrines into hand-flush water-seal latrines started catching up. The recommendation of the seminar was printed by WHO and circulated among the authorities concerned, which really convinced the engineers about the adoption of this technology. Also WHO circulated an article written by Jitendra Tuli, public officer of WHO, which created a tremendous impact on planners, administrators, engineers, etc. An international workshop was organised by WHO on primary health care in 1983, at which low-cost sanitation was discussed thread-bare and it was recommended that sanitation was very much related to health care.

UNICEF

This world agency also played an important role in the sanitation programme of India. It helped in having hand-flush water-seal toilets in schools, besides funding the construction of hand-flush toilets under ICDS (Integrated Child Development Services) programme. UNICEF also involved itself in sanitation programmes in Andhra Pradesh, Orissa, Uttar Pradesh, Madhya Pradesh, Jammu and Kashmir and Bihar. This international agency collaborated with WHO and the Ministry of Works and Housing in the Patna national seminar, and it bore the entire expenditure of the international seminar organised in Calcutta. A national workshop was organised by UNICEF in Sri Lanka in which the author participated as a 'resource person'. UNICEF has hitherto sponsored the visit of experts of different countries, viz., Sri Lanka, Bangladesh, Nepal, Afghanistan, Vietnam, Ethiopia,

the U.S.A., Indonesia etc. to Patna to see the low-cost sanitation programme. Apart from this, literature on low-cost sanitation has been distributed by UNICEF and the idea of low-cost sanitation has been propagated through the media of mass communication (slides, etc.). UNICEF has also sponsored the programme for imparting training to masons and engineers in low-cost sanitary toilet.

United Nations Development Programme

UNDP, whose executing agency is the World Bank, started its activities in India in the field of low-cost sanitation in 1978. First of all it got evaluated the programme of low-cost sanitation already being carried out in Bihar and Gujarat. Thereafter, a study on the probability of pollution of the drinking water source from the pit latrine was done in Bihar, Gujarat and Tamil Nadu with the help of the Prevention and Control of Water Pollution Boards of these States. UNDP also assigned the task of preparing a design of the low-cost sanitary latrine to the Central Building Research Institute, Roorkee, in Uttar Pradesh. It took the assistance of the All-India Institute of Hygiene and Public Health, Calcutta, Environmental Engineering Research Institute, Nagpur, Central Building Research Institute, Roorkee, Indian Council of Medical Research, New Delhi, Public Health Institute, Poonamallee and PRAI, Lucknow and finally got prepared a manual on low-cost sanitary toilets for its adoption in South East Asia, Latin America and Africa.

UNDP was requested in 1979 by the Govt. of India to assist in preparing master plans and preliminary engineering and feasibility reports on low-cost water-seal latrines for Assam, Bihar, Gujarat, Maharashtra, Rajasthan, Tamil Nadu and Uttar Pradesh. For this purpose, 20 towns were selected in Uttar Pradesh and 50 towns each of the other six remaining States, in the first instance, by the Government of India. The reports in respect of these States, completed in 1981, covered 110 towns and generated considerably interest in the Central and State Governments. The studies related to the conversion of existing dry latrines into low-cost water-seal latrines, provision of individual low-cost water-seal latrines in houses and provision of community toilets for those households for which individual latrines could not be constructed.

Encouraged by these studies which constituted phase I of the project, the Govt. of India requested UNDP to prepare similar feasibility reports for Andhra Pradesh, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Orissa, Punjab, Tripura and West Bengal, Goa, Mizoram and Pondicherry. The studies done by UNDP helped the Government launch a centrally-sponsored scavenging elimination programme with 50 per cent grant to convert all the dry latrines in 33 towns in 14 States of Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. UNICEF financed some demonstration units in a few States. The State Governments also started putting the low-cost pour-flush latrines both in the project and non-project towns

In the course of preparing the feasibility reports, UNDP organized, supervised and financed, either partly or fully, a number of special studies which included evaluation of ongoing latrine conversion programmes in Bihar, Gujarat and Tamil Nadu, evaluation of the community latrines in Bihar maintained on the 'pay-and-use' basis, design criteria of pour-flush latrines, optimization of technology of pour-flush latrines, sociological study on the impact of latrine conversion on scavengers, institutional, financial and legal studies of 20 local bodies and soil and water pollution studies due to on-site disposal of human excreta conducted in Bihar, Gujarat and Tamil Nadu, as stated earlier.

UNDP has also played a very important role in the diffusion of the concept of low-cost sanitary latrine outside India. Due to the involvement of UNDP in this programme, those engineers, who were rather hesitant to accept this technology, now approve of its installation in urban areas. Also, UNDP got organized an international seminar in Calcutta, a national seminar in Delhi and two regional seminars, one in Rajasthan and the other in Tamil Nadu. In all these four seminars the adoption of low-cost sanitary toilets in urban areas was unanimously recommended.

Author's Role

Incidentally in 1969 the author got himself invovled in the movement for the liberation of scavengers from carrying night-soil as head-load during the Gandhi Centenary period.

The Government of Bihar took a decision to get converted all the existing bucket privies into water-borne latrines and to connect them either to sewers or to leaching pits (now popularly known as *Sulabh Shauchalayas*) to do away with the sub-human practice of carrying night-soil by a section of the people belonging to the low caste called *Bhangi* and *Mehtar* during the Gandhi Centenary period as a tribute to the Father of the Nation. In order to make the programme a success, the Government decided to give 50 per cent of the total cost of construction a (maximum for two *Sulabh Shauchalayas:* one for male and female in one holding) to the needy house owners who wa get their bucket privies converted into *Sulabh Shauchalayas* presumed that those who were having bucket privies w poor to afford the cost of water-borne latrines. It was the fi constraint that prevented them from having sanitary latr 1968-69, the Government of Bihar made an allocation o lakhs to various local bodies, including the Patna Mu Corporation, for the conversion of dry latrines into *Shauchalayas*.

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The Government of Bihar used to give grants to the Biha... Gandhi Centenary Celebration Committee for the propagation and demonstration of the leaching pits so that the people might feel attracted to adopt this new technology of two-pit hand-flush water-seal toilets. The efforts of the Gandhi Centenary Celebration Committee in this context were limited to propagation and demonstration alone and the progress in conversion was not at all noticeable. A few house-owners, impressed by the technology of this kind of sanitary latrine, tried to take advantage of the loans and grants from the local bodies, but they found it difficult to obtain financial assitance from local bodies. Some house-owners, who got the required amount, spent it on other items. The time taken in the process of obtaining the loan and grant discouraged even the small number of people who were ready to adopt it. The local bodies also did not show much enthusiasm for the programme, perhaps because the awareness of this new technology had not spread too far. The author tried to convince the then Secretary to the Gandhi Centenary Celebration Committee to allow social workers to directly participate in the programme and

engage the organization in the work of conversion of dry latrines into hand-flush water-seal toilets so that the desired result could be achieved and they could create an impact on the beneficiaries for the adoption of this new technology. But the Secretary did not agree to the author's proposal and said: 'voluntary organizations should keep themselves confined to demonstration and propagation only and should not go in for the actual implementation of the programme.' He further said: 'voluntary organizations should not earn money for carrying on their activities; rather they should run their affairs only on donation from the public and grants from the Government.'

The author had a different opinion and he stressed that voluntary organizations should not keep themselves confined only to demonstration; rather they should involve themselves in the actual implementation of the programme and they should earn also instead of living on donations and grants. In this way, the organization could serve a large section of the population (without having) to toe the official line. The institutions in India, which depend on grants are unable to discharge their responsibilities efficiently for want of resources of their own.

This led to the author's departure from the Bihar State Gandhi Centenary Celebration Committee and he set-up an organization named *Sulabh Shauchalaya Sansthan*, (now known as *Sulabh International*) in 1970 with the help of those working with him. The society was registered under the Societies Registration Act XXI of 1860 (*bearing No. 73/70–70*) in Patna. In 1970 the Government of Bihar promulgated an ordinance empowering the executive officers of the local bodies to punish those house-owners who did not get their dry-latrines converted within the stipulated period given by the local bodies.

So after forming the organization, they approached the Government of Bihar to recognise it for the implementation of the programme. In October 1970, the Bihar Gandhi Centenary Celebration Committee was dissolved and Sulabh remained the only organization having the expertise of the leach-pit-type latrines in Bihar. Between 1968–69 and 1974, the Government of Bihar allotted about Rs. 30 lakhs to various local bodies, but no concrete results could be achieved. Most of the funds were diverted to other works of the local bodies and the programme

could not gather momentum. The State Government took four years in recognizing *Sulabh International* for the implementation of the programme of conversion of dry latrines into *Sulabh Shauchalayas* and do away with the sub-human practice of carrying night-soil on the head. The State Government made a critical appraisal of the programme made in the past by various local bodies and, finally, it recognised the *Sulabh International* as a catalytic agency to work between the beneficiaries, local bodies and the Government which was convinced that the programme could not be implemented in full and the results could not be achieved within the stipulated period without the help of voluntary organizations. It was observed that the Government and semi-Government organizations could only raise funds, monitor and supervise the work being done by voluntary organizations, but the implementation of the programme could be done only by voluntary organizations, because the workers would have to move from house to house either in the morning or in the evening to contact the beneficiaries.

It was decided by the State Government that the social workers of the *Sulabh International* would move from house to house to convince the owners to get their bucket privies converted into *Sulabh Shauchalayas* because the former are health hazards and sources of many diseases, such as diarrhoea, dysentery, hookworm etc. and also a blot on human civilization. It was also decided that the house-owners, willing to get converted their bucket privies into *Sulabh Shauchalayas*, would simply fill up applications and agreement forms for obtaining loans and grants and hand them over to the neo-social workers (social workers of the *Sulabh International* are termed as neo-social workers) of the organization, who, in turn, would deposit them in offices of the local bodies. After proper verification, the amount for the conversion of bucket privies into *Sulabh Shauchalayas* would not be given to them; rather it would be given to the *Sulabh International* on behalf of the beneficiaries. After obtaining loans and grants from the local bodies on behalf of the beneficiaries, the *Sulabh International* would collect all the materials required for the conversion work and the actual conversion work would also be done by the neo-social workers of the organization. And, this was the beginning of the programme of low-cost sanitation in Bihar in 1974.

Method for Implementation of the Programme

The procedures laid down by the Government of Bihar for the conversion of bucket privies into *Sulabh Shauchalayas* worked well. In this procedure, the beneficiaries are not required to bear the burden either of obtaining loans and grants from the local bodies, or of collecting materials for the conversion of bucket privies. It is very difficult to procure cement at levy rates. Therefore, the beneficiaries feel free because their bucket privies are converted without their having to bother about it. The conversion and construction work is done by the experienced workers of the *Sulabh International* to the full satisfaction of the house-owners. However, if the house-owners so desire, they can supervise the work. In fact, the house-owners are requested by the *Sulabh International* to supervise the work so that it could be done according to their full satisfaction. Due to urbanization and industrialization, most beneficiaries remain engaged in their own work and, therefore, they prefer the conversion and construction work on the turn-key basis, even if they have to pay a little more by way of supervision charges. If the same work is done by the house-owners themselves, they can save a little amount, but they will have to face the arduous task of obtaining loans and grants from the local bodies, arranging materials for the construction and also some skilled masons for the conversion of their bucket privies. Methods for the conversion of dry latrines are so well planned that the workers engaged in the conversion work at the lower level cannot steal the materials or use substandard materials and one has to obtain certificate from the house-owners of satisfactory completion of the work.

Before starting the work, a copy of the directory is given to each house-owner who is requested to supervise the work according to the directory and if the work is not being done properly, the house-owner can stop it and inform the office of *Sulabh International* or local bodies. A utilization card is filled by the house-owner only to determine that the work has been done within the stipulated period and satisfactorily. After the work is over, the social workers of the monitoring cell of *Sulabh International* check the construction by visiting from house to house.

After submission of the report a reply-paid post card is posted to the house-owner to confirm the statement recorded by the social

workers of *Sulabh International.*

Thereafter a guarantee card, along with five post cards, is given to each beneficiary. If any defect develops in the construction within five years, it is repaired free of cost. If somebody registers any complaint developed in the construction work he is given a card stating therein the number and date of complaint. The defects are repaired within seven days. This process has worked well and *Sulabh International* has been able to create confidence among the Government, local bodies and the house-owners about the actual implementation of the programme in India.

Experiences through Encounters

To run such type of an organization, the chairman or the Secretary, whoever may be the executive head, should be dynamic in adjusting himself to all the circumstances of society. He must have all the qualities of a politician, a bureaucrat, a psychologist, a neo-social worker, a technocrat as well as of an administrator. Either a politician or a neo-social worker or an engineer or an administrator alone will not be able to show results. A politician does not mean that he should belong to a particular political party; rather he should have access to politicians. Since the future of a country is shaped largely by politicians, for taking up this scheme in priority sector or for raising the yearly budget for conversion of dry latrines, one has to convince politicians and, therefore, one will have to gain access to prominent leaders of all political parties. For example, the total budget of the Government of Bihar in 1968-69 was Rs. 2 lakhs and in 1985-86 it was Rs. 2 crores. So this is not only because of the author, but also because of the policy of the Government of Bihar. But certainly he has played a major role in convincing the politicians and the administrators as well in raising the budget limit from Rs. 2 lakhs to Rs. 2 crores.

A neo-social worker means he should be the Chairman or Secretary of the society registered under the Societies Registration Act. He should be so social that he may sit with the people of all status, may be literate or illiterate, rich or poor, sick or healthy and upper or lower caste people. He should be one who may be able to create confidence among the colleagues that all are at par and none is higher or lower excepting the designations for discharging duty.

A neo-social worker has to possess a good sense of bureaucracy in generating mass confidence in the social movement, otherwise bureaucrats generally believe the social workers as 'khau-pakau' (swindlers).

A neo-social worker has to have the qualities of a good psychologist. He will have to understand and read the minds of the people he meets. They may be either common men, politicians, bureaucrats, technocrats, sociologists, psychologists, beneficiaries or his own colleagues of the organization and accordingly he will have to act so that most of the people should remain happy with his behaviour.

A technocrat has full knowledge of the techniques adopted by an organization as also most of the techniques prevailing in the world. If he has got the technical knowledge, he can be able to convince the engineers, administrators and others about the advantages and disadvantages of different technologies. The executive head of the organization should have ability to run the organization efficiently. As the chairman of an organization becomes the supreme authority, he has to play the part of all the three wings—legislative, executive and judiciary. The head of the organization will have to be a more judicious and upright person to run the administration of a big organization like ours. It is rightly said:

'By a little mind, you can't rule over the empire.'

Secondly, the concept of the double-pit hand-flush water-seal toilet is not new, but people, in general, are not aware of the technique of double-pit hand-flush water-seal toilet as they are of the septic tank. Therefore, people have a fear psychosis in adopting a new technology. Generally, the consumers do not want to spend money on experiment. They want a ready-made, foolproof thing which could satisfy their need.

The International Labour Organization (ILO) has rightly pointed out about the *Sulabh International* that 'the idea of double-pit pour-flush latrines is not new, although some details of the *Sulabh Shauchalaya Sansthan* plans are original; what is new is the success of the scheme, whereby a private organization has built tens of thousands of latrines in a short time'. Although the idea of double-pit hand-flush toilet was available in India, yet all the

organizations engaged in this work in the country were advocating construction of only one-pit in the beginning and the other later on when the first one got filled up, to save the construction cost. When the author took up this programme in 1969, he started advocating the construction of both pits simultaneously to save the house-owners from the difficulties of constructing another pit just after the first one got filled up. This idea became acceptable, and in Bihar they started constructing double-pit hand-flush toilet. This idea was confirmed by the participants in the seminar held at Patna in 1978 organised by the WHO, UNICEF and Ministry of Works and Housing, Government of India.

Before the author took up this programme, this type of latrine could not get support from the Government as it should have been for adoption in the urban areas; rather they used to recommend this type of latrines for rural areas. The large-scale installation of *Sulabh Shauchalayas* and their successful functioning found favour with the Government and also by the participants at the said seminar.

In 1977, the Public Health Engineering Department of the Government of Bihar raised questions on pollution of groundwater from the pit latrine and it suggested to the Urban Development Deptt. of the Government of Bihar to issue instructions to stop the conversion of dry latrines into *Sulabh Shauchalayas*, otherwise the entire water supply of Patna would be contaminated and the people would die. The Urban Development Deptt. of the Government of Bihar got alarmed and it sought the author's opinion in this regard. The author suggested to the department to obtain an expert advice on this issue either from the National Environmental Engineering Research Institute, Nagpur, or from the Central Public Health Environmental Engineering Research Organization of the Ministry of Works and Housing, Government of India.

The Government of Bihar referred this matter of NEERI, Nagpur, and it sought their opinion. NEERI reported that if pit latrines were constructed with precautions at a safer distance, there was no chance of pollution of ground water or water pipelines. Although it served the purpose and the Government was convinced on this issue, yet the author's mind started itching to get a permanent solution of this problem and he himself went to

Nagpur and had discussions with them. He contacted CPHEERO of the Ministry of Works and Housing, Government of India also. Besides, he contacted the WHO, where he met Mr. A.K. Roy in 1977, who was working there as a sanitary engineer and was later the Resident Manager of the Technology Advisory Group of UNDP in India. At present he is associated with *Sulabh International* as an expert in sanitation technology.

The problem of pollution of water from pit latrines was also discussed in the Patna Seminar in 1978 and Dr. T.R. Bhaskaran, one of the topmost public health engineer in India, participated in the seminar on behalf of the WHO and he explained in detail his research done between 1940 and 1950. The paper presented by Dr. Bhaskaran and the replies given by him to the participants, by and large, satisfied the engineers of Public Health. Later UNDP also did research on water pollution between 1979 and 1982 in three States of India, viz., Bihar, Gujarat and Tamil Nadu and they also confirmed the statement by Dr. Bhaskaran, who was also engaged in this study. Now in Bihar, by and large, there is no apprehension about the technology and proper functioning of *Sulabh Shauchalayas*. The scavengers engaged in cleaning bucket privies also are not scared of unemployment, because the Government has given assurance that they would be given other jobs. In this way, scavengers also did not become an obstacle in the implementation of this programme.

Everyone wants that one's bucket privy should be converted into *Sulabh Shauchalaya*. But people are unable to bear the cost—income level being what it is. Therefore, unless assistance is made available, the programme cannot go ahead. Recovery of the loan may not be a problem if the local bodies want to recover it. Advertisement through the press and news through the media have also played an important role in convincing the house-owners for adoption of the new technology. The author's strong will to defend the work done by *Sulabh International* has also played an important role whenever faced either with the politicians, the press, the technocrates, the administrators or with the national and international agencies involved in similar programmes. The quality of work which is maintained by the *Sulabh International* has attracted the attention of the administrators and everyone wants the services of the *Sulabh International* in achieving the targets of the

liberation of scavengers from carrying night-soil by getting all the existing bucket privies converted into *Sulabh Shauchalayas*.

During 1974-88, 1.86 lakh dry latrines had been converted into *Sulabh Shauchalayas* in Bihar alone. And consequently more than 3000 scavengers in 15 towns of the State, namely Biharsharif, Deoghar, Ranchi, Purnea, Saharsa, Chaibasa, Madhubani, Bhagalpur, Daltonganj, Gaya, Chapra, Bettia, Motihari, Patna and Hazaribag.

In fact the non-availability of funds has been the main constraint, otherwise, all the 4 lakh dry latrines would have been converted and the entire State declared 'Bhangi Mukti' by this time.

CHAPTER 6

Unliberated and Liberated Scavengers

I. Unliberated Scavengers

As stated earlier the unliberated scavengers of Patna, Arrah and Muzaffarpur have been included in the present study. From each of these three towns, 50 scavengers have been selected for study. All these 150 unliberated scavengers from the three towns are the employees of Corporation (in case of Patna) or municipalities (in case of Arrah and Muzaffarpur). They are not doing the scavenging job privately and are the regular employees of autonomous bodies. On the basis of the informations collected from these towns, it appears that 100% of these unliberated scavengers are Rauts by caste in Arrah and Muzaffarpur; whereas in case of Patna 88% are Rauts, 10% are Balmikis and 2 % (only one scavengers) are Raiphars (Christian) by caste.

The collected informations about the family structure among scavengers reveal that both joint families and nuclear families are found in all the three towns. In Muzaffarpur, the majority of them (52%) live in joint families, in Patna 28% and in Arrah 32 % are living in joint families It means that in Patna and Arrah most of the families of the unliberated scavengers are nuclear in structure (72% and 68% respectively), whereas in Muzaffarpur only 48% are nuclear families. Hence, the patterns of family structure in Muzaffarpur differ from that of the families of unliberated scavengers in Patna and Arrah. These scavengers live in, different types of houses—owned, rented and government quarters. Only in Patna, the majority of them (70%) live in government quarters, whereas only 18% in Muzaffarpur and 4% in Arrah live in municipal quarters. It suggests that the Patna Municipal Corporation has provided housing facilities to a larger number of

its employees than the municipalities in Arrah and Muzaffarpur. Twenty-two per cent unliberated scavengers in Patna, 72% in Arrah and 74% in Muzaffarpur live in their own houses—whether mud-wall houses or hutments or jhuggis. It clearly indicates that in places where the employees have not been provided with residential facilities, most of the them live in their own tenements.

It may be either due to the fact that it is not possible for them to pay the rent of the houses in town areas or because of the social stigma the scavengers do not get a tenement on rent. According to collected information, 8% of these scavengers in Patna and Muzaffarpur and 24% in Arrah live in rented tenements or houses. Hence, it may be interpreted that where the unliberated scavengers have got quarters, they are mostly living there and where the quarters are not available, most of them are living in their own hutments. It is also important to note that those living in rented houses are not actually living in houses, rather in small accommodations like a room, a jhuggi or a tenement.

In some cases two or more scavengers' families share the tenement. Hence, it appears that the housing condition of the unliberated scavengers is extremely deplorable. The information on the kinds of their houses indicates that most scavengers in Patna lived in *pucca* houses because of government quarters provided to most of them. On inquiry, it came to light that some of the scavengers were occupying *pucca* accommodation on rent. It means that the owned tenements or houses have a *kachcha* structure. These findings provide further evidence of the poor housing condition of the unliberated scavengers. They live in congested, and *kachcha* accommodations which are poorly maintained. Information was also gathered about the number of rooms in the houses or quarters in which these unliberated scavengers are living.

It was found that 85 scavengers lived in one-room apartments, 47 in two-room quarters, 12 in three-room houses and another six in four-room houses. The scavengers having 2, 3 or 4 rooms were living either in joint family or they were sharing the houses with other families. In this way, generally one single family of an unliberated scavenger occupied only a one-room tenement. Hence, it appears that the scavengers are not living in spacious accommodations or at least in such houses which provide the

minimum accommodation, which is inadequate for a healthy living. This fact is evident from the information about how these scavengers feel in respect of the accommodation they are having or occupying. In all the three towns, majority of them declared that the house was not accommodative. As many as 70% of the scavengers in Patna, 62% in Muzaffarpur and 80% in Arrah had the same opinion. It means that only a small section feels that the accommodation is proper. But the overwhelming majority has complained of improper, inadequate and poor accommodation. Information was also collected about the housing condition and it was enquired whether the houses were provided with electricity or not. On the whole, only 16% in Muzaffarpur, 24% in Arrah and 72% in Patna have power connections. Hence, the worst condition is in the case of the scavengers of Muzaffarpur and the relatively better conditions are found in case of scavengers in Patna. It may be either due to the fact that most unliberated scavengers in Patna are living in government quarters and, hence, they are provided with electric connections at government cost. Hence, a higher percentage has electric connections in Patna.

The second reason may be the fact that the power connection facility is better in Patna than in Arrah and Muzaffarpur because Patna being the capital of the State, there is a better supply of electric power to the consumers. These factors may also be responsible for better condition in Patna in comparison with Muzaffarpur and Arrah. Regarding the source of drinking water, the information furnished by the scavengers suggests that in no case there is any private arrangement for drinking water. It means that no family of the scavengers owns a well or a water tap or a hand pump or a tube-well. This fact speaks of the poor economic condition and absence of modern civic amenities for these scavengers. The informations further reveal that no family takes water from a public well or from a public tube-well. There are only two sources of drinking water, i.e., public tap and public hand pump. In case of the scavengers in Patna, it is found that 100% take water from public taps, but in Muzaffarpur and Arrah, it is 34% and 82% respectively.

The unliberated scavengers were asked to give the place of defecation. The information furnished by them reveals that there are three alternatives used as places of defecation by them. They

either defecate in open space or in community latrines or in service latrines. The information also reveals that none of the unliberated scavengers from Patna defecates in an open space and only one scavenger belonging to the income group of Rs. 160—200 declared that he and his family members defecated in service latrines. In 98% of the cases the place of defecation was the community latrine. It means that unliberated scavengers living in government quarters have not been provided with separate latrines in their quarters. The pattern of information gathered from them also reveals that income is relevant to the habit of defecation because, in the three highest income groups no scavenger or his family members defecate in the open and the percentage of response showing defecation in open space has constantly declined with the rise in income in the first three income groups. The relevance of economic factor or family income to the place of defecation is further evident from the fact that zero per cent of the unliberated scavengers in the lowest income group, 42.1% in the next higher income group, 55% in the next higher income group, 50% in the income group of Rs. 1201—1600 and 100% in the two highest income groups use service latrines.

The information from the unliberated scavengers of Arrah indicate that defecation in the open is found both in lower and higher income groups, but the use of community latrines is not found in the last two higher income groups whereas the use of service latrines is found in inconsistently varying degrees in different income groups. Hence, it appears that the place of defecation used by unliberated scavengers in these towns depends on local conditions, availability of service latrines or community latrines and of open space for defecation. A more indefinite pattern has been found in the case of Arrah town than in the case of Muzaffarpur or Patna, and only in the case of the unliberated scavengers of Patna the commonly used places of defecation are community latrines.

The heterogeniety is also reflected in the informations collected about their age-structure, level of education and economic condition. These scavengers in each town belong to different age categories ranging from 20 years to 51-60 years though in varying percentages (Table 2). Some of them (4%) are within 20 years of

age and have just entered the service, whereas 6.6% are in the age-group of 51-60 years and are at the verge of retirement. The highest percentage (35.3%) is in the age group of 31-40 years and the second highest percentage (30%) in the age group of 41-50 years. Thus, majority of unliberated scavengers (65.3%) are in the age group of 31-50 years.

The data concerning the level of education suggest (Table 3) that most of the scavengers in each town (70% in Patna, 92% in Muzaffarpur and 86% in Arrah) are illiterate. No scavenger has completed school education and only 4.0% have read up to 7th or 8th class and only 1.3% up to 9th class. It shows the low-level of literacy in this category of scavengers. The above data also reflects educational backwardness in the male section. It is obvious that the condition will be worse in the female section and hence, on the whole the degree of literacy is very low among unliberated scavengers and their families. As regards the economic condition, the data (Table 4) show that the monthly income ranges from Rs. 400 to above Rs. 2000. These income variations are found in each of the three towns, though in Arrah town no family has a monthly income of more than Rs. 1600. On the whole 8.6% of the families have the lowest income of up to Rs. 400 and 32.7% belong to the income category of Rs. 401—Rs. 800. Thus, 58.7% of the families have a monthly income of more than Rs. 800 rising up to more than Rs. 2000. But it does not mean that the earning of an unliberated scavenger is very high. In most families, there are two or more earning members. Both husband and wife are employed in many cases. Moreover, most of these live in joint families. Hence, in view of the family size the income is very low and the economic condition cannot be described as satisfactory. The fact in respect of the presence of two or more earning members in the families of unliberated scavengers is evident from the information collected about the number of male (Table 5) and female adults (Table 6) in each family.

It is found that in most cases one-two male adults as well as female adults are members of the families. As both male and female adults are employed, the number of earning members is bound to be two or more in each family. The informations about the number of male children (Table 7) and of female children (Table 8) with the numbers of male and female adults also suggest

that in many cases the families are joint in structure and the size of the family is not very small. Hence, keeping the size of family in view and in the light of the fact that the number of earning hands in most cases exceeds two, the income-range is not higher. The joint structure of the families of these scavengers is also reflected in the data on married male (Table 9) and female members (Table 10). In many cases, the number of married male or female adults is more than one, suggesting joint family structure. It is also evident from the data that no distinct variation is found in family size, family structure and family income in the three towns of Arrah, Muzaffarpur and Patna.

The level of literacy and education is very poor among the families of these scavengers. Of the 150 families in three towns, only 55 families (37%) do not have any illiterate male (Table 11), whereas only 10 families (6.7%) do not have any illiterate female member (Table 12). It indicates that in majority of the cases, the families have illiterate males (63%) and females (93.3%). This is the level of illiteracy among unliberated scavengers in urban areas of Arrah, Muzaffarpur and Patna. It also suggests that comparative percentage of illiteracy is lower among men than women. But this difference does not mean that the male members possess a satisfactory level of literacy. The level of literacy is considerably lower among male as well as female members of the families of scavengers. In case of male members 4.2% are educated up to intermediate stage (Table 13); but in case of female members no one is educated up to this stage (Table 14).

In case of male members, 5.0% in the three towns taken together are matriculates, 9.9% are under-matriculates, 69.4% are educated up to middle stage and 11.5% are illiterate (Table 13). And, among female members 1.7% are matriculates, 1.1% under matriculates, 40.2% are educated up to Middle stage and 57% are illiterate (Table 14). These data reveal that the percentage of literacy is higher among men than women, but the male section of this occupational group is also very backward and scores extremely low in respect of literacy and education. The tables reveal that no significant difference exists in the three towns in respect of the level of literacy. Hence, the educational backwardness is the common feature among scavengers working in different towns. The tables also show the total number of adults

(illiterate, literate and educated) in 150 families of scavengers from three towns. The total number of male adults is 262 (Table 13) and of female adults is 179 (Table 14) brining the total figure to 441. In this way there are approximately three adults per family. It shows that even in case of joint structure, the size of the family is not very large. The low literacy level among these families is not confined to the present generation only, but is also likely to persist in the coming generations. The enquiries into the families sending boys and girls to schools have revealed that boys are sent for schooling only in case of 19 (38%) families of Patna, 20 families (40%) of Muzaffarpur and 16 families (32%) of Arrah.

On the other hand, only five families (10%) in Patna, 11 families (22%) in Muzaffarpur and seven families (14%) in Arrah send girls for schooling. On one hand the data reflect that the number of families sending girls for schooling is much lower than that sending boys for schooling and on the other it is found that these educationally, economically and socially backward scavengers do not understand the importance of educating younger generation, though there are facilities for their free education. These facts present a very gloomy picture of the condition of literacy even in the future generation of these scavengers. It is also significant to note that only facilities for free education are not available to this section of society, the government also gives stipends and other forms of economic assistance for encouraging literacy and education among the Scheduled Castes. But, in spite of these facilities only a very small number of boys and girls go to school which indicates lack of social consciousness and absence of realization of the importance of education for the *Bhangi* sub-caste. It is also possible that in certain cases the unliberated scavengers may not be aware of the facilities provided. But it is a remote possibility because the facilities given to the children of Scheduled Castes are so much talked about through media and on different platforms that the scavengers are expected to know about them. It is also possible that these unliberated scavengers think that their children are also to follow their occupation for which education is not at all essential or required. On this basis, unliberated scavengers constitute one of the most socially backward section of the Scheduled Castes (or of the Harijan community). The status of 'the lowest among the lowest' is bound

to persist due to very low literacy level and extreme poverty.

The information collected from the unliberated scavengers about the number of boys and girls attending colleges reveals that higher education is almost nil in the case of this section of the Harijan community. On the whole, the boys attending colleges have been found in two families of Patna, two families of Muzaffarpur and one family of Arrah. As regards girls, 100% of the scavengers from each town replied in negative. These data clearly suggest that there is no college education among girls at all and it is negligible in the case of boys. It further reveals the social and educational backwardness of this section of society. It is also important to point out that these unliberated scavengers and their families are not living in rural areas; rather in urban areas and they are expected to be more conscious of their rights, the present trends in the country and the governmental efforts at the social, educational and economic uplift of the poor. They are also more exposed to media than their counterparts in rural areas. Moreover, those living in Patna, capital of Bihar, have greater awareness about trends in the present age, and facilities provided to them by the government. But, these have made no change in poverty status and they still suffer from the same type of extreme educational backwardness.

The information regarding earning of male and female members reveals that in most cases there is only one earning male member in the families of the scavengers from each of the towns. As many as 97 families have only one earning male member while 36 have two in the family. Nine families have three earning male members whereas only two families have four; nine families don't have any earning male member. It means that in such families only female members earn. Of the 130 families, only one female member earns. Only in case of ten families the number of earning female members is two. In case of one family of Patna, three female members are earning. It means that the number of earning hands is not very large in most families in spite of the fact that a considerable number of families have joint structure.

The information provided by unliberated scavengers also throws light on the number of unemployed males and females in their families. It is found that in majority of the families there is no unemployed male or female. As many as 41, 37 and 41 families

from Patna, Muzaffarpur and Arrah do not have any unemployed male person. In the same way 34, 32 and 37 families from Patna, Muzaffarpur and Arrah do not have any unemployed female member. It means that employment is not a serious problem because of the nature of the job scavengers do. There is no competing claim on the job. As scavenging is essential in the towns due to the existence of traditional service latrines and the conversion of these service latrines into *Sulabh* system started on a mass scale only in the recent past, the male and female member of the *Bhangi* caste are required for carrying on the profession. Hence, these families do not face difficulty in getting jobs in municipalities and corporations for scavenging work. It may be the most important reason for a lower number of the unemployed among unliberated families of scavengers. They were also asked to furnish information about the males and females engaged in scavenging. In the case of 20 Patna families, no male member is engaged in scavenging whereas only in seven families no female member is engaged in scavenging work. In Muzaffarpur, 100% of the respondents declared that no male member was engaged in the scavenging work and, on the other hand, no family is without a female engaged in scavenging. In Arrah, 27 families do not have any male member engaged in scavenging whereas 32 families do not have any female member engaged in scavenging. It means that only in case of Arrah, the scavenging is done more by men than women; whereas in Patna and Muzaffarpur the number of families having males not doing scavenging work is larger than the number of families having women without the scavenging job.

The information collected from the scavengers about the number of person (male and female) engaged in sanitation work reveals that in Patna 32 families, in Muzaffarpur 12 families and in Arrach 23 families out of 50 do not have any male member engaged in sanitation work; whereas 49 families in Patna, 45 in Muzaffarpur and 50 in Arrah declared that no female member was engaged in sanitation work. It means that 100% of families in Arrah have women engaged in scavenging work whereas only one family in Patna and five in Muzaffarpur have no female member engaged in sanitation work. On the other hand, 18 families in Patna, 38 in Muzaffarpur and 27 in Arrah have male members engaged in sanitation work. These data also lead to the inference

that in comparison to females a large number of males are engaged in sanitation work like sweeping, cleaning of drains and disposing of garbage, whereas the scavenging work is mostly done by women. This situation is not found in only one town, rather, in all the three towns—though in varying degrees.

Information was also collected about the number of family members (both males and females) engaged in non-sanitation work. It was found that in most cases (121), male members of the families were not engaged in non-sanitation work. In case of female members, 100% scavengers declared that no female member was engaged in non-sanitation work. These suggest that only in a very few families of the scavengers non-hereditary and non-traditional occupations have been adopted. It may be interpreted that occupational immobility is still very much prevalent in this section of society which may either be due to illiteracy or difficulty in getting other jobs for illiterate persons. The reservation of jobs has also not helped in occupational mobility because other groups and sub-castes given the facilities of job reservation are also there, and the people from these sub-castes and groups may have a slightly better position in getting the reserved jobs. Thus the general backwardness of the *Bhangi* caste, lack of literacy and education and competition for other jobs may be the reasons for the continuance of the same traditional occupation in this sub-caste of the weaker section of society.

Smoking Habits

The analysis of the lifestyle and habits of the unliberated scavengers and their family members reveal some interesting features. Informations collected about smoking habit reveal that male members of 134 out of 150 families from the three towns are in the habit of smoking (Table 15). That is in 89.2% of these families, the male members smoke. In case of 80% of these families, female members are also in the habit of smoking (Table 16). It is also significant to note that the female members of these families do smoke because they are being modernised or because they have developed this habit as a fashion. The socio-cultural environment in which they live and the traditions they follow are responsible for this lifestyle, which is not admirable for women in the traditional Indian society where smoking has been a habit of

male adults. The traditional outlook does not appreciate women developing the habit of smoking. But in spite of this general trend, female members of scavengers' families have the habit of smoking. This aspect of lifestyle adopted by the female adults presents a contrast with the general lifestyle and normative pattern adopted by women in traditional social order. In case a woman smokes, she is condemned or laughed at by members of society. As regards alcoholism (drinking habit) it is not a rare phenomenon among the male members of the families of scavengers in Bihar. The present study also reveals that in most cases, the male members of the families of scavengers are in habit of drinking (Table 17). Only 22% of male scavengers denied being alcoholics. It means that in 78% of the families studied, the male members are alcohol-addict; 26% of the scavengers from Patna, 28% from Muzaffarpur and 12% from Arrah informed that the male members of their families were not in habit of drinking. It suggests that in each town the majority suffers from alcoholism. But among female members, drinking habit is almost absent. As many as 100% of the scavengers from Patna and Arrah, and 96% from Muzaffarpur stated that the women did not drink (Table 18). It means that only two women (4%) from Muzaffarpur town were alcoholic.

In this way, alcoholism is confined to the male section of the community of scavengers and taking alcohol by women is an exception. The observations also suggest that due to economic hardships, scavengers cannot afford to smoke good-quality smoking material—nor can they afford good alcoholic drinks. In most cases, female members smoke *bidis*, which is the cheapest one in the market. The same trend is dominant in case of male members also. There are very few male and female members of scavengers who smoke cigarettes. And those who do are of inferior quality. In the same way, they consume cheap liquor. In most of the cases they are in the habit of taking toddy, or a country-made liquor, which are crude, raw and, hence, cheap. And those in the habit of smoking, male or female, smoke frequently. In the same way those in the habit of drinking do not miss the opportunity, if they have some money in pocket. These suggest that most of these people have become alcohol-addicts and habitual smokers. It is also obvious that the higher frequency of smoking and drinking costs them a good part of their earning.

life in post-independence era. Their membership of the union is not out of eagerness for political affiliation, but because of the customary practice that the employees become members of their unions. The respondents do not have any type of affiliation with any social, cultural or political organization. It reflects a complete absence of political consciousness and orientation. The factors of illiteracy, poverty, social stigma of the traditional society and lack of contact with the educated and progressive sections of the community are responsible for inadequate political socialization. The absence of political consciousness motivates them to derive only entertainment and enjoyment from the media of mass communication and they are not in a position to realise the importance of these media in arousing political consciousness and in increasing knowledge of the current affairs and problems of the country. As a result, they are not able to appreciate the importance of political participation nor have they developed consciousness about the fact that they play a vital role in the political development of the country. Thus, despite efforts made by the Central and State Governments for generating political consciousness among the weaker sections of society, the unliberated scavengers have not been benefitted so far by these schemes.

The information obtained from scavengers about their background reveal that only 44.0% of 150 scavengers are in this occupation for 15 years or less, whereas 55.9% are engaged for more than 15 years (Table 25). Those engaged in scavenging for more than 15 years have varied periods of scavenging experience i.e. 16-20 years, 21-25 years, 26-30 years and 31 years or more. The percentage of scavengers engaged in scavenging has consistently declined with the increase in the period of experience, but a sizeable section has considerably a longer period of scavenging to its credit. It is also evident from the table that any significant relation does not exist between income variable and the duration of scavenging. It was also gathered from them that they were *Bhangis* by birth and scavenging was their hereditary occupation. It means that nobody adopted the occupation of scavenging because he or she was willing, but because it was a family occupation imposed on them by birth and not choice. The enquiry into the reasons for taking up this occupation reveals that according to 48.7% of the interviewee scavengers, there was no alternative, while according to 40.7% it was the traditional occupation of *Bhangis* and according to 37.3% it was easily available (Tables 26 and 27). All these reasons suggest that scavenging was adopted as an occupation for earning livelihood under compelling circumstances and social values which did not permit them to have a free hand in choosing occupation or to take up an occupation other than scavenging. This generalised finding is valid for all these scavengers irrespective of family income (Table 26) or family structure (Table 27).

All of them said 'no' when asked if they liked this profession. They did not want their children also to take up this occupation. This is quite natural because the sub-human work of cleaning and carrying night-soil cannot be liked by anybody. When they were asked to give reasons for their disliking, most of them replied that it was a dirty job. The second important reason was the lower social status associated with it. Persons doing the scavenging work are hated in society and the other members of the community do not like to have any interaction with them except utilising their services for cleaning and carrying night-soil. Another important reason mentioned by them was also related to lower social status because some of them declared that the occupation did not carry any respect. On the basis of these responses, it may be stated that the scavenging occupation has been adopted by them under compelling circumstances. They neither like it nor regard it as a respectable occupation. They feel that the occupation is dirty and sub-human and it is not proper for a person to clean and carry the night-soil of other persons. The society does not accord any respect or status for performing this important job, rather those engaged in this work are placed at the lowest rung of the social ladder.

Some other questions were also asked from the scavengers on their occupation and the status or position they enjoyed in society. It is obvious from their reply that under this system they are required to clean the night-soil and to collect it in containers from different service latrines. This automatically involves manual handling of the night-soil which is extremely degrading and sub-human. It is a manifestation of the ugliest form of social exploitation and injustice. It is important to note that although untouchability has been abolished under the Constitution of the country, the scavengers have failed to attain the status of

'touchables' as members of the caste society.

When asked: 'Are you allowed to touch persons of other castes while carrying night-soil?', all the scavengers replied in negative. It is important to note that though untouchability has been abolished under the Constitution and the practice of untouchability is a punishable offence, yet the scavengers are not allowed to touch the members of other castes while carrying night-soil. Regarding health hazards the scavengers were of the view that the scavenging profession caused several diseases like cold, cough, cholera and even tuberculosis. This is due to their exposure to unhealthy environments and the highly insanitary condition of work.

The scavengers were also asked: 'Have you made any effort to change this occupation?' The informations obtained from them reveal that 26% of them from Patna, 6% from Muzaffarpur and 18% from Arrah made efforts to change this occupation. It means that a smaller percentage from each town tried to change the occupation, but the majority did not take this step. It is not because the majority was in favour of this occupation, but because it had the impression that the efforts would prove futile and there was no other job which they could get after giving up scavenging. Hence, lack of initiative or effort on the part of the majority of scavengers was due to the realization of the fact that even efforts to this effect would not succeed.

Those who made efforts for changing the occupation were also asked to inform about the steps taken by them. More or less the same reply was given by 25 scavengers from the three towns who had made some efforts. All of them approached the higher authorities for some better job—better not essentially in the sense of economic gain, but in the context of social respect and prestige. Some of them registered their names in employment exchanges and approached the exchanges for suggesting some other jobs. But all these efforts proved fruitless and they neither got and proper guidance from the employment exchange nor did the higher authorities come to their rescue and render help in providing alternative jobs to these scavengers.

To study the degree of desirability of change in occupation, a question put to the scavengers was: 'suppose you are asked to start some business and you are provided with financial help also, are you prepared to leave this occupation?' All of them gave positive reply, which shows an eagerness on thier part to get rid of the scavenging profession and to get some alternative means of livelihood. They were further asked: 'Will you leave this occupation even if you get less income than what you are getting as scavenger?' On the whole, 54% of the scavengers are in favour of change in occupation even if they are losers financially. This view expressed by a majority clearly suggests that they are very keen on changing the present occupation even if it involved economic loss. Hence, economic consideration is important for a sizeable section of the scavengers covered by this question, but the majority desires to get rid of this occupation even at the cost of economic hardship. If the income is lower but the job is respectable, the majority wants to change the present occupation. It shows the importance of social factors and values in the desire or willingness favouring the change of occupation.

It is obvious from the above discussions that the scavengers are not in favour of continuing in the profession. They are doing scavenging because they do not get any other job. Some of them tried to get some other jobs and approached the authorities concerned and the employment exchanges for this purpose, but their efforts were in vain. The analysis also suggests that in case any agency or organization helps them in rehabilitation and provides financial assistance to start some business, they are ready to give up the present occupation and to take up business, 100 per cent unliberated scavengers have this desire and are willing to avail the opportunity of starting business if it is provided to them. More than 50% of the respondents are willing to take up business instead of scavenging even if the former fetches lesser income. It means that the economic factor is not the only consideration; rather the socio-cultural factor and those of prestige, respect and status are also important in determining the attitudes of the scavengers towards the scavenging profession.

They were also asked to express their liking for some other jobs either for themselves or for their children in case they have to give up their occupation. The question put to them was: 'In case you have to leave the present occupation, what other job would you like to take up for you and for your children?' They expressed their liking for different types of jobs like those of peon, sweeper,

assistant or clerk, businessman or any suitable job according to their qualifications. A good number of them did not mention any choice for a particular occupation either for themselves or for their children. In case of jobs for the female members, 14% from Patna and 12% from Arrah did not mention any specific job, whereas in the case of children 2% from Patna and 4% from Arrah did not specify any job. It was also found that in case of jobs for female members, the highest percentage of response went in favour of the job of maid-servant mentioned by 44% in Patna, 88% in Muzaffarpur and 80% in Arrah. Other important jobs mentioned by the respondents for the female members are those of peon and sweeper. As many as 28% of the respondents from Patna, 28% from Muzzaffarpur and 24% from Arrah mentioned the job of sweeper; whereas 26% from Patna, 12% from Muzaffarpur and 42% from Arrah mentioned the job of peon for the female members. In the case of children, the highest percentage of response in Patna went in favour of any job according to qualification (56%); in Muzaffarpur the highest percentage of response has gone in favour of the job of peon (48%) and 62% from Arrah have mentioned in job of peon for the children of their families. In this way it appears that the jobs of peon, maid-servant and sweeper have been mentioned by a large number of respondents as alternative jobs. It reflects the realistic outlook and approach of these scavengers. They realise that they are illiterate or lowly educated and their children are also not expected to receive higher education in the existing circumstances. Hence, they have mentioned only those alternative jobs which may be provided to them according to their educational qualification. They appear to be aspirant for better position for their children who may improve their academic status. Hence, they have opined that their children may be given suitable jobs corresponding to their academic performance and educational qualification. Thus, the higher level of aspiration is also not unrealistic and imaginative.

Another question put to the scavengers was: 'What are the difficulties felt by you in the present occupation?' The informations reveal that the total number of respondents is 150 from the three towns, whereas the total number of responses is 258 (Tables 28 and 29). It means that many of them have given more than one response and have mentioned two or more difficulties felt by them

in the scavenging profession. It is also evident that 54% of the scavengers are not provided with accessories needed for cleaning night-soil or transferring it from the dry latrine to the bucket. The accessories include hand-gloves, a piece of cloth for covering mouth or face and an equipment for transferring the same from one place to another.

Another important difficulty mentioned by 32% of these employed scavengers is delay in the payment of salary, 26.7% of the scavengers complained against hard duty and heavy load of work. According to them the scavenging work is strenuous and involves a lot of physical labour. Another difficulty pointed out by the scavengers is 'exploitation', social and/or economic, mentioned by 26% of them. The factor of lower salary has been mentioned by a smaller percentage (19.3%) and only 3.3% have mentioned other miscellaneous difficulties. It is also important to note that 16 scavengers (10.7%) do not face any problem in doing the scavenging work.

The analysis of collected data on the basis of income (Table 28) and on the basis of age (Table 29) reveals that neither the income variable nor the age variable is significantly relevant to variations in response patterns expressing difficulties involved in a scavenging profession. Scavengers of different age groups and varying income levels have expressed their problems showing no relevance of income or age.

A number of questions were asked from these scavengers to know the sources from which they came to know about the *Sulabh Shauchalaya* scheme and its importance in liberating the scavengers. The first question put to them was whether they had heard about the *Sulabh Shauchalaya* scheme. All of them gave a positive reply. In reply to another question whether they liked the scheme 100% stated 'yes'. It is obvious that the scheme aims at liberating scavengers and doing away with the sub-human occupation of scavenging and cleaning of night-soil manually. Hence, those who are most concerned with the scheme are those engaged in the scavenging work. Moreover, the scheme aims at benefiting the scavengers and hence their liking for the scheme is quite natural and logical.

They were asked to give reasons for this liking. Their views suggest that the most important reason mentioned by 50.7% is that

The information indicated that 34% of scavengers have electricity in their houses while others have not even though they live in urban areas. Nor do they have other civic facilities (Table 36). The collected data show that 60% of liberated scavengers get water from public taps, 21.3% from hand-pumps, 13.3% from wells and 5.3% from tube-wells (Table 37). Very few families own a private source of drinking water. This again proves the poor economic and living condition of liberated scavengers and their families. It is also evident that only 8% of the respondents own private sources of drinking water, whereas 92% take water from public sources (Table 38).

The collected informations further reveal that only 8% of the liberated scavengers have private toilets, 46.7% use community latrines and 45.3% use open space for defecation (Table 39). It is also found that no liberated scavenger uses community latrines in Purnea and most of them (94%) use open space as the place of defecation.

In the light of the above findings it may be stated that the living standard of liberated scavengers is very low. They are not provided with the basic amenities of life even in urban areas.

This fact has also come to light through field enquiry that actual scavenging work was done by women in most cases. Both men and women scavengers were employed, but the task of cleaning and carrying night-soil was done by female scavengers in most of the cases. In the present study only 20% of the liberated scavengers are men and 80% are women (Table 40).

In Ranchi 100% are women scavengers, whereas in Purnea 76% are females and 24% males. In Patna 64% are female scavengers and 36% males. Thus, in Purena and Patna towns most of the liberated scavengers are women.

The liberated scavengers are divided into various age-groups ranging from 20 to 61 years and above (Table 41). There is only one scavenger belonging to the age-group of 61 years and above and she is from Patna town. In the same way, one female scavenger is below 21 years of age and she is from Purnea. Moreover 30.7% of the liberated scavengers belong to the age-group of 31-40 years, 30% of 41-50 years 23.3% to the age-group of 21-30 years and 14.7% of the group of 51-60 years.

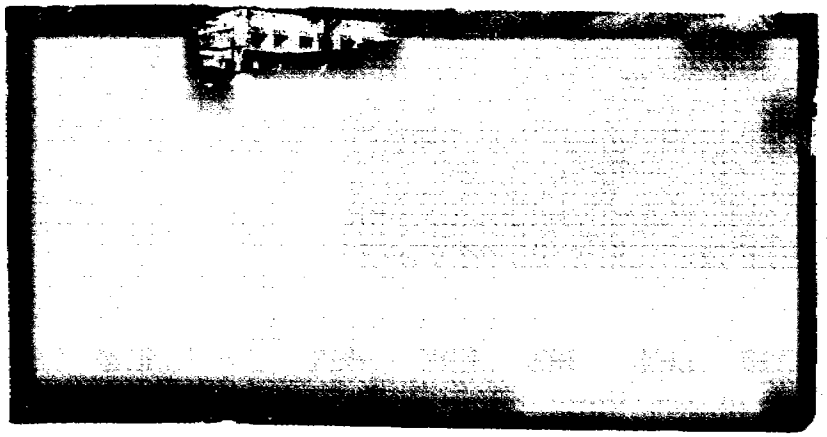
As of literacy and education, it appears that a vast majority of

scavengers are illiterate. Only 7.3% of them have read up to calss IV and only one (0.7%) up to middle class (Table 42). It is, thus, obvious that the condition of literacy is very poor and, in general, the liberated scavengers are illiterate. This finding clearly suggests that in absence of education they can do only manual work. It has also come to light that the scavengers having primary or middle level education dropped out during the study. They could not give any specific reason except that the poor economic condition of the family did not allow them to study. They started earning and, hence, they left their studies.

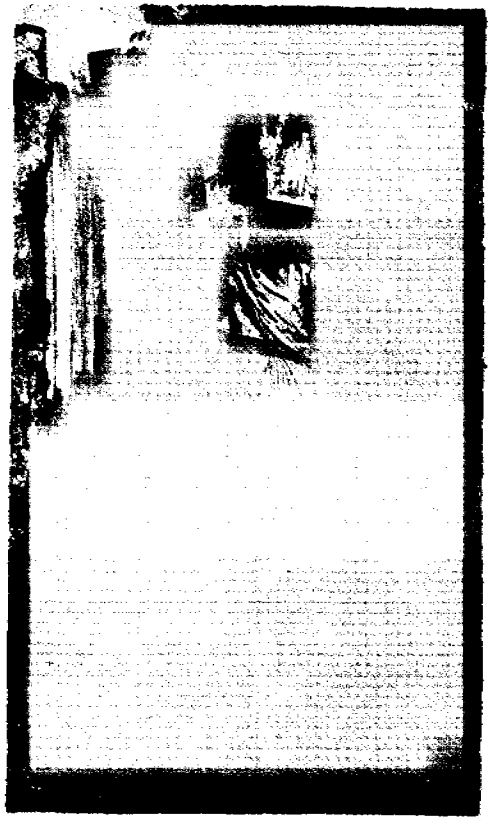
An enquiry into their interest in the adult education programme reveals that the interest patterns are not uniform in all the three towns (Table 43). In case of the liberated scavengers of Ranchi town, 62% have declared that they are interested in adult education whereas in Purnea only 28% and in Patna 16% are interested in adult education. It means that most of the liberated scavengers of Ranchi favour adult education while in Patna and Purnea towns the majority is not interested. It is important to note that in Ranchi all the liberated scavengers are women and in spite of belonging to the female sex, they have shown greater interest in adult education.

The table also presents that classification of informations on age basis. In Ranchi the highest percentage of response showing interest in adult education is in the age-group of 21-30 years (92.9%), whereas the lowest percentage (33.3%) is in the age-group of 41-50 years. In Purnea, there has been a constant decline in adult education with the rise in age. Thus, in this town, there is a significant relevance of age to the interest in adult education. In the case of Patna, 100% scavengers in the age-group of 21-30 years have replied in negative whereas 26.7% in the age-group of 31-40 years, 17.6% in the age group of 41-50 years and 9.1% in the age group of 51-60 years have shown interest in adult education. Thus, some relevance of age to the response patterns is found in Patna also. But, in the case of Ranchi, age is not relevant to the interest in adult education.

Informations were also collected about the personal income of liberated scavengers as well as their family income. The enquiry into family income was made with this fact in mind that there are two or more earning hands in the family. The collected facts



(*Left to Right*) Shashillaya Devi and Jhamni Devi after liberation. (Photo from Patna).



Shashillaya Devi and Jhamni Devi, when they were scavengers in Ranchi, carrying night-soil on the head. There is no measure of their miseries.

reveal that no scavenger has an income of less than Rs. 100 per month (Table 44). The highest percentage of response is from the income group of Rs. 301-400 (44.7%). The monthly income of the family ranges from Rs. 400 to above Rs. 1600 (Table 45). As two or more persons in most families are earning, the family income is much higher than the personal income of the liberated scavengers.

It is evident from the collected informations that they started scavenging work at different ages; 18.7% in the the age-group of 10-15 years, 7.3% at 21-25 years and 5.3% started scavenging after 25 years of age. The majority of them (68.7%) started scavenging at the age of 16-20 years (Table 46). Hence, it may be interpreted that majority of them started the scavenging work at the proper age of taking up the occupational career. The table also shows that 94% of the liberated scavengers in Ranchi, 60% in Purnea and 52% in Patna took up scavenging in this age-group. Hence, in each town the majority started scavenging in the same age-group. It is also found that scavenging was taken up at an early age by a higher percentage of the wage-earners in Patna (36%) than in Purnea (20%), whereas no one from Ranchi took up scavenging in this age-group. Likewise, 10% of the scavengers from Patna and 6% from Purnea took up scavenging after 25 years of age, but no one from Ranchi took up this job after 25 years. The start of the scavenging career, both early and late, is found in Patna and Purnea, but not in Ranchi. It is also revealed that the scavengers were liberated at different ages and a large number of them (36%) after 40 years of age (Table 47).

The table shows that they worked for a considerable period as scavengers; 20% were liberated in the age-group of 26-30 years, 16.7% in the age group of 31-35 years, 14.7% in the age-group of 20-25 years and 12.7% in the age group of 36-40 years. This difference in age at liberation is not on account of their own options, but because of the stage of time at which the liberation scheme was implemented with the efforts of Sulabh International.

The informations on the period of scavenging before liberation, collected from the three towns, reveal that the highest percentage of scavengers (39.3%) were liberated after working for 21 years or more. Only a smaller section of 9.3% were liberated after less than five years, 18% after 5-10 years whereas 20.7% were liberated after 11-15 years and 12.7% after 16-20 years. Thus, it appears that

in most cases the liberation took place after a long period of working as scavengers. The period of scavenging in all the three towns has been considerably long when the liberation took place.

The reason is quite obvious. The liberation of scavengers is not an old movement. This scheme was effectively introduced by *Sulabh Shauchalaya Sansthan* (now *Sulabh International*) and only through this institution the liberation of the scavengers has been possible. As this scheme started working effectively after 1970, the liberation is not very old. Moreover, at the time of liberation, the scavengers belonged to different age-groups and most of them were engaged for a considerably long period of service as scavengers. Hence, the duration of scavenging before liberation has been long in most cases.

On enquiry from the scavengers it was found that scavenging was their traditional occupation. A question was put to them, 'Did you, on your own, try to change your occupation?' In general, the liberated scavengers admitted that they did not try themselves to get their occupation changed. In fact, they were liberated by some other agency. This admission presents the true picture of the situation. It was the *Sulabh Shauchalaya Sansthan* which prepared a scheme for the liberation of scavengers. The *Sulabh Shauchalaya* scheme implemented by this organization under the chairmanship of the present author worked for the liberation of the scavengers in different towns not only in Bihar, but also in other States of the Country.

The service latrines were converted into *Sulabh Shauchalayas*, relieving the scavengers of the inhuman work in areas where this scheme was implemented. But, at the same time, the liberated scavengers were not out of job after the liberation; it was ascertained that they would be given some alternative jobs by the municipalities and corporations and that there would, thus, be no room for their unemployment.

When asked if they were satisfied with the present occupation after liberation, a small section of Purnea and Patna scavengers replied in the negative (Table 49).

However, it appears from this table that all the liberated scavengers from Ranchi are satisfied with their present occupation, which is not scavenging; it is some other job provided by their employers. In Purnea 43 respondents are satisfied, whereas 7 are

not. In the same way 37 respondents from Patna are satisfied, whereas 13 have expressed dissatisfaction. It may be due to the fact that the present occupations or jobs held by these liberated scavengers are also lower in status and are not liked by the members of other castes or sub-castes.

The scavengers who expressed satisfaction were asked to give reasons. All of them replied that their existing occupation was better than the previous one, though there was no improvement in their monthly emoluments. The casue of satisfaction is, therefore, not economic; it is exclusively psycho-social. Those who were not satisfied were also asked to explain their dissatisfaction. They gave different reasons. The most important reason for their dissatisfaction was the rather meagre salary they received and more work that they have to do (Tables 50-51). There is no specific variation either in the views given by male and female scavengers (Table 50). But the classification of given reasons on the basis of family income shows that only scavengers from lower income groups have expressed the view that the reason of dissatisfaction is less salary. Moreover, it is also evident that in the second highest income-group no specific reason for dissatisfaction has been given (Table 51).

A few questions were also put to the liberated scavengers with a view to studying the impact of liberation on them. The purpose of asking these questions was to find out if there has been a change in their social status after being liberated. For this purpose certain specific conditions were mentioned and they were asked to give information on them before and after their liberation. The conditions put to them were—(1) visit to temples visited by caste Hindus; (2) engagement of Brahmins to supervise religious ceremonies; (3) invitation by other caste people on ceremonial occasions; (4) taking water from common places along with other caste people, and (5) taking food and catering in hotels and other places.

It appears from the obtained informations that there has been a noticeable change in the social interaction among liberated scavengers and other low or high caste people. Eighty-six of the 150 interviewed scavengers visited temples before their liberation while the number has increased to 120 after liberation (Table 52).

Likewise, 94 of them engaged Brahmins to supervise religious ceremonies in the pre-liberation period, but after liberation, 128 were having the services of Brahmins in their families.

As regards invitation by other caste people on ceremonial occasions, there appears to be a significant impact of the liberation. In the pre-liberation period only 13 persons declared that they were invited by other caste people on ceremonial occasions. But after the liberation 127 declared that they were being invited by other caste people on such occasions.

No less significant is the case regarding taking water from common places along with other caste people and taking food in hotels and other places. In the pre-liberation period there were only 32 who took water from common places along with other caste people and 38 scavengers took food in hotels and other places. But in the post-liberation period the numbers were 142 and 138 respectively.

These furnished informations clearly reveal that there has been a significant impact of liberation on social relationships. The liberation has raised the status of these people in the eyes of the community and the traditional notion of untouchability is not strictly observed in their cases.

The liberated scavengers were further asked: 'Have you ever advised your relatives, who are in this profession, to stop this work?' All of them replied in the negative. Generally, the liberation has taken place through conversion of service latrines into *Sulabh Shauchalayas* and, consequently, where the liberation scheme has been started, the scavengers have been relieved of this sub-human job. There is, therefore, no question of advising the working scavengers to stop scavenging. They were also asked to state whether they were having intimate relations with those who were still engaged in scavenging work. It is significant to note that each of them replied in negative. It must be borne in mind that the respondents were also scavengers in the past.

They have been liberated in the recent past. There has been a change in their job, but their caste or sub-caste has remained unchanged. The scavengers are also from the same caste or sub-caste and have relations among those still unliberated. In spite of this the liberated scavengers do not have any intimate relation with scavengers. In informal conversation and through observation, it was gathered that the liberated scavengers were conscious that they did not do scavenging. In their talks, they declared with a sense of pride that they did not do this dirty job. It is obviously an impact of the liberation which has changed their traditional relations, attitudes, outlooks, approaches, patterns of interaction and social relations.

A few questions were also asked from the liberated scavengers to collect information about the educational status of their family members. One question put to the respondents was: 'Do you send your children to school?' The purpose was to find out the state of literacy and education in the younger genertion as also the changes in the attitude of the illiterate liberated scavengers. The collected informations suggest that in each town the majority has replied in the negative. The highest percentage of liberated scavengers sending their children to schools is from Patna (36%) and the lowest from Purnea (20%) (Table 53). It shows a significant relevance of the degree of urbanization to the favourable attitude towards the education of children. Among the three towns, Patna is the most urbanised and has a higher degree of urbanism, whereas, Purnea is the least urbanised town.

The table provides a classification of responses on income basis, but income does not appear to be a significant variable in determining the number of children being sent to school.

The scavengers who replied in the negative were further asked to give reasons for not sending their children to schools. In all, 96 were covered by this question. All of them stressed 'poor economic condition' or 'poverty' as the basic reason for it. It is also important to note that the Central and State Governments have provided considerable facilities, including free education, for the schooling of children belonging to Scheduled Castes. However, the liberated scavengers do not send their children to school because whatever little was needed was hard for them to give. It shows utter poverty of this section of society.

The people who sent their children to schools were asked how much education they wanted their children to receive. These 54 scavengers (36% of the total) were also asked to give their views separately for male and female. It was done keeping in view the fact that in an Indian society, in general, education of male children is considered more important than that of girls and, in the

working section of the Indian society in particular, female education has remained almost 'nil'. It appears from the informations received that except a lower percentage of the scavengers from Patna, all other scavengers attach importance to education of their male children and do not want to impose any limit from their own side. As far as the education of girls is concerned, out of 24 from all the three towns who send their daughters to schools, 7 (29.1%) aspire to educate their daughters up to the matriculation stage, whereas 17 (70.8%) want the maximum possible education to be imparted to them.

The next question related to the availability of adequate facilities for study at home. The data obtained from them are analysed on income basis (Table 54). In each town, the highest percentage of response is negative. Only 18% scavengers from Ranchi, 12% from Purnea and 36% from Patna, said that they were having adequate facilities at home. The highest percentage showing the existence of such facility is in Patna and the lowest in Purnea. This pattern is again consistent with the degree of urbanization. Towns having higher urbanization level and a higher degree of urbanism provide such facilities to a higher percentage of scavengers whereas those having a lower degree of urbanism have such facilities in a lower percentage. The table also reveals the variation of responses in different income-groups, though income has not been found to be a significant and relevant variable in this regard.

The next question put to the scavengers was: 'Do your children study at home?' The informations given by them reveal that on the whole, according to 36% of the scavengers their children studied at home, while 46.7% replied in the negative. In the case of 17.3% the question was not applicable because their children did not go to schools (Table 55). Thus, a relatively higher percentage of them declared that their children did not study at home. It may be due to inadequate facilitiy or due to lack of environment motivating the children to study at home. As the class of liberated scavengers has remained backward not only from the social and economic points of view, but also from the educational viewpoint and the liberated scavengers are either illiterate or semi-literate, they do not realize the importance of study at home nor are they very serious about it.

The scavengers, whose replies were negative, were further

asked to give reasons for it. This question was put to 70 persons who stated that their children did not read at home. All of them declared that lack of space was the main cause. At the same time, they admitted that lack of interest was the second basic reason for this state of affair. They said that the children could study outside the room, house or hutment in the open field on a mat and with the help of lantern if they had real interest and keen desire for their study. One may, therefore, conclude that poor economic condition and lack of interest among the children of this section of society are the basic reasons for that state of affairs.

Another question the scavengers were asked was about discrimination with their children in class rooms because of their caste. There was only one solitary case of a family in Purnea where discrimination was felt by the wards, whereas in all other cases there was a negative reply. It means that, in general, the children of the liberated scavengers do not experience any discrimination in their classes either from other students or from teachers becasue of their belonging to the *Bhangi* caste. It suggests that discriminatory behaviour on caste basis is not found in schools.

They were also asked to inform about the persons who encouraged their children to continue their studies. One scavenger said that his children were encouraged by relatives and one stated that her children were encouraged by friends, whereas all other scavengers declared that their own family members encouraged their children to study. On this basis it may be interpreted that there is no agency to propagate education in this class or section of the community and the family members themselves take the initiative in sending children to school.

In most cases the liberated scavengers themselves met the expenses over the education of their children. Only in 14 cases out of 49, the facilities provided by the Government have been mentioned as the source of children's education. It suggests that most of them are either not aware of the facilities provided by the Government or they are being deprived of these facilities. It is also possible that they are required to spend something over books and dress for their children for which they do not get any financial assistance from the Government, which is why they are required to meet these expenses out of their earnings. However, the liberated scavengers are not satisfied with the assistance provided

TABLE 26
Why did you Take up this Occupation?
(Income-wise)

Income	Traditional occupation	Easily available	No alternative	Due to poverty	Total
Up to—400	3 (23.1%)	5 (38.5%)	8 (61-5%)	1 (7.7%)	17
—800	20 (40.8%)	15 (30.6%)	21 (42.9%)	5 (10.2%)	61
801—1200	24 (42.1%)	23 (40.4%)	26 (45.6%)	10 (17.5%)	83
1201—1600	9 (37.5%)	11 (45.8%)	13 (52.2%)	1 (4.2%)	34
1601—2000	1 (33.3%)	1 (33.3%)	3 (100%)	—	5
2001 +	4 (100%)	1 (25%)	2 (50%)	—	7
Total	61 (40.7%)	56 (37.3%)	73 (48.7%)	17 (11.3%)	207

TABLE 27
Why did you take up this occupation?
(Family Structure-wise)

Family Type					Total
Joint = 56	21 (37.5%)	20 (35.7%)	35 (62.5%)	5 (8.9%)	81
Nuclear = 94	40 (42.6%)	36 (38.3%)	38 (40.4%)	12 (12.8%)	126
Total = 150	61 (40.7%)	56 (37.3%)	73 (48.7%)	17 (11.3%)	207

TABLE 28
What are the difficulties felt by you in the Present Occupation?

Income (Rs.)	Less salary	Hard Duty/ Heavy load of work	Delay in payment of salary	Accessories not provided	Exploi-tation	Others	No difficulty	Total
Up to 400 = 13	3 (23.1%)	4 (30.8%)	5 (38.5%)	7 (53.8%)	2 (15.4%)	—	1 (7.7%)	22
401—800 = 49	11 (22.4%)	9 (18.4%)	21 (42.9%)	34 (69.4%)	11 (22.4%)	3 (6.1%)	3 (6.1%)	92
801—1200 = 57	12 (21.1%)	18 (31.6%)	10 (17.5%)	27 (47.4%)	12 (21.1%)	1 (1.8%)	7 (12.3%)	87
1200—1600 = 24	3 (12.5%)	4 (16.7%)	10 (41.7%)	12 (50%)	10 (41.7%)	1 (4.2%)	4 (16.7%)	44
1601—2000 = 3	—	2 (66.7%)	2 (66.7%)	—	1 (33.3%)	—	—	5
2001 + = 4	—	3 (75.0%)	—	1 (25.0%)	3 (75.0%)	—	1 (25.0%)	8
Total = 150	29 (19.3%)	40 (26.7%)	48 (32.0%)	82 (54.0%)	39 (26.0%)	5 (3.3%)	16 (10.7%)	258

TABLE 29
What are the Difficulties Felt by you in the Present Occupation?

Age (Yrs)	Less salary	Hard Duty/ Heavy load of work	Delay in payment of salary	Accessories not provided	Exploi-tation	Others*	No difficulty	Total
Up to 20 = 6	2 (33.3%)	2 (33.3%)	1 (16.7%)	4 (66.7%)	1 (16.7%)	—	—	10
21—30 = 36	7 (19.4%)	7 (19.4%)	14 (38.9%)	21 (58.3%)	13 (36.1%)	1 (2.8%)	4 (11.1%)	67
31—40 = 53	10 (18.99%)	17 (32.1%)	13 (54.5%)	27 (50.9%)	13 (24.5%)	3 (5.7%)	7 (13.2%)	90
41—50 = 45	9 (20.0%)	12 (26.7%)	18 (40.0%)	27 (60.0%)	8 (17.8%)	1 (2.2%)	4 (8.9%)	79
51—60 = 10	1 (10.0%)	2 (20.0%)	2 (20.0%)	2 (20.0%)	4 (40.0%)	—	1 (10.0%)	12
Total = 150	29 (19.3%)	40 (26.7%)	48 (32.0%)	81 (54.0%)	39 (26.6%)	5 (3.3%)	16 (10.7%)	258

*NOTE: 'Others' include health hazard, no job security and no leave in emergency.

TABLE 30
Reasons for Liking Sulabh Shauchalaya Scheme

(% age)

Age (yrs.)	Economic	Hygienic	Liberates scavengers	Free From fourl smell	Scavenging not needed	Better than service latrine	Beneficial for general public.	Total
Up to 20 = 6	—	4 (66.7)	2 (33.3)	1 (16.7)	2 (33.3)	—	—	9
21—30 = 36	3 (8.3)	21 (58.3)	11 (30.6)	9 (25.0)	8 (22.2)	1 (2.8)	2 (5.6)	55
31—40 = 53	—	27 (50.9)	20 (37.7)	14 (26.4)	15 (28.3)	1 (1.9)	5 (9.4)	82
41—50 = 45	—	17 (37.8)	18 (40.0)	6 (13.3)	9 (20.0)	2 (4.4)	4 (8.9)	56
51—60 = 10	—	7 (70.0)	4 (40.0)	1 (10.0)	2 (20.0)	2 (20.0)	1 (10.0)	17
Total = 150	3 (2.0)	76 (50.7)	55 (36.7)	31 (20.7)	36 (24.0)	6 (4.0)	12 (8.0)	219

TABLE 67

What Probl do You Face Due to the Service Latrine in Your House?

Qccupational level	Unhygienic	Foul smell	Irregular scavenging	Foul smell at the time of scavenging	Presence of some family members is essential at the time of scavenging	Foul smell unbearable	Total
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	
Service = 50	50 100%	18 36%	4 8%	25 50%	1 2%	34 68%	132
Business = 59	59 100%	11 18.6%	7 11.8%	34 57.6%	5 8.5%	50 84.7%	166
Labour = 10	10 100%	3 30%	—	7 70%	—	7 70%	27
House-lady = 11	11 100%	3 27.2%	—	6 54.5%	—	7 63.6%	27
Retired = 7	7 100%	5 71.4%	1 14.3%	5 71.5%	—	3 42.8%	21
Professional = 7	7 100%	2 28.6%	1 14.3%	3 42.8%	1 14.3%	5 71.4%	19
Cultivator & others= 6	6 100%	1 16.6%	1 53.3%	2 53.3%	—	6 100%	16
Total = 150	150 100%	43 28.7%	14 9.3%	82 54.6%	7 4.7%	112 74.6%	408

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TABLE 68
What Problems do You Face Due to the Service Latrine in Your House?

Occupational	Unhygienic	Foul smell	Irregular scavenging	Foul smell at the time of scavenging	Presence of some family members is essential at the time of scavenging	Foul smell unbearable	Total
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	
Illiterate = 17	17 100%	6 35.3%	2 11.7%	13 76.5%	2 11.7%	11 64.7%	51
Up to Middle = 48	48 100%	15 31.2%	4 8.3%	30 6.3%	1 2.0%	36 75.0%	134
Up to Matric = 61	61 100%	12 19.7%	5 8.2%	27 44.3%	2 3.3%	50 81.9%	157
Intermediate = 11	11 100%	5 45.4%	1 9.1%	6 54.5%	1 9.1%	6 54.5%	30
Graduate = 11	11 100%	55 45.4%	2 18.2%	6 54.5%	1 9.1%	7 63.6%	32
Post-Graduate = 2	2 100%	—	—	—	—	2 100%	4
Total = 150	150 100%	43 28.7%	14 9.3%	82 54.6%	7 4.7%	112 74.6%	408

TABLE 72
Please Mention the Reasons for Abandoning the Previous System Operating in Your House

Caste Level	Unhygienic	Foul Smell	Costly	No provision for sewerage	Scavenging problem	By order of higher authority	Others	Not applicable	Total
Upper = 60	47 (78.3%)	6 (10%)	16 (26.7%)	27 (45%)	18 (30%)	2 (3.3%)	2 (3.3%)	10 (16.7%)	128
Lower = 86	71 (82.6%)	14 (16.3%)	22 (25.6%)	39 (45.3%)	28 (32.6%)	6 (6.9%)	—	14 (16.3%)	194
S/C = 3	2 (66.7%)	1 (33.3%)	2 (66.7%)	1 (33.3%)	1 (33.3%)	1 (33.3%)	—	—	8
S/T = 1	1 (100%)	1 (100%)	—	—	1 (100%)	—	—	—	3
Total = 150	121 (80.7%)	22 (14.7%)	40 (26.7%)	67 (44.7%)	48 (32.0%)	9 (5.0%)	2 (1.3%)	24 (16.0%)	333

TABLE 73
Please Mention the Reasons for Abandoning the Previous System Operating in Your House

Education	Unhygienic	Foul smell	Costly	No provision for sewerage	Scavenging problem	By order of higher authority	Others	Not applicable	Total
Illiterate = 17	11 (64.7%)	3 (17.6%)	7 (41.2%)	4 (23.5%)	8 (47.1%)	2 (11.8%)	—	4 (23.5%)	39
Up to Middle = 61	48 (78.7%)	8 (13.1%)	17 (27.9%)	26 (42.6%)	14 (22.9%)	3 (4.9%)	2 (3.3%)	12 (19.7%)	130
Matric = 43	36 (83.7%)	9 (20.0%)	11 (25.6%)	18 (41.9%)	13 (30.2%)	3 (6.9%)	—	5 (11.6%)	95
Intermediate = 13	11 (84.6%)	1 (7.7%)	1 (7.7%)	9 (69.2%)	5 (38.5%)	—	—	9 (15.9%)	29
Gradiate = 15	14 (93.3%)	1 (6.7%)	4 (26.7%)	9 (60.0%)	7 (46.7%)	1 (6.7%)	—	1 (6.7%)	37
P.G. = 1	1 (100%)	—	—	1 (100%)	1 (100%)	—	—	—	3
Total = 150	121 (80.7%)	22 (14.7%)	40 (26.7%)	67 (44.7%)	48 (32.0%)	9 (6.0%)	2 (1.3%)	24 (16.0%)	333

APPENDIX 6

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME IN WEST BENGAL 1990 BY HUDCO

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME

WEST BENGAL

DECEMBER 1990

URBAN INFRASTRUCTURE FINANCE WING

HOUSING & URBAN DEVELOPMENT CORPORATION
AND
INDIAN HUMAN SETTLEMENT PROGRAMME
HUMAN SETTLEMENT MANAGEMENT INSTITUTE
NEW DELHI

Rpt 6

CONTENTS

INTRODUCTION

It is the aim of the Government of India to make the country totally free of manual scavengers by the end of 1994. In order to fulfill this aim, the grant component of the Ministry of Welfare has been dovetailed to HUDCO's loan component, since 1989, to provide thrust to the execution of the programme. The programme includes the conversion of dry latrines to water-sealed pour-flush latrines and construction of new and community latrines, which will eradicate the inhuman practice of manual scavenging. Simultaneously, rehabilitation programmes will enable the scavengers to acquire new skills and find other professions. So far, 396 towns have been covered under this low cost sanitation programme, liberating as many as 17,270 scavengers.

Series of Evaluation Studies by HUDCO

In order to enable HUDCO to help promote formulation of viable projects and to have feed back on the design, administrative arrangements and operational and maintenance cost of Low Cost Sanitation. It was decided to sponsor evaluation study of Low Cost Sanitation programme in various states. This study for the state of West Bengal is the third attempt in this direction.

OBJECTIVES OF THE STUDY

In broad terms the objective of the study was to evaluate the performance of low cost s. itation schemes in selected towns and help HUDCO formulate policy strategy.

Town Profile

The towns selected were Darjeeling, Gobardanga, Jalpaiguri,

Midnapore, Naihati, and Santipur. The population of the towns varies from 27,000 to 1,14,000 persons. The average household size in these towns ranges between 5.32(Naihati) and 7.67(Midnapore). The chief wage earners(CWE) of most of the houses are in the age group of 30-50 years. Most CWE are self-employed. The level of education of CWE indicates that a large proportion of them have attended schools. Water is easily available within a distance of 20 metres and the major sources of water for the LCS user households are either wells (Jalpaiguri), handpumps (Santipur) or community facilities. These towns have adequate piped water supply for drinking purposes. For other purposes localised sources like wells or tanks are used.

SURVEY RESULTS

I. PROFILE AND PERCEPTIONS OF USERS PROVIDED WITH LCS

Prior to conversion of LCS over 80% of the households were using dry latrines/pit type latrines, which had to be cleaned frequently. The reasons why majority of the households accepted LCS is because of privacy, non-availability of scavengers and the fact that this is an environmentally safe method of disposal.

Pit Characteristics

The pits in all the cases are located within the compound but not under any covered area. While in installation of pits, one of the consideration is distance from source of water. Almost 50% of the pits in Shantipur, and Jalpaiguri and Midnapore are within a distance of 10 mt. In Gobardanga and Naihatti 37% of the pits are within a distance of 10 mt. This is more due to lack of space.

Use and individual maintenance

Though the pit is designated as a 10 user system, in as much as 35% of the households surveyed, they are used by less than 5 members. Normally all households use LCS facility. Maintenance is done periodically and use of acid, soap or phenyl is common. The life of the system depends on flushing and it has been observed that over 70% flush the system with less than 6 litres of water.

Performance of LCS units

Most households have not come across any problem with the functioning of LCS. Wherever encountered, it has been in terms of defective fixtures, or clogging of pipe despite non-usage for waste dumping. Bad smell is the major problem and households as well as officials attribute this to lack of maiantenance and proper flushing.

y Problem with LCS Functioning (per cent)

Town	No	Emits bad smell	Fixtures defective	Fixtures not durable	Pipe others choking
Shantipur	84	-	6	-	3 6
Gobardanga	90	-	7	-	-

Jalpaiguri	60	16	4	4	12	8
Mindapore	73	5	11	-	11	-
Naihatti	73	11	11	-	-	5
Total	76	6.4	7.8	0.8	5.2	4.4

As far as material is concerned over 80% of the respondents in Naihatti, Shantipur and Gobardanga have indicated it as good, whereas around 35% in Jalpaiguri and Midnapur have stated it to be bad. In terms of work quality except Jalpaiguri, in all other towns it is good or acceptable. Most households feel the design to be good and also its functioning.

Households who have indicated problems with material generally refer to cement mortar, aggregates and bricks which in turn affects quality. As part of the technical survey, the quality of brick was tested and it was found to break when dropped from a height of 3 ft. In few cases voids were also observed.

The aggregates used in the cement concrete (and steel bars) are of average quality. Though a standardized fibre glass pan is used, the households have replaced these on their own with ceramic pans.

There have also been instance of collapse of pit walls, which reflects the quality of work. Discussions of officials with MED in a few circles indicated that contractors generally do not implement their suggestions while execution. They attribute this to the fact that the contractors are in no way dependent on these officials.

Satisfaction level

The beneficiaries of LCS facility are satisfied with the system, as it provides privacy and is a safe disposal mechanism. The basic problems faced are with fixtures, which are defectivein quality of material used. One major problem is the provision of superstructure (except in Municipal Development Programme). Households have invested between Rs.300 (thatch/bamboo) Rs.1200 for a pucca structure. Households have also indicated that beneficiary selection also needs to be based on capability to invest even in the least cost superstructure. They have raised this issue because, in such localities households have been provided LCS but have not used

due to lack of superstructure, whereas those requiring it immediately had to wait for their turn. It has been observed that there are facilities lying unused for over 2 years.

A large proportion of households are not aware of the time taken for a pit to get filled up. Care was taken to cover households who were provided LCS during the period 1985-87. Not a single household had reported the pit being full. Officials pointed out that it will take at least 5-6 years for a pit to get filled up. The households though aware of the LCS's utility in terms of prevention of pollution, have not understood the utility of the two pit system.

The procedure in availment of LCS depends on application to the municipality (first come basis), and need for a facility. The information source in most cases has been the Ward Commissioner or other municipal officials. The households are aware of the fact that selection depends on time of application, but also indicate that closeness to the Ward representative helps in availing the facility faster. Households are also aware of the fact that distribution of facility is based on availability of funds and space within the plot.

II. PROFILE AND PERCEPTIONS OF SERVICE PRIVY USERS

Opinion about the present system

Service privies are widely used as a means of excreta disposal as its cost of construction is very low. Dry earth, bucket type, well type are the mostly used. Everywhere the unit is located within the coumpound of the house. In majority of the households surveyed, more than 80% are not satisfied with the present system of solid waste disposal. The main draw backs and problems as mentioned by the households are (i) irregular cleaning of the unit by scavengers (ii) the unit emits bad smell (iii) and is not hygenic.

Awareness of LCS and their benefits

All of them are interested in having a LCS unit in their house and they revealed that the advantages with LCS are (i) no need of scavengers services for cleaning, (ii) does not emit bad smell, (iii) more hygienic compared to service privy. Most of the households are trying for a LCS unit either by approaching the municipal office or through the Ward Commissioner who is elected by the people of the particular Ward. A few of the households cannot accommodate a LCS unit because of space

constraint and expressed their reluctance to have the pits underneath room or verandah. Almost all the households prefer to have the LCS unit constructed in the same place as the present service privy is located and the 2 pits to be located within the compound and strictly outside any built up area.

Willingness to pay for LCS unit:

About 80% households on an average are willing to pay for LCS on a monthly instalment basis and remaining 20% constitute households who are either not willing to pay anything or unable to pay. The average cost of LCS unit as perceived by the houeholds varies from as low as Rs.1050/- in Naihatti to Rs.1533/- in Gobardanga. The average monthly instalment the households are willing to pay for getting a LCS unit varies from Rs.25/- in Jalpaiguri to Rs.37/- in Gobardanga.

Some of the households, especially in Midnapore who are using service privy, revealed their preference for septic task of system instead of a 2 pit LCS unit. The advantage of a septic task type as compared to LCS unit as mentioned by them are (i) ceramic pan which is larger and better looking than a fibre glass pan used in LCS (ii) more hygienic as compared to LCS as no percolation of water takes place from the pits and possible contamination of well water.

They suggest that the municipality apart from constructing LCS free of cost, should also consider the feasibility of granting the LCS unit cost, which is Rs.2300 approximately, to those households willing to construct a septic tank system in place of two pit pan flush latrines, so that the rest of the amount for the construction of the septic tank system will be borne by the household. And the LCS construction cost amount to be released as per the progress of construction of septic tank system. They say that this adjustment is possible as the main aim of Government is to eradicate the service privies and liberate the scavangers.

III. PROFILE AND PERCEPTION OF COMMUNITY LATRINE USERS

Awareness of LCS system

Majority of the community latrine users are not aware of the LCS system. The households are to some extent aware of the LCS design, such as containing 2 leach pits etc. as the community latrine is also of the same design. But most of them are not aware that households are entitled to get a LCS unit free of cost from the municipality.

Opinion about the functioning of the community latrine

The community toilets as constructed by the municipality are generally of 3, 4 or 6 seater units and have superstructure with a roof, unlike only upto seat level for LCS.

The average distance of a unit from the users house varies between 21 mts. in Midnapore to 60 mts. in Darjiling. The unit is used by almost all the members of the households, except for small children below the age of 5 years. The problems faced in the functioning of the community latrines are in the nature of (i) scarcity of water, (ii) lack of lighting facilities, (iii) emits bad smell and (iv) defective fixtures. Scarcity of water is a major problem in Darjeeling with 91% of the households reporting this problem. In other towns, water is available in sufficient quantity, but the users use normally less than the required amount of water. Most of the units cannot be used in the night because, they lack lighting facility, in some cases even though the facility is there, the bulbs are missing. Community latrines are mostly cleaned by the municipal scavengers and they do it very irregularly, only in Naihati most of the units are cleaned by the users. In Darjeeling due to lack of sufficient water, some of the units are cleaned even with drain water. The toilets are just cleaned with plain water and the usage of cleaning/germicide material like phenoil, soap, etc. is rarely observed. The users do not pay anything for the usage of the community latrine.

Opinion about functioning, problems (per cent)

Town	Scarcity of water	No light	Emits bad smell	Fixtures defective	Total
Darjiling	91	65	56	37	249
Jalpaiguri	34	72	61	42	209
Midnapore	24	58	68	21	171
Naihatti	27	63	59	24	173
Total	44	64.5	61	31	200.5

The overall opinion about the community latrine is that the people are not satisfied with the functioning of the unit and for this, the reasons are mainly (i) general negligence and usage of less quantity of water and (ii) irregular cleaning either by the users or scavengers and non-usage of cleaning materials.

IV. PROFILE AND PERCEPTIONS OF HOUSEHOLDS WITHOUT ANY FACILITY

Awareness about the LCS system

Majority of the households are aware about the LCS system. The major source of information about the LCS system is through either friends or relatives and to some extent from the municipality and Ward Commissioner.

Opinion about the present method

The average distance of this facility from house varies from 75 mts. in Naihatti to 177 mts. in Jalpaiguri. All the members of the household use this facility. Most of the households are not satisfied with this method and they point out that they lack privacy and distance is also another disadvantage. All the households are interested in having LCS but they are not aware that the municipality constructs it free of cost upto seat level.

V. PERCEPTIONS OF OFFICIALS AND CONTRACTORS

The views of the officials were ascertained in terms of :

a) Unit costs
b) Contracting procedure
c) Finances
d) Administrative aspects and
e) Problems

The programme in most towns has been successful and wherever it is below average it is generally due to unit costs and physical constraints.

The per unit cost of a 10 user LCS is estimated between Rs.2300 to Rs.3400 (upto seat level). The directorate provides cement and pan and deducts the amount from the cost. As far as LCS under MDP is concerned the per unit cost is Rs.3000

including super structure. It has been observed that generally contingencies are not used nor is dry design supervision charges collected.

The contractors selection is normally based on least bid method, but in Naihatti it has been observed that if all contractors agree to execute work on the least cost quoted, then the work is distributed among them. On an average 12-15 contractors execute LCS work. The tenders are normally floated in terms of number of units in a Ward.

Finances are generally available, unless reappropriated, but officials admit that it takes 2-3 months for release of payment to the contractors. In case of schemes like IDSMT it has been observed that due to non-release of funds, the finances allocated for another component is diverted to LCS work to achieve the target.

The major administrative tasks of officials is in

a) Selection of beneficiaries
b) Tendering, supervision, and
c) Preparation of bills for payment

The selection of beneficiaries is normally done by the Ward Commissioner on a first come first serve basis. It has been observed that there are instances wherein need and economic considerations have been given importance in selection of beneficiaries. Other considerations include availability of space and proximity to the selected official of the Ward.

Tendering is done on the basis of number of units to be constructed and distribution of work is based on least cost. Normally supervision is done while the foundation is being laid. This is done at random, as officials feel; that non-laying of foundation for pits could save as much as Rs.500 for the contractors. On completion, bills are prepared and passed for payment only if a certificate is produced by the contractor from the household countersigned by the Commissioner or his authorised staff regarding work quality. Bills are delayed, but if it is a large work of more that 50 units, payments are made (subject to funds) after completion of every 10 units.

The problems with the programme, apart from finance is also due to lack of space especially in bustees, water intrusion in low lying areas and limited construction time.

)ace is another major constraint as the pit and seat needs a minimum of 1.5 - 2 sq.m. the design is to be adhered to and in most local bodies it has been observed that lack space has led to the pits being closer in most cases. Construction around tanks in ost settlements is impossible due to water intrusion.

ainfall is another constraining factor in achievement of LCS target. Officials dicated that the effective construction period is of about 5 months as work is not ıdertaken during monsoon and pooja period. During this period the maximum units ey can construct is around 800 numbers.

uggestions

fficials feel that unit costs need to be revised; for example an official in Jalpaiguri ointed out that the scheme still adopts a rate which is 50% of the current rate while leasing funds. Local level MED officials feel that they also need to control the lease of funds, as this is the only way they can ensure quality of work from the ontractors. Currently it is with the local body. MED has approval powers only.

Jsage of latrines especially non-MDP depends on household investment in uperstructure. Though most households have invested in superstructure, there are few households who have not invested due to lack of finance. It is felt that only ouseholds who have the capability to invest in superstructure should be provided the acility on a priority basis. It has been observed that there are latrines which have been onstructed over 2 years back and are lying unused.

Manpower to implement the programme is another important component. In most ocal bodies, it has been found that only one overseer is assigned for LCS works. If higher percentage of conversion is to be achieved then manpower will have to e increased. The capability of construction units per year is around 600.

VIEWS OF CONTRACTOR

The contractors opinion was ascertained on the following aspects:

a) Awareness of procedures
b) Cost ceiling
c) Administrative and financial issues
d) Problems and
e) Suggestions

Most contractors surveyed have been involved in construction of LCS units since the inception of LCS programme in the towns. Though not skilled they have acquired skill with assistance from officials. The contractors apart from undertaking LCS, also undertake regular construction work on behalf of the local body.

The contractors nomally spend 5 to 10 days in installing a LCS system and the work is generally subcontracted on a piece rate basis. The contractors surveyed have on average constructed 100-125 units in the towns selected as part of the survey.

The contractors apart from construction also publicise the system, by explaining its utility to the households who enquire when construction is on. The contractors feel that the programme has been successful, but indicated that the major problem with programme is the unit cost as the margin is very low. This is more so when cement and pan is supplied by the local body. The margin according to them works out to be around Rs.125 if all goes well. The case of hill towns is worse because the cost of brick is higher than in the plains. The cost estimates according to the contractors does not include transport costs even in case of towns where it is significant. Availability of water during construction is another problem. Low margin of profit is one reason why contractors in Midnapore had not submitted tender documents. This has forced the MED to execute the work partly and the municipality decided to raise cost by 4.99% to attract contractors.

The procedures are similar to any other contracting work and the payment pattern is also the same. The payment is subjected to availability of funds and there are instances of delay of 2-3 months. They also indicated that banks do not provide credit facilities. However, they have been given advance especially when the number of units constructed are more than 100.

The contractors problems largely pertain to profit margin and payment problems. They do come across problems like households demanding modification of pit and sealing the honeycomb structure and demand for larger pits, etc. but manage to convince the households or solve it with official intervention. Most contractors dicated of instances wherein they had converted round pits to square pits.

The contractors feel that unless provision is made for construction of superstructure, the investment is likely to lie waste for sometime. They also insist on design flexibility especially in areas where space is a constraint. They also suggest that feasibility of placing pits beneath the seat needs to be examined. Unit cost is their main concern and feel that without a larger margin it would be difficult to sustain. Currently they are undertaking this programme as a goodwill measure and manage to make profit in the labour component.

/I LIBERATION OF SCAVENGERS

An important objective of LCS is in liberation of scavengers. In most towns cavengers have been inducted into the street cleaning operations of the municipality. hantipur is one town where training was provided in trades like brush making, arpentry, welding, pottery etc. Despite such training, facilities have not been reated to enable them to earn their sustenance. A few scavengers interviewed ndicated that the trainees lacked interest and were frequently assigned jobs like etching tea, etc. They were not provided with any loan despite pending application or the same for two years. Despite such drawbacks the scavengers feel that street leaning is better than scavenging. They also indicated that training without dequated post-training period support will not be of any use.

Officials in towns where there has been no rehabilitation point out that inadequacy f funds as a reason for non-provision of an alternative to scavenging. They also point ut that most scavengers feel that they will lose their jobs if they accept an alternative rade.

How much is grant - loan %
How high are monthly instalment
Are these collected

e evaluation study was done by the Operations Research Group, Baroda for Urban Infrastructure inance Wing (UIFW), HUDCO

APPENDIX 7

GUIDELINES FOR INTEGRATED SCHEME OF LOW COST SANITATION FOR LIBERATION OF SCAVENGERS, BY HUDCO

Appendix 7

Dated : ...

Annexure II

GUIDELINES FOR INTEGRATED SCHEME OF LOW COST SANITATION FOR LIBERATION OF SCAVENGERS

1. INTRODUCTION

As part of the Action Plan for the implementation of Government's programmes and policies, a decision has been taken to take concrete steps for the elimination of the dehumanising practice of manual scavenging of night soil in a time bound manner. Despite consistent efforts by the Central and State Governments, the problem of manual scavenging still persists in our country.

It has been decided that the Integrated Scheme of Low Cost Sanitation for Liberation of Scavengers may be taken up in all small and medium towns with less than 5 lakhs population on a whole town basis so that the towns are declared scavenger free. The approach would be through large scale conversion of dry latrines into water seal pour flush latrines or construction of new low cost water seal pour flush latrines.

2. OBJECTIVES

The objective of the Scheme is to totally eliminate manual scavenging by converting/constructing low cost sanitation units through two pit leaching system with appropriate variations to suit local conditions. This would result in liberating scavengers from dehumanising practice of manual scavenging. Scavengers so liberated, would be rehabilitated by the State Governments concerned with the help of funds provided by the Ministry of Welfare.

3. ELIGIBLE AGENCIES

This Scheme will be on a 'whole town' basis and generally implemented by the urban local body with grants/loans sanctioned through a [redacted] agency. Housing Board, Slum Clearance Board, Development Authority, Improvement Trust, Water Supply and Sewerage Board, Cantonment Board etc., duly authorised by the State Government for undertaking the Scheme, are also eligible for HUDCO Loan/Subsidy. HUDCO will prefer sanctioning these schemes to a Nodal agency to be constituted/nominated by the State Govt. A Nodal agency created on the lines of Tamil Nadu Urban Finance and Infrastructure Development Corporation (TUFIDCO) is most suitable. In the meantime, while nodal agency is being constituted/nominated, HUDCO will consider sanctioning such schemes to local bodies like Municipalities etc.

4. SELECTION OF TOWNS

The requisite number of Towns are to be selected by the State Govt. and forwarded to HUDCO for getting these towns approved from MOUD. Priority would be given to those towns which have a predominance of [redacted] or where widespread open defecation takes place. Proposals may be sent for small and medium towns having a population between 5000 [redacted] formulated on a 'WHOLE TOWN' basis.

The State/Agencies will be required to identify the name of the towns and submit application in the prescribed form giving socio-economic data indicating number of households of different income categories requiring

conversion/new construction and number of scavengers likely to be liberated after the implementation of the scheme. Based on the data, the Co-ordination Committee in Ministry of Urban Development will consider the town(s) for approval. After these towns are approved by the Co-ordination Committee RO/Agency will be informed for formulation of the scheme.

5. SELECTION OF BENEFICIARIES

Beneficiaries under this scheme would be from all income categories. Current monthly income limits for different categories are as under.

1. EWS-upto Rs.1250 2. LIG - Rs. 1251 to Rs. 2650

3. MIG-Rs.2651 to Rs.4450 4. HIG-above Rs.4450

The agencies are expected to send loan applications in the prescribed form alongwith all documents to our Regional Office.

6. DOCUMENTATION CHARGES:-

Documentation charges of Rs.5000/- are required to be paid if the scheme is only for beneficiaries belonging to EWS category and Rs.10,000/- if the scheme belongs to any other higher category including a composite scheme with EWS Component in it. Documentation charges of Rs.5000/- or Rs.10,000/- as the case may be are to be submitted alongwith the loan application by way of Demand Draft drawn in favour of HUDCO, New Delhi. Documentation charges are non-refundable for reasons whatsoever. This amount will not carry any rate of interest.

7. FINANCING PATTERN

A) Under the present scheme, loan and subsidy is

extended simultaneously by HUDCO after the sanction of the scheme for construction upto plinth. The loan and subsidy is sanctioned as follows based on the income category of the beneficiaries :

		UPTO PLINTH				SUPER STRUCTURE			
		EWS	LIG	MIG	HIG	EWS	LIG	MIG	HIG
i)	Loan	50%	60%	75%	75%	90%	85%	75%	60%
ii)	Central Subsidy	45%	25%	nil	nil	nil	nil	nil	nil
iii)	Beneficiary contribution	5%	15%	25%	25%	10%	15%	25%	40%
iv)	Rate of interest per annum (Gross)**	8.5	8.5	8.5	8.5	8.5	12.0	12.5	14.5

Laufzeit 7 Jahre (einschl. 2 Jahre Durchführungszeit)

It is clarified that Central subsidy portion would be restricted as mentioned above. If the State Government so desires, it may subsidise the beneficiary's contribution or the loan component in order to reduce the burden on beneficiaries. According to the present arrangement of financing, HUDCO extends financial assistance for construction of the unit upto plinth level to a maximum extent of 50% of cost for EWS, 60% for LIG, 75% for MIG/HIG category at 8.5 per cent interest repayable in a maximum period of 7 years including a maximum of 2 years for implementation. Quarterly Repayments of HUDCO loan at different intereset rates are payable as per statement at Annexure-I. Shorter repayment periods are encouraged as it helps to reduce the cost of collection. The balance

Wider spread financing but see letter

2.

is arranged by the beneficiary/borrowing agency/State Govt. from their own resources. The subsidies and loans are released simultaneously in the proportions mentioned above and the borrowing agencies would have to ensure timely recovery of the loan component from the beneficiaries.

Loans without subsidy can also be given under HUDCO's Basic Sanitation Scheme to Local Bodies for constructing community latrines on 'pay and use' principle in areas occupied by the poorest sections of the urban population including footpath dwellers or areas of public use like bus stand, market places, etc. loan under this schemes is also available for rural areas. The loan can also be operated through voluntary agencies. Conversion of community latrines in slums, housing/chawls can also be covered under the Basic Sanitation scheme taking into account the lack of space for the provision of individual latrines and the consequent risks of open defecation.

B) In addition to the Interest Rates, as above, Front-end-Fees on the total loan amount shall be levied on all the schemes as per following scales:

EWS Component	: 0.50% of loan
LIG Component	: 1.00% of loan
MIG/HIG Component	: 1.25% of loan
All other schemes i.e. composite schemes	: 1.25 of loan

In order to encourage the borrowing agencies to complete legal documentation within the prescribed period of four months (6 months for North-Eastern States) a rebate of 0.25% in the Front-end-Fee is allowed. In respect of those schemes where the legal documentation is not completed within the prescribed period, Front-end-Fees shall be levied without giving rebate of 0.25 per cent and the Front-end- Fees equivalent to 0.25 per cent shall be transferred to Research and Development Account of the borrowing agency, which shall be made available to it in the form of grant for upgrading their organisational capability and for such other purposes. Agencies would be given maximum three years time to utilise R & D amount after which it will be treated as HUDCO income.

C) Interest tax @ 3% on the amount of interest shall be payable by the borrowing agency in addition to the interest and Front-end-Fees, as mentioned in preceding paras. This interest tax shall be payable quarterly on the due dates together with interest. However, interest tax shall be discontinued as and when it is withdrawn by the Govt. of India.

D) In the event of default of principal and/or interest the borrower shall pay penal interest @ 2-1/2% (Two & Half per cent) over and above the normal rate of interest.

E) HUDCO reserves the right at any time to increase the interest rate on the loan amount or a part thereof at

any time by giving prior written notice to the borrower of such increase.

8. SECURITY

8.1 Loan advanced by HUDCO can be secured by :

An unconditional and irrevocable Bank Guarantee from a scheduled bank acceptable to HUDCO.

or

State Govt. Guarantee.

or

By mortgage of immovable properties to the extent of 133-1/3 per cent of the loan amount.

or

By a Negative Lien to be replaced by a mortgage of the land acquired with HUDCO loan or any other immoveable properties or any other security acceptable to HUDCO within a period of 180 days or any extended period from the date of release of 1st loan instalment together with an irrevocable Power of Attorney in favour of HUDCO.

8.2 A risk charge @ 0.50 per cent will be payable in addition to the normal rate of interest on the loan outstanding in case the security for the loan is 'Negative Lien'. However, in a scheme where the loan is secured by 'Negative Lien' and the borrower defaults and requests for continuance of this security, if 'Negative Lien' is accepted by HUDCO, the risk charge shall be increased to 1.00 per cent instead of half per cent.

8.3 Where the security is Bank Guarantee the borrowing agency should ensure that the bank is willing to give guarantee in the form prescribed by HUDCO.

8.4 In order to ensure speedy completion of legal documentation, the Borrowing Agency can furnish Block Govt. Guarantees as has been done by certain State Governments, (e.g. Uttar Pradesh in case of State Urban Development Agency).

9. COST

The cost of conversion/construction of latrine may not exceed Rs.2500/- per unit upto plinth for 5/10 users (Rs.3000/- per unit for Hilly/Island Areas & North-Eastern States).

10. RELEASES

1. Upto 25% of the subsidy can be released immediately after sanction of schems.

2. Upto a maximum of 75% of loan/subsidy can be released on signing of Loan-cum-Grant Agreement, subject to the condition that actual release of funds will be made in instalments related to actual demand by the borrowing agencies on their utilisation capacity and field level requirements. No utilisation certificate will be insisted upon for release of these amounts.

3. The utilisation certificate upto 80% of the loan/subsidy already released will be required when the agency applies for release of the balance 25% of

loan/ subsidy. Clause HUDCO?

4. Site inspection will be undertaken before release of the last instalment.

5. If the loan or different components of the loan disbursed under the Agreement was/were not used by the Borrower within a period of six (6) months due to any of the reasons like withdrawal of the scheme, not taking up the implementation of the scheme, reduction in the number of units to be constructed under the schemes etc. the Borrower shall immediately refund such amount(s) to the Corporation and in any case before the expiry of a period of one year from the date of disbursement of the loan failing which the Corporation, notwithstanding anything to the contrary stated herein, will charge rate of interest as applicable for DPF schemes or such other higher rate as may be fixed by the Corporation, on all such funds from the date of release to the date of refunding the same to the Corporation. Provided, however, in case the Borrower finds that it cannot utilise the loan funds disbursed for any reason and deposits such funds with HUDCO within a period of one year from the date of release of funds, no penal/increased interest rate shall be levied. Further, the funds so deposited can be released by HUDCO to the Borrower on receipt of a request from it indicating the

progress of work and the need for release of deposited funds. In such an event no levy of increased interest would be made on the Borrower and no interest will be payable by HUDCO to the Borrower on such deposits.

11. COORDINATION, IMPLEMENTATION AND MONITORING

This programme is coordinated by Urban Infrastructure Finance Wing at HUDCO's Corporate Office. The Regional Offices of HUDCO have been directed to render assistance to the State Governments/Agencies for formulation of their proposals. The local bodies or borrowing agencies selected by the State Governments should send their proposals for financial assistance in the prescribed application form to the respective Regional Office. A list of the existing HUDCO Regional Offices with addresses is enclosed as Annexure II.

State Governments should send their progress reports on the implementation of the scheme in prescribed proforma to reach Ministry of Urban Development, Ministry of Welfare and HUDCO for each quarter. As this programme is being given utmost priority by the Government in its Action Plan Portfolio the State Government should ensure that the implementation of the programme does not involve any cost and time over-runs and strict monitoring of the same takes place at the State and local level.

12. REHABILITATION

As part of the scheme for Liberation of Scavengers it is imperative that schemes regarding the rehabilitation of the scavengers so liberated are also given due importance and

such schemes are prepared by implementing agencies as per Guidelines of Ministry of Welfare simultaneously and furnished to Ministry of Welfare for consideration.

13. Documents to be attached with the loan application:

1. If the agency is approaching HUDCO for the first time for financial assistance, the agency has to furnish documents concluding eligibility of the agency to borrow loan from HUDCO for such projects.
2. Cost estimates for typical unit.
3. Loan application alongwith enclosures.
4. Bar chart/Investment schedule.
5. Documentation charges of Rs. 5000/- or Rs. 10,000/- as the case may be by means of a Bank Draft drawn in favour of HUDCO, New Delhi.
6. Latest Audited Annual Accounts for 3 years.

14. Application Form & other Formats

Loan Application Form, Model Byelaws and other forms as mentioned in the Guidelines, can be obtained from : -

Dr. P.S. Rana
Executive Director (Infrastructure),
Housing and Urban Development
Corporation (HUDCO),
Urban Infrastructure Finance Wing,
Andhra Association Building,
24-25, Lodhi Institutional Area,
New Delhi - 110 003.

Telephone : 617696, 4632473

Telex : 031-62545 HUDI IN

Fax : 4625308 GRAM : HUDCO

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APPENDIX 8

LATRINE COST FIGURE FROM KANPUR MIRZAPUR UNDER GANGA ACTION PLAN (1988)

Appendix 8

Kanpur - Mirzapur Project

SUMMARY OF RATES

ON SITE

1. Conversion of dry latrine

a.	Within premises	10 users	1461/
b.	" "	15 "	1976/
c.	" "	20 "	3504/
d.	Under foot path	10 "	1673/
e.	" "	15 "	2203/
f.	" "	20 "	4171/

2. Construction of New latrines

a.	Within premises	10 users	2248/
b.	" "	15 "	2763/
c.	" "	20 "	4291/
d.	Under foot path	10 users	2460/
e.	" "	15 "	2990/
f.	" "	20 "	4956/

OFF SITE

1. Conversion of Dry Latrine

a. 10,15 users	1056/
b. 20 users	2084/

2. Construction of New Latrines

a. 10, 15 users	1843/
b. 20 users	2671/

APPENDIX 9a

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME

IN ANDRAH PRADESH 1990 BY HUDCO

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME

ANDHRA PRADESH

OCTOBER 1990

URBAN INFRASTRUCTURE FINANCE WING

HOUSING & URBAN DEVELOPMENT CORPORATION
AND
INDIAN HUMAN SETTLEMENT PROGRAMME
HUMAN SETTLEMENT MANAGEMENT INSTITUTE
NEW DELHI

Appendix 9a

CONTENTS

INTRODUCTION

It is the aim of the Government of India to make the country totally free of manual scavenging by the end of 1994. In order to fulfil this aim, the subsidy component component of the Ministry of Welfare and the Ministry of Urban Development has been dovetailed to HUDCO's loan component, since 1989, to provide thrust to the execution of the programme. The programme includes the conversion of dry latrines to water-seal pour-flush latrines and construction of new and community latrines, which will eradicate the inhuman practice of manual scavenging. Simultaneously, rehabilitation programmes will enable the scavengers to acquire new skills and find other professions. So far, 396 towns have been covered under this low cost sanitation programme, liberating as many as 17,270 scavengers.

Series of Evaluation Studies by HUDCO

In order to enable HUDCO to help to promote formulation of viable projects and to have feed back on the design, administrative arrangements and operational and maintenance cost of Low Cost Sanitation, it was decided to sponsor evaluation study of Low Cost Sanitation in various states. This study for the state of Andhra Pradesh is the second attempt in this direction.

Objectives of the Study

In broad terms the objectives of the study is to evaluate the performance of low cost sanitation schemes in selected towns and help HUDCO formulate policy strategies.

Town Profile

The towns covered in the study of Andhra Pradesh are Vijayawada, Bhimavaram, Srikakulam and Anakapalle. Another town Amalapuram, was added for field observations. All towns belong to the category of small and medium towns with Vijayawada is being largest town.

The survey revealed that the household size varies from 6.83 in Vijayawada to 6.0 in Anakapalle. Bhimavaram and Srikakulam are the poorest towns among the four. In Bhimavaram 43 per cent earn less than Rs.700 per month while in Srikakulam 37 per cent earn less than Rs.700 per month. Vijayawada is the richest where 45 per cent of the interviewed households earn more than Rs.1500 per month. The main sources of income are petty labour, private service, business and agriculture. The level of

education indicates that in Bhimavaram and Srikakulam the illiteracy is still quite high. In Bhimavaram 48 per cent of the respondents are illiterate while in Srikakulam 60 per cent of the respondents are illiterate. In Vijayawada and Ankapalle the level of education is higher where more than the 60 per cent of the respondents have finished school or college. In Vijayawada the individual and community hand pumps are the main source of water. In Bhimavaram and Anakapalle open wells are used. In Srikakulam piped water supply is the main sources of water. The Low Cost Sanitation programme in the four towns has been implemented since 1984 and has been supported by HUDCO and the State Government.

Survey Results

1. FUNDING ADMINISTRATION AND MANAGEMENT OF LOW COST SANITATION PROGRAMMES

In the selected towns, the following progress had been achieved (July 1990)

Vijayawada	:	13,787 units
Bhimavaram	:	2,833 units
Srikakulam	:	1,349 units
Anakapalle	:	1,028 units

In order to undertake the programme, the local agency needs to be fully prepared in terms of

a) adequate, appropriate and competent personnel for implementing the programme

b) proper assessment of local situation and beneficiary needs

c) approval from the state government

d) adequate finance to start the programme and

e) bank / state guarantee

Programme initiation

It was found that the programme initiation had been done without a comprehensive local situation needs assessment. However, in Vijayawada such a study was conducted in 1982. The early survey revealed that 5,530 houses had insanitary latrines and 14,113 houses had no latrines at all. The programme in Vijayawada was implemented in 1986 making the survey's result to a large extent redundant due to many changes in the households. These changes comprise:

a) several households converted their latrine into sanitary flush type latrines with their own resources.

b) several houses were sub-divided into two or more portions between the family members for letting out and thereby sufficient space was not available to construct leach pits.

c) several house owners expanded to build space/rooms thereby leaving little space for the leach pits.

d) several house owners having tried dry latrines with temporary superstructures have made the superstructures permanent. They do not wish to convert the dry latrine into a pour flush latrine since the superstructure would be affected.

e) Many existing latrines have been converted into bathrooms and therefore there is no space for constructing a pour flush latrine.

The delays in Vijayawada have been on the account of inadequate staff to undertake the programme and the incapability to persue the matter with the State Government. On the other hand, the State Government also did not take action for a long time on account of lack of funds. In Srikakulam and Anakapalle the State Government had sanctioned the programme in 1984 after a delay of about a year. The programme was implemented almost without delay after sanction. Bhimavaram represents a good example where strong initiative and pursusion by the local implementing agency has resulted in no delays in sanctions. The programmes commenced in the same year.

Procedure for implementation of Administration and Management

House owners intending to either convert or construct new latrines have to make an application to the respective Municipal Corporations or Municipalities in a prescribed form, indicating the required capacity of the latrine, i.e 5, 10 or 15 users. The applications are scrutinised by the local authorities and site inspection is done so as

to ascertain the availability of space. Release of loan amounts has been related to the required capacity of the latrine. It has not been related to the income of the households. The house owner is expected to construct the latrine by himself or through his authorised contractor. The local agency does not undertake any construction activity. Its role is restricted to paper work and to act as a facilitator. When the construction is done the local agency inspects the construction work. On completion of the construction the loan amount is released to the house owner or his authorised contractor through a cheque. The quality of construction is found satisfactory. However, since the actual cost is more than the actual cost, a number of cases have been found in which people were not able to raise the additional amount and the quality of construction has therefore not been upto the mark.

The administrative and managerial support for the programme in respective four towns has been found satisfactory. However, the technical staff need to be trained and acquainted to the programme components since some of them are not fully conversant with the pour flush latrine technology.

The physical progress in completion of Low Cost Sanitation units has been satisfactory Vijayawada (70%), Srikakulam (70%) and especially Bhimavaram (82%). In Anakapalle it has been unsatisfactory (49%). One of the main reasons is that promotion of the low cost sanitation programme has been lacking.

Estimated and real unit costs

The estimated costs of pour flush latrines vary from around Rs 700 per unit to Rs 1600 per unit depending upon the capacity of the unit. The cost was calculated in 1985-86 based on the Standard Schedule of Rates. In Vijayawada, the costs have been revised based on 1988-89 Standard Schedule of the Rates. The actual cost to users is however, slightly higher than the indicated costs as people invariably make variations in the specifications. This increase in expenditure was found to be around 10 per cent.

Funding, fund utilisation and loan recovery

The programme was funded on a matching basis by the State Government and HUDCO. In all the cases, it can be said that State Government subsidy has been fully utilised when the HUDCO loan has not yet been fully utilised. The utilisation of the HUDCO loan in Vijayawada was 48 per cent (Rs.8,014,000), in Bhimavaram zero

per cent, in Srikakulam 27 per cent (Rs.290,000) and in Anakapalle 3 per cent (Rs.34,000). In spite of the state of utilisation the physical progress has been good as stated ealier. In Bhimavaram for example this has been on the account the fact that part of the State Government subsidy which was budgetted for community latrine has been used as loan for individual latrine thereby recording high progress for individual latrines. This was done since there was little demand for community latrines.

As far as loan recovery is concerned, Vijayawada has recovered Rs. 1,39,000 (1.7%) and Bhimavaram Rs 89,000 (30.7%). The other towns is yet to initiate recovery proceedings. The recovery is poor and the reasons are several :

a) low level of affordability of the people

b) lack of willingness to pay to Government agency and

c) laxity on the part of the bill collectors to collect the instalments

Promotion

The overall rate to which people seek the HUDCO loan has been very low and the targets are yet to be achieved even almost after four years. This has been on the account of absence of promotion. One exception is Bhimavaram. Programme promotion has been done by using the media and audio visuals.

Role of NGOs in Low Cost Sanitation Programme

The surveys in the selected towns of Andhra Pradesh have revealed that involvement of NGOs has been totally neglected by the local agencies. In fact, the local agencies were in total ignorance of the role of NGOs in implementing low-cost sanitation programme. A strong case for improving the programme and suitably incorporating NGO's is of prime importance.

2. TECHNICAL ASPECTS OF POUR FLUSH LATRINES IN SELECTED TOWNS

Superstructures

The standard UNDP design for two pit pour flush latrine manual recommends the superstructure size of 1.13 m x 0.98 m. However, the survey reveals that the actual

situation is quite different, since 70 to 80 per cent of the respondents have complained that the cubicles are too small. People may have tried to economise by reducing the size, but darkness and discomfort has lead to discontentment. Another indicator of the superstructure is the materials with which it is constructed. In Bhimavaram superstructures have been completed satisfactory with plastering and whitewash (71 per cent). Whereas in the other three towns, only 23 - 35% superstructure have been completed with plastering and whitewash.

Average of 25 to 60 per cent of the PF latrine super structure in the sample cases have been observed to have damaged superstructure: cracks in walls, broken of doors and damaged roofing sheets. These have largely been on account of the effect of the cyclone in Andhra Pradesh. This therefore makes a very strong case for proper superstructure in PF latrines built in cyclone prone areas.

A variety of roofing materials have been used depending on the local situation. In Vijayawada 50 per cent of a household have used stone roofing while in Bhimavaram 78 per cent of household have used reinforced concrete slabs.

Survey shows that as many as 65 to 80 per cent of the sample cases reported rain water entry into the pan and pits. It has been observed that the absence of adequate projections of the roof over the latrine door has contributed to it. Further, inadequate plinth height above adjoining ground level also contributes to entry of rain water.

The UNDP - TAG manual specifies the design for the pan of the pour flush latrines. In the selected towns, the local implementing agencies have been able to supply the standard design pour flush fibre-glass pans to the beneficiaries.
The slope of the latrine floor has been observed to be proper in terms of its ability to drain off the water and keep the floor dry.

Breakage of pan, foot rests, floor and pit covers was commonly prevalent in studied towns.

Leaching Pits

As per the UNDP Project standards pit size varies from 0.9 m dia to 1.2 m dia and from 1.15 m depth to 1.5 m depth. In the selected towns, whereas the depth of the pit has been found to vary from 1.15 m to 1.5 m, the diameter has been found to be constant in all cases at 0.9 m. This has been on account of the usage of standardised cemen

rings instead of a honeycomb brick wall. The cover for the pits has been found to be of the same design in all the cases.

The distance between the two pits is a very important indicator of the successful performance of the pour flush latrine. 47 per cent of the samples in Vijayawada, 22 per cent in Srikakulam and 53 per cent in Anakpalle have shown only 0.6 m distance between the pits. In Bhimavaram, 74 per cent of the cases had maintained the 0.9 m distance between the pits.

As regards the distance between water source and pits in the sample surveyed, a minimum distance of 6 to 8 metres has been observed.

Overflow of sewage normally occurs when either the pit is full and the flow has not been diverted to the second pit or when rain water enters the pan/pits in large quantities. It was in Anakpalle that only a small percentage of the sample reported overflow of sewage on account of the filling up of pits.

3. USER'S ASPECTS OF LOW COST SANITATION PROGRAMMES

Knowledge and awareness of construction, use and maintenance of pour flush latrines

In the selected towns of Andhra Pradesh, people's knowledge and awareness has been limited. In Vijayawada, Srikakulam and Anakpalle, 70 per cent of the beneficiaries reported a lack of knowledge regarding the pour flush latrine technology. Even the local implementing agencies are not fully aware of the varied dimensions of low-cost sanitation.

User's Satisfaction (See also table)

Water scarcity has been reported in 80% of the sample households. Nearly 20 to 30 per cent of the users have reported foul smell.

As regards privacy, in all the selected towns in Andhra Pradesh, conditions of privacy were found to be satisfactory.

A high 70 to 100 per cent of the beneficiaries in the selected towns reported that the cubicle size was too small and nearly 50 to 80 per cent of them reported of darkness within the cubicle.

Sl. No.	Problems	Vijaya-wada	Bhima-varam	Srika-kulam	Anaka-palle
1	Foul Smell	110(27.50)	16(18.80)	8(20.00)	6(20.00)
2	Water Scarcity	80(20.00)	-	-	-
3	Overflow of Sewage from Pan	-	-	-	2(6.7)
4	Overflow of Sewage from Pits	-	-	-	6(20.00)
5	Darkness in Cubicle	250(62.50)	40(47.08)	36(90.00)	25(83.33)
6	Cubicle too small	281(70.25)	66(77.64)	32(80.00)	30(100.00)
7	Rainwater entry into Pan	265(66.25)	63(74.12)	31(77.50)	24(80.00)
8	Rainwater entry into pits	85(21.25)	70(82.35)	30(75.00)	22(73.33)
9	Damaged Super-Structure	96(24.00)	60(70.59)	22(55.00)	19(63.33)
10	Lack of know-ledge working of PF Latrine	280(70.00)	35(41.18)	30(75.00)	23(76.67)

4. COMMUNITY LATRINES

The concept of community latrines is to provide common latrine facilities by the local agency instead of providing loans for construction of individual latrine by the beneficiaries so as to achieve more speedy instantaneous improvement in the conditions

of sanitation. Amongst the selected towns in Andhra Pradesh, only the town of Bhimavaram has a component of community latrines in the low cost sanitation programme.

In all 38 community latrine blocks were proposed to be constructed in Bhimavaram. However, only 5 blocks of 16 seat community latrines and 9 blocks of 12 seat community latrines have been constructed. The cost of the 16 seat community latrine block has been Rs.65,000/- and that of 12 seat community latrine has been Rs.55,000/-. The community toilets that have been completed have seperate cubicles for men and women. The superstructure of the toilet is pucca with brick walls and reinforced cement concrete roofing. Ordinary cement flooring has been provided. Cement grills for ventilation have been provided in each of the cubicles. No glazed tiles have been provided unlike in community toilets built recently in some resettlement colonies of Delhi. Open tanks have been provided in each of the community latrine blocks for storing water. Rectangular honeycomb pits of equivalent capacity to individual latrine pits have been constructed.

The Bhimavaram Municipality has decided to stop the community latrine scheme due to the low level of acceptance and usage by the people. People's non-acceptance has been not on account of lack of water availability or poor quality of construction. They would much rather prefer to avail of loans for constructing and using individual latrines.

5 LIBERATION OF SCAVENGERS

Before the programme there were about 400 scavengers in Vijayawada, 190 in Bhimavaram and about 60 each in Srikakulam and Analpalle.

The HUDCO sponsored low-cost sanitation scheme has been able to do a laudable work by liberating an estimated number of 310 scavangers in Vijayawada, 70 in Bhimavaram, 30 in Srikakulam and 25 in Anakapalle. However there is further need to liberate and rehabilitate remaining scavengers. The liberated scavengers have not been rehabilitated since there was no rehabilitation component in the earlier HUDCO Low-cost Sanitation Schemes. Today HUDCO's `whole town' approach n Low Cost Sanitation Schemes includes the rehabilitation of scavengers.

The evaluation study was done by the Housing, Urban Development & Municipal Affairs IIUDMA), New Delhi for the Urban Infrastructure Finance Wing (UIFW), HUDCO

APPENDIX 9b

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME IN MAHARASHTRA 1990 BY HUDCO

EVALUATION STUDY OF LOW COST SANITATION PROGRAMME

MAHARASHTRA

AUGUST, 1990

URBAN INFRASTRUCTURE FINANCE WING

HOUSING & URBAN DEVELOPMENT CORPORATION
AND
INDIAN HUMAN SETTLEMENT PROGRAMME
HUMAN SETTLEMENT MANAGEMENT INSTITUTE
NEW DELHI

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INTRODUCTION

It is the aim of the Government of India to make the country totally free of manual scavengers by the end of 1994. In order to fulfill this aim, the grant component of the Ministry of Welfare has been dovetailed to HUDCO's loan component, since 1989, to provide thrust to the execution of the programme. The programme includes the conversion of dry latrines to water-sealed pour-flush latrines and construction of new and community latrines, which will eradicate the inhuman practice of manual scavenging. Simultaneously, rehabilitation programmes will enable the scavengers to acquire new skills and find other professions. So far, 396 towns have been covered under this low cost sanitation programme, liberating as many as 17,270 scavengers.

Series of Evaluation Studies by HUDCO

In order to enable HUDCO to help promote formulation of viable projects and to have feed back on the design, administrative arrangements and operational and maintenance cost of Low Cost Sanitation, it was decided to sponsor evaluation study of Low Cost Sanitation programme in various states. This study for the state of Maharashtra is the first attempt in this direction.

OBJECTIVES OF THE STUDY

In broad terms the objective of the study was to evaluate the performance of low cost sanitation schemes in selected towns and help HUDCO formulate policy strategy.
Town Profile

The towns selected in Maharashtra State were Vasai, Kopargaon, Sangamner and Parbhani. In Vasai, Kopargaon and Sangamner the population ranges between 40,000 and 75,000. The population of Parbhani has reached 200,000.

The progress of the low cost sanitation programme upto June, 1990 is given below :

I. INSTITUTIONAL ASPECTS

Basic Data available with the agency :

Most of the Councils are levying sanitary tax on the citizens where the scavenger services are provided. From these tax records the Muncipal Councils have identified the number of dry latrines to be converted under the low cost sanitation programme. However, in Parbhani town these details were not available as scavenger services

were not rendered. In this town the scavenging is done by private scavengers. For implementation of the scheme, the Municipal Council of Parbhani had to carry out a door-to-door survey and identified 5,700 cases where conversion was needed. More citizens approached the Council with complaints that their names were not included when the survey was carried out and requested to include their names in the list. The Council refused their requests and instructed them to convert their latrines at their own cost.

Project Funding :

While formulating the scheme, the Government decided to provide a maximum Rs 2,000 in the following manner for conversion of one latrine unit :

Type of Funding	Amount (Rs)	Remarks
1 Grant-in-aid of conversion subject to a maximum of Rs 1000.	50% of actual cost	Government grant
2 Loan component with a repayment period of 12 years	-do-	HUDCO loan @ 6% pa

The Government grant and HUDCO loan were routed through the Maharashtra Water Supply and Sewerage Board to the Councils. The Councils are to distribute the same to the beneficiaries. Where the conversion done by the individual exceeds Rs 2,000, the excess is to be met by the Councils or the beneficiaries.

To facilitate the implementation of the scheme and knowing that in some of the places the actual cost may exceed Rs 2,000, the Government has permitted the Councils to utilise the 5% grant meant for Scheduled Castes/Scheduled Tribes welfare, for this purpose.

The Councils seemed to be in need of more information in regard to the procedure to be followed for obtaining loan/grant and timing of funds expected from the Government and HUDCO. The manner in which funds would be distributed to the beneficiaries, how the security would be obtained from them and other related procedures, were not finalised while formulating the proposal.

Departments involved in execution :

The primary responsibility for the execution of the Low Cost Sanitation Programme was delegated by the Government to the Councils. The Councils formulated the scheme, submitted proposals for obtaining finance, allotted work to contractors, supervised their work, released the funds and rehabilitated the scavengers during the execution of the programme.

Work execution :

The details and sequence of work execution were not decided by the Council while submitting the proposal. The Council informed the beneficiaries about the scheme through circulars. In Vasai and Parbhani the work was allotted to a NGO viz Sulabh International. In Parbhani, the Council had appointed contractors before appointing Sulabh International. In Sangamner and Kopargaon cities, work was done by private contractors appointed by individual beneficiaries.

The Vasai Council opted for a particular provision of the Municipal Act which permits the Council to appoint the contractor without calling for tenders if the District Collector permits it to do so. The Council thus appointed Sulabh International without calling for the tenders. The supervision of work was done by the Council's Sanitation Department. Sulabh International was compensated at Rs 2,225 per unit and payment was made on following terms :

50% advance	:	On signing agreement
40%	:	after completion of 50% work
10%	:	after completion of 80% work.

Initially, the Parbhani Council appointed 19 contractors by following normal procedure, to whom 10-20 units were given at a time for conversion. Total units converted by these contractors were 410. As the number of latrines to be converted was large, the Parbhani Council appointed Sulabh International without calling for tenders and even the permission of the Collector was not obtained for awarding work to contractors on a single tender basis. Separate agreement was made by the Council with Sulabh per work order of 200 units at each time. The supervision work was carried out by the Council's Engineering Department.

In Kopargaon and Sangamner the work was carried out by contractors appointed by individual beneficiaries. For monitoring the work carried out by individuals, the Councils insisted that the beneficiary should approach the Council for obtaining prior permission. The Engineering Department gave permission for conversion. After completion, this was informed to the Council and an inspection was carried out by the nominated Department. The completion certificate was issued to the beneficiary after which grant/loan amount he could claim from the Council. Before releasing the grant/loan, the Council decided to route the papers through Recovery Department for collection of tax arrears, if any. The supervision work was carried out by the Sanitation Department and the Engineering Department in Kopargaon and Sangamner towns respectively.

In Vasai, Kopargaon and Sangamner, the Councils did not decide on the strategy to be followed for disbursement of loan and grant to the beneficiaries, how loans should be recovered, whether the yearly sanitation tax levied in advance should be refunded to them, whether for new facilities sanitation tax should be recovered or not. However, the Parbhani Council issued an agreement for the loan component to the beneficiary who executed the scheme with his own funds. The agreement states that loan shall be recovered as per HUDCO rules. In all Councils the executing of the converted units was reported to the Recovery Department for proper accounting of taxes.

As far as individual beneficiaries are concerned, if the conversion is undertaken by them they have to arrange their own funds. Irrespective of actual cost of conversion, the Council promised to disburse maximum grant of Rs 1,000 and a loan of Rs 1,000. Only the Vasai Council decided to pay in addition, Rs 225 out of its own funds for such conversions.

LEGAL MEASURES TAKEN TO SUPPORT THE PROGRAMME :

The Councils increased the sanitation tax levied on beneficiaries using bucket type latrines (from the year 1988-89 from Rs 60/- to Rs 300/-) to recover the overheads and to force the people to convert the unit. Necessary amendment was made in the bye-laws of Councils to this effect.

Further, they decided to discontinue the services of scavengers after declared dates of conversion. However, no rules were passed for this. As per the bye-laws, the Councils are not permitting the construction of bucket type latrines.

For the implementation of the scheme, Councils have not passed any bye-laws relating to :

- non-appointment of new scavengers when existing scavengers are released from the present services and absorbed in other services.
- to demolish bucket type latrine structures, if constructed after the execution of programme.
- to levy penalty on use of bucket type latrines to refrain the users.
- to provide places owned by Councils (such as roads, gutters where the space is insufficient) to beneficiaries for construction of pit/septic latrines.
- to initiate legal action in case of default in carrying out conversion or loan repayment.
- to finalise and earmark the place/area (where the converted unit is to be constructed) if it is not done due to dispute.
- to force/instruct tenant or owner if there is a dispute between tenant and owner regarding who has to bear the cost.
- to prohibit private scavenging

Presently, where the tenant/owners do not co-operate in conversion, pressure tactics are used by the officials/ward members to create awareness among the people. No legal action is reported to be taken in this regard. Even for arrears of recovery of property and other taxes, rarely legal action is initiated against the defaulters. For the efficient implementation of the programme, suitable amendments should be made in the bye-laws as given above and legal actions may be initiated against those who do not co-operate.

NGO's views on Project Implementation what kind of NGOs

NGO officials reported the following type of problems in project implementation.

- Sometimes the land or soil available for the construction of pit type is not suitable. Implineable black cotton soil, becomes after some period, very hard

and the water which is required to seep through the honey-comb wall does not seep out. In such cases they have to amend the design, which may increase the cost of construction.

- Sometimes, the space available for construction is so small that it is very difficult to construct pits/tanks in such places. They have to alter the designs of the pit so as to maintain the required capacity. Sometimes the pit is constructed just below the pan (Aqua - Privy Pit System).
- Sometimes the place available for construction is so unclean and unapproachable that the locally hired labour refuses to work in that environment. In such cases they have to pay them some additional remuneration to get the work done.
- In some cities, NGOs came across a shortage of skilled and unskilled labour, especially where other job opportunities are available. Local labour prefer to accept some work other than construction of latrines. In such cases, labour from other States is called for at higher wages, which again puts a burden on the NGOs.
- It was reported that disputes over sites and cost between the tenants and landlords cause hindrances in the implementation of the scheme. As the local Council cannot take immediate action in such matters, the work is delayed.
- Sometimes beneficiaries do not co-operate with the NGOs for the final selection of sites where the implementation is required to be carried out.

2. SOCIO-ECONOMIC ASPECTS

Awareness of Beneficiaries regarding scheme :

In the survey, it was revealed that most beneficiaries were aware of the benefits of conversion, the implementation and their role in conversion :

Awareness of Schemes among the Beneficiaries

Particulars	Name of Towns			
	Vasai	Kopargaon	Sangamner	Parbhani
No of families surveyed	45	50	50	91
Awareness of members				
YES	34	45	49	87
NO	11	5	1	4

Constraints in Adoption of Scheme :

The type of constraints that were faced in adoption of the low cost sanitation scheme by the Councils are the following :

- While handing over the converted units, neither the councils nor the contractors have explained to the beneficiaries the operations and maintenance aspects.
- The beneficiaries are not aware about the operational aspects of the scheme i.e. when they should change the course of the outflow from one pit to other :
- How to empty or clean the pit tank and latrines and at what frequency;
- How much water should be used while using the newly constructed unit.
- In case of inadequate space what size and type of pit should be selected to meet minimum requirements.

_ Awareness of loan repayment ?

- Where the beneficiaries are residing in rented premises the landlord and other tenants create various types of problems in selection of site, in fixing cost of maintenance and amount contributed by each tenant towards their contribution, etc. apart from the above, following types of problems were reported by the beneficiaries during the survey.

3. TECHNICAL ASPECTS

Quality of Construction and Supervision :

The conversion work was executed by the Councils through the following parties :

Vasai - Sulabh and beneficiary
Kopargaon - Beneficiary
Sangamner - Beneficiary
Parbhani - Sulabh, Beneficiary and Private Contractors

None of the Councils has executed the work themselves, but they survised the work done by contractors/NGOs during conversion. Supervision was carried out by Junior Engineers or Sanitary Inspectors (who are not technical persons). There are however no records/ documentation of site visits made, Inspection Reports etc with any of the Councils. In the absence of any reports, it is difficult to state whether detailed inspections were conducted by the Councils.

Inspections are necessary for conducting a technical audit aimed at checking the quality of construction, adherence to standards to avoid pollution and to ensure proper functioning of the sewage treatment system. In the absence of a technical audit by the Council during construction, corrective action required, if any, at a later date would amount to the demolition of the structure and will be an expensive proposition.

4. COMMUNITY LATRINES

Procedure for construction of community latrines :

Based on the public demand, municipal officials carry out a survey to decide the location of community latrines and the number of seats to be provided. After the survey junior engineers prepare cost estimates based on District Schedule of Rates and the designs of the community latrines. The sanctions for the estimates are obtained from the Standing Committee of the Council if the estimated cost is less than Rs

50,000 and from General Body of the Council if it exceeds Rs 50,000. For construction work, Councils adopt the Public Works Department system of execution. After the sanction, advertisements calling for tenders are given in two local newspapers and the work is awarded to the contractor based on the lowest bid. Formal agreement with the contractor is made. After the contractor commences the work, the contractor is expected to follow all the technical details and specifications given in the work order during construction of community latrines. The quality of work is checked by a Junior Engineer at regular intervals till the completion of work.

The time taken for completing this chain of tasks i.e. right from initiation to handing over of the unit to the beneficiaries is about 10 - 12 months.

Operations and Maintenance :

Operations and maintenance of the community latrines is handled departmentally by the Municipal Councils. In all the four municipal Councils, no outside agency or the residents of the area are involved in the maintenance of the community latrines.

Given below are the views of user on use and maintenance which were collected by us in our surveys :

	TOWNS							
Particulars	**Vasai**	**%**	**Kopargaon**	**%**	**Sangamner**	**%**	**Parbhani**	**%**
Number of persons surveyed	21		20		20		38	
Choke ups	21	100	19	95	14	70	26	68
No Elect-ricity	21	100	20	100	20	100	33	87
Unclean	21	100	20	100	16	80	28	74
Broken pans	9	43	12	60	-	-	10	26
No water	12	57	20	100	10	50	26	68
Poorly maintained	15	71	14	70	50	19	50	

Average percentage of the respondents reporting frequent choke ups is 80%. The reasons for choke ups are :

- throwing stones into the pan
- insufficient flushing water
- Over-flowing of septic tanks

In Vasai, Kopargaon and Sangamner, there is no electric supply to any of the community latrines . The reason given for this is that bulbs are stolen frequently. Though it may be a fact, it cannot be the reason for not providing electricity.

Unclean latrines also compel the user to use other places. As per survey, on an average 86% of the people interviewed, found the toilets unclean. The municipal officials including Makadams and Sanitary Inspectors should frequently inspect and direct the work done by sweepers.

Some cases were noticed where the doors are not provided at all in the original construction plan. This is a serious drawbackas far as community latrines for women are concerned. Junior Engineers and professional architects should ensure the provision of a door for sufficient privacy in community latrines. Wherever sitting arrangements are found to be unsuitable, sanitary inspectors should issue proper instructions to the civil department so that necessary repair or replacement is carried out immediately.

Overflowing of the septic tank, may lead to serious health problems in the surrounding area as it leads to spreading of epidemics and growth of mosquitoes. Sanitary Inspectors should ensure that none of the septic tanks in the city are overflowing. They should also ensure that all the septic tanks in the city are cleaned at regular intervals.

5 SCAVENGER LIBERATION AND REHABILITATION

In the survey of four towns, specific information/data has been collected about the present status of scavengers, their work, social background, etc. This information was compiled and is given below in a summarised form :

Town	Number of latrines		Number of serviced		Total scavengers
	Private	Community	Male	Female	
Vasai	282	-	2	14	16
Kopargaon	289	-	6	6	12
Sangamner	412	60	11	7	18
Parbhani	5700	-	-	-	NIL*

* Private scavenging is done through Bhangi Association employing approximately 100 scavengers.

Views of Scavengers :

Given below are the views of Scavengers, Scavenger Union Leaders, Sanitary Inspectors etc. about the system of scavenging based on our discussions with them :

1) They want to come out of scavenging.

2) They are ready to come out of this sytem even at marginal financial loss.

3) They do not want their children do the same job and they want them to have proper education but due to security of job and the housing facility, they normally ask their children to accept the scavenger job. This is the reason why they do not take much interest in educating their children.

4) There is a need of finance for self employment purpose like establishment of a shop and for training for various trades such as masonry and carpentry.

5) Private scavengers would like to seek some better job other than scavenging but, the other employment should be assured.

6) At the public stand posts, water, soap etc. should be made available to ensure adequate hygiene.

The evaluation study in Maharashtra has been conducted by JPS Associates Bombay, for Urban Infrastructure Finance Wing (UIFW),HUDCO.

APPENDIX 10

'DISCUSSION POINTS AND RECOMMENDATIONS' FROM SEMINAR ON O&M OF SANITATION SYSTEMS FOR LOW-INCOME AREAS, IHS ET AL. 1993

Concerning Operation and Maintenance, the general conclusion in the project is that this aspect should be included in the planning phase and should influence the choice of technology. Further, a good technical database as well as clear definition of tasks of agencies involved in implementation were essential aspects.

Issues of Operation and Maintenance: Discussion and Recommendations:

From the morning presentations a number of key issues emerged:

1. The role of local agencies in view of decentralization of project planning, implementation and operation and maintenance, privatization of certain tasks, user control on implementation and coordination between the responsible actors in different stages of the project cycle.
2. Demand driven provision of low-cost sanitation facilities and services, which could also follow the mechanisms of the market. In addition, the desired generation of demand should be reflected against the public health goals and the required communication and education.
3. Approaches for finance and cost recovery mechanisms.

These issues need to be discussed with a view of the

a. Implications for funding agencies and donor support
b. Focal areas for research and development

Two groups were established that dealt with the identified issues. In a plenary session the conclusions and recommendations were presented, discussed and accepted.

The main conclusions and recommendations of the deliberations are:

1 The findings of the presented research project comply with experiences gained elsewhere. The conclusions do not only apply to an urban context, but also to a rural context. Further dissemination or the results and discussion is required.

2 In order to achieve sustainable sanitation systems, there is a need to develop strategies that take account of the limited capacity of local agencies and resources. Strategies should aim to use the least means and effort and achieve maximum results. They need to be developed in the field of technology, institutional (and community) strengthening and financial resource mobilization.

3 These strategies will need to impart an assessment of the needs, the identification of key-actors (from central government down to users and private sector) and follow an integrated approach, including issues of water supply and health promotion.

4 It was felt that decentralization of responsibilities to lower levels of government is required. This can only be made effective if the capacity of local agencies (municipalities) is increased and involvement in planning and implementation stages is established. The role of central agencies should be made more enabling towards local agencies during implementation.

5 Coordination between involved agencies and user control is regarded as a prime feature of any successful project or O & M service and should receive high priority.

6 Decentralization, coordination and user control are long-term goals and requires donor agencies to:
- accept a process approach;
- ensure long-term involvement and flexibility in approach; and
- have confidence in long-term impacts.

7 Demand-driven approach is supported by the meeting and should:
- be supported by understanding the users and their needs;
- enhance the demand by addressing the potential users and make them aware of health related sanitary measures and to actively promote sanitary options;
- adopt market methods of promotion and delivery of goods and services, based on market research and adapted to local conditions; and
- ensure reliable, value-for-money and technically sound goods and services.

8 Full cost-recovery cannot be adopted without considering the financial consequences for the urban poor. The meting expressed its concern about the international and indiscriminate pressure to adopt full cost-recovery for infrastructure services, which increases the financial burden of the urban poor. Sanitation could be seen as a public good that is in the interest of public health and a better urban environment. Hence, other financial options for delivering and servicing the whole package of basic infrastructure should be considered and investigated.

9 Further research is required in the following fields:
- strategies to strengthen the capacity of urban local bodies, both in implementing and providing maintenance services;
- strategies to adopt market oriented provision of sanitation, demand generation and delivery of maintenance services;
- alternative options for finance of investment for infrastructure and the provision of maintenance services;
- partnerships between communities, private sector and local government may be explored; and
- relation between promoting better cost-recovery and affordability in the context of urban poverty (alleviation).

The chairman thanked the participants for their useful contribution and participation and closed the seminar.

APPENDIX 11

PROCEEDINGS OF CONCLUDING SEMINAR ON O&M ASPECTS OF SANITATION SYSTEMS IN LOW-INCOME SHELTER AREAS, HSMI/HUDCO

NEW DELHI 1992

Appendix V 11

OPERATION & MAINTENANCE ASPECTS OF SANITATION SYSTEMS IN LOW INCOME SHELTER AREAS

CONCLUDING INTER-COUNTRY SEMINAR

New Delhi, 16 April, 1992

PROCEEDINGS

hudco

HUMAN SETTLEMENT MANAEMENT INSTITUTE
212, ASAID VILLAGE COMPLEX
NEW DELHI - 110 049.

Operation & Maintenance Aspects of
Sanitation Systems in Low Income Shelter Areas

Concluding Inter-Country Seminar 16 April, 1992

SESSION I: INAUGURATION

Shri Mulkh Raj, Director Finance, Housing & Urban Development Corporation (HUDCO), welcomed all the delegates to the seminar. He said that the present research was an institutional collaborative effort between two of the Habinet countries i.e India and Thailand. The Institutes were the Human Settlement Management Institute of HUDCO, The National Housing Authority and Chiang Mai University in Thailand alongwith the Institute for Housing & Urban Development Studies (IHS), and the International Water and Sanitation Centre (IRC) in the Netherlands.

The Director Finance referred to the earlier one-day seminar on April 07, 1992 at NHA in Bangkok and the two-day workshop held on the same research on 10 and 11 April, 1992 also at the HSMI, New Delhi. A number of propositions had emerged from these events:

1. **Effective Demand & Sanitation Options:**

   - Without an effective demand from the beneficiary, sanitation solutions in low income shelter areas cannot succeed

2. **Operation & Maintenance and Local Bodies:**

   - Unless local bodies are involved in planning and implementation right from the start, adequate levels of operation and maintenance cannot be achieved.

   - Given the present capabilities of local bodies, adequate operation and maintenance can only be realised by encouraging privatisation

   - Unless local bodies are granted more powers and acquire additional income, operation and maintenance duties cannot be taken up successfully

3. **Design, Technology and Operation & Maintenance**

   - Sanitation technologies when applied on a nation-wide basis should not be standarised.

- Unless the long-term environmental effects on soil and groundwater are considered in technology choice, on-site sanitation should not be considered.

He further referred to the various documents which had been distributed to the participants include evaluation Studies of Low Cost Sanitation Programmes in Maharashtra, Andhra Pradesh, West Bengal and Madhya Pradesh, sponsored by the Urban Infrastructure Finance Wing of HUDCO, a paper on "Policies for adequate operation and maintenance of sanitation systems in low-income areas; aiming at sustainability by Dr. Quratul Ain Bakhteari, paper on "Low Cost Sanitation" by Shri AK Roy, paper on "Sanitation in Low Income Shelter Areas: Key Issues and Strategies by Shri BB Samanta, Low-Cost Sanitation Systems: Ways and Means of Resource Mobilisation by Dr. Ksemsarn Suwarnarat, India and Thailand Country Papers on the present research and proceedings of the National Seminars in India and Thailand. He also informed the participants that Shri RK Bhargava, Secretary, Ministry of Urban Development have kindly agreed to be with us but due to an urgent work he had to go out of Delhi. His advice and the main issues that he considers important has been circulated to the participants as inaugural address.

After this he requested Shri Ksemsarn Suwarnarat, Bangkok Metropolitan Administration, Thailand, to address the delegates from the Thai side. Shri Ksemsarn said that although some less industrialised countries were developing economically at high speed, services to the poor often did not follow at the same pace. The rich invariably become the beneficiaries of economic development. It is necessary that the fruits of economic development percolate down to the poor. The key to solve the existing infrastructural problems and particularly those relating to sanitation depends on making facilities sustainable. He looked forward to a keen interaction with other delegates during the day in various aspects relating to operation and maintenance of sanitation facilities.

Shri Mulkh Raj then on behalf of the organisers and collaborating research institutes expressed his thanks and gratefulness to Shri KK Bhatnagar, Chairman & Managing Director, HUDCO, for having kindly agreed to give benefit of his presence and to consent to inaugurate the seminar. He then invited Shri KK Bhatnagar to give his advice on essential points which the participants can keep in view and to kindly inaugurate the seminar.

Shri KK Bhatnagar, CMD, HUDCO, then delivered the inaugural address. India he stated, had embarked on a series of ambitious programmes on Low Cost Sanitation. Connected to this the unfortunate system of scavenging is to be eradicated completely in India within a set time frame. In this context the subject of O&M should be discussed at the present time when the country is engaged in the process of large scale implementation of low cost sanitation schemes. Comprehensive research in the field is necessary so that the whole issue can be adequately addressed.

Shri Bhatnagar said that a sanitary latrine is one of the basic requirements of every family. As such many crucial inputs for sanitation provision can come from individual families.

Along with this the various concerned government agencies, local governments, NGOs and CBOs should have the mandate to provide requisite technology, equipment, materials and operation & maintenance services for low cost sanitation.

The whole town approach is being applied to low cost sanitation programmes at present. However, it is necessary that requisite facilitation and finance be provided through the network of nationalised banks, local bodies etc. so that sanitation can become available to any one who desires it. HUDCO could also provide finance for this.

It is worthwhile to explore the possibilities of making the liberated scavengers the core of the O&M effort. Local bodies could be entrusted the task of providing facilitation and organisational support. Funds for this could come by modifying the programmes which could also include funds for O&M.

Cost-recovery figures for local bodies are very poor and this requires more initiative at the local body level as well as beneficiary involvement.

The CMD, HUDCO, said that there was a great dearth of equipment for O&M activities in all local bodies. In this area there is a requirement for further research in the field to design and identify such appropriate equipment. HUDCO would be happy to play a developmental role in encouraging research on this subject. Shri Bhatnagar wished the delegates all success for a fruitful day of deliberations.

SESSION II: INTRODUCTION

The participants were introduced to the whole gamut of issues relating to the operation and maintenance (O&M) of low cost sanitation (LCS) by Shri Harry Mengers, Faculty IHS. He listed the factors that influence human health and the environment such as water, sanitation, drainage, solid waste and various socio-economic factors

He stressed that considerable effort has gone into the search and development of adequate sanitation options both for on-site and off-site solutions. Many sanitation programmes have adopted such options. In the Eighties many urban and rural residents benefitted from these programmes. However, at the same time, problems emerged that brought about a crisis in the confidence for such options, in particular, the technical viability of low cost on-site sanitation as well as the financial viability of off-site systems.

Shri Mengers proposed that before refuting the developed options one needs to determine the possible causes of failure. One major cause that has been identified is inadequate O&M. In theory a lot is known about O&M but a serious information gap exists at field level. As a result, professional interest has increased to generate more feedback through research undertaken in this subject.

He identified the following factors which effect level of O&M :

- Technical factors
- User attitude/awareness
- Institutional orientation
- Availability of resources
- Legal framework and By-laws

He further said that the organisers of the seminar have the following objectives in view :

* To review key issues of O&M of sanitation systems in low income areas with reference to the research and other experiences in the Asian region.

* To formulate policy and recommendations for the planning, design and implementation of low cost sanitation schemes.

Technical Session I

Following the introductory session, Shri AK Roy presented his experience of being long involved in the sanitation sector. He highlighted his active involvement in the sector through government, international and non-governmental organisations. He traced the origin and history of Low Cost Sanitation (LCS) in India and made reference to the various institutions which had contributed to the development and propagation of LCS in the country over the past decades.

Special reference was made to the decade old UNDP survey of 211 towns when about 1.5 million households were interviewed with a view to promote understanding the issue and quantify the numbers of households which use different sanitation options. It was found that only 9% households had access to sewerage, 43% had no sanitation facilities while the rest relied on the various options available. About 6 million bucket privies were found to exist then.

Shri Roy emphasised the operation & maintenance difficulties faced by high technology systems. He further stressed that the under-developed countries should not go in for high tech systems as they not only incurr high capital cost but high O&M costs as well. The points needing attention for the proper functioning of LCS systems were described by him as follows:

- Standard design of the low costs sanitation units should be clearly indicated for particular areas with different geo-physical conditions and should be strictly followed.

- Finance availability should be liberalised to cover the towns effectively.

- Cleaning and switching of pits requires intervention and man-machine management needs to be improved as the other technologies which need the vacuum trucks have a problem of spare parts.

- The implementing agencies should take up the task of creating awareness and staying in project towns for first few years in order to build confidence amongst the beneficiaries after implementation.

The following measures according to him need to be taken to ensure good operation & maintenance:

1. The procedure be explained and demonstrated before the latrine is put into operation.
2. The instructions be pasted inside the latrine cubicle.
3. An office be established in the town by the implementing agency where people can write or approach to get their difficulties resolved.
4. When the first pit gets filled, the implementing agency should demonstrate as to how to divert the flow to the unused pit. Normally this is done within the guarantee period.
5. Need to assist in arranging manpower to desludge and empty pits and dispose of the contents in a manner ensuring economic return.

The second presentation was made by Shri BB Samanta, Project Coordinator,UNICEF, who gave an idea about the extent of the urban population which is to be covered by suitable sanitation options. At the outset, it was pointed out that one third of the urban population lives in sub-stanrdard slums and more than 30% in semi-pucca or kutcha houses. He also briefly explained the low cost sanitation programmes undertaken by UNICEF. He identified the following issues of O&M aspects of low cost sanitation :

Technology

- **Not many options are available.**
- **Only low cost option seem feasible in low income areas.**
- **Two-pit pour flush toilet is widely accepted.**
- **Specific options for different geo-hydrological situations.**
- **Not much efforts to design superstructure to suit local conditions.**
- **Options need to be linked with rising inflation and acceptability, affordability and replicability. This requires development and introduction of low cost based materials.**

User

- **Adoption, use and maintenance of low cost sanitation is dependent on awarness of beneficiaries.**

- Household level facilities are better used and maintained than community ones (except pay and use community toilets)

- Sanitation and health link is not adequately understood by the people.

- Outdoor defecation is not perceived as a health hazard but is associated with convenience.

Institutional

- The need to have effective local body to plan and execute LCS in a small town.

- In slum areas of bigger towns (other than UBS areas) adequate staff is not available.

Financial

- Financial base of small local bodies is weak.

- Outside institutional support is limited.

- Cost recovery is not upto the desired level.

Dr. Samanta suggested the following strategies to ensure success of LCS schemes :

- Lack of standardised strategy. The need is to have specific strategy for given context.

- Involvement of the community to carry out assessment of LCS needs.

- Choice of technical option depends on:

  * Technical feasibility

  * Economic viability

  * Acceptability and affordability

- Cost recovery is essential part of financing

- Communication and social mobilisation should be given due emphasis.

- NGO's should be involved.

- Constant research and development effort is essential part of planning and implementation strategy.

- Need to vary designs as per hydro-geophysical and socio-cultural circumstances.

- New research and development based materials need to be developed.

Shri Sanjib Sarma gave a slide presentation which highlighted several interesting aspects of operation and maintenance in the case study towns, besides focussing on specific problems identified in relation to site conditions, user attitudes, etc. and indigenous responses of sanitation needs.

SESSION IV

Panel Discussion I: **Effective Demand & Sanitation Options.**

Propositions

- **Without an effective demand from the beneficiary, sanitation solutions in low income shelter areas cannot succeed.**

Panel Members : Shri V.Suresh, Dr. B. Pathak, Dr.Ksemsarn Suwarnarat, Dr. IB Patel.

Shri Mulkh Raj, introduced and further explained the proposition and invited the panel members Mr. V. Suresh, Dr. Pathak, Dr. Ksemsarn and Dr. Patel, to respond. Thereafter, he requested selected resource persons in the audience to contribute statements before opening the ensuing discussion.

Mr. V. Suresh, Director (Corporate Planning), HUDCO started out by saying that money spent on sanitation saves many times more on curative medicine. He also said that in spite of the massive programmes of low cost sanitation in the country the required impact still seems to be missing. Coordinative action between manifold agencies involved is required, so as to ensure that both technical and non-technical issues are well meshed. He called for a campaign type of programme in which there is a major role for mass media and other means of communication, such as folk theatre, pictorial materials and demonstration models to facilitate instruction to less literate people. NGOs be encouraged to play roles as catalysts and intermediaries. Lastly, he emphasised the link between water availability and the adequate functioning of pour-flush sanitation.

Dr. Pathak of Sulabh International dwelt on the origins of the wide spread habit of open defecation in India which in part can be traced to traditions, climate etc. In villages it can still be observed that even rich households do not have toilet facilities. However, with the advent of urbanisation and commensualisation of agricultural lands these practices can no longer be maintained. Dr. Pathak further stated that whilst the rich can easily pay for sanitation it is the poor who can hardly afford even the modest amounts required. Hence, the need for low cost sanitation and favourable terms of payment. He stated that amongst the states Rajasthan, Orissa and Maharashtra are taking active interest in the programme while the others are lagging behind. So far there has been no Chief Minister's meeting called on the subject of LCS. An enormous amount of change is also required in peoples attitudes. In the later discussion Dr. Pathak stated that ideally the organisation involved in developing the low cost sanitation in a certain area should be involved from beginning to end.

Dr Ksemsarn of Bangkok Metropolitan Authority, Thailand mentioned the Thai concept of "Happy Room" for toilet in Thailand. As of now, it is a fully accepted practice to have toilets in or near the house. A major problem however remains with the resulting waste. Efforts are presently being undertaken to make the individual households act more responsibly in this respect by installing the required treatment facilities.

Dr. IB Patel of the Environmental Sanitation Institute at Ahmedabad stated that the implementation of low cost sanitation schemes is not so much running into problems of acceptance on the part of the beneficiaries rather there is problem of the implementing bureauracy and technical agencies who do not view these technologies as professionally worthwhile. He viewed both temple and toilet as complementary facilities for human purity in which the temple provides for purification of the soul and the toilet ensures the purity of the body. Also Dr. Patel emphasised the need for understandable messages which suit the educational level and ethnic background of the targetted beneficiaries (visualisation and local language).

Shri Iyer of UNDP emphasised that low cost sanitation should preferably be made part of a programme directed at tackling all the basic issues which make for a healthy home.

Dr. Basu, Advisor, Planning Commission, supported the need for an integrated approach. He further emphasised that increase in availability of funds alone will not necessarily result in a more successful programme. What matters is the diligent mix of technical, financial and promotional interventions. A distinction need to be made between latrine conversion programmes and new construction. The latter group is generally more deprived and not used to toilet use at all.

Ms. Akke Schuurmans of the Quetta Sewerage and Sanitation Project at Pakistan, explained the sanitation marketing concepts as employed in this project. For this she made elaborate reference to the paper "Policies for adequate operation and maintenance of sanitation systems in low-income areas; aiming at sustainability" by Dr. Quratul Ain Bakhteari. In the Quetta Project the latrines are provided against near full cost recovery in order to allow a parallel private delivery mechanism to emerge. The commitment from the beneficiaries is ensured by a down payment of Rs.200/-. Furthermore, there is a great emphasis on cutting out any overhead on the contracting costs. Reference Centres act as facilitating points through which in an agreement is concluded between a local mason and the prospective beneficiary to instal the toilet. The use of local mason ensures sufficient degree of control over the quality of construction. As far as the beneficiary motivation is concerned this has generally a lot more to do with convenience and status, rather than health awareness per se. Ms. Schuurmans cautioned against concentrating too much on health benefits to be expected. To be honest these will only come about in a combination with several other interventions such as improved drainage, solid waste collection, water supply, imunisation programmes, improved nutrition etc. So, although sanitation definitely contributes to the overall health condition it is more on the convenience consideration that the programme need to be pursued.

Panel Discussion II : **Operation & Maintenance and Local Bodies**

Propositions

- Unless local bodies are involved in planning and implemtnation right from the start, adequate levels of operation and maintenance cannot be achieved.
- Given the present capabilities of local bodies, adequate operation and maintenance can only be realised by encouraging privatisation.
- Unless local bodies are granted more powers and acquire additional income, operation and maintenance duties cannot be taken up succesfully.

Panel Members : Dr. Ksemsarn Suwarnarat, Dr. B.Pathak, Dr. PS Rana

Shri Bijlani strongly advocated the need to accord higher status to local bodies which are generally treated as weak, incompetent and ill-equipped. Unless this attitude is reversed low cost sanitation services delivery will be consequently constrained. At his instance it was decided to change the moot point number one into "Local Bodies should be involved in all stages of the planning, implementation and post installation phases of LCS schemes".

He complained about the lack of awareness and skills in respect of LCS and other appropriate technologies amongst engineers. He urged that emphasis be laid on engineeing curricula on the understanding of such LCS technologies.

Dr. Pathak stated that Sulabh always works in close interaction with local bodies. So far they have worked with 700 local bodies in 200 districts. He observed that the abolition of octroi had further weakened the financial position of these bodies.

Dr Ksemsarn argued that unless and until inhabitants are prepared to pay for urban services through service charges and taxes, they cannot expect local bodies to perform effectively.

Dr Rana, HUDCO, argued strongly in support of strengthening the local bodies as they appear best placed to provide and maintain local services. However, one sees the strengthening of nodal agencies at state level to make up for the deficiencies at local level. This can keep the local bodies perpetually weak.

Shri Iyer emphasised the supply driven nature of present LCS programmes. Too little effort is put in raising the interest of the local bodies or the beneficiaries whom they represent. He also stated that LCS had also been conceived to reduce and simplify O&M aspects of LCS programme.

Dr Patel cited various successful implementation models of working through local bodies. He felt that maximum involvement of these bodies at all stages of planning and implementation is necessary. He also advocated the establishment of local committees comprising government and non-government agencies involved in the programme.

Considering the trend of interventions by the participants it was felt that discussion was necessary on two additional areas :

i) What should be the financing terms in relation to income categories- as a package of loan and subsidy?

ii) What should be the incentives to the local bodies.to operationalise this?

Dr. Pathak said that of late the overall progress of low-cost sanitation schemes had become slow. It was proposed that there be only a package of loan and subsidy common to all income categories.

Shri Roy mooted an increase in the loan component with a longer loan repayment period. He also said that income categories were irrelevant since the main objective was the liberation of scavengers.

Shri Iyer noted that the HUDCO loan at 6 per cent for LCS had a hidden subsidy, since HUDCO's borrowing rates are much higher. Also, as LCS programmes generally focus on liberation of scanvengers they become strongly supply driven. Hence financing patterns need to be sufficiently attractive to all actors concerned: state governments, local bodies, implementing agencies and the beneficiaries concerned.

Shri Vishwanathan wondered as to when beneficiaries were specified by income category, the loan ammount applicable to the various categories remains the same. He suggessted that beneficiary contribution should not be specified in terms of money.

Panel Discussion III: Design, Technology and Operation and Maintenance

Propositions

- Sanitation technologies when applied on a nation-wide basis should not be standardised.
- Unless the long-term environmental effects on soil and groundwater are considered in technology choice, on-site sanitation should not be considered.

Panel Members: Shri. AK Roy, Dr.IB Patel and Ms. A Nuntapotidech

Shri Roy specified that there were 19 designs to choose from, when deciding on LCS provision under varying conditions. Thus the technology was standardised while the design was not. However, as far as possible, designs should be site or town specific.

Shri Marc Jansen agreed that absolute standardisation is difficult and should not be contemplated in large countries like India with varying geo-physical conditions. For example, it was significant whether water availability was guaranteed or not. In both cases the technologies should differ and innovations tried.

Ms Nuntapotidech, speaking on Thai conditions, observed that national policy with relation to LCS was most important. Local governments could not address all the issues involved. Software support as well as the availability of other physical infrastructure like drainage and solid waste management was imperative.

She made reference to a National Economic and Social Development Plan which was under preparation in Thailand as part of the Seventh Five Year Plan. Its objective is to achieve optimal coordination between government agencies, the private sector and the people. She concluded with a village development example where village committees had the power of prioritisation of activities at the village level. A revolving fund was created by the committee from loan repayments to increase the replicability of development activities. She advocated long term planning (5-10 years) as well as education and training of municipal staff.

On a query as to possible soil/water pollution from on-site sanitation, Shri Roy clarified that studies done at the University of California, and at All India Institute of Public Health and Hygiene had determined that the travel distance of bacterial pollution was moderate (except in rare adverse situations). Safe distances, as specified in the TAG (UNDP/World Bank) manual were sufficient to prevent pollution. Agencies dealing in LCS had not found any evidence of bacterial or chemical pollution. Although it was acknowledged that some risks of pollution of water bodies are involved, Shri Roy argued that the overall benefit of on-site sanitation out-weighs such risks. However, further research was advocated.

SESSION V: CONCLUDING AND VALEDICTORY

Shri Mulkh Raj, Director Finance, HUDCO, summarised the deliberations of the day and highlighted the main recommendations :

- Unless effective demand was assured, LCS could not succeed
- Designs need to be area or even sometimes, town specific. Technologies may be standardised but designs may vary as per requirement.
- The financing terms of the various LCS programmes need review for greater beneficiary acceptance
- There are a number of problems in local government by-laws which need review and augmentation

- Since LCS is a large scale, nation-wide government commitment, it should be viewed as a giant campaign with emphasis from households right upto central government levels. The status of latrines needs elevation in the minds of people at all levels.
- The attitude of those in power to LCS needs to be more supportive
- Engineers need more appreciation of LCS
- O&M problems are fewer when the workmanship is better. This also increases the credibility of the sanitation technology
- Some O&M aspects of LCS activities can be privatised or entrusted to NGOs
- More conclusive proof is required on pollution aspects related to large-scale adoption of LCS as an alternative.
- Further research on Institutional Aspects of O&M of LCS is required. He argued that this research project be extended to include this aspect with DGIS support.

Shri KK Bhatnagar, CMD HUDCO, delivered the valedictory address. He evinced great interest in the combined recommendations of the assembled delegates. He agreed that income categories were not relevant from the point of view of liberation of scavengers. However, from the point of view of LCS provision, categorisation was necessary since the low income categories may require financial support while the comparitively higher income levels may require financial incentives.

He was happy to note that changes had been suggested in the structuring of the various LCS programmes. These were necessary to streamline them for easier implementation.

He noted that a wealth of highly relevant material had been collected from the conduction of the seminar, the dessimination of which would be invaluable for all professionals dealing with the operation and maintenance of low-cost sanitation schmes. On the basis of this material HUDCO would develop a training course based on the O&M of low cost sanitation

Shri Bhatnagar thanked all the participants from the various national and international institutions, with special emphasis on the visiting research team and other professionals from Thailand, the Government of the Netherlands and all HSMI/HUDCO personnel who had made the seminar a success.

HSMI/OMS RESEARCH/ April 17, 1992

TWO-DAY NATIONAL LEVEL WORKSHOP
OPERATION AND MAINTENANCE OF SANITATION SYSTEMS IN LOW INCOME SHELTER AREAS - AIMING FOR SUSTAINABILITY

10-11 APRIL, 1992

PROCEEDINGS OF 10 APRIL, 1992

HUMAN SETTLEMENT MANAGEMENT INSTITUTE
F-212, ASAID VILLAGE COMPLEX NEW DELHI - 110 049.

hudco

Two-Day National Level Workshop on Research - Operation and Maintenance Aspects of Sanitation Systems in Low Income Shelter Areas

on April 10-11, 1992, New Delhi

A warm welcome was extended to all the participants of the India National Workshop by Shri Sanjib Sarma, Fellow, HSMI. Shri Mulkh Raj, Director Finance, HUDCO, then explained the background in which the research was conceived between the collaborating institutions namely, Human Settlement Management Institute of HUDCO, the National Housing Authority and Chiang Mai University (both from Thailand), the Institute for Housing and Urban Development Studies, Rotterdam and the IRC International Water and Sanitation Centre in the Hague. He also explained the objectives of the workshop and invited the participants to introduce themselves.

In his inaugural address, Shri M. Arunachalam, Minister of State for Urban Development, Government of India, stressed that increased access of the poor to sanitation systems and basic urban services on an assured basis within the framework of a strong and responsive local government, is central to the housing and urban strategy of the Government. Considering the dismal sanitation situation in the majority of towns and cities of India, which directly affects the citizens, particularly the welfare of women and children, the Government of India and state governments have tried to battle with this problem through several initiatives.

Since conventional sewerage systems could not be provided in most towns owing to the high cost and organisational effort involved, low cost sanitation technologies have been proposed and incorporated in government policy. This is done to assure the maximum coverage of the population in the shortest possible time on a decentralised basis and at the least cost. The objective is to instal incrementally upgradable sanitation systems evolving in time with progressive shelter construction, growth of the city, and improved incomes of the people. These points have been emphasised in project layout designs of government supported programmes.

The Minister observed that a priority area receiving government's attention is the existence of lakhs of dry, bucket type latrines throughout the country and the inhuman practice of manual handling of excreta by the scavengers. The disposal sites themselves are also environmental hazards and breeding places for all types of disease causing vectors. To redress this situation the Government of India introduced the "Scavenger Liberation and Low-Cost Sanitation Scheme" which sought to emancipate the scavengers by conversion of all dry latrines to waterborne, sanitary ones. The scheme, operated by the Ministry of Urban Development and Ministry of Welfare, has a "whole town approach" where all dry latrines in any town are converted into pour flush ones and new latrines are constructed in houses without latrines, thereby rendering the scavenger redundant and ensuring individual maintenance of pour flush latrines. The scheme has inducted

voluntary agencies in a number of states to assist beneficiaries in the construction of latrines. For the pavement dwellers, the effort is to provide Jan Suvidha Complexes as in Delhi which can be entrusted to NGOs for maintenance on a user fee basis.

The Minister stated that, if sanitation systems are devised without reference to community needs or its involvement, then the maintenance gets neglected by the local body due to lack of resources. This is reflected in the way improved slums soon degenerate into sanitary sores. In city after city, the people are the victims of conflict over maintenance between public agencies. The Minister underlined the importance of efficient coordination of various agencies involved in these tasks, since better maintenance is also related to smooth processes for transfer of responsibility by Development Authority to local body.

HUDCO's role in ensuring the implementation of sanitation schemes through state government agencies and local level bodies, was appreciated by the Minister. He expressed a hope that the collaborative research project on operation and maintenance of sanitation systems would spell out appropriate suggestions and guidelines on various relevant issues, thereby enabling the formulation of action plans that achieve maximum benefits from established facilities. He also called for dissemination of the research results to government departments and other related institutions in order to facilitate application to locally specific situations. The Minister concluded that such investigative studies can substantially improve the replicability and sustainability of schemes, make efficient use of scarce resources and improve the health and well being of the people and children in the long run.

Following the introductory session, Shri Sanjib Sarma presented the main findings and recommendations of the research study in India. At the outset, it was pointed out that only 50% of the urban population in the country was covered by effective sanitation. This means that approximately 108.6 million people were left uncovered. The government of India targets in the Eighth Five Year Plan included 75% coverage for sewerage and sanitation, and elimination of manual scavenging in 500 towns (to be made scavenger free annually). Various low cost sanitation programmes initiated by the government and the management framework of operation and maintenance were also briefly explained.

The research objectives were stated as follows:

1) To review operation and maintenance aspects of onsite and offsite sanitation systems in low cost housing and upgrading schemes, taking into account other infrastructure requirements that contribute to a sanitary environment.

2) To review the use and performance of these systems.

3) To review the user attitudes and practices with respect to operation and maintenance of sanitation systems.

4) To review the role of agencies that are involved in operation and maintenance of sanitation systems.

5) To establish long term institutional and investment requirements for the operation and maintenance of these sanitation systems.

6) To formulate operational recommendations for the planning, design and implementation of future low-cost sanitation schemes.

The selection of case study towns were based on criteria such as town size, location, types of sanitation systems, age of system, type of schemes, operation and maintenance agencies. The ten towns identified for the research study were Chomu, Shajapur, Silchar, Mangaldai, Agartala, Shertallai, Coonoor, Magadi, Hosur and Srikakulam. The various sanitation programmes documented included the Liberation of Scavengers, IDSMT, UBS, UNDP/WB and LCS. The types of technology adopted were single and twin pit latrine systems and public latrines.

The major research issues and findings were discussed under the following subtitles:

1. Technical Issues, Planning and Design

- Application of standard design.
- Insufficient leaching of liquid effluents.
- High water table
- Field demonstration units
- Dissatisfaction with the pour flush pans
- Damage to slab covers and permanent sealing of D/Box
- Nonuse of local materials
- Construction of superstructure
- Use by tenant and owners
- Threshold levels of piped water supply not always available
- Taps in toilets
- Mechanised pit emptying equipment not avilable.

Public Latrines

- No separate sections for men and women
- No hand/clothes washing facilities inside the latrine
- Size of women's sections
- Limited use by children
- Existence of dry type public latrines
- No water source in or around some pupblic latrines
- Ventilation, natural light and electric lighting
- Cubicle doors not lockable from inside
- No guarded space for storing tools/equipments
- Constrained open space
- No wall around complexes

2. Institutional Issues

- Lack of coordination between implementing agency and local body
- Local body not involved in implementation
- Lack of trained staff
- Attendants for public latrines
- Little or no training of contractors
- No market for pit contents
- No separate financial head for O&M
- No effective forecasting of O&M requirements for staff,equipment and finance
- No work planning schedules created for O&M
- No O&M cell in local bodies
- No manuals available with local bodies
- Arbitrary process for contractor identification
- Guarantee for technical performance
- Lack of NGO involvement
- Effective promotion of LCS programmes.

3. Financial and Cost Recovery Issues

- Finances for full town coverage
- No cost recovery from renters
- Poor cost recovery
- No relationship between loan recovery and interest rates/loan period
- No components of O&M funds in LCS programmes
- No funds for training and promotion
- User contributing power not considered
- No price rise clause
- Leasing of public latrines.

4. Environmental Issues and Supporting Infrastructure

- Effluent from septic tanks
- Insufficient capacity of soakage pits
- Insufficient piped water supply
- Related drainage and solid waste infrastructure
- No established solid waste disposal methods utilised
- Location of trenching grounds
- No regular monitoring of septic tanks in public latrines

5. User Related Issues

- Low knowledge of hygiene and excreta/heath related issues
- Low knowledge of sanitation technology
- No repetition of health and awareness creation programmes
- Many children do not use latrines
- Children defecate in drains and open spaces

- Excessive use of water
- Detergents and acids used for cleaning pans & floors
- Vent pipe often installed in 2pit latrines
- Records not kept for pit switching/emptying
- No help in time of crisis
- Lack of standard O&M interventions
- High pit/tank emptying rates
- User complaints for public latrines not attended to
- Concept of neighbourhood sweeper for public latrines not tried

In the light of the various issues related to operation and maintenance of sanitation systems as discussed above, the major problems which emerged through the research analysis were summarised as follows:

Problems with O&M

- **Municipality not involved during planning and implementation**
- **No funds allocated for O&M**
- **No trained staff**
- **No training of municipal staff (Officer/Supervisor level; Sweeper level)**
- **No equipment**
- **Lack of beneficiary awareness**
- **Poor workmanship**
- **Rigidity in designs**
- **No guarantee for technical performance**
- **Insufficient intiative from municipality**
- **Minimal attempt to mobilise resources**
- **No work-planning schedules**
- **No assessment of future requirements of finance, staff and equipment.**

Shri Sanjib Sarma gave a slide presentation which highlighted several interesting aspects of operation and maintenance in the case study towns, besides focussing on specific problems identified in relation to site conditions, user attitudes, etc. and indigenous responses to sanitation needs. Following this presentation, the participants discussed individual perceptions of operation and maintenance experiences in local situations. Some of the key points of discussion are briefly recorded below:

1) **It was debated whether super-structures should form part LCS programmes. On the one hand, non-provision led to non-use of latrines, while on the other hand, if implementation was not preceeded by effective awareness creation programmes, it often resulted in misuse or wrong use of latrine units.**

2) **Users prefer standard type of ceramic pans instead of the fibre glass or mosaic pans. In this respect porcelain pourflush pans are the best. However very few organisations in the country**

manufacture such pans. It was informed by Shri AK Roy of Sulabh International that a new pan made of synthetic material would soon be available in the market.

3) On the aspect of soakage pits connected to septic tanks (in public latrines) it was said that some local bodies did not insist on soakage pits because of extra costs involved and effluent was let into storm water drains.

4) In high water table areas there are problems in the functioning of two pit pour-flush latrines. It was suggested that the latrine and pit area could be elevated so that the pan could be above flood levels throughout the year.

5) It was suggested that burnt clay rings (with perforations) could be used instead of honey comb masonary to save on extra cost of leaching pit construction.

6) It was recognised that cost recovery was low in most schemes, and that local bodies could pursue this more aggressively.

7) On the subject of coordination between implementing agency and local body, it was pointed out that more recently the implementation of LCS was increasingly being entrusted to the local bodies.

Session I: Organizational Aspects of Operation and Maintenance.

The following questions were raised and discussed among the groups under the organisational aspects:

Q.1 Are O&M responsibilities clearly defined for a) municipality, and b) users?

Q.2 Are there roles for NGO's, CBOs, private scavengers?

Q.3 What organisational improvements do you think will improve your ability to provide O&M services?

Q.4 Are your present staff/staffing pattern commensurate with your O&M responsibilities for Sanitation?

Q.5 Could more systematic municipal work planning contribute to better O&M performance?

Q.6 Could you define separate O&M municipal budget heading contribute to better O&M management and planning for O&M activities?

The reaction of the groups on the above question brought-out the following points:

Groups I

1. No clearcut defined responsibilities for Chomu Municipality. However, the Coonoor and other municipalities in Tamil Nadu, Rajasthan and Kerala have clearcut defined responsibility for O&M.

2. NGOs play dominant role for municipalities in Tamil Nadu (Socioeconomic survey, implementation of the programme, management of funds, motivation of the beneficiaries and educating the beneficiaries in O&M).

   In Kerala and Rajasthan, no role is being played by NGOs in this programme.

   CBOs Role - creating awareness amongst public, helping beneficiaries in implementation and O&M activities.

   Private scavengers who have been liberated can form small groups and assist the public in cleaning pits and O&M of individual latrines as well as community latrines.

3. The municipality staff is not allotted specific duties and responsibilities. This is to be reviewed. The necessary strengthening of the existing set up can be carried out by using the services of liberated scavengers. The staff should also be given specific training in the programme including planning the implementation and O&M.

4. The existing strength of staff deployed for this purpose is considered to be highly insufficient. Reorganisation is required giving identified responsibilities. The job distribution should be more specific.

5. Yes.

6. Yes, but coupled with adequate staff with specific job description allotted to them.

GROUP II

1) Not at all defined at present. Responsibilities suggested:

a) Municipality: The Municipality shall take the responsibility of cleaning the filled up pits and the user in that case shall pay a nominal fee to the municipality.

b) The unser shall approach the municipality in case the pit is to be cleaned by the municipality. The user shall maintain the latrines in good and clean condition.

2) Yes, for CBOs and Private Scavengers. Each ward of the municipality can have a CBO and this CBO will be headed by the respective councillors. The CBO will in turn interact with the town municipalities for cleaning of the pits. These scanvengers shall be imparted training by the Municipality.

3)&4) The Sanitary Inspector shall be entrusted with the responsibilities of the O&M job. Whenever the post of sanitary inspectors are not existing these posts shall be created and filled up by suitable persons. A health committee can supervise the O&M and prizes can be given to the best maintained premises.

5) Yes. Municipality can plan for the supervision and cleaning by phases with maintenance of the records of the number of users, date of commissioning etc.

6) Yes. A portion of the taxes collected can form a separate budget for O&M management.

GROUP III

1) Yes.
Individual Latrines - Owner's responsibility
Community Latrines - Municipality's responsibility
Note:enforcement of law by municipality for compulsory use of community latrine
-Pay and use type is preferred

2) Yes. for NGOs and CBOs
- Ward level committee may be introduced
- Private scavenging system to be discouraged

3)
- More manpower needed
- To introduce trained manpower in municipality
- To improve better attitude amongst Municipalworkers for delivering goods.
- To introduce "Pay and use" system by municipality or by NGO/CBO for community latrines.
- Responsibility to be defined.

4) No/partly. Requires improvement/development of manpower.

5) Yes. Needs assessment during planning and its capability of implementation.

6) Yes. Capability of implementation. Involvement of people. O&M norm - Budget/Revenue charge to be levied from owner of the latrine for cleaning by municipality.

Additional Points

1) Inservice training for
- decision makers/managers
- mid level supervisors
- workers (grass root level)

2) Special training for masons

3) Surveillance, monitoring and recording

4) Laboratory facility - Pollutional aspect

5) Mass awareness programme.

Session 2: Cooperation and Role of Users in the O&M of Sanitation Systems.

The following questions were raised and discussed among the groups in the second session:

Q.1 What are good/effective methods to address the public to improve health/hygiene awareness and create a felt need for sanitatio in facilities.

Q.2 How do we establish cooperation during the implementation of LCS programmes.

Q.3 How do we assure proper, sustained use and maintenance of sanitation systems by users.

The reaction of the groups on the above question brought-out the following points:

Group I

1) Cooperation and role of users in the O&M of sanitation systems.

   a) Creating an awareness in school, children, teachers and communicating the importance of the programmes to the public.

   b) Doordarshan programme on Low Cost Sanitation and impact on health and hygiene to be screened once or twice in a week on TV.

   c) Communicating details of programmes through printed pamphlets written in local language.

   d) House to house contact to educate public about the programme.

   e) Arranging Mohalla meetings involving NGOs, Politicians and municipal authorities etc.

   f) Communicating the importance of the programme through beating drums.

   g) Communicating the programme through mohalla mandals (women to women contact)

   h) Wall pasting/hoardings indicating clearly Dos and Dont's of the importance of the progarmme. Display on the backs of Ration cards, gas cards and property tax bills.

2) a) Creating awareness of the programme amongst the public.

   b) Beneficiary participation in the programme either in cash or in kind.

   c) Beneficiary/NGOs role in provision to ensure proper workmanship

   d) Beneficiary should feel that it is their own programme and they must extend all possible help to NGOs, contractors and municipal authorities who are responsible for the implementation of the programme.

   e) Fiscal incentives to mohalla for maintaining clean environment through successful implementation of the programme.

f) Liberated scavengers forming a small group to be attached to the municipalities to ensure O&M of the facilities including fixtures.

3) a) Health education highlighting the problems of water borne diseases.

b) Enforcement of punishment (Fiscal) to those who squat outside.

c) As the government spending heavy funds in the area of health/hygienic, a further incentive may be given to the beneficiary by way of giving interest free loans repayable for longer period of 15-20 years.

d) 90% financing in the form of interest free loan may also be made avaiable for con struction of community latrines.

e) Trouble free operation of constructed units through day to day O&M.

f) Possibility of a private party maintaining the toilets and cleaning the pits as and when required.

g) For those beneficiaries who would like to have additions/ alterations to their houses it should be ensured that the plan approvals are given in consultation with sanitary inspectors who will ensure that the toilets are maintained properly in the existing houses.

GROUP II

1) The NGOs/CBOs can work very effectively for this purpose by adopting following methods.

a) Arranging exibitions depicting the damagersof attracting diseases by not having good sanitary systems.

b) Organising film shows

c) Publishing small booklets in the local languages

d) Arranging programmes in primary and high schools.

2) There is already an awareness among the low income people and most want to have proper sanitary systems. In such cases enlisting the cooperation of the user is easy. However, the municipal acts have to be amended whenever necessary with a provision to make people accept the latrines compulsorily. This will enable the municipalities to implement the scheme.

3) Follow up surveys by the CBO at least twice in a year can ensure the sustenance of the system and also its proper maintenance. Further the O&M wing of the Municipality should have interaction with the CBOs and attend to problems whenever it is necessary. Also the suggestion made for the question in session I if implemented in suitable way, will sustain the system to a great extent.

GROUP III

1. Message should be :

   - Informative
   - Educative
   - Communicative

   Methods employed can included:

   - group discussion/meeting/debate
   - pamphlet/hoarding/wall posters/painting
   - games
   - door to door compaign
   - slides/video
   - newspaper/TV/radio
   - cultural activities/songs/drama
   - health education campaign.
   - clean municipality campaign.

   By forming ward committees of peoples representatives/ volunatry organisation/school heads/ people of all professions.

   By forming neighbourhood committee to spread appropriate messages.

   By involving educational Institutions (school students)

   By involving women specially.

2) Leading personalities of the area are to be contacted for discussion before construction.

   - involve voluntary organisation
   - involve women
   - motivate individual
   - construct demonstration latrine
   - organise Health Grievance Day (once a week)
   - Involve people during implementation and to increase the sense of ownership.
   - Assure satisfactory workmanship during construction.

3) Organize mass awareness and training campaign

   - introduce satisfactory school sanitation.
   - involve students (senior level in school) in campaign programme
   - establish better communication system
   - attend to complaints quickly.
   - ensure better workmanship during construction

- provide service for cleaning if requested.
- assure water supply
- assure lighting (in community latrine)
- assure regular cleaning of community latrines

Additional Points

- Base line data to be collected. It may be pre- project data.
- Collect post-project data
- Collect data from control area (if possible)
- Compare pre-project and post project data
- Communicate the result to the people.

APPENDIX 12

AN ALTERNATIVE PIT LATRINE EMPTYING SYSTEM,

BY MULLER ET AL. (1993)

annex 12

19th WEDC Conference ACCRA, Ghana 1993

WATER, SANITATION, ENVIRONMENT and DEVELOPMENT

An alternative pit latrine emptying system

Maria S Muller, Jasper Kirango, and Jaap Rynsburger

Introduction

This paper addresses the development of an appropriate pit emptying service, including the design of suitable equipment, in Dar es Salaam, Tanzania. The basic perspectives which guided the project partners are presented as well as some information on how the Manual Pit Latrine Emptying Technology (MAPET) service is functioning. MAPET is community based, but will provide better service if integrated in the city-wide service system of Dar es Salaam. Project partners for this pilot project (1988 - 1992) were WASTE Consultants and the Dar es Salaam Sewerage and Sanitation Department.

Situation in Dar es Salaam

In Dar es Salaam, as in other large Third World cities, the great majority of houses have on-site sewage disposal, i.e. mostly pit latrines, some septic tanks. Pit latrines are used by 80% of the households. On the 1992 population of over two million inhabitants or 450,000 households, this means that Dar es Salaam has about 170,000 pit latrines. Obviously, when the pits are full, they must be emptied[1]. It is estimated that yearly about 50,000 m^3 of sludge from latrine pits need to be emptied. Add to this the demand for the desludging of septic tanks, and one realises that any pit emptying service agency faces a formidable task. Are the authorities in Dar es Salaam able to respond to this demand?

The Dar es Salaam City Council operates, through the Dar es Salaam Sewerage and Sanitation Department (DSSD) and the Health Department, its own vacuum tanker services with about five cesspit tankers in continuous operation each.

Apart from the formal system, there are informal, self-employed, pit emptiers who practise the traditional method[2]. Characteristic of this method is that, next to the full latrine pit a shallow hole is dug on the resident's plot, and that the sludge is scooped into this new hole by manual labour. Another characteristic is that, the pit emptier and the house owner deal with each other personally, without the interference of a (bureaucratic) organisation. In a process of face to face negotiations they agree on the price to be paid and the day of starting the work, and on the location of the hole for burying the sludge.

The existing services together do not have sufficient capacity to handle the rising need for pit emptying. A major shortcoming is that the voluminous size and weight of the vacuum tankers is unsuitable for narrow and unpaved roads in the densely built, unplanned areas. Especially the low-income areas lack adequate services because of the unsuitability of the vacuum tankers. The main requirement was, therefore, to design equipment appropriate for the densely settled areas; equipment that is manufactured and maintained locally. However, technical innovation alone is not enough to improve service delivery.

An alternative service

The new equipment and service is called MAPET (Manual Pit Emptying Technology). DSSD took responsibility for introducing MAPET through its own organization in Dar es Salaam, while WASTE Consultants acted as the advisor. The equipment is manually operated and is sufficiently small to be manoeuvred through narrow roads. Using local materials and components and widely known construction techniques, the equipment can be locally produced and repaired in small workshops. The operation of the equipment requires team work of three men, who - as experience bears out - stay voluntarily together for several years. As MAPET can function to a large extent independently from a centralized administrative organization and workshop, it is possible to decentralize its service to the neighbourhood level.

MAPET technical features and operation

A MAPET team consists of three men. One is the leader. In order to be allowed to rent the MAPET equipment he needs a certificate from DSSD. For this certificate the team must first do a training at DSSD. If a pit emptier is found dumping the sludge somewhere behind the bushes, he loses his certificate.

The MAPET team goes with two hand carts (one pump cart and a tank cart of 80 cm width) from the community centre to the customer. They can cover a distance of a couple of kilometres. They first negotiate with the customer where to dig a hole to bury the sludge. They then insert the hose-pipe into the squatting hole and connect it to the tank cart. The tank cart is connected to the hand pump with an air hose. The air is pumped out of the tank and the resulting vacuum causes the sludge to be sucked into the tank. The full tank is emptied into the hole.

Digging the hole constitutes most of the work and takes more than one hour. The 200 litre tank is full within five minutes. With heavy sludge it takes longer. Water is mixed into the sludge. By draining the hose-pipe out at full vacuum ('plug and gulp') the sucking can be intensified. Customers generally ask for 4 to 10 tanks to be taken out of their latrines. The pit emptiers earn about 2,000 to 5,000 shilling which they share among themselves. In order to make a living of the MAPET pit emptyings they should have at least one customer per day.

The process of MAPET introduction

The following points of view have guided the development of MAPET:

First, pit emptying is a service consisting of several components, of which the equipment is only one element. Other components are e.g. training to operate the equipment, repair facilities, the capacity to find customers, economic and financial aspects of the service organisation, and facilities for sludge disposal. All these components of the MAPET service have subsequently been addressed during the pilot project. Project experience has confirmed the importance of appropriate and locally constructed equipment. It has also confirmed the notion that a service can only be performed satisfactorily if all other components function properly.

Secondly, the introduction of new equipment, even more so of a whole new service, requires a step-by-step approach. This allows the innovations to be adjusted to local conditions at the appropriate time. This entailed e.g. that the basic MAPET equipment was constructed as a prototype in a few months' time, but that serious adjustments were made in response to the experiences of the immediate users, i.e. the pit emptiers, over a period of 3 years. Similarly, training of the mechanics took place over a number of years, as they carried out the improvements in the MAPET equipment in the DSSD's own workshop. A step-by-step approach also implied that other components of the MAPET service were developed only when the need arose. For example, when the pit emptiers found it difficult to generate a regular demand from customers, a system of informing and motivating customers and community leaders was developed.

Thirdly, the new service, including the equipment, should be based on the most appropriate elements of the existing pit emptying methods. That is, building upon what exists, on what is known and familiar to people and organisations. In this way MAPET is not a strange element, as it combines e.g. the modern vacuum technology of the cesspit tankers with the traditional system of on-site sludge disposal by manual labour. It also strengthens the so-called traditional element of personal interaction between pit emptiers and customers, which is an important feature of modern small-scale, informal business contacts.

Fourthly, a form of public-private cooperation was envisaged between the DSSD and the informal sector. The public authorities have ultimate responsibility for sanitation services as they concern public health. It was also recognised that the demand for employment is tremendous. In times of structural adjustment programmes, MAPET could not generate new employment opportunities in DSSD, a government institution, but only in the private, informal sector. The solution adopted was that the DSSD would be the owner of the MAPET equipment and lease it to the pit emptiers. The DSSD provides essential support services, such as performing large repairs, promotion of MAPET in new neighbourhoods, and training and supervision, while the pit emptiers are self-employed workers, responsible for earning their own income. They do not receive a basic salary from DSSD. In this cooperation DSSD has a position to control irregular sludge disposal by private emptiers.

Different forms of organisation and management are conceivable, with a different balance between public and private responsibilities. Several options are being tried out in Tanzania.

The resulting MAPET service has both advantages and disadvantages. Some of the advantages are that:

- The MAPET equipment can reach the most inaccessible houses.
- The service can be performed almost immediately, while the vacuum tanker service requires a long waiting time.
- And the possibility of regular social contact between residents and emptiers, which enables community influence and supervision.
- MAPET can offer 'service to size': small volumes suiting the customer's household budget.

Some of the disadvantages are that:

- The MAPET service is expensive per unit of volume (m^3) compared with that of the vacuum tankers.
- The method of sludge disposal (burying on the plot) is not suitable for areas with a high ground water table and very densely populated areas.
- Cash flows between the DSSD and the private pit emptiers are difficult to control in practice.

MAPET service as part of a city-wide system

The pilot project has shown that MAPET can function satisfactorily in local communities. The emptiers can identify their customers and earn a low but steady income, informal mechanics in the neighbourhood carry out minor repairs, a certain amount of sludge disposal takes place within the community, and in a general sense MAPET enjoys social acceptance in those communities where it is already working. Leaders in other areas that came to know about MAPET are eager to bring it into their neighbourhood as a solution to the public health problems. Some NGO community initiatives have identified MAPET as a

first priority to start a neighbourhood improvement campaign. On the other hand, residents and leaders would like to have more influence on the MAPET service, as they observe the potential for integration within the economic and health service system of the local community. Also they see the potential for income generation by the community.

However, MAPET is not an independent alternative to the tanker service. The size of the population requires the volume and hauling capacity of pit emptying as performed by the DSSD vacuum tankers[3]. In addition, MAPET should be operationally linked to the DSSD regarding sludge disposal. In areas with a high ground water table, MAPET cannot operate at present because of the absence of disposal facilities. Sludge must be removed from these areas and transported to central dumping stations of the city. The DSSD is the most likely organisation to use its vacuum tankers for this purpose. The aim is to combine the advantages of a community based service with the advantages of a strong organisation able to haul sludge through the city for final disposal. The required institutional arrangements (technical, financial, and operational) between the DSSD as a bureaucratic, government controlled organisation, the independently operating MAPET pit emptiers, and local communities are quite complicated. This is a formidable task, not less than the first introduction of MAPET.

The next phase of the MAPET project will include the development of an institutional framework for a neighbourhood based service, as well as the development of a sludge transfer system. The sludge transfer will initially be directed towards locally manufactured transfer stations as well as options for sludge treatment at neighbourhood level.

As in the first stage of the project, progress will be directed by the problems experienced by the organizations and operators directly involved at the city-wide and at the neighbourhood level. Solutions will be reached through a unique combination of the potential of these organizations in the public, private and community sectors.

References

1 Comparative Study on Pit Emptying Technologies, draft Final Report, WASTE Consultants, Gouda, The Netherlands, 1993

2 MAPET Progress Report 2, WASTE Consultants, Gouda, The Netherlands, 1988

3 The COMPET study has recommended to separate urban areas with pit latrines into typical large tanker, mini tanker and MAPET areas. The typical MAPET areas are those where even mini tankers do not have access. Large tankers appear to be the most economic (if adequately managed, which is often not the case) for hauling sludge to sludge disposal stations over distances more than 5 km from the pit.

APPENDIX 13a

'FINDINGS, COMMENTS AND CONCLUSIONS AND RECOMMENDATIONS' OF USE AND MAINTENANCE OF LCS FACILITIES STUDY OF SRINAGAR CITY; BY SARMA ET AL. (1989)

USE AND MAINTENANCE OF LOW COST SANITATION FACILITIES STUDY OF SRINAGAR CITY JAMMU A D KASHMIR

May, 1989

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4. MAJOR FINDINGS

4.1 Analysis of Household Questionnaires

Wardwise Coverage

The questionnaires were canvassed in all nine wards over which the scheme was spread. The number of questionnaires canvassed by each enumerator varied from 18 to 37 questionnaires each. The percentage distribution of HH per ward varied from a low of 0.7% in ward No.14 to a high of 15.4% in ward No.10.

Religion

Of the HH surveyed an overwhelming 91.9% belonged to the Muslim Community while 8.1% were Hindus.

Occupation

In the surveyed HH 40.4% belonged to the regular service sector with 37.0 being from the business sector. The occupationwise breakup is as follows:

Service	-	40.4%
Business	-	37.0%
Skilled Worker	-	18.5%
Jobless	-	4.1%

Education Levels

The largest percentage (46.5%) of the people were educated upto school level while 25.4% were college educated. The balance of 28.2% were found to be illiterate. This indicated that about 72% of the beneficiaries interviewed were formally educated.

Tenure Status

Nearly all the parties interviewed (98.6%) were the owners of the house being lived in.

Household Income

Nearly half of the interviewed beneficiaries were found to be in the middle income range of Rs.701-1500 per month. A large number aggregating to 37.6% were in the income range under Rs.700 per month. The income profile is as follows:

Rs. 0 - 700	-	37.6%
Rs. 701 - 1500	-	47.0%
Rs. 1501 - 2500	-	9.4%
Rs. Above 2500	-	6.0%

Residential Plot Area

There was found to be an extremely large variation in plot size ranging from 20 - 1800 sq.m. This would seem to indicate that plot size does not have any direct relevance and the technology has been accepted by a wide spectrum of people.

Household Size

Again in HH size there was found to be wide variation with sizes ranging from 1 to 18 members. The average family size was found to be 6.81 which is 24% above the national average of 5.5. The average number of adult males was 37.25% with female adults constituting 32.9%. Amongst the children below 18, there were 14% male children and 16% female children.

Difficulties During Conversion

88.5% of the people said that they did not experience much difficulty during conversion. The difficulty expressed by the balance 11.5% consisted mainly of lack of alternate toilets available for use during the conversion.

Difficulties in Use by Children

A large percentage (96%) of the children were found to experience no specific difficulty in latrine use. The high percentage should not, however, obscure the fact that there is a lot of open air defecation by children.

Instructions on Use of Facilities

89.3% of the beneficiaries indicated that they had received written instructions on the use of the new latrines and their operation and maintenance.

Hygiene Parameters

99.3% of the interviewed HH indicated that they use water for anal cleansing. On the use of soap for washing of hands after defecation, 67.8% professed to do so while a notable 31.8% said that they did not, or used other materials. A worrysome 87.1% evinced ignorance as to the danger of children's feces to human health.

Level of Satisfaction

A high percentage of 82.6% were satisfied with the performance of the technology provided for latrine conversion.

Performance of Leaching Pits

The great majority of the beneficiaries (83.1%) were satisfied with the performance

of the leaching pits. Of the balance the following reasons for dissatisfaction were observed:

Blockage	-	14.2%
Rapid filling	-	1.4%
Pan overflowing	-	0.7%
Pit overflowing	-	0.7%

In 98.6% of the cases, however, sullage water did not enter the pits to cause any of the above mentioned problems.

Pit Filling Time

Since this was a new scheme, in 98.2% of the cases the first pit had not yet been filled.

Willingness to Pay

Since this was a scheme for free provision, 96.2% of the beneficiaries were not willing to pay an extra monthly sum towards improvement in physical infrastructure services. A small percentage were willing to pay between Rs.2/- and Rs.25/- per month for additional/better services.

Water Supply

About 90% of the families were served by piped water supply by means of house taps. The balance got their water from communal taps or other sources. 24% fo the HH had a tap located in the toilet.

Health Improvement

Only 8.3% of the people admitted to diseases before conversion. However 62.3% felt that the latrines had been responsible for improvement in health.

Community Organisations/Health Campaigns

78.2% of the people had never witnessed any public health campaigns. Only 12.9% professed to have seen a family planning campaign. Again only36.2% of the beneficiaries were a part of any community organisation. However 71.1% expressed willingness to join one.

Latrine Details

It was found that 77.2% of the latrines had a pucca superstructure constructed by the beneficiaries themselves. 41.4% had these toilets adjoining bathing places. The location of the latrine was found to be outside the premises in the majority (89.1%) of the cases, most often in one corner of the plot.

Area Cleanliness

The enumerators reported from visual observation that garbage was strewn around the house in 76.2% of the cases. This was supported by the finding that in 46.6% of the cases open surface drains were found choked.

4.2 Views of Concerned Agencies

1 Srinagar Municipal Council

The SMC stands suspended and is under the charge of an Administrator from the state services. The main activity of the municipality in the area of environmental cleanliness is in street sweeping, solid waste collection and drain maintenance. Approximately 70% of the total budget ~Rs.8 crores is spent on these items. The sanitation provisions under the Municipal Act are enacted through the office of the Municipal Health Officer.

The SMC is by and large very satisfied with the performance of Sulabh International with whom it has a good working relationship. Because of the two-year warranty provided, future requirements and responsibilities towards maintenance of the facilities are not seen to require immediate attention. The municipality foresees that the on-site facilities will, in fact, be the responsibility of the individual HH who can make direct arrangements with local sweepers for operation and maintenance.

On being interviewed by the researchers, the Municipal Health Officer had the following comments regarding the scheme:

- Both municipal officers and beneficiaries alike were not adequately conscious of the important connection between proper sanitation and improved health.
- There were a large number of cases of diarrhoea and gastro-enteritis in the city both of which are water/excreta borne diseases.
- Health education programmes are a dire necessity to create awareness particularly amongst the poorer, uneducated sections of the city dwellers.
- The central older parts of the city are a particular problem because of lack of space within plots and narrow access lanes. The municipality avoids siting of leaching pits under roads and pathways as they fear encroachment and subsequent litigation.
- Community latrines should be provided near public areas like markets, bus terminals etc.
- In-service, field training programmes are necessary for sanitary inspectors with a view to increase their understanding of the technology being applied and to improve motivation and commitment.
- The municipality does not have faith in popular participation. They claim that the people see the city government as an agency to be pressurised.

2 Sulabh International

The main problem faced by Sulabh is the low unit cost that is applicable as per 1985-86 price levels. They feel that a price revision is in order to match the price increase of required materials which they have to buy at prevailing market rates.

Another problem faced is because of beneficiaries using soil and other particulate matter for anal cleansing which leads to blockages in some latrines. Sulabh is called upon to attend to such complaints and rectify/repair any damage done.

The NGO is satisfied with the acceptance of the new technology by the citizens of Srinagar. They receive requests for construction of toilets from many households who have not yet been targetted for conversion.

4.3 Related Findings

Designed Capacity Overload

The number of users per latrine often exceeds the design capacity. This is caused by the fact that parts of premises are rented and multiple families start using the facilities designed only for 6 or 12 users.

Junction Box Malfunction

In a few cases it was noticed that sewage was flowing simultaneously to both pits due to a failure to sufficiently close one of the outlets in the junction box. This will, of course, lead to grave problems both at the time of pit switching and subsequent desludging. Additionally, in almost all cases the junction box was found to be badly hidden and often plastered or concreted over. This will cause difficulty when faults have to be rectified and/or pits have to be switched.

Malyari Land

A singular situation is found in the city. It has been a custom in the past to use human excreta as fertiliser or `malyari' land i.e. HH land used for vegetable cultivation. On the one hand this practice is declining because of progressively less arable space being available within plots. On the other this traditional habit bodes well for future use of desludged pit deposits.

Problems in Low Lying Areas

In certain low lying areas, particularly in the new suburban extensions in the south of the city, the water table is very high - approximately 2-4 ft. below ground level. This interferes with the functioning of the pits since sufficient leaching action does not take place and the bottom of pits are sometimes submerged.

High Density Core Areas

In much of the high density core areas of the city installation of low cost latrines is difficult because of lack of space mainly for the leach pits. The municipality is opposed to siting of pits under roads and pathways anticipating problems related to encroachment and excavation of road/path surfaces for desludging of pits.

Anal Cleansing Habits

Despite the finding of the household survey to the contrary it has been observed that in a number of cases soil is used for anal cleansing as is testified to by the presence of small mounds of earth outside latrines. Sulabh officials have corroborated this by citing instances where they have attended to complaints of blockage caused by introduction of soil into the system.

Improper Flushing Practices

A case commonly observed is improper flushing practice. Insufficient flushing water is often used despite close proximity of water supply leading to caking of the pan with excreta and consequent clogging.

Improper Superstructure

Under the present scheme of free provision it is the responsibility of the beneficiaries to construct the toilet superstructure. In a large number of cases it was found that only part superstructure had been built often open to the sky. Wind blown debris and leaves, twigs etc. cause malfunction in such cases. This feature is predominant in low income areas.

Hygiene Awareness

Hygiene awareness in Srinagar is inadequate. Rich and poor alike are in the habit of flushing night soil into the drains. The HH survey also revealed that an alarming 87% of the beneficiaries did not consider excreta harmful to health.

5. COMMENTS

The present scheme falls under the purview of the Low Cost Sanitation Committee set up by the SMC, the committee members being senior officers of the municipality. It is curious to note therefore that the Municipal Health Officer is not a member of this committee although it is his department which will be directly in charge of post installation issues once the facilities are transferred to the SMC.

The scheme was awarded to Sulabh International on the basis of an unit price of Rs. 1600/- per latrine (without superstructure). The break-up of quantities of material and current costs are as follows:

Material

Item	Quantity	Cost
Bricks	650 Nos.	Rs. 650.00
Steel	7 Kgs.	Rs. 63.00
Cement	3 Bags	Rs. 250.00
Coarse Aggregate	10 cu.ft.	Rs. 60.00
Sand	35 cu.ft.	Rs. 105.00
Lifting Rings	4 Nos.	Rs. 20.00
Pan and Trap	1 Set	Rs. 150.00
Pit Digging	-	Rs. 40.00
	Sub total (a)	Rs.1338.00

Manpower

Mason	2 Mandays	Rs. 140.00
Labour	2 Mandays	Rs. 70.00
Labour (material	2 Mandays	Rs. 70.00
	Sub total (b)	Rs. 280.00
	Total of (a) + (b)	Rs.1618.00
Overhead 25%		Rs. 404.50
	Grand total :	Rs.2022.50

It is seen that the unit cost no longer covers the basic cost of materials and labour at present prices. Sulabh has to do a continuous financial balancing act within the state, taking advance money from other projects in different towns in the hope of future adjustment.

The tradition of using night soil on malyari land is seen by the researchers as fortuituous for the future of low cost sanitation schemes in the Srinagar region. In such schemes

elsewhere, the final removal and disposal of the pit deposits is seen as a potential future problem. People generally think of night soil as something to be removed immediately from the premises. In the case of Srinagar, malyari use of pit deposits will solve the problem in those areas where open land is available within the plots.

It appears that the SMC has set no policy as to its own involvement in the after care of the sanitation facilities beyond the two-year warranty period. It is generally understood that the task will be that of the municipal health department working through its network of Ward Offices overseen by the respective Ward Oficers. The Ward Offices are extremely important as they are the interface between the community and the SMC. In future they will have to receive and attend to any complaints regarding the facilities provided.

On inspection of some Ward Offices the researchers found the ı to be in a dilapidated condition. Some were even found to be unmanned by SMC staff and locked during working hours. It appears doubtful whether these offices will be able to take on additional responsibilities as required by the present (and any subsequent) schemes, in their present condition.

It was found that the communities were not involved in the planning, designing and implementation of the scheme in any way beyond an opinion as to the siting of the latrines.

Since the scheme is one of free provision of facilities, cost recovery of the capital cost does not come up for consideration here. However it is also notable that no advance commitment of the beneficiary groups was solicited in terms of contributions towards the subsequent operation and maintenance of facilities.

The researchers feel that because of free provision of the facilities the population by and large do not have much interest in the upkeep and/or betterment of the facilities since they do not experience the feeling of ownership that is generated by paying for a facility.

On the other hand it is worth noting that small groups of residents from various colonies have approached the SMC for improvements in physical infrastructure for which they have offered to pay.

A special case was found in a resettlement colony for the Tibetan population. The inhabitants have a good degree of literacy, belong to the middle income group and are, by and large, neat and clean in their personal clothing, house maintenance etc. Here the sanitation facilities were found to be in a spotless condition and all working perfectly.

It is generally opined by SMC and Sulabh officials that provision of units in the core areas is extremely difficult because of lack of space within plots, inadequate access etc. Despite these difficulties the researchers found a number of latrines functioning well in many houses in these areas.

6. CONCLUSIONS AND RECOMMENDATIONS

- There appears to be an important potential role of the municipal health department in further promoting proper on-site sanitation.

- The Municipal Health Officer should be a member of the Low Cost Sanitation Committee of the SMC.

- Health awareness campaigns need to be arranged and aggressively conducted in all sections of the city.

- Field demonstration units should be constructed in various areas and the communication media, such as the press and television, used for popularising future schemes.

- Congested core city areas need to be urgently addressed for sanitation provision. On the one hand the residents should be coerced to accept conversion, while the SMC should consider siting of leaching pits under footpaths and roads at least in these areas.

- It is important for the SMC to make an assessment of its own requirements beyond the two - year warranty period in terms of additional finances, equipment and personnel.

- The Ward Offices require urgent attention so as to upgrade them for the additional tasks of monitoring and maintenance which they will be called upon to fulfill.

- There should be an extension of service to those families who are willing to install units without subsidy from government.

- In-service, field training programmes are needed for the level of Sanitary Inspectors and Sanitary Supervisors with the objective of increasing their understanding of the technology being applied (with special emphasis on maintenance requirements) as well as to increase their confidence and commitment to the scheme.

- Emphasis should be consciously shifted from only physical target achievement to the broader goals of the project and should also keep in mind the after- care requirements.

- There should be a price escalation clause in the agreement signed for such schemes so that purchase of materials at market prices prevailing at the time of implementation is possible. This will aid quicker implementation.

- Despite the fact that the scheme is one of free provision of facilities, scope for beneficiary contribution should be seriously investigated, possibly towards operation and maintenance.

- There should be concerted effort to extend the scheme to all areas where malyari land is available within, or adjacent to, residential plots. In other areas municipal/ horticulture departments should plan to buy pit deposits for use in gardens, parks etc.

- It may be desirable to reassess the design of the junction box to prevent short circuiting of pits.

- There is need to keep the junction box as visible and accessible as possible so as to facilitate easy opening during blockage and during switching of pits.

APPENDIX 13b

'FINDINGS, COMMENTS AND CONCLUSIONS AND RECOMMENDATIONS' OF USE AND MAINTENANCE OF LCS FACILITIES STUDY OF MALKAPUR; BY SARMA ET AL. (1989)

USE AND MAINTENANCE OF SANITATION FACILITIES IN LOW INCOME SHELTER AREAS STUDY OF MALKAPUR TOWN MAHARASHTRA.

March, 1989

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4. MAJOR FINDINGS

4.1 Analysis of Household Questionnaires

Wardwise Distribution

The questionnaires were canvassed in 19 of the 31 wards of the town where the programme was implemented. The five enumerators canvassed 8, 20, 20, 20 and 30 questionnaires each.

Provisional Level and Location of Latrines

From the households surveyed it was found that there is an average of 7.98 (say 8) persons per latrine. The majority of houses had only one toilet and only 5.1% of the houses had more than one toilet. In a majority of 84.54% of the houses the pits were found to be located outside the house.

Size of Houses

Average plot area	139.14 sq.m.
Range of the plot area	10 sq.m. to 900 sq.m.

24.74% of the sample beneficiaries live in plots larger than the average while 75.26% live in plots of size less than 140 sq.m.

Demographic and Socio Economic Characteristics

The average family size was found to be 8.39 which is 52.7% higher than the national average of 5.5. About 51% of beneficiaries were male and 49% female with children constituting 38.56% of the population. More than 50% of the beneficiaries belong to the muslim community.

Educational Level

The largest percentage (67.13%) of the people were educated upto school level while 9.19% were college graduates and the balance (23.68%) were illiterates.

Tenure Status

An overwhelming majority (97%) were owners of the house being lived in.

Income Profile

Almost half the beneficiaries questioned (46.94%) belonged to income range Rs. 700 - 1500 per month followed by 33.67% in the Rs. 0 -700 range. The details are as follows:

Rs. 0 - 700	33.67%
Rs. 700 - 1500	46.94%
Rs. 1500 - 2500	14.29%
Rs. 2500 & above	5.10%

Hygiene Parameters

The questionnaire revealed that 83.67% of the people use water for anal cleansing while 16.33% do not and/or use other solid or particulate material. 78.57% use soap for washing of hands after defecation while 21.43% use soil or nothing at all. A notable percentage of 51.02% evinced ignorance as to the danger of childrens' feces to human health. About 49% thought that a child's excreta is dangerous.

Level of Satisfaction

A high percentage of 89.8% were satisfied with the performance of the sanitation technology provided for latrine conversion.

Instructions on Use of Facilities

83.67% of the beneficiaries indicated that they were supplied with information leaflets with instructions on the new echnology and on its proper use and maintenance. 16.33% said that they had not received any written material from the municipality.

Payment by Beneficiaries

All beneficiaries (100%) said that they paid no amount as loan repayment to the authorities. Only a small percentage (13.27%) exhibited any willingness at all to contribute any monthly sum in the future towards improvement in infrastructural facilities. The range of contributions which they offered in future for any infrastructural upgradation varied from Rs. 5/- to Rs. 25/- per month.

Availability of Water

A majority of the people (58.7%) get water from house taps while 40.22% make use of communal taps. A small percentage (1.08%) use handpumps. Also, 8.33%, have a tap located within the latrine.

Public Health Campaigns/Community Organisations

Only 8.16% of the people had ever witnessed any type of public health or awareness creation campaign. Again only 17.35% said that they were members of any kind of community organisation. However, 46.94% of the beneficiaries expressed willingness to join one.

Area Cleanliness

The enumerators reported that the majority of the people are in the habit of dumping their

garbage in communal dumps thereafter to be cleared by the municipal authorities. However the questionnaires revealed that only 60% of the open surface sullage /storm water drains were clean; a furher 20.5% were choked mainly with solid waste and wind blown street sweepings/soil; 16.5% had no drains adjacent to their dwellings. This indicates that a proportion of the beneficiaries do not properly remove their solid waste to designated dumping points.

4.2 Views of Implementing Agency

The implementing agency for the Malkapur Scheme was the Maharashtra Water Supply and Sewerage Board. In - depth interviews with the officials of the Board at Malkapur, Akola and the Head Office in Bombay revealed, however, that the implementing agency faces a number of problems when engaged in the type of sanitation scheme under study in Malkapur and have many reservations which they clearly stated.

The provision of clean sanitation is the responsibility of the Municipal Council. They, however, show little or no interest in programmes being implemented by the MWSSB. The latter feels that for successful implementation, the municipal councils should consider such programmes are their own and that they should also implement the same. Only then would they shoulder the responsibility of the programme being entrusted to them. Apparently, elected representatives at the state and municipal levels also concur with this view.

Once the municipal councils were made the implementing agency, the MWSSB would continue to provide technical know-how and guidance in the form of skilled personnel from the Board.

A summary of the financial, administrative and technical difficulties being faced by the Board is given here in extracts from a note to the Government of Maharashtra on the low cost sanitation programme being implemented by the MWSSB:

A. **Financial Difficulties**

i) HUDCO requires that loan applications should be separate for each town. For preparation of loan proposal for each town voluminous data is required to be collected which takes about 3 to 4 months wilth special efforts, since information about each individual beneficiary has to be listed. Even though the proposal is submitted, it is not certain whether HUDCO would sanction that proposal and release the loan in the expected time. Although the conversion programme has been started in 66 towns, loan applications for 27 towns only could be forwarded to HUDCO. So far HUDCO has sanctioned loan of Rs. 159.60 lakhs for 22 of these towns and released Rs. 54.47 lakhs for 19 towns. The programme in 12 towns was completed without applying for HUDCO loan to utilise the G.I.A component then available. However, HUDCO has informed that they would not sanction loan for the work which is already carried out.

ii) By the end of March 1988, an amount of Rs. 387.24 lakhs has been received for this programme towards G.I.A. However, the HUDCO loan received is Rs. 54.47

lakhs only. The proportion of G.I.A. to loan of 1:1 could not be maintained.

iii) Actual expenditure on the programme of a town is many a time more than the estimated cost due to various reasons. HUDCO does not sanction loan on the increased cost. This creates a gap between the loan required and loan received. It was proposed by the Board to utilise O.M.B. for meeting this gap. However, the Government turned down the proposal.

iv) Loan for HUCO is received by the Board on behalf of the Municipal Councils. Although the loan was released by HUDCO for 19 towns, only 8 Municipal Councils have executed the agreement. The remaining Municipal Councils did not turn up for executing the agreement inspite of repeated letters from the Board and Deputy Director of Municipal Administration.

v) Municipal Councils do not repay the loan instalment and interest in time. The Board has to pay the same to HUDCO as per schedule from its own funds. The amount paid by the Board to HUDCO and not received form M.Cs. as on 31.3.1988 works out to Rs. 26.11 lakhs.

B. **Technical/Administrative Difficulties:**

i) Agencies are not easily available for conversion of bucket type latrines into twin pit low cost sanitation latrines because at each location the quantum of work to be executed is very small. The materials like bricks, sand and metal etc. which are collected in small quantities for conversion of latrines are stolen overnight. This is the main reason why the contractors are reluctant to come forward for construction of such works.

ii) The house owners do not co-operate by tolerating inconvenience to them even for 3-4 days during which the existing bucket latrine is required to be closed down.

iii) The house owners are reluctant to allow construction of pits within the premises even when sufficient space is available for construction of pits.

iv) At many locations there is not enough space either within plots or on the adjoining lanes/roads for construction of pits. Such lanes are used as normal approaches to the houses and also accommodate water supply pipes etc. due to which construction of pits become extremely difficult.

v) The success of this programme depends upon cooperation which can be received from the Municipal Council Authorities and the beneficiaries. Our experience in this respect is not satisfactory.

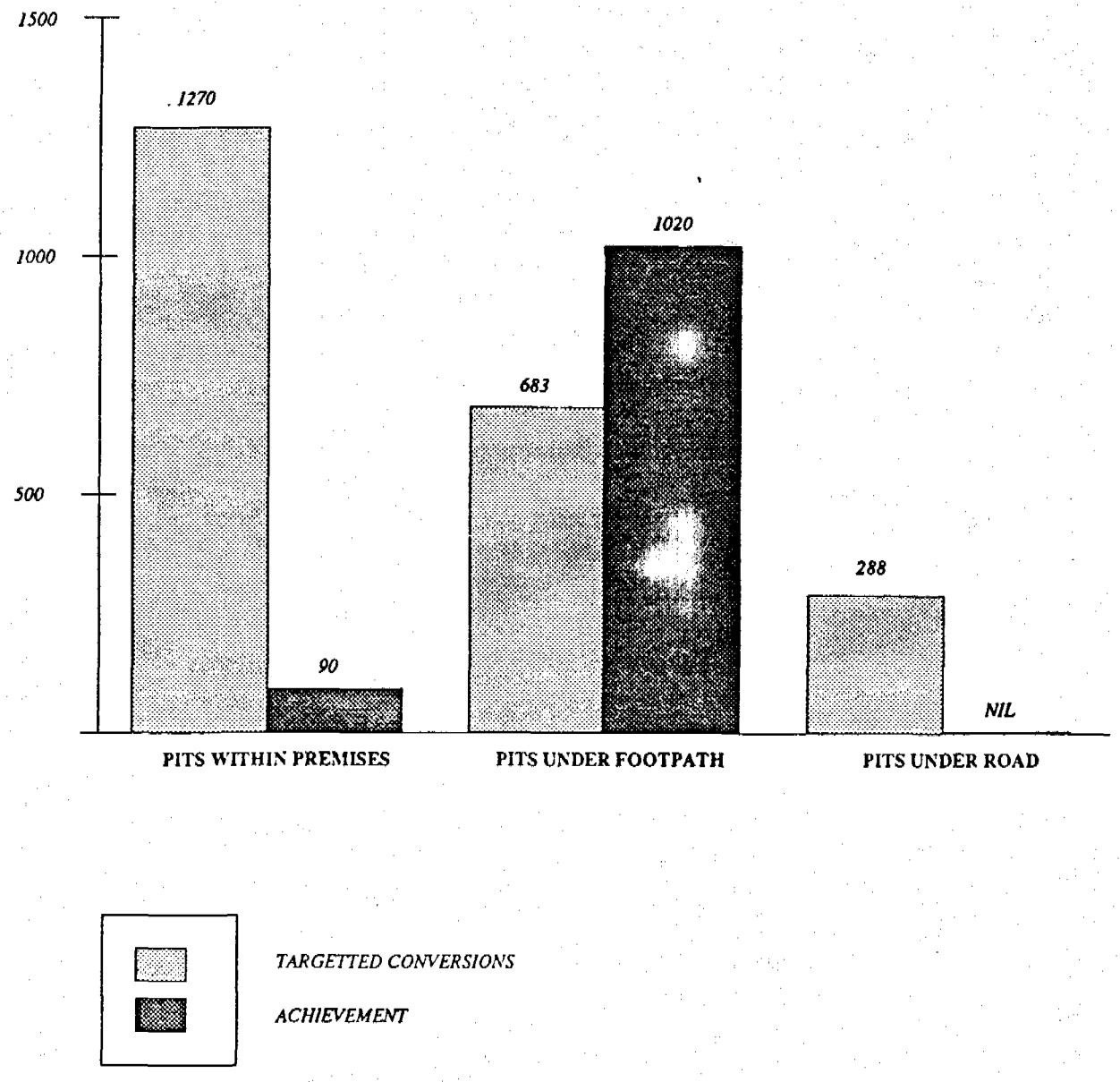
4.3 Related Findings

Achievements of Physical Targets:

It was found that only one component of the scheme has received overwhelming emphasis

Source

ACHIEVEMENT OF PHYSICAL TARGET
LOW COST SANITATION SCHEME
MALKAPUR, MAHARASHTRA



Source: MWSSB, 1988

throughout - the physical construction target. From the point of view of the MWSSB the main objective has always been physical implementation of the project with a view to transfer the assets created to the municipality within a prescribed time frame. The local municipal authorities are pleased that their town has been chosen for developmental activity from the centre/state level and await project completion with little thought of the various post installation issues and problems which will arise in future.

Coordination between Involved Agencies:

A fact which clearly manifested itself was the lack of coordination between the formal agencies involved. The MWSSB, through its statewide cadre of professional engineers operating through their various engineering circles and with their established tendering/contractin procedures are capable of fulfilling construction targets as per the requirements of the scheme. It was found, however, that there was little or no contact/coordination between the personnel of the local municipality and these MWSSB officials. Of the two municipal engineers,one was looking after the waterworks while the engineer (sewage) was completely occupied in the supervision of the work of the 110 municipal sweepers through the Sanitary Inspector.

Conviction Level in the Formal Sector:

A number of doubts were found to exist in the mind of officials of both agencies as to the appropriateness and viability of the sanitation technology being applied. Another category of persons, the contractors and their representatives, also expressed doubts as to the efficacy of the technology. The researchers wonder how a new technology can be transferred to the field via a hierarchy of personnel who are themselves not completely convinced about the particular technology.

User Awareness and Motivation for Conversion:

A low level of hygiene awareness was found in the beneficiary groups and as to knowledge of health related benefits of the technology being provided. This, coupled with the lack of conviction on the part of some of the provision agency officials, has led to a situation of poor motivation of beneficiaries towards conversion.

User Knowledge of Project Details

The community was found to be generally ignorant about important details of the project like grant and loan facilities which had made the scheme possible. They were unaware that the loan component was recoverable from them in phased instalments. All assumed that the programme was one of free provision of sanitation facilities. Hence the fact corroborated by the canvassed questionnaire that 100% of the beneficiaries do not pay any amount in monthly instalments.

Attitude towards Use and Maintenance of Facilities

Despite the fact that instruction booklets have been given to a majority of the

beneficiaries, knowledge on proper use and maintenance was found to be deficient particularly on issues like opening and desludging of pits. Most families knew when to switch to the second pit but had no idea as to when to open the first pit for removal of pit deposits. Questioning of users at random proved that most households had lost the booklets in question.

Contracting Procedures

Standard contracting procedures for tendering and allocation of works are followed by the MWSSB. The Contractors, however being used to executing large works, find small margins of profit in such schemes. They also complain of theft of construction materials due to the decentralised nature of the work. They therefore sub-contract the work to small masons and rarely bother to visit work sites. This, perforce, has a negative effect on the quality of construction. Visual observation by the researchers corroborated this fact.

Scavenger Liberation

The present scheme was called the `Scavenger Liberation Scheme, Malkapur'. However, the sporadic and part implementation of the scheme still requires the presence of the scavenger since the majority of the latrines in Malkapur remain the dry, bucket type. Of the targetted number of conversions only 57% have been converted since mid 1984. It is to be noted however that the total number of dry latrines in Malkapur far exceed the number targetted for conversion.

Community Involvement

There has been a conspicuous lack of community involvement from the inception of the programe. Other than a questionnaire to elicit some basic situational and peripheral data (Annexure - 5), the community has hardly been consulted on the present scheme. Their involvement has not been sought in planning, designing, implmentation or after care aspects.

Associated Infrastructure Provision

A singular related finding was in the field of provision of water supply. As already stated in 1.4 the majority of the people get unmetred water supply from public standposts. Water supply is therefore free. What is remarkable is the mode of provision. The researchers conject that one or more of the city fathers, seeking re-election, promised free adequate water in his/their election manifesto. As a result, it is found that the standposts have been provided in haphazard fashion with far too many tap points - it is not uncommon to find 3-4 standpoints in a pipe length of o ly 10 metres! The result is low pressure because of too many taps on line (often with the taps missing) and very high cost of provision. It would have been cheaper to give yard taps to each household with the added advantage of lower water loss since taps would not be stolen.

5. COMMENTS

The present low cost sanitation scheme under study envisages partial cost recovery of the loan component from the beneficiaries. The success of the cost recovery procedure however is affected by the mode and modalities of provision of other elements of infrastructure. In the Malkapur case the water supply provision is seen as a case in point. The researchers feel that the previous free provision of an associated infrastructure component is detrimental to the concept of cost recovery for a subsequent provision. It is felt that the poor cost recovery in Malkapur is partly because of this reason.

This is the first time that a scheme of this type has been implemented in the town. Whenever a new technology of this type is being promoted there is considerable demonstration effect which, in the long run, will be highly beneficial in the acceptance and establishment of the technology overall. Special emphasis and attention is therefore necessary in such new schemes if the `whole town approach' for conversion of latrines is to be realised.

Part provision of a low cost sanitation scheme (as in the case of Malkapur) throws up specific problems such as the non-realisation of the concept of Liberation of Scavengers. Since a sizable number of latrines continue to be of the dry type, the scavenger remains indispensable.

A large number of house owners do not allow location of leaching pits inside their plots because of lack of knowledge and confidence in the new technology. In such cases if there is also no space available outside the plot then conversion is not possible. This reduces the success rate of the scheme.

It was noticed from MWSSB figures that there were no conversions at all in the cases where the leaching pits were to be located under the road. It seems that the beneficiaries do not want pits located within their premises and the municipality does not want to locate them under metalled roads anticipating problems when the pits are filled and the road surface will have to be excavated to open them.

In a number of instances it was found that that there were long, exposed lengths of PVC pipe between connecting the latrines with the pits. These could easily be damaged by children or animals.

6. RECOMMENDATIONS

- Coordination between all involved agencies right from municipalities to state and central governement institutions should be assured from the inception stage of schemes.

- Emphasis should be consciously shifted from only physical target achievement and should be enlarged to the broader goals of the project and should also keep in mind the after - care requirements.

- To ensure proper motivation of personnel of provider agencies, orientation/ training programmes should be conducted to expose all concerned officials to the technology being applied.

- Involvement of the beneficiaries should be solicited from the inception of the scheme and should be ensured through all stages. This will help smooth progress of the scheme, avoid theft of materials from site and ensure user participation in post installation operation and maintenance of facilities.

- Awareness creation cum health education programmes should be systematically conducted (even repeated if necessary) to synthesise users to the benefits to be gained from the technology and to emphasise the important connection between proper sanitation and good health.

- It is imperative for the caretaker agency to make an early assessment of future requirements particularly in terms of additional finances, equipment and personnel.

- Preferably the local body should be made responsible for the implementation of the scheme. If any state or central level agency is involved it should mainly have an advisory/facilitating role providing technical know - how, personnel and ensuring proper flow of materials and end quality of the product.

- Construction should be entrusted directly to local small contractors/masons. An orientation cum training programme should be conducted in the early stages of a project to acquaint them to the new technology, upgrade their skills and motivate them as to the main objectives of the project.

- Operation and maintenance arrangements should be planned for by the local body with the help of community organisations/NGOs and include the services of the liberated scavengers.

- Special motivational efforts are required in those cases where houseowners do not allow location of leaching pits inside their plots because of uncertainty and lack of knowledge about the new technology. In really recalcitrant cases use can be made of the Maharashtra Municipal Act (Sub-section I, Section 287) to enforce conversion in the interests of the overall benefit to the community.

- Liberated scavengers should be trained in alternate occupations and assisted to find suitable job opportunities.

- It is necessary to create a market for the pit deposits since it is essentially a new "product" for the town. Horticultural departments should take a lead by buying these deposits and using it as manure in parks, gardens etc.

- Successful schemes should be adequately documented and information disseminated to all related agencies to boost confidence in the technology and aid in successful replication of projects.

APPENDIX 14

PARTS FROM EVALUATION OF SANITATION ... SINHA AND GOSH 1991

Chapter-IV

IMPACT OF LIBERATION ON SOCIO-ECONOMIC CONDITIONS AND BEHAVIOUR OF SCAVENGERS

4.1. In this chapter an attempt has been made to assess the impact of liberation of scavengers and its impact on socio-economic conditions and behaviour of scavengers in selected towns.

4.2. Liberation of Scavengers

4.2.1. The household survey of scavengers in the selected towns reveals that the scavengers belong to scheduled caste community. As many as 75 per cent of scavengers are either *Mehtar* or *Dome* by caste. Traditionally they used to carry night soil. Some of these scavengers had migrated either from the villages/towns of their own district or other districts. While the percentage of migrants is quite high at Bhagalpur, it is quite low at Gaya. Major migration had taken place during the last three or four decades either at their (the heads of households) own generation or at their father's generation. A few households had migrated at grandfather's generation. Search for employment was the main reason for migration. Other reasons were marriage, transfer of service, flood, social discrimination at their own native villages etc. (Tables 4.1 to 4.6)

4.2.2. A few scavengers' households had given up the traditional occupation of carrying night soil long before the scheme was launched. Though most of the scavengers in the selected towns such as Bhagalpur, Gaya, Bhilwara have been given alternative jobs such as sweepers and other jobs as IV class employees in the municipal corporations, railway etc., but the members of many scavengers' households in Daltonganj are still carrying night soil as employees of municipal corporations. In Daltonganj out of 39 households, the earners of 18 households though employees of municipal corporation are still being allowed to carry night soil. In Bhilwara, though the scavengers have been given alternative jobs in the municipal corporation, many of them are still cleaning dry latrines privately as reported by the respondents. So is the case of Bhagalpur, but their numbers are very few. In Gaya, no respondent has reported that any of their family

member is cleaning the dry latrines. (Table 4.7). Since a large number of dry latrines are yet to be converted into P.F. latrines, it was investigated from other sources that many of the scavengers are still cleaning the dry latrines privately and secretly which it seems has not been reported by the respondents. So long as the dry latrines exist in the selected towns, none of these towns could be declared scavenging free towns. However, as many as 259 scavenger households (81.2%) were liberated under the National Programme of Liberation Scheme which was introduced in the beginning of Six th Plan. (Table 4.8)

4.3. Demographic and Occupational Structure

4.3.1. Before analysing the socio-economic conditions of the scavenger households, it is necessary here to give a brief account of the demographic and occupational structure of the scavenger households. Total population of the 319 sample households of scavengers in the selected towns is 1531, out of which 832 are males and 699 are females. Male population is higher in all the selected towns except in Daltonganj where the female population is higher than the male population. Literacy rate among the scavengers is high in Bhagalpur, Gaya and Bhilwara, and it is low in Daltonganj. Among the literates, majority of them have attained education upto primary level and middle level. A few have attained education upto high school and Intermediate level. There are two graduates each in Gaya and Bhilwara. Thus there has been an educational awakening among the scavengers in the selected towns except in Daltonganj where the literacy rate among the scavengers is very low. As much as 86.3 percent of the scavengers in the selected towns are engaged as sweepers in the municipal corporation, hospital, railway, etc. As much as 7.5 per cent of scavengers are working in various governmental and non-governmental departments as class IV employees other than sweepers. Rest of the scavengers are employed in other jobs such as hawkers, rickshawpullers, labour, petty trade, drivers, artisans, scavengers, mali, etc. (Tables 4.9 to 4.12)

4.3.2. Here an attempt has been made to analyse whether the socio-economic conditions of the scavengers have improved after the liberation, whether there is any change in their attitudes and behaviour, whether there is any change in attitudes of other classes of people towards them.

4.4. Socio-Economic Conditions of Scavenger Households and Families

4.4.1. Majority of the scavenger households in the selected towns are of nuclear type consisting of parents and their children.. The percentage of nuclear families varies from 81 per cent to 92 per cent. The dominance of nuclear families among the scavenger households reveals an important trend towards change from joint families to nuclear families (Table 4.13). Majority of the household families live in one room accommodation (Table 4.14).

4.5. Housing

4.5.1. In Daltonganj, as many as 92 per cent of the households live in *kutcha* houses either with tiled roof or thatched roof, while in Bhilwara 86 per cent of the households live in pucca or semipucca houses (Table 4.15). Thus the findings of the survey reveal that majority of scavengers in Bhilwara live in better houses in terms of structure. Since the stones are available there in plenty, they could build up *pucca* structure at cheaper cost. In Gaya also, a large number of scavengers are living in *pucca* houses because a good number of them employed in municipal corporation are living in government quarters. However, the conditions of these houses are not at all fit for human living. Many of these houses could fall at any time as there are a lot of cracks and depletions in the walls and roofs. During our field survey many of these scavengers complained about the deplorable conditions of these houses. In Bhagalpur also, a good number of scavengers are living in rented houses and government quarters. The findings of the survey reveal that as many as 58 per cent of the houses lived in by scavengers in four selected towns have been built by the members of the households themselves and 8.7 per cent of the houses were built with Government assistance. Rest are living either in government quarters or in rented houses (Table 4.16).

4.6. Income and Family Size

4.6.1. Majority of the scavenger households in the selected towns having upto six members belong to income categories between Rs.501 and Rs.1500 per month. One important feature is that the income tables

of the selected towns reveal that very few households belong to lowest income categories i.e. those households whose monthly incomes go upto Rs. 500 or to the highest income category i.e. those households whose monthly incomes are Rs. 2000 or more. As far as income position of the scavenger household is concerned, the position of Bhagalpur town is better than other selected towns. In Daltonganj the income position is poorest among the four selected towns (Tables 4.17 to 4.20).

4.7. Rise in Income

4.7.1. Most of the scavengers were liberated in the selected towns during the period 1980 to 1987. After liberation, average monthly income of the scavengers has increased. Before liberation, average monthly income of the scavengers was Rs.595 at Bhagalpur, Rs.540 at Gaya, Rs.478 at Daltonganj and Rs.283 at Bhilwara. During the survey average income of these scavengers has increased to Rs.1204 at Bhagalpur, Rs.1091 at Gaya, Rs.804 at Daltonganj and Rs.994 at Bhilwara. Though this increase of monthly income has not been recoknd for a particular point of time since all scavengers were not liberated at specific year of the sixth or seventh plan but it shows an increasing trend after liberation. In terms of percentage, Bhilwara has recorded the highest increase of monthly income of 251 per cent and Daltonganj has recorded the lowest increase of 68 per cent. In Bhagalpur and Gaya this increase has been 102 percent. (Table 4.21)

4.8. Increase in Movable Assets

4.8.1 Looking at the position of movable assets, it is found that in Bhilwara there has been a considerable increase in movable assets in the scavenger households such as T.V., motor-cycle, fan, radio, cycle, watch, metalic utensils, etc. since they were liberated. In other selected towns such as Bhagalpur and Gaya also there has been an increase in movable assets in the scavenger households but this increase is not much as compared to Bhilwara. In Daltonganj there has not been any significant increase in movable assets. No scavenger household in Daltonganj has possessed T.V. or motor cycle, etc. so far. There are two possible reasons for increase in movable assets in Bhilwara. One is that there has been considerable increase in income and the other is that they are more fascinated by luxurious goods suchas T.V., motor cycle, etc. (Table 4.22).

4.9. Increase in Livestocks

4.9.1. The scavengers prefer to keep pigs than other animals. Very few scavenger households keep goats and cows. In Bhagalpur and Bhilwara more number of families are now keeping pigs as compared to the period before liberation. In Daltonganj and Gaya very few households are keeping pigs. Out of 319 households in four selected towns, as many as 98 families are keeping pigs as compared to 50 families that used to keep before liberation.

4.10. Saving

4.10.1. Saving is one of the important indicators for measuring the living standards of individuals. Before liberation, hardly any scavenger household had any saving account with the bank in selected towns. Out of 319 scavenger households, only 26 families (12 per cent) are having saving accounts with banks and other financial institutions with an average saving of Rs.1216 only for the last two years. However, the percentage of households having saving accounts is as low as 3 per cent at Gaya. The average saving is highest at Bhilwara, followed by Bhagalpur and Daltonganj. (Table 4.23)

4.11. Credit

4.11.1. Out of 319 households, as many as 65 families (20 per cent) have taken loan. The average amount of loan varies from Rs.1953 to Rs.10,107 in four selected towns — the highest of Rs. 10,107 being in Bhilwara. Because, in Bhilwara the member of 4 sample households have taken substantial loan from the government for house construction. Though majority of them have taken loan for non-productive purposes, such as, consumption, medical, marriages, etc., but quite a few have taken loan for house repairs/construction, business and purchase of movable assets. Out of 65 families, as many as 15 families have repaid some amount of loans. Majority of scavengers have taken loan from money lenders,that means, the money lenders are still active, particularly in Gaya and Daltonganj. However, in Bhilwara the sample households have taken loan from office only. Rest have taken loan from other sources such as office, relatives and banks. (Tables 4.24 and 4.26).

4.12. Social Change of Scavenger Community

4.12.1. Communication

Mass media such as Newspaper, T.V. and Radio etc. are gradually playing an important role in the lives of scavengers. Although majority of the respondents in the selected towns cannot read newspapers but quite a few scavenger respondents except the respondents of Daltonganj do read newspapers at regular intervals ranging from everyday to once a while. The members of 13.5 per cent of the sample households in Bhagalpur, Gaya and Bhilwara read newspapers, and out of these, about 2 per cent only subscribe newspapers and the rest 11.5 per cent read newspapers at neighbour's house, community centre or in office. Most of them read newspapers at neighbour house, office or community centre. Very few read newspapers at their own house (Tables 4.27 to 4.29).

With regard to T.V. and Radio news, a good number of respondents of sample households (57 per cent in Bhilwara and 45 per cent in Bhagalpur) listen to T.V. and Radio news at regular intervals from every day to once a while. In Gaya, 10 per cent of the respondents of sample households listen to T.V. and Radio news while in Daltonganj none of the respondents listen to T.V. and Radio news. In Bhilwara quite a good number of families posses T.V. and Radio so they get opportunity to hear news at their own residence. (Tables 4.30 to 4.32)

4.12.2. Attitudes and Behavioural Changes

Since scavenging is regarded as low grade occupation, the castes such as *Mehtar* and *Dome* carrying night soil have often been discriminated by other people. Most of the earners of the scavenger families are no more carrying night soil from the dry latrines and they are working as sweepers as regular class IV employees in the municipal corporation. Not only the average incomes of the scavenger families have increased but also stigma of carrying night soil attached to them has also been removed. This has reduced the discriminatory attitude of other people towards them, though they are not treated at par with other higher caste inspite of change in occupation. Before liberation the members of the scavenger famililes used to suffer a lot of social and economic discrimination quite frequently at the hands of other people. For example, they were not allowed to enter even at the courtyard of the houses of other communities. Even their touch at the

courtyard would have defiled the entire place. Such kind of discrimination is not there now, though rule of commensuality is still being observed.

As much as 65 per cent of the scavenger households in the four selected towns had suffered discrimination quite frequently and 30 percent of the scavenger families had suffered discrimination sometimes. Those who did not suffer any discrimination were the scavengers who were liberated long before. After liberation the attitudes of the other people have changed. As much as 69 per cent of the scavenger respondents have reported that the attitude of other classes of people towards them have changed for the better to some extent. Another 18 per cent have reported that there is a great change in attitude of other people towards them. (Tables 4.33 and 4.34).

4.13 General Observations on Scavengers Localities

4.13.1. The general observations of scavengers localities reveal that the scavengers are living in a state of poverty, except in one or two localities in each selected towns of Bihar and Rajasthan, where the socio-economic conditions of the scavengers have sufficiently improved. The increase in income has not brought about improvement in the socio-economic conditions of the scavengers. One of the reasons for poverty is that a large number of scavengers are addicted to drinking liquor.

4.13.2. The improvement in the socio-economic conditions of the people cannot be assessed by economic variables alone such as income, saving and movable assets etc. Equally important is the social and physical environment in which they live. It is because their living condition is greatly influenced by the basic services and facilites such as housing, drinking water, latrine, drainage, education and health centres etc. The general observations reveal that these services and facilities are lacking in varying degrees in scavengers' localities, except one or two localities in the selected towns of Bihar and Rajasthan.

4.14 Conclusions

4.14.1 The foregoing analysis of the household survey shows that the socio-economic conditions of scavengers in the selected towns have improved in terms of income, saving and movable assets after liberation. The household survey also reveals that the scavengers do not suffer the kind of social and economic discrimination which they

used to suffer before liberation. Besides, mass-media such as newspaper, T.V. and Radio are gradually playing an important role in their lives. However, the general observations reveal that the socio-economic conditions have not improved if it is viewed in broader perspective of their living conditions. The increase in income does not necessarily bring about a significant change in their living conditions unless a significant change is brought about in infrastructural facilities such as drinking water, latrines, drainage, education and health centre etc.

Children of liberated scavengers at the carpentary workshop in Sulabh Training Institute, Patna

CHAPTER-VII

SUGGESTIONS AND RECOMMENDATIONS

7.1. Pour-Flush Latrine

7.1.1. Although the guarantee cards supplied by Sulabh International mention of free repairs and maintenance services upto five years, survey findings reveal that the defects in some of the P.F. latrines have not been attended due to communication gap. Thus, as many as 23 per cent beneficiaries are facing problems in using P.F. latrines such as leakage in pipe, chocking, damaged pits, overflowing etc. Another 7.3 per cent beneficiaries are not at all using P.F. latrines due to sewer chocking. During our survey, we observed that there is a communication gap between the beneficiaries of P.F. latrines, the representatives of Sulabh International and the local authorities. Therefore, it is suggested that after installation of P.F. latrines, there is a need for proper monitoring and follow-up action by the Sulabh International to check the P.F. latrines at regular intervals and see how these are functioning. It is, further suggested that one community organiser should be selected from each locality. The person so selected would act as a liaison between the Sulabh, the beneficiaries and local authorities. It is through the community organiser, communication gap between the Sulabh and beneficiaries would be bridged. Dissemination of knowledge about the usefulness of P.F. latrines as well as environmental sanitation is essential in making the programme a success. For this purpose Sulabh International in collaboration with local authorities should organise training camp for the community organisers so that they may educate the people with regard to the effectiveness of P.F. latrines and environmental sanitation.

7.1.2. Though the beneficiaries of P.F. latrines have agreed to get the superstructures built up on P.F. latrines, 12.5 percent beneficiaries are not using P.F. latrines for lack of superstructures on P.F. latrines. Therefore, before installation of P.F. latrines, Sulabh International should make sure that all the beneficiairies would get superstructures on their P.F. latrines constructed immediately after installation of P.F. latrines. For this purpose it is suggested that the Sulabh International should take up the responsibility of constructing superstructure for those beneficiaries who are unable to get the superstructures constructed because of their poor financial conditions. Such cases should be brought to the notice of local authority and provisions for loan-cum-subsidy be made in the budget for poorest section of society who can not afford construction of superstructures. If the superstructures are constructed alongwith installation of P.F. latrines, the beneficiaries could use them immediately after conversion/construction.

7.1.3. Eight per cent beneficiaries are not using P.F. latrines because the pits have already been filled up with excreta. It is suggested that local authority should be informed by the community organizers of the P.F. beneficiaries to get these pits cleared. It is the responsibility of local authority to make necessary arrangements for getting the accumulated excreta cleaned from the pits.

7.1.4 The survey findings reveal that a large number of dry latrines are still exisiting in the selected towns. All these dry latrines should be converted immediately into P.F. latrines so that the night soil is not allowed to be thrown in the river or drains or any other place indiscriminately. It could also prevent the sweepers of municipal corporation from cleaning those dry latrines privately or secretly. In this respect the community organizer can play a crucial role. They could motivate the people to convert their dry latrines.

7.1.5. The State Governments should be directed to submit the progress report along with fresh proposals of conversion/ construction of dry-latrines into P.F. latrines before September of every year so that the fund could be released in time by the Ministry of Welfare, Government of India and the funds so received by the State Governments could be utilized during the same financial year.

7.1.6. The State Governments should be directed to forward proposal for only those towns which have got pre-surveys of the entire town done recently otherwise the proposals submitted on the basis of the old survey would vary and the number of conversions would increase at the time of execution. At the time of the survey, it should also be kept in mind that house-owners express their opinion frankly whether they want one or two units constructed. At the time of execution they may not opt for two units or increase the number and add to the complexity of the problems.

7.1.7. It is recommended that local coordinating committee consisting of District Magistrate, representatives of local bodies and Welfare Department and voluntary organizations such as Sulabh International be formed with a view to sort out the bottlenecks in the implementation of conversion

and liberation of scavengers scheme. They should meet periodically and review the progress of work and feed back to the State Level Coordination Committee.

7.2. Training and Rehabilitation

7.2.1. One of the reasons for dropout of scavengers' children is that the training institute is far from their residential town. Many of the trainees feel homesick. It is suggested that a few regional training centres should be set up where they could feel more at home. They can visit their home on Sundays and holidays.

7.2.2. Setting up of regional level training institute depends upon functional needs of the regions so that the training could be imparted in those trades which could be effective in terms of employment or self-employment. Before setting up any regional training institute, pre-surveys of scavenger children and occupational needs of the regions should be conducted.

7.2.3. Another reason for dropout of scavenger children is that the sufficient tools, equipments and machines are not there in the Sulabh Institute of Research and Rehabilitation for which many of the trainees lack practical knowledge. It is, therefore, suggested that the Government should provide sufficient tools, equipments and machines to the training institute.

7.2.4 It is also recommended that duration of the training course should be increased. The scavengers' children being under privileged group, their mental aptitude and ability cannot be matched with average students. While specifying the duration of each course, due consideration of this aspect must be considered.

7.2.5 It is recommended that the execution of rehabilitation after imparting training to liberated scavengers should be done by Sulabh Institute of Research and Rehabilitation or any training institute responsible for imparting training.

7.2.6. The amount sanctioned from Special Central Assistance should be directly allocated for training and rehabilitation to Sulabh Institute of Research and Rehabilitation or the concerned training institute.

7.2.7 A placement officer should be appointed in Sulabh Institute of Research and Rehabilitation or the concerned training institute, whose main function would be to contact the public and private sector organizations for rehabilitation of these trained children.

7.2.8. The scheme of rehabilitation should be prepared two months before the training programme for each course comes to an end.

Table-3.1

Distribution of Sample Households according to Castes

Name of Town	Non-scheduled caste	Scheduled caste	Total
Bhagalpur	89 (89%)	11 (11%)	100 (100%)
Gaya	69 (69%)	31 (31%)	100 (100%)
Daltonganj	80 (80%)	20 (20%)	100 (100%)
Bhilwara	104 (69.8%)	45 (30.2%)	149 (100%)
Total	342 (76.2%)	107 (23.8%)	449 (100%)

Table-3.2

Number and Percentage of Sample Households according to Type of Families

Name of Town	Nuclear	Joint	Total
Bhagalpur	59 (59%)	41 (41%)	100 (100%)
Gaya	78 (78%)	22 (22%)	100 (100%)
Daltonganj	80 (80%)	20 (20%)	100 (100%)
Bhilwara	63 (42.3)	86 (57.8%)	149 (100%)
Total	280 (62.4%)	169 (37.6%)	449 (100%)

Table-4.9

Distribution of Population of Sample Households according to Sex

Name of Town	Male	Female	Total
Bhagalpur	204 (52.4)	185 (47.6)	389 (100%)
Gaya	276 (56.6)	212 (43.4)	488 (100%)
Daltonganj	82 (48.0)	89 (52.0)	171 (100%)
Bhilwara	270 (55.9)	213 (44.1)	483 (100%)
Total	832 (54.3) %	699 (45.6) %	1531 (100%)

Table-4.10

Distribution of Population of Sample Households according to Level of Educational Attainments

Name of Town	Illi-terate	Pri-mary	Middle	High/ Hr Sec-ondary	Inter-mediate	Gradu-ate	Total
Bhagalpur	193 (63.7)	70 (23.1)	26 (8.6)	12 (4.0)	2 (0.6)	-	303 (100%)
Gaya	273 (66.3)	74 (18.0)	33 (8.0)	24 (5.8)	6 (1.4)	2 (0.5)	412 (100%)
Daltonganj	137 (94.5)	4 (2.8)	3 (2.1)	1 (0.6)	-	-	145 (100%)
Bhilwara	263 (63.6)	101 (24.5)	34 (8.2)	11 (2.7)	2 (0.5)	2 (0.5)	413 (100%)
Total	866 (68.0)%	249 (19.6)%	96 (7.5)%	48 (3.8)%	10 (0.8) %	4 (0.3)%	1273 (100%)

Note: While working out the percentage of population and its number according to educational attainments, the children below five years have been excluded.

Table-4.11

Distribution of Population of Sample Households according to Workers and Non-workers

Name of Town	Total Population	Workers	Non-workers					
			Housewives	Student *	Non-students **	Unemployed	Old persons ***	Children ****	Total
Bhagalpur	389	156 (40.1)	13 (3.3)	38 (9.8)	49 (12.6)	44 (11.3)	3 (0.8)	86 (27.1)	233 (100%)
Gaya	488	186 (38.1)	16 (3.3)	35 (7.2)	68 (13.9)	94 (19.3)	13 (2.6)	76 (15.6)	302 (100%)
Daltonganj	171	69 (40.4)	10 (5.8)	6 (3.5)	40 (23.4)	16 (9.4)	4 (2.3)	26 (15.2)	102 (100%)
Bhilwara	483	165 (34.2)	39 (8.1)	86 (17.8)	71 (14.7)	44 (9.1)	8 (1.6)	70 (14.5)	318 (100%)
Total	1531	576 % (37.6)	78 (5.1)%	165 (10.8)	228 (14.9)	198 (12.9)	28 (1.8)	258 (16.9)	955 (100%)

* Students: Those who belong to age group between 5 and 17 years and are studying.

** Non-students: Those who belong to age group between 5 and 17 years but are not studying.

*** Old Persons: Those who are above 59 years.

**** Children: Those who are under 5 years.

Table-4.12

Distribution of Population of Sample Households according to Occupations

Name of Town	Sweepers	Service	Others*	Total
Bhagalpur	145 (92.9)	9 (5.8)	2 (1.3)	156 (100%)
Gaya	149 (80.1)	26 (14.0)	11 (5.9)	186 (100%)
Daltonganj	62 (89.9)	3 (4.3)	4 (5.8)	69 (100%)
Bhilwara	141 (85.5)	5 (3.0)	19 (11.5)	165 (100%)
Total	497 (86.3)%	43 (7.5)%	36 (6.2)%	576 (100%)

*Others:Hawker/Pettybusiness/Driver/Artisan/Scavenger/Mali/Electrician,etc.

Table-4.13

Number of Sample Households according to Type of families

Name of Town	Nuclear	Joint	Total
Bhagalpur	69 (86.2%)	11 (13.8%)	80 (100%)
Gaya	92 (92.0%)	8 (8.0%)	100 (100%)
Daltonganj	34 (87.2%)	5 (12.8%)	39 (100%)
Bhilwara	81 (81.0%)	19 (19.0%)	100 (100%)
Total	276 (86.6%)	43 (13.4%)	319 (100%)

Annexure III A

Training of Scavengers' Children in different trades by the Sulabh Institute of Research and Rehabilitation, Patna from 1985-86 to 1987-88

1985-86

Name of Muncipality Corp. N.F.A.	Candidates trained	Tailoring	Mechanic	Typing	Driving	Mfg. cane materials	Mfg. leather goods	Pan mfg.	Carpentry	Electrician
1	2	3	4	5	6	7	8	9	10	11
1. PATNA	388	66	98	14	41	50	7	27	37	48
2. BIHAR-SHARIF	93	23	6	1	17	9	27	x	1	9
3. GAYA	40	2	8	3	9	5	2	x	x	11
4. BHAGAL-PUR	18	1	3	1	5	x	x	x	5	3
5. RANCHI	11	x	4	x	7	x	x	x	x	x
6. MADHU-BANI	9	2	1	1	4	1	x	x	x	x
7. PAKUR	8	3	x	1	2	x	x	x	x	2
8. SAHARSA	6	x	1	x	5	x	x	x	x	x
9. KHAGARIA	6	x	1	x	3	x	-	x	x	x
10. KISHAN-GANJ	13	x	x	x	3	10	x	x	x	x
11. CHAIBASA	3	x	x	1	1	x	x	x	x	1
12. MOKAMA	3	x	x	2	x	x	x	x	x	1
13. CHAPRA	12	x	10	x	2	x	x	x	x	x
14. ARRAH	1	x	1	x	x	x	x	x	x	x
15. BARH	1	x	x	x	x	1	x	x	x	x
	612	97	133	24	99	76	38	27	43	75

Annexure III B

1986-87

Name of Muncipality Corporation N.F.A.	Candidates trained	Tailoring	Mechanic	Typing	Driving	Mfg. cane materials	Mfg. leather goods	Pan mfg.	Carpentry	Electrician
1	2	3	4	5	6	7	8	9	10	11
1. PATNA	708	150	124	37	65	76	79	25	82	70
2. GAYA	42	x	7	6	13	x	2	x	2	12
3. BHAGALPUR	13	x	x	x	x	x	11	x	1	1
4. BETIAH	21	x	6	2	7	x	6	x	x	x
5. ARRAH	33	x	9	1	4	x	1	2	8	8
6. CHAPRA	8	x	x	x	4	x	x	x	2	2
7. MOTIHARI	9	x	1	x	3	x	x	x	2	1
8. DALTON GANJ	8	x	2	3	2	x	x	x	x	1
9. MOKAMA	6	x	x	x	1	x	x	x	3	2
10. RANCHI	2	x	x	1	x	x	1	x	x	x
11. SAHARA	1	x	x	x	x	x	x	x	x	1
12. CHAIBASA	1	x	1	x	x	x	x	x	x	x
TOTAL	852	150	150	50	99	76	100	27	100	100

Annexure III C

Trades 1987-88

Name of Municipality/ Corporation/ N.F.A.	Candidates trained	Tailoring	Mechanic	Typing	Driving	Mfg. of cane materials	Mfg. of leather goods	Pan mfg.	Carpentry	Electrician
1	2	3	4	5	6	7	8	9	10	11
1. ARRAH	55	9	7	10	6	1	3	3	9	7
2. AURANGABAD	2	x	x	x	1	x	x	1	x	x
3. BETTIAH	17	3	1	1	3	x	4	x	x	5
4. BHAGALPUR	14	x	4	5	2	x	3	x	x	x
5. PATNA	639	130	53	50	49	94	73	81	78	31
6. CHAPRA	18	1	1	x	5	6	2	1	x	2
7. DALTONGANJ	15	x	9	1	3	2	x	x	x	x
8. GAYA	41	12	4	9	5	x	1	2	x	8
9. JAHANABAD	7	1	x	x	3	x	x	1	x	2
10. MOKAMAH	18	x	3	2	11	x	x	x	x	2
11. MOTIHARI	14	x	9	2	2	x	1	x	x	x
12. NALANDA	21	8	1	x	9	x	3	x	x	x
13. RANCHI	4	x	x	1	1	x	1	x	1	x
14. SASARAM	7	x	1	1	1	x	3	1	x	x
15. CHAKRADHARPUR	10	x	x	1	8	x	x	1	x	x
16. MUZAFFARPUR	1	x	1	x	x	x	x	x	x	x
17. GIRIDIH	3	x	1	x	x	x	2	x	x	x
18. DEOGHAR	1	x	1	x	x	x	x	x	x	
19. HAZIPUR	47	6	13	3	14	x	3	x	5	3
20. PURNEA	24	x	6	2	8	x	x	x	x	8
21. BARH	7	x	5	x	2	x	x	x	x	x
22. SAMASTIPUR	42	11	8	4	5	x	x	x	6	8
23. FATHUHA	11	5	2	x	1	x	x	x	x	3
24. RAXUAL	11	3	5	x	1	x	1	x	x	1
25. DARBHANGA	7	x	2	3	x	1	x	x	x	1
26. MAHNAR	11	7	x	x	x	x	x	x	x	4
27. MONGHYR	24	2	10	4	3	x	x	x	1	4

Contd...

Annexure IIIC

1987-88

Name of Municipality Corporation N.F.A.	Candidates trained	Tailoring	Mechanic	Typing	Driving	Mfg. of cane materials	Mfg. of leather goods	Pan mfg.	Carpentry	Electrician
1	2	3	4	5	6	7	8	9	10	11
28. ROHTAS	14	2	x	1	3	x	x	1	x	7
29. KATIHAR	2	x	1	x	1	x	x	x	x	x
30. BEGUSARAI	8	x	x	x	2	x	x	2	x	4
31. MADHUPUR	4	x	2	x	2	x	x	x	x	x
32. BUXAR	1	x	x	x	1	x	x	x	x	x
TOTAL	1100	200	150	100	152	104	100	94	100	100

Note : After six months, 350 candidates would be selected in three trades viz. Driving - 150, mfg. of cane materials - 100 and mfg. of pan - 100.

Source : Sulabh Institute of Research and Rehabilitation, Patna.

APPENDIX 15

ABSTRACTS OF EIGHT NON-INDIAN PUBLICATIONS RELEVANT FOR THIS SUBJECT

Rijsburger, J. (1990). Emptying pit latrines: WASTE vacuum in Dar es Salaam, Tanzania. AT Source, vol

WASTE Foundation, a small NGO, is executing a proje... ...es Salaam, Tanzania, to improve the emptying of pit latrines in the large squatter areas. The local government runs a cesspit emptying service through different departments, but has problems with accessability of plots and maintenance of the vehicles, which are all manufactured abroad. Thus human powered pit emptying equipment is developed and being tested. This consists of a pumpcart : vacuumpump and flywheel mounted on a pushcart; vacuumtank consisting of oildrums; hosepipes; mixing tools to stir the solid sludge; a hook to unblock hosepipes. The sludge is either disposed on site in a dug pit or transported to a nearby transfer station - a concrete vault of about 10.000 liter which can in turn be emptied by a vacuum tanker. Traditionally the emptying is done by demolishing the slab and manually emptying it completely, which is very expensive due to the amount of work involved. Once the slab is broken, it would be uneconomical to have just a small quantity taken out, which would make the emptying cheaper. With the new equipment this is not necessary and customers are satisfied because the system allows for emptying in small batches, which reduces the cost at any one time. A management structure was set up for the coordination of private emptying practice. The Sewerage and Sanitation Department owns the locally constructed equipment, which is kept at the neighbourhood office of the Party. This office lends it to trained and licensed pit emptiers and acts as intermediary between customers and emptiers. The Sewerage and Sanitation Department ensures transportation and treatment at urban level.

Ward, C.F. (1989). Ground water quality monitorin
to on-site sanitation in developing countries. Jo
Institute of Water and Environmental Management,
1989.

The tacit assumption of all sanitation programmes is that they will lead to an improvement of public health. Groundwater quality monitoring is necessary to ensure that this is indeed the case. Fear for groundwater contamination is sometimes impeding sanitation programmes because the low-cost option of on-site sanitation is not considered safe. Groundwater movement is highly dependent upon local conditions and so pollution problems are site specific. Monitoring is therefore necessary. It may be carried out to detect, predict and prevent pollution, but the objective needs to be clear. The effectiveness depends on the design of the monitoring network, particularly on the location of sampling points and on informed interpretation of the analytical results.
In practice, routine water quality monitoring is rarely undertaken for different reasons such as cost, unclear responsibility, no experience, no technical resources, priority for latrine construction. Yet it is feasible to conduct effective monitoring if: a) the programme is designed according to resources available b) it is limited to selected areas c) the benefits are seen to outweigh the costs d) institutional responsibility is clear. A monitoring programme can be implemented in three stages: 1) to determine nature and expend of pollution 2) to determine mechanisms or processes of pollution 3) to identify causes of pollution. To be effective groundwater quality must be monitored from the outset of any sanitation programme.

Perrett, H. (1983). Social Feasibility Analysis in Low-Cost Sanitation Projects. (TAG Technical Note No. 5.). Washington, DC, USA, The World Bank.

Social feasibility analysis should be an integral part of the planning process for low-cost sanitation, because of the large number of social, cultural and behavioral factors which influence sanitation programmes and determine it's success or failure. It establishes the extent to which the project is likely to be socially feasible. Eight questions are central to this analysis:

1) Do the intended beneficiaries want improved sanitation?
2) Are the beneficiaries able and willing to pay for sanitation improvements?
3) Are the beneficiaries able and willing to contribute labour and/or materials towards the cost of sanitation improvements?
4) Do people's likes and dislikes fit those of the technology options to be provided?
5) Are the technology options to be provided compatible with the project population's existing defaecation practices and related habits?
6) Are the planned locations of latrines acceptable to beneficiaries?
7) Are the planned sharing arrangements acceptable to the beneficiaries?
8) Do the project projections about the rate at which new latrines will be built or existing ones improved match beneficiaries' capacity to change their habits or adopt new technologies?

These questions and the ways in which the answers to them interact with other aspects of the project design are discussed in this document.

Social feasibility analysis is an iterative process and relies on two different kinds of information: one about the project itself, the second about the project population and its environment. The analysis forms the bridge between the two. The main steps of the process are discussed and concrete examples given.

Comments:

The document gives a very good overview of the social and cultural factors which influence sanitation development, but it starts from a more or less predetermined project. This is indeed usually the case. But a process whereby the community is involved from the start in analysing sanitation problems and reviewing options for improvement together with project staff, may be much more conductive to a sustaibable sanitation project.

Perrett, H.E. (1984). Monitoring and Evaluation of Communication Support Activities in Low-Cost Sanitation Projects. (TAG Technical Note No. 11). Washington,DC, USA, The World Bank.

Usually four principal kinds of communication activities are implemented in low-cost sanitation projects. These are the encouragement of participation of men and women; promotion of construction or improvement activities; provision of various kinds of information or instruction; health/hygiene education.
Monitoring is an inbuilt review process which tells whether or not scheduled activities are being carried out as planned and if there are problems which require immediate attention. Evaluation is the process by which results of communication activities are measured against its targets and objectives, it is a longer term activity. Monitoring and evaluation are mutually supportive: monitoring helps to explain trends in and reasons for evaluation findings. Emphasis of the document is on monitoring activities, which cover three main categories. First the delivery of communication, which monitors whether communication activities are actually taking place as planned. Secondly quality of communication which assesses on an ongoing basis whether messages reach the target groups and are being understood and acceptable. Thirdly, the utilization of communications, which refers to how target groups respond to what is being communicated and how they are using the information. A methodology for data collection for each of these categories is discussed and examples of findings, their possible reasons and solutions given.
Accurate measurement for evaluation of the impact of communication activities on overall programme success is extremely difficult and problematic due to a variety of compounding variables which are not easy to isolate and control. Thus it is vital that it is clear
- what kind of impact is to be measured
- what objectifiable indicators can be used to determine that impact
- what time period is considered sufficient for impact to occur
- what variables are likely to intervene in the process of communication that may negate potential impact.
Examples are given of the kind of questions which can be asked as well as examples of findings and solutions. The document ends with a discussion on common mistakes, some general rules and the cost involved in monitoring and evaluation of communication support.

Parlato, R. (1984). A Monitoring and Evaluation Manual for Low-Cost Sanitation Programs in India. (TAG Technical Note No. 12). Washington, DC, USA, The World Bank.

After four years of project experience in small and medium sized towns in India and over 60.000 latrines built, TAG decided to evaluate the progress of the urban low-cost sanitation programmes. The evaluation was meant to help identify potential problem areas and to form the basis for a monitoring system to review programme operations on an on-going basis. This manual is the working document for these activities. Major problems in the programme appeared to be:
a) financial constraints of local governments
b) operational problems such as underestimates of unity costs, resulting in lack of interest and/or slow construction rates by the contractors; not enough money for promotion/publicity and lack of local level planning and management.
c) socio-economic constraints such as cost and cultural considerations affecting motivation for sanitation
These problems are studied in the evaluation which has three components. First, a financial and administrative survey, focussing on unit cost and its relation to contractor performance as well as on project management issues. Secondly, a socio-economic household survey to assess social/cultural factors influencing motivation and use. Thirdly, a technical survey to assess quality of construction. The objectives of each of the components are discussed. The questionnaires, notes on methodology, implementation and cost are given in the annex.
In addition, the evaluation objectives and methodology for community latrines in a financial/administrative survey, a technical survey and an observation survey, are discussed. The conceptual framework and basic components of a monitoring system to be carried out at municipal, state and national level are described in the last section, including suggestions for it's implementation. Forms for monitoring are given in the annex.

Munch-Petersen, Nils Finn (1989). Low-cost sanitation in Bangladesh. Copenhagen, Danmark, Hoff & Overgaard a/s.

A socio-economic study was carried out as an integrated component for the extended phase of an ongoing World Bank/UNDP supported low cost sanitation programme in 84 Pourashavas (municipal centres) in Bangladesh. Included are proposals for:
1) the necessary socio-economic components of a feasible investment plan for low-cost sanitation, e.g beneficiary target group, capability and willingness to pay for latrines including a feasible cost recovery system
2) approriate communication materials and methods for the promotion of improved sanitation and health
This report contains a wealth of information, some of the most notable findings are:
- a little more than one fourth of all households may want to buy and be able to afford a single pit latrine
- only one fifteenth may do so with the twin pit latrine, which is planned to be constructed in the project
- the project is thus left with the paradox that it should promote and install a single product that will most probably be seen as an upmarket solution to low-cost sanitation
- latrines are perceived as a private installation. Latrines for groups of families are not considered a good solution
- latrines are mainly bought for reasons of convenience and privacy - not for health reasons. Thus design and marketing should center on these functions
- the decisive factor for selecting a specific type of latrine is cost. Secondly a latrine should look nice and be easy to clean
- with a wide range of income levels, the market should provide a broad range of low-cost options, that reflect aestatic qualities (brightly coloured mosaic latrine pans) and status objectives as wanted by the public
- the superstructure has often been overlooked as a central element in latrine programmes. As privacy and status are main motivating factors, the superstructure is the main element conveying these functions
- water and sanitation are not linked in the minds of the public. It is thus doubtful if they should be linked in programmes and marketing
- existing health education materials are most often confusing and seem mainly aimed at government servants and funding agencies, not at the general public, women or school children
- health behaviour which is being promoted, should be possible and practiceable in the sense that messages should have relevance for the target group
- latrine programmes involving installments to be paid by the procurers of latrines seem to function well only where small, resident NGO's are involved
- training for low-cost sanitation should primarily be aimed at existing and potential small-scale producers of low-cost sanitary ware, selected on the basis of technical skills and proven performance
- training should also be given to persons and groups who are presently involved in the servicing and maintenance of latrines, taking into account the skills they already have.

Boesch, A. and Shertenleib, R. (1985). Emptying on-site excreta disposal systems. IRWCD-Report No. 03/85. Switserland, Duebendorf, IRWCD.

Studies carried out in different developing countries identified four main shortcomings to exisitng pit emptying services:
1) The physical size of the machinery can prevent adequate access to latrines
2) Vacuum systems cannot handle some of the thicker, compacted sludges in old pit latrines
3) Maintenance of vacuum tankers is often poor
4) Management and supervision of emptying services are often ineffective.
Thus, IRCWD suggested further investigations and tests in the field to develop new or adapt existing equipment. This report describes the field tests of three prototype pit latrine emptying systems: a hand operated diaphragm pump and two vacuum tankers in regular service in Africa. A matrix for selecting suction equipment (vacuum pumps) for specific applications is proposed. Taking into account the performance of existing components, seven types of tankers have been identified and the appropriate access conditions and sludge types indicated for each tanker type. For areas where access to latrine pits is very difficult, suitable remote emptying systems will be required. Draft specifications are recommended for the design of suction tankers.
The tests have shown that any equipment capable of handling heavy sludge is not simple, nor easy to operate and maintain. Equipment which is cheaper and easy to operate and maintain can only handle water and thin sludges. This fact should influence the planning and design of future sanitation systems, especially where sophisticated equipment cannot be maintained and operated properly over a long period. Appropriate planning of latrine location as well as the design of the single pits can facilitate the emptying procedure and therefore lower the requirements of the emptying equipment. Easy access to the pit itself in the form of removable covers is also important.
Under existing conditions, planners have a choice between two systems: the vault latrines, with a relatively small tank easily emptied by a simple vacuum truck, but requiring a reliable emptying service and producing a greater amount of sludge; or pit latrines, which can accept considerable quantities of water and are less liable to overflow in the absence of reliable services, but accumulate compacted sludge which can obnly be removed by sophisticated equipment. Properly operated twin-pit latrine systems retain all the advantages of pit latrines, whilst allowing for simple manual removal of pit contents without health hazards. Where physical and socio-cultural conditions permit, this is definitely the best choice of technology.

Sinha, B.D. and Ghosh, A.K. (1990). Evaluation of Low Cost Sanitation: liberation, training and rehabilitation of scavengers. India, New Delhi, Arnold Publishers.

The study is carried out in four towns in Bihar and Rajasthan, to assess the socio-economic impact of the scavenger liberation scheme, effectiveness of the pour-flush latrines and effectiveness of the training programme of children of scavengers. The scavenger liberation scheme consists of two components, the conversion of dry latrines into pour-flush latrines and necessary training for the scavengers and their dependents. The cost is borne half from a grant of the central government and the other half by the state government, using their own resources or any other source such as local bodies, financial institutions or the beneficiaries.
35% of the sample households are not using their new pour-flush latrines for various reasons such as bad superstructure, filled up pits not cleaned, choking, non-availablility of water and inappropriate location. Still, 75% of the households preferred pour-flush latrines to dry latrines, mainly because of reduced smell and fly nuisance, and ability to clean the latrines themselves. Introduction of the new latrine has improved the sanitary conditions of the households. Survey outcomes suggest that after installation of the latrines, proper monitoring is very essential and that lack of communication between user, builder and local authorities is the cause of much of the problems. It is suggested that a community organizer is selected from each locality to act as mediator and to motivate those who have not yet converted their latrines.
Although all four sample towns were declared scavenger free, three of the four towns still had dry latrines which are emptied by scavengers. The night soil is dumped indiscriminately into open drains, rivers, fields etc, whereas before, at least there were alotted dumping areas.
86% of the scavengers are engaged as sweepers and average monthly incomes have increased since liberation. Also discrimination because of the stigma of carrying nightsoil has decreased. But basic services and facilities are still lacking in the localities where scavengers live, showing that increase in income does not necessarily bring about a significant change in living conditions.
In three towns 126 children of scavengers have received training in different trades. Of these 46% dropped out for reasons as insufficient stipend, lack of interest in the trade, lack of understanding, overwork and homesickness. The training programme is also not effective in generating employment/self employment among the trained children.
Recommendations are made to improve the management system of the scheme and to improve the training for the scavengers.