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Safe Water 2000

THE GLOBAL CONSULTATION ON SAFE WATER AND SANITATION FOR THE 1990s

NEW DELHI, 10 - 14 SEPTEMBER, 1990

INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

MINISTRY OF URBAN DEVELOPMENT
GOVT. OF INDIA

NEW DELHI
6.9.1990

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INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

Background

Water supply and sanitation are State subjects. Schemes for urban water supply and sanitation are planned, implemented, operated and maintained by the State Governments and local bodies by making provisions of funds in their annual plans under the State sector. The Ministry of Urban Development assists the State Governments and Union Territories through coordination, policy formulation under the International Drinking Water Supply and Sanitation Decade, technical guidance, development of trained manpower, research activities, management information system and in securing international cooperation and assistance.

2. The United Nations Conference on Human Settlements held in 1976 at Vancouver recommended that safe water supply and hygienic waste disposal should receive high priority from Governments and International Agencies to enable Governments to achieve the targets of serving all the population by 1990. These objectives were reiterated in the United Nations Water Conference at Mar-del-Plata, Argentina in March, 1977 and it declared that the 10 year period 1981-90 be designated as the International Drinking Water Suplply and Sanitation Decade.

Targets

3. The Decade Programme was launched in India on 1st April, 1981 with the objective of increasing the urban population coverage with water supply facilities from 72.25% in 1981 to 100% in 1991 and with sewerage and sanitation facilities from 25.04% in 1981 to 80% in 1991.

Specific Action Taken

4. Several important steps were taken in the preparatory phase of the Decade Programme in India. Among these, one was the Government's decision in designating of the Central Public Health and Environmental Engineering Organisation (CPHEEO) of the erstwhile Ministry of Works and Housing as the technical office to serve as the National Coordinator and focal point in respect of activities connected with the Decade Programme. During the preparatory phase, sector studies and briefs were prepared in respect of almost all the States and Union Territories. Series of Conferences of Chief Engineers in charge of Public Health Engineering of all the States and Union Territories were convened at Delhi, Nagpur, Trivandrum, Ooty and Hyderabad from November, 1978 to December 1980 to discuss and assess the

targets, norms, target population, requirement of funds, man power, materials and equipment and anticipated constraints. Recognising the need for coordinated action and approach to achieve the targets, the Government of India on the 16th October, 1980 constituted an Apex Committee under the Chairmanship of the Secretary, Ministry of Works and Housing. This Committee is responsible for national policy formulation during the Decade. Three Working Groups on 'Financial Resources', 'Materials and Equipment', and 'Programmes and Man Power' were also constituted by the Apex Committee. The reports of all the Working Groups approved by the Apex Committee were endorsed by All India-Conferences of State Ministers, Secretaries, Chief Engineers and Heads of Implementing Agencies, incharge of water supply and sanitation held in February, 1982 and January, 1983.

5. A Regional consultation meeting was held at New Delhi by WHO in November, 1979 to enable participants from countries of the South East Asia region and International Agencies to review preparatory actions for the Decade. A follow up regional consultation meeting was also held in September/October, 1981 wherein support programmes such as manpower development, community education and participation, operation and maintenance of water supply projects as well as quality surveillance were discussed.

6. A National Decade Master Plan on Water Supply and Sanitation was prepared by the MInistry of Works and Housing, Government of India on the basis of State/UT Decade Master Plans. The National Decade Master Plan Document covers aspects such as socio-economic and health situation, sector position, decade programme goals, coverage and support programme policies, decade programme priorities, resources requirement (fund, man power, materials and equipment) project formulation , operation and maintenance, external and internal assistance followed by brief executive summaries of all the States and UT Decade Master Plans.

Revised Targets

7. In order to achieve the Decade objectives and targets by March 1991, the erstwhile Ministry of Works and Housing proposed an outlay of Rs. 5797.7 crores for Urban Water Supply and Sanitation Sector for the Seventh Five Year Plan (1985-90). However, in view of the resource constraints, the National Development Council approved an outlay of Rs. 2935.64 crores for these Sub-sectors. During the Mid-Decade Review Conference of Secretaries, Chief Engineers and Heads of Implementing Agencies held in October, 1985, it was decided, in view of the reduced outlays provided during the Plan and other physical constraints, to scale down the targets in respect of Urban Water Supply and Sanitation from 100% to 90% and 80% to 50% respectively. These revised targets are expected to be achieved by March, 1991. The revised targets were endorsed in the Conference of State Ministers held in February, 1986 subject to review at a later stage.

Achievements

8. On the basis of the information received from the State Governments and Union Territories, a statement showing the coverage of urban water supply and sanitation, State-wise, from March, 1981 to March, 1988 is enclosed at Annexure I. It would be observed therefrom that 82.24% and 43.9% of the urban population have been provided with drinking water supply and sanitation facilities respectively as on 31.3.1988. The coverages from 31.3.89 onwards are being collected and compiled by the Ministry. It will take considerable time to obtain updated and correct information from all the State Governments and Union Territories. However, it is expected that by 31.3.90, the coverage should be 85% with drinking water supply and 48% with sanitation facilities in urban areas.

Future Strategy

9. Although the targets set for the Decade 1981-90 could not be achieved, yet the situation is not discouraging and it is possible to achieve thease targets in the ensuing decade despite the growing population and rapid urbanisation. The lessons learnt during the decade stand the country in good-stead and show the need for integrated approach, better coordination with various agencies, better financial management, development of trained man-power< suitable accounting, editing, budgetary control reporting, monitoring systems, development of suitable tariff structure keeping in view the poorer sections in the society and city level self-sufficiency at least in the ensuing decade and, above all, greater power and responsibility for local bodies and involvement of the community and non-governmental organisations (NGOs).

10. The Ministry of Urban Development has projected the following requirement of funds for urban water supply and sanitation during the 8th Five Year Plan :-

(Rs. in crores)

	State Sector	Central Sector	Total
Water Supply Scheme			
New facilities	4,095	455	4,550
Rehabilitation	1,287	143	1,430
Augmentation	2,583	287	2,870
Sub-total	7,965	885	8,850

	State Sector	Central Sector	Total
Sewerage/sanitation Schemes			
Sewerage	3,375	375	3,750
Low Cost Sanitation	874	376	1,250
Solid Waste Management	100	100	200
Sub-total	4,349	851	5,200
Grand Total	**12,314**	**1,736**	**14,050**
Support Programme : (Central Plan)			
Public Health Engineerng Training	-	10	10
Research and Development	-	10	10
Water Quality, Sewerage, Laboratory Facilities	-	14	14
Management Information System and related activities	-	5	5
Sub-total	-	44	44
Total Cost	**12,314**	**1,780**	**14,094**

The 8th Five Year Plan is yet to be finalised by the Planning Commission.

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.	Name of State/UT	Popln. as on March 1981	Coverage as on March 1981				Popln. as on March 1985	Coverage as on March 1985				Popn. as on March 1986
			Water Supply		Sanitation			Water Supply		Sanitation		
			Popln.	%	Popln.	%		Popln.	%	Popln.	%	
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Andhra Pradesh &	10338	4760	46.04	400	3.869	11258	5220	46.36	682	6.057	11820
	Hyderabad	2150	2150	100	1000	46.51	2380	2380	100	1476	62.01	2440
	TOTAL – A.P.											
2.	Arunachal Pradesh	42	20	47.61	20	47.61	52	46	88.46	20	38.46	120
3.	Assam*	*2047	530	25.89	300	14.65	2347	881	37.53	369	15.72	2347
4.	Bihar	8719	5530	63.42	1740	19.95	9669	5748	59.44	2213	22.18	9669
5.	Goa£	352	330	93.75	60	17.04	452	370	81.85	60	13.27	463
6.	Gujarat	10602	9430	88.94	4370	41.21	11602	9647	83.14	4408	37.90	12818
7.	Haryana ?	2827	1130	39.97	350	12.38	3097	2140	69.09	879	28.38	3153
8.	Himachal Pradesh ?	326	326	100	50	15.33	366	326	89.07	50	13.66	381
9.	Jammu & Kashmir	1260	1230	97.61	100	7.936	1420	1230	86.61	110	7.746	1556
10.	Karnataka	10730	9530	88.81	3620	33.73	11740	9530	81.17	4506	38.38	12742
	TOTAL – KARNATAKA											
11.	Kerala	4771	2850	59.73	300	6.287	5271	3400	64.50	1485	28.17	5391
12.	Madhya Pradesh	10586	7100	67.06	540	5.101	11896	9479	79.68	929	7.809	12174
13.	Maharashtra	21993	20870	94.89	8420	38.28	24164	21033	87.04	9602	39.73	25350
	Bombay											
	TOTAL – MAHARASHTRA											

1	2	3	4	5	6	7	8	9	10	11	12	13
14.	Manipur	375	260	69.33		0	505	260	51.48	4	0.792	530
15.	Meghalaya	241	60	24.89		0	271	60	22.14		0	279
16.	Mizoram	122	10	8.196		0	132	10	7.575	2	1.515	132
17.	Nagaland	120	70	58.33		0	150	70	46.66		0	150
18.	Orissa	3110	1070	34.40	290	9.324	3480	1326	38.10	328	9.425	3573
19.	Punjab	4648	3050	65.61	1640	35.28	5078	3614	71.16	2461	48.46	5192
20.	Rajasthan	7210	4060	56.31	300	4.160	7250	4060	56	695	9.586	7250
21.	Sikkim*	52	24	46.15		0	82	73	89.02	27	32.92	138
22.	Tamil Nadu Including Madras	15952	12900	80.86	7400	46.38	17302	14490	83.74	8217	47.49	17482
23.	Tripura*	226	110	48.67	10	4.424	266	137	51.50	35	13.15	344
24.	Uttar Pradesh*	19899	13990	70.30	2560	12.86	21329	14950	70.09	2990	14.01	21687
25.	West Bengal $	14447	8670	60.01	2240	15.50	15167	9654	63.65	2948	19.43	16079
	Calcutta $											
	TOTAL W. BENGAL											
	TOTAL FOR STATES	153145	110060	71.86	35710	23.31	166726	120134	72.05	44496	26.68	173290
UNION TERRITORIES												
26.	A. & N. Island	50	50	100	20	40	60	60	100	33	55	69
27.	Chandigarh	510	480	94.11	480	94.11	563	563	100	563	100	581
28.	D. & N. Haveli $	7		0		0	17	13	76.47		0	17
29.	Daman & Diu @											
30.	Delhi	5768	4700	81.48	3700	64.14	6818	6690	98.12	5000	73.33	6891
31.	Lakshadweep N	19		0		0	21		0		0	
32.	Pondicherry	316	180	56.96	120	37.97	346	264	76.30	138	39.88	363
	TOTAL FOR U.T.	6670	5410	81.10	4320	64.76	7825	7590	96.99	5734	73.27	7921
	GRAND TOTAL	159815	115470	72.25	40030	25.04	174551	127724	73.17	50230	28.77	181211

REMARKS

* The States are yet to furnish the information of coerage of urban water supply and sanitation for the period ending 31.3.88. Hence date of the recent Part of these States are adopted.

@ Information included in Goa State but for the year 1988. The U.T. is yet to furnish the information.

N No Urban area is in the U.T. of Lakshadweep.

$ Figures are based on sector digest forms of 1988.

& Andhra urban furnished reconciled figures as per CE, PH. A.P. Lr. dt. 19.7.1989 & 13.4.89.

? Haryana has shown 100% sanitation coverage. This needs clarification.

In case of Nagaland W.S. coverage for 1988 is reported as that of 1987.

In case of Sikkim the figures for 1988 are targetted figures.

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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

SCHEME OF LOW COST SANITATION AND LIBERATION OF SCAVENGERS

As part of the Action Plan for the implementation of Government programmes and policies a decision has been taken to take concrete steps for the liberation of scavengers by the elimination of the dehumanising practice of manual scavenging of night soil in a time bound manner. Despite repeated efforts by the Central and State Governments, the problem of manual scavenging still persists in large parts of the country. While precise estimates about the current scavenger population and existing dry latrines are not available, according to an estimate made by the Planning Commission, the number of existing dry latrines is about 76 lakhs and the scavenger population about 4 lakhs.

2. The most cost-effective way of eliminating scavenging would be through the conversion of dry latrines into low cost sanitation units or construction of the same where no sanitation facilities exist. Low cost sanitation for the urban poor had been provided in the past through different schemes operated by agencies like HUDCO, Ganga Action Plan, Ministry of Urban Development and Ministry of Welfare. These schemes have now been integrated as part of the Action Plan of the Government for the elimination of manual scavenging to the maximum possible extent in the 8th Plan. Under this scheme 500 towns with a population of less than 5 lakhs (1981 census) are to be declared scavenger free annually. This would be achieved on a 'whole town' basis through urban local bodies in the State Governments/Union Territories by replacing existing dry latrines or construction of low cost sanitation units where open defecation is resorted to and rehabilitation of the scavengers thereby liberated.

3. The scheme is being operated through Housing and Urban Development Corporation (HUDCO) by providing a mix of subsidy from the Central Government and loans from the HUDCO in a synchronised manner to the State Governments/Union Territories where the problem persists as per the following financing pattern subject to availability of funds :-

EWS	-	45% subsidy, 50% loan and 5% beneficiary contribution.
LIG	-	25% subsidy, 60% loan and 15% beneficiary contribution.
MIG/HIG	-	Nil subsidy, 75% loan and 25% beneficiary contribution.

EXTERNAL ASSISTANCE FOR WATER SUPPLY AND SANITATION PROJECTS

Considering the magnitude of the problem and the resources constraint, there is need to tap international (multilateral and bilateral) agencies for financial assistance and sharing advanced technology. The Government of India has been assisting the State Governments in securing international cooperation and assistance. A list of such externaly laided projects is enclosed.

The association of external agencies, such as, the World Bank, with financing and implementation of the projects in this sector has had the following advantages :-

(i) The World Bank projects have underlined the need for making the sector self-sufficient to the extent possible by the levy of tariff on the beneficiaries. The scope for generating adequate internal resources is also being appreciated by the sector agencies;

(ii) Various institutional and organisational reforms have been initiated as part of the steps taken to streamline the project administration of World Bank aided projects.

(iii) Commercial accounting has been introduced in the project areas. This has led to better financial discipline and operations;

(iv) the association of the World Bank and the UNDP has led to upgradation of skills in key technical areas, such as, water treatment, water conveyance, sewage treatment and disposal, leak detection, etc. This is expected to upgrade national capabilities also; and

(v) in the project areas, modern management practices, such as, management information system, sound personel practices, computerised billing and recovery of dues have been introduced. This has increased productivity.

On the other hand, World Bank aided projects have also highlighted certain crucial issues and dilemma for the project agencies which are as under :-

(i) World Bank's insistance on adequate tariff increase from time to time to make the projects self-sustaining has been creating difficulties;

(ii) depreciation of the rupee against the US $ creates problem for the State Governments to provide matching counterpart funds in Indian rupees;

(iii) complicated procurement procedures, which need prior clearance of the World Bank, lead to delays;

(iv) in most areas, the technical and managerial capabilites of the project authorities need considerable upgradation to cope with the Bank procedures; and

(v) project authorities are unable to adhere to the implementation schedule arrived at during negotiations with the World Bank.

WORLD BANK ASSISTED
WATER SUPPLY AND SANITATION PROJECTS

Name of the Project		Date of agreement	Cost (Rs. in crores)	IDA Assistance (US $ million)
A.	**Completed Water Supply Projects and Sanitation Projects with World Bank (IDA) Assistance :**			
1.	Bombay Water supply and Sewerage project Phase I (Urban) in Maharashtra	22.1.74	185.00	55.00
2.	U.P. Water Supply and Sewerage Project (Urban and Rural)	25.9.75	60.00	44.00
3.	Punjab Water Supply and Sewerage Project (Urban and Rural)	27.10.78	67.00	38.00
4.	Maharashtra Water Supply and Sewerage Project (Urban and Rural)	21.6.79	86.00	48.00
5.	Bombay II W/S Sewerage Project, Bombay	13.11.78	354.00	196.00
6.	Rajasthan Water Supply & Sewerage Project	25.6.80	137.76	80.00
B.	**Ongoing Projects**			
7.	Gujarat Water Supply and Sewerage Project, W/S in Nadiad, Godhra, Jamnagar, Bhavnagar, Anand & some Problem villages. Sewerage facilities for Ahmedabad, Nadiad, Anand, Rajkot and Savarkundla	9.11.82	137.54	72.00
8.	Tamil Nadu W/S & Sanitation Project, Coimbatore, Madurai and Salem, 20 small towns in Coimbatore 11 small towns in Salem and 44 small towns throughout the State	14.11.84	149.41	73.00
9.	Kerala W/S and Sanitation Project. Quilon, rural stable areas and rural developing areas	24.9.85	93.66	41.00
10.	Bombay IIIW/S and Sewerage Project, Bombay	12.5.87	434.00	185.00
11.	Madras W/S & Sewerage Project. Madras City and adjacent urbanised areas	21.12.87	150.80	69.00

Name of the Project	Date of agreement	Cost (Rs. in crores)	IDA Assistance (US $ million)
12. Hyderabad Water Supply and Sanitation Project		250.00	89.00
C. **Under Consideration Projects :**			
13. Assam W/S & Sewerage Project		352.00	
14. 2nd Rajasthan W/S & Sewerage Project		514.60	
15. 2nd Madras W/S & Environmental Sanitation project		505.00	
16. Madhya Pradesh W/S and Sewerage Project (Bhopal, Indore, Ujjain, Gwalior, Jabalpur, Raipur, Bilaspur, Rewa, Jagadalpur and Sagar)	-		182.00 (under revision)
17. Bihar W/S project (Ranchi, Dhanbad, Jharia)	-		57.91
18. Punjab W/S and Sanitation Project (Jalandhar, Ludhiana, Amritsar, Patiala, Moga, Rajpura, Pathankot, Barnala and Longowal)	-		197.43

UNDP Assistance

1. IND/85/XO1 - Water Resources Management Studies in Tamilnadu
2. IND/86/001 - Water Resources Development and Management Phase II, Madras
3. RAD/86/160 - Water Supply Sanitation Sector Development Team for Asia
4. RAS/89/010 - Metropolitan Cities Environment Improvement Programme.

WHO Assistance

1. IND CWS 001 - Community Water Supply and Sanitation

Bilateral Agencies - Under consideration

1. Integrated Development of the Dal Lake Srinagar, Jammu & Kashmir.
2. Supply of Deweeding Equipment for Weed Control in the Dal Lake, Srinagar, Jammu & Kashmir under DANIDA Assistance Programme.
3. Training Network for Water and Waste Management in India.

PUBLIC HEALTH ENGINEERING TRAINING PROGRAMME

The Public Health Engineering Training Programme was started as part of the Health Plan in the year 1956 and has continued with increasing tempo over the years. Now that the International Drinking Water Supply and Sanitation Decade is on, and skilled manpower would be required in a larger measure than before, it is Ministry's endeavour to meet This need by increasing the tempo of the programme. The training provided caters to all categories of personnel to ensure that the training reaches greater numbers and effects a qualitative improvement to enable them to face the variegated tasks set before them.

In the field of Public Health Engineering, the development of manpower is to be achieved basically in two ways, by improving the number and quality of trained persons at all levels and by appointing categories of persons, where needed, who are in short supply for systems construction and for proper operation and maintenance of the services. At the beginning of the decade, there were about 9.800 graduate engineers and 15,800 diploma engineers in the sector, occupying posts ranging from senior-level engineers to engineers at operative levels. It was estimated that for the first phase of the Decade programme coinciding with the end of the Sixth Plan (1980-85) the requirement would be 18,900 graduate engineers and 30,800 diploma holders. For the second phase of the programme (1985-91) the total requirement was estimated at 28,700 graduate engineers and 52,800 diploma holders. Besides, the availability of technicians has to be increased from the level of 29,200 to 1,27,300.

Keeping these targets in view, a perspective training plan with the following broad objectives has been evolved by CPHEEO :-

(a) To make available engineers and technicians, with the basic qualifications in adequate number and at the right time.

(b) To develop, in the existing personnel adequate conceptual appreciation, technical skills and capacity to motivate people.

(c) To ensure that the technical personnel get abreast of the latest appropriate technical developments, thus guarding against the ever present danger of absolescence.

(d) Periodical inservice training to refresh current knowledge.

(e) Familiarisation with appropriate low cost technologies, which are specifically suited to the conditions prevailing in the country.

(f) Maintenance and operation of water supply and sanitation systems.

(g) Community Participation and Health Education with the objective of bringing about participation of the beneficiaries in the planning, locating and maintenance of the systems.

Different committees in their reports have made various recommendations regarding development of Manpower and expansion of training programme in the field of Public Health Engineering.

(i) The 48th report of the Estimates Committee on erstwhile Ministry of Works and Housing for drinking water supply and sanitation.

(ii) Recommendations of the Conference of Chief Engineers on Planning for the International Drinking Water Supply and Sanitation Decade.\

(iii) Recommendations of the Working Group on the Programmes and Manpower set up by the Apex Committee on International Drinking Water Supply and Sanitation Decade programme.

The training programme is catered to 3 categories of personnel in the field of public health engineering field viz (1) Graduate engineers being given training in the post Graduate course; (2) Subordinate engineers holding diplomas being oriented in public health health engineering through short-term course and (3) Refresher courses tailored to the needs of the senior, middle and junior level engineers and other para engineering personnel.

Post Graduate Courses :

This type of training has been necessitated due to the fact that the entry level qualifications for service in Public Health Engineering Departments/Boards is generally Bachelor of Engineering Degree and there could be difficulty in raising this level to that of Post Graduate qualifications.

The Ministry extends stipendary support to sponsored trainees admitted in academic institutions, at present. On an average 100 candidates are trained each year.

Short-term Courses in Public Health Engineering :

The subordinate engineers in the Public Health Engineering Departments/Boards have a key role to play in all the activities of water supply and sanitation programme. This course has been tailored in such a way that the diploma holders get an exposure towards the finer points of public health engineering so

that they can make use of the same in the field. The duration of the course is 3 months and at present it is being conducted by 2 academic institutions in the country.

The Ministry extends financial assistance for conduct of short-term courses in these institutions.

Refresher Courses :

A very important area of training under the programme has been the refresher courses. These courses are diverse in nature covering all categories of engineers from the senior to the junior level and other para engineering personnel. The list of refresher courses sponsored by the Ministry is given in the Annexure-II.

The refresher courses are financially supported by Government of India and are conducted in collaboration with the State Public Health Engineering Departments/Water Supply Boards and other concerned Institutions.

State Level Training Courses :

The proper operation and maintenance of water supplies is one of the key factors in ensuring a high quality of service to the consumers. The training is imparted to operators, mechanics and other lower level categories of public health engineering personnel through State level training programme. Under this programme, Government of India is encouraging the State and Union Territories to develop their own training centres by providing necessary technical and financial assistance to the extent possible.

In addition, every year several Public Heath Engineers and Administrators who are engaged in the field of water supply, sanitation and solid waste management programmes are regularly sent abroad for necessary training with the assistance of WHO and ODA (U.K.).

The lack of adequately trained technical manpower is undoubtedly a serious constraint in some States and Union Territories. Therefore, there is an urgent need to recruit more engineers and adequately trained personnel engaged in water supply and sanitation programme. Keeping this in view, the Ministry of Urban Development in collaboration with WHO, SEARO organiased a National Seminar on Environmental Engineering Education, Training & Research, from 13th to 15th January, 1988. The objectives of the Seminar were :-

(1) To review the Post Graduate Courases of Studies in Public Health Engineering IN the

national plan for the Decade as well as the current environmental health needs in the country and suggest modifications;

(2) To review the present patterns of inservice training for professionals and sub-professionals in the field of PHE and suggest measures to strengthen the same.

(3) To review the status and identify priority areas of research & development.

Professors from different eminent technical institutions, research scientists and engineers from different organisations in the country, representatives of different Central Government Ministries/ Departments and Officers of State Governments dealing with Public Health Engineering Training Programme participated in the Seminar. The seminar provided a forum for discussion and gave an opportunity for Professors, Departmental Heads, Central Government authorities and International Agencies to meet together and exchange views and experience and plan future strategies With respect to Public Health Engineering Training Programme.

Candidates trained in different courses under Public Health Training Programme of the Ministry

S.No.	Name of Course	No. of candidates trained (as on 31.3.1990)
1.	P.G. Course in Public/Health/Enviormental Engineering	1446
2.	Short-term Course in Public Health Engineering	1842
3.	Refresher Courses in Public Health Engineering	5145
4.	Water Works Supervisers Course	2063
5.	Sewage Works Supervisors Course	185
6.	Improved Design Techniques using micro-computer	102

ANNEXURE - I

List of Institutions recognised by Ministry of Urban Development for conducting ME Couse in PHE/Environmental Engineering

Sl.No.	Name of Institution
1.	All India Institute of Hygiene and Public Health, Calcutta.
2.	V.J.T.I., Bombay.
3.	Visvesvaraya Regional College of Engineering, Nagpur.
4.	Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar.
5.	Sri Jayachamarajendra College of Engineering, Mysore.
6.	Motilal Nerhru Regional Engineering College, Allahabad.
7.	Shri G.S. Institute of Technology of Science, Indore.
8.	Anna University, Guindy, Madras.
9.	Malviya Regional Engineering College, Jaipur.
10.	I.I.T., Bombay.

ANNEXURE - 2

List of Refresher Courses sponsored by the Ministry of Urban Development

Sl.No.	Name of Course
1.	Water Works Supervisors Course
2.	Sewage Works Supervisors Course
3.	Corrosion Control.
4.	Water Supply System Management
5.	Water Treatment Plant Design
6.	Public health Engineering Structures
7.	Waste Stabilization Pond Practices
8.	Filter operation.
9.	Care & Use of Chlorinators
10.	New Developments in Water Treatment
11.	Pipes & conduits
12.	Water Analysts Course
13.	Waste Water Analysts Course
14.	Solid Waste Management
15.	Cathodic Protection
16.	Sewer Maintenance and Cleaning.
17.	Preventive maintenance & Lock Detection
18.	Low Cost Sanitation - Water Seal Intrines
19.	Pumping Equipment and their maintenance
20.	Safety measures in PHE structues
21.	Sewage Treatment Plant Design.

RESEARCH & DEVELOPMENT ACTIVITIES IN WATER SUPPLY & SANITATION SECTOR

Introduction

The Ministry of Urban Development provides funds for applied Research and Development activities confined to the field of Urban Water Supply and Sanitation Sector including Solid Waste Management.

Mechanism of Implementation

Every year research proposals are invited by the Ministry from the undermentioned Organisations/ Departments. The proposals so received are examined in CPHEEO in the first instance. Later the R&D Committee of the Ministry under the Chairmanship of Secretary considers them for approval. For all the approved proposals, funds are released to the respective Organisations/Departments in a phased manner. The progress of the projects is reviewed by the Ministry quarterly.

Who can submit a proposal

Research Organisations, Educational Institutions, Field Departments, local bodies dealing with urban water supply, sanitation and solid waste management, registered Societies assisted by Central Government funds, non-governmental organisations, State Governments and U.T. Administrations.

Areas of Research Support

Low cost and appropriate technology in water supply, sewerage and sanitation, systems approach to water supply and waste management, desalination of water for drinking purpose, reuse and re-cycling of waste water, effective, economical and appropriate techniques of solid waste management, water quality survillance, cost benefit analysis of various technology options, rapid techniques for detection of faecal bacteria in the field, studies on ways and means of resource generation from within the community, socio-economic aspects of water supply system, water usage, recycling of wastes including solid wastes, studies on evaporation control in open water reservoirs, effective methods of low cost sanitation in rocky and other difficult hydro-geological formations advance techniques in treating water and waste water, energy recovery from wastes, artificial recharge of ground water, water and sewage tariff studies etc.

When and how to submit a proposal

Fifteen copies of research proposal on the prescribed format can be submitted during January - June every year.

Components of Grant

(i) Staff support; (ii) Equipment, Chemicals and Glassware directly connected with the Research Project Pilot Study; (iii) TA/DA; (iv) Computer time; (v) Stationery & Printing and (vi) Contingency.

Note : The above mentioned financial support is mainly to supplement the expenditure to be incurred by the respective organisations. It is presumed that organisations have the necessary basic infrastructure and other facilties to carry out such studies.

Items not allowed out of grant

No item other than those mentioned at S.No. 6 is allowed.

Contract Address

Adviser (PHEE)
Ministry of Urban Development
Nirman Bhavan
New Delhi-110 001

Telegram : As above
Telex : 31-63255-SHIV-IN
Telephone : 3017482

A list of R&D Projects sponsored by the Ministry of Urban Development is at Annex. I.

ANNEXURE - I

R & D PROJECTS SPONSORED BY THE MINISTRY OF URBAN DEVELOPMENT

S.No.	Title	Name of the Agency Carryng out the work	Status
1.	Performance Evaluation Study of Compost Plants in 7 cities of Bombay, Delhi, Calcutta, Bangalore, Baroda, Jaipur and Kanpur	Neeri, Nagpur	Completed
2.	Performance Evaluation of Rural watersupply schemes in India.	Neeri, Nagpur	Completed
3.	Pilot Studies on De-salination of water for drinking purpose in 8 villages of 4 States.	CSMCRI, BARC, DRL.	Completed
4.	Performance Evaluation of Water Treatment Plants in 51 towns in India	Neeri, Nagpur	Completed
5.	Study of Solid Waste Management in Pilgrim towns	Neeri, Nagpur	On going
6.	Research & Development of instrument in areas of water management	SJCE, Mysore	Completed
7.	Study of Urban Water Supply Tarrifs	IIPA, Delhi	On going
8.	Performance Evaluation of Water Distribution System in 7 selected cities of India	Neeri, Nagpur	On going
9.	Development of Computer Software for sub systems of Solid - Waste Management in Indian context.	Neeri, Nagpur	On going

S.No.	Title	Name of the Agency Carryng out the work	Status
10.	Developing a method to extract water from sea coast fresh water aquifer	IIT, Madras	On going
11.	Relative Evaluation of Low-cost methods of floccution.	VRCE, Nagpur	On going
12.	Effectiveness of combined horizontal flow roughing filter and slow sand filter system.	Bengal Engg. Colleage, Howrah	On going
13.	Optimisation of Water Treatment system using dynamic Programming	Neeri, Nagpur	On going
14.	Problems relating to drinking water in Urban slums	Society of Development Studies, Delhi.	On going
15.	Fabrication of Leak Detection Equipment (3 sets)	SJCE, Mysore	On going
16.	Comparative Study of Treating Waste water using Waste Stabilisation Ponds.	TWAD Board, Madras	On going

Pilot Project on Leak Detection and Preventive Maintenance of Water Distribution Systems In 6 selected Indian citities with O.D.A. assistance

The need for minimising wastage of precious drinking water due to leakage has been receiving atttention in many countries including India. Studies have revealed that 15 to 40% of total water flow into a distribution system is lost due to leakage. In India water supply is usually intermittent and therefore during non-supply hours when the system is not under pressure, external pollution may get into the system through the points of leaks posing a public health hazard. Therefore a systematic approach towards waste and leakage survey, detection followed by a prompt corrective action and preventive maintenance should form an integrated part of operation and maintenance of water distribution system on a regular basis to save considerable quantity of water, prevent possible contamination of treated water, improve pressure in the distribution system and increase revenue to make the system self-sufficient. If these measures are taken up by various Water Supply Authorities in the country, there may not be any immediate need to take up augmentation scheme.

Keeping this in view, the Ministry has been conducting training courses on these aspects with the help of NEERI, Nagpur for the benefit of State Public Health Engineering Departments/Water Boards and Municipal Corporations. About 3 years back an exercise was initiated in collaboration with WAPCOS and NEERI to launch a pilot project on waste assessment, leak dection and preventive maintenance of selected water distribution system in 6 Indian cities. The ODA (U.K.) has agreed in principle to some extent. The said pilot study will be carried out jointly by WAPCOS and NEERI under the overall supervision of the Ministryof Urban Development. The project cost was estimated to be of the order of Rs. 82 lakhs including the import duty amounting to about Rs. 20 lakhs on leak detection equipment. The assistance from ODA may be of the order of about £ 3 lakhs covering the cost of 7 sets of leak detection equipment and necessary technical consultancy. As per the proposal, the participating State Governments/local bodies should set up permanent Leak Detection Cells in their respective Departments and provide institutional, technical manpower, local expenses and transport during the period of study. Such Cells will continue to function even after completion of the project.

In November - December, 1989, 2 ODA Consultants visited 4 out of 6 project areas in order to have first-hand information on the existing situation in the selected areas and prepared a project report. The CPHEEO has commented on the same suggesting some modifications. It is expected that an agreement between ODA and Gove®nment of India in this regard may be signed soon and the project may start some time in October, 1990 which will take 3 years for completion.

MANAGEMENT INFORMATION SYSTEM

The Management Information System (MIS) is a formal method of making available to the management timely and accurate information necessary to facilitate the decision making process and to enable the organisation to carry out planning, control and operational functions effectively.

The development of the basic structure of the Management Information System for urban water supply and sanitation was taken up earlier by a Pilot Project Team constituted by the Ministry. The softwares for the six sub-systems viz., planning, project monitoring, inventory control, personnel, finance, operation and maintenance were developed by the Indian Institute of Management, Ahmedabad with financial assistance from the WHO. The softwares have been tested, modified and an improved version has been developed.

In view of the importance of the Management Information System in community water supply and sanitation, 2 workshops were organised at New Delhi by the Ministry during April and July, 1989 which were attended by almost all the concerned officials in the PHE Departments, Water Supply and Sewerage Boards. Computer demonstration of the packages, its modules and floppy diskettes were given to the participants.

The Ministry in association with the WHO conducted a special training course of Management Information System at New Delhi during September, 1989 in which hands-on-training was imparted to senior level engineers from the country as well as some of the neighbouring countries. The participants were supplied with floppy diskettes containing the sub-systems of Management Information System.

COMPUTERISATION IN WATER SUPPLY AND SANITATION

Financial assistance for purchase of micro-computer for use in improved planning and design of water distribution and sewerage networks and Management Information System was offered in March 1986 by the Ministry of Urban Development to 31 States agencies dealing with Urban Water Supply and Sanitation.

Concurrent with the financial support offered to the State agencies for purchase of hardware and software, a significant effort has been made in order to develop human resources in these specialised areas. Between February 1985 and March 1989, 7 training courses were conducted in which 102 officers drawn from state Government, Central Government, and teaching institutions have been trained during these training courses. The participants received hands-on training in using the software packages for improved plannning and design of water distribution and sewerage net works as well as few other propriety software packages such as Lotus 1-2-3 and d-Base.

Data Base management at Central Level

A computerised data base management for water supply and sanitation was developed in 1987 and has been installed in the CPHEEO. The system specification has been designed by the CPHEEO and a computer programme development has been supported by UNDP/World Bank Project RAS/81/0-01, the developed programme was also been transferred to many of the States who responded to the offer made by the Ministry of Urban Development.

National Consultancy for development of computer programme

Sri Jayachama Rajendra College of Engineering, Mysore was engaged by WHO/Government of India for development of computer programme on list of topics for using community water supply and sanitation. These are :-

(1) Population projection

(2) Water Treatment plant design

(3) Office file management

(4) Training activities undertaken by CPHEEO

(5) Project data base for World Bank and bilateral assisted projects.

(6) Project data sheet pertaining to the International Drinking Water Suplply and Sanitation Decade.

(7) Action Plan (Annual and Five year)

A workshop of 10 days duration on use of micro-computer for Project Management and Monitoring was organised by the Ministry in association with the UNDP/World Bank at the All India Institute of Local Self Government, Bombay during June, 1989.

The Ministry in association with the UNDP/World Bank organised a refresher course of 4 days duration on Micro-computer Application for Design of Urban Water Supply and Sewerage Networks at New Delhi, 1989. The refresher course was attended by 40 participants.

The Ministry has agreed to provide grants to 7 recognised institutes conducting Post Graduate course in Public Health Egnineering for procurement of micro-computers and accessories for the benefit of sponsored in-service engineers.

Computerised Water Billing System

The Ministry of Urban Development has constituted the Implementation Committee for Water Utility Billing system. The Members of the Committee are from Ministry, Maharashtra Water Supply and Sewerage Board, U.P. Jal Nigam and PWD Goa. The Implementation Committee would study micro-computer based Water Billing System currently in use in Bangladesh and would suggest its use to the User's authority responsible for Water Billing System.

PUBLICATION OF MANUALS ON "WATER SUPPLY AND TREATMENT" AND "SEWERAGE AND SEWAGE TREATMENT"

The Ministry of Urban Development published two Manuals viz "Manual on Water Supply and Treatment" and "Manual on Sewerage and Sewage Treatment". In view of the fact of advancement in the technology in the field of Water Supply and Sanitation, it was decided by the Ministry to revise and up-date these two Manuals published about a decade ago. The Ministry constituted two Expert Committees, as follows, to revise and up-date the Manuals :-

(i) Expert Committee for revision and up-dating of "Manual on Water Supply and Treatment", and

(ii) Expert Committee for revision and updating of "Manual on Sewerage and Sewage Treatment".

The Expert Committee for revision and up-dating of the Manual on "Water Supply and Treatment" has completed its task and the final version of the manual is ready to go for printing. In so far as the Manual on "Sewerage and Sewage Treatment" is concerned, it is being revised and up-dated and the Expert Committee is likely to complete its task by mid next year i.e. 1991.