PROCEEDINGS
OF
IX WORKSHOP OF THE
CHIEF ENGINEERS (P. H.) AND
SENIOR ENGINEERS (INDIA)

Trivandrum
February, 5th to 8th 1980

Convened by:

MINISTRY OF WORKS AND HOUSING
GOVERNMENT OF INDIA
AND
STATE GOVERNMENT OF KERALA

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IX WORKSHOP OF THE CHIEF ENGINEERS (PH) AND SENIOR ENGINEERS, TRIVANDRUM, 5TH TO 8TH FEBRUARY 1980

PROCEEDINGS

The workshop was jointly convened by the Ministry of Works and Housing, Government of India and the State Government of Kerala. The Department of Public Health Engineering, Kerala, hosted the meet which was inaugurated by Sri E. K. Nayanaar, Hon'ble Chief Minister of Kerala, at a function held at the Tagore Theatre, Trivandrum and presided over by Sri A. C. Shanmuga Das, Hon'ble Minister for Community Development and Sports, Kerala.

The Chief Minister in his inaugural address, stressed the need for bringing the subject of water supply and sanitation under the Core Sector of the National and State Developmental Plans so that this basic amenity is made available to all people in the country during the International Decade 1981-90.

Sri P. K. Chatterjee, Adviser (PHEE), Ministry of Works and Housing, in his keynote speech set out the preparations done so far in connection with the International decade for water supply and sanitation, outlined the task ahead before the Chief Engineers and Senior Engineers and hilighted the objectives to be achieved during the decade.

Sri M. Dhandapani, Special Secretary to the Government of Kerala, also addressed the delegates. Sri Shanmuga Das, Hon'ble Minister for Community Development and Sports in his Presidential Address advocated that the provision of water supply and sanitation should be taken up on a war footing.

Sri V. A. Anandadoss, Deputy Adviser (PHE), Ministry of Works and Housing, proposed a vote of thanks.

When the delegates reassembled to transact business, Sri P. K. Chatterjee, Adviser (PHEE), explained the work done so far in the earlier meetings and also the decisions taken at the regional consultation meet at the W.H.O. of various countries in the South-East Asia Region in connection with the preparations for the International Decade for water supply and sanitation. His remarks were supplemented by M/s William Finlay and G. Heyland of the W.H.O. and Dr. Skoda of the UNICEF, with a view to see how far the recommendations of the regional consultation meet could be made to fit with the requirements of India.

The Chief Engineers and the Senior Engineers made a field visit to the water supply headworks of Trivandrum at Aruvikarai, where recently the augmentation proposals have been carried out to ensure 24 hours supply to the city. The new intake works, treatment plant and service reservoir have been commissioned already and the distribution system extended to meet the needs of the city.

At the next session, the delegates discussed in detail the decisions of the regional meet explained to them earlier and reached useful conclusions which resulted in the passing of the resolutions in the concluding session.

The workshop discussed also the needs of training, manpower and materials requirements and came up with valuable recommendations which are listed separately.

The workshop included a visit to Kanyakumari Water Supply Project and the Water Supply and Sanitation Project for Greater Cochin and Alwaye Water Supply Project. The Kanyakumari Water Supply System is practically an extension to the Nagercoil Water Supply System. The Water Supply and Sewerage to Greater Cochin serve the shipyard, harbour and other installations and the Wellington Island.

An Ad hoc Committee comprising S/Sri N. S. Bhairavan, Mallinath Jain, Daivamani, Mr. Khambati and A. Gandhi, was set up to go into the question of maintenance of metropolitan water supply and sanitation projects. The recommendations of this committee are appended separately.

IX WORKSHOP OF THE CHIEF ENGINEERS AND SENIOR ENGINEERS, TRIVANDRUM, 5TH TO 8TH FEBRUARY 1980

RECOMMENDATION

Target population.—At present the provision for water supply and sanitation both in State and Central Sectors is hardly of the order 2 per cent of the overall plan outlays. As India is party to the U.N. Water Conference resolution to provide with basic minimum water supply and sanitation facilities to all the people of the world, it is very essential to increase the plan outlays considerably to achieve the goals set. It is, therefore, resolved that water supply and sanitation be included in the "CORE SECTOR" of the Development Plans of the Government of India and the State Governments.

The Conference further resolved that for population projection in rural areas, the national average increase in growth may be adopted to arrive at the present population.

2. *Targets.*—The Conference resolves that the target (goals) set for the decade (1981–90) and which have been earlier recommended in the last conference of Chief Engineers be adhered.

Coverage

(*i*) Urban Water Supply	..	100 per cent
(*ii*) Rural Water Supply	..	100 per cent
(*iii*) Urban Sewerage/Sanitation	..	100 per cent in respect of all class I cities and 50 per cent in respect of class II and other cities (*Note.*—Overall coverage in the State should be 80 per cent by means of sewerage or other simple sanitary method of disposal.)
(*iv*) Rural Sanitation	..	25 per cent or more to be covered wit' sanitary toilets

3. *Community involvement.*—Maximum participation of beneficiary communities should be developed in planning process and maintenance stage.

4. *Information systems.*—Information services currently being provided in P.H.E. Departments, are grossly inadequate. It is required primarily for selection of alternate technologies, case studies on completed projects, substitution of materials, impact of projects on society and community participation, directory of expertise and indicators of cost affectiveness of technologies.

Information and data cells should be established in the P.H.E. Departments at the State level and co-ordinated at the Central level. Information specialists to document knowledge information and data processing and retrieval should be associated in these activities. Modern tools of data collection, storage and retrieval should be used at the State and Central level in order to effectively support the decade programme.

5. *Professional Development and Manpower needs.*—It has been estimated that about 2,000 postgraduate and 40,000 graduate engineers and an equal number of diploma holders in Environmental/Public Health Engineering would be required for implementing the decade programme.

There are sufficient number of Engineering Colleges and Polytechnics in the country to meet the requirements, at undergraduate and diploma levels, but essentially they are all trained as Civil Engineers with insufficient training in water supply and sanitation. Hence they need further retraining for one or two years before they become suitable to the departmental requirements. Basic Civil Engineering Degree should be suitably modified with emphasis in Environmental/Public Health Engineering. Wherever feasible a full-fledged Bachelors Degree Course in Environmental Engineering should be started. This will result in effective and optimum utilization of trained manpower.

At the postgraduate level, the existing institutions should be strengthened and augmented so that at least 25 per cent of the engineers in P.H.E. Departments acquire a Master's Degree to improve their professional capability. Stipends and other assistance provided by the Centre for postgraduate courses should not only be continued but also strengthened and augmented to meet the requirements of the International Decade.

A crucial deficiency is noted at the sub-professional and artisan level. Regional Training Institutions should be established to train drillers, plumbers, master mechanics, technicians, water and sewage plant operators. Industrial Training Institutes offering similar programmes, should be encouraged to offer similar programmes, wherever feasible.

In order to update professional knowledge and skills of field engineers in an advancing area like Environmental/Public Health Engineering, refresher courses should be organised on a continuing basis in existing institutions, refresher courses now being offered should be continued as an immediate measures.

Professional development and manpower utilization should be well integrated into the plan allocations at the State and regional levels to avoid under utilization of manpower. Targets set for various activities in the Decade Programme should be met in toto, rather than sectorally.

6. *Material Resources.*—Recognising that there are critical shortages of materials such as cement, steel, pipes, etc., in the country even for the present tempo of activity, it is resolved that the Central Government may collect data from State Governments regarding the likely demand during the decade and make an assessment of needed augmentation in existing plant capacities and establishment of new plants. A committee may be setup at Centre to expeditiously assess the situation and to assist in early action.

7. *Health Education.*—The decade programme funds may include health education component and the Public Health Engineering Department actively carry out health education during the decade in co-ordination with Health Department.

8. *Decade preparations*: (*Financial resources*).—The present annual expenditure in the sector is of the order of Rs. 350 crores—400 crores in the country.

The annual outlay for the sector has to be of the order of Rs. 1,500 crores during the decade if the targets set are to be achieved. Planners and decision makers both at Central and State levels to be made aware of this and involved to ensure that the plan outlays are suitably increased. Any gaps in the resources may be filled up by obtaining external aid through the U.N. Agencies such as W.H.O., UNDP, UNICEF.

9. *Projects for investment.*—There is urgent need for preparation of projects for the decade programme. The State Governments may suitably augment the technical setup for undertaking this task. UNDP assistance may be sought for preparation of projects in case of selected projects wherever found necessary. Identification of priority projects for investment may be carried out in each State expeditiously and compiled for being posed for external assistance.

Date: 7-2-1980. 10.45 to 11.30 a.m.

Committee to go into the maintenance of major metropolitan water supply and sewerage projects

1. Whether construction agency is to maintain after the scheme is commissioned?
2. Whether a new agency for operation and maintenance to be created?
3. What will be the structure of an ideal organisation for the maintenance of water supply and sewerage projects including collection of revenue/rates etc.?

Committee members

1. Sri N. S. Bhairavan
2. ,, M. N. Jain
3. ,, Daivamani
4. ,, Khambati
5. ,, A. Gandhi

Note.—The committee to elect a Chairman come out with their recommendations to be discussed at the concluding session.

Recommendations of the Committee which went into the aspects of maintenance of major metropolitan water supply and sewerage projects

1. The various functions of planning, investigation, constructions and management of large water supply and sewerage schemes should all be the responsibility of the same agency, as this will be the best arrangement for the following reasons:—

(*a*) Such an arrangement will afford opportunities to the personnel for gaining all round knowledge in all these functions, which they can with great benefit utilise in discharging the responsibilities entrusted to them; they will be in a better position to appreciate the problems and difficulties encountered in these various functions, and take appropriate action to overcome such problems.

(*b*) This will ensure proper accountability and deny opportunities for placing the blame on another organisation.

(*c*) This arrangement is admirable for better financial management and discipline.

(*d*) A single central agency will be ideal for proper co-ordination between the construction and maintenance wings.

(*e*) It will also lead to optimum economy and efficiency in operation.

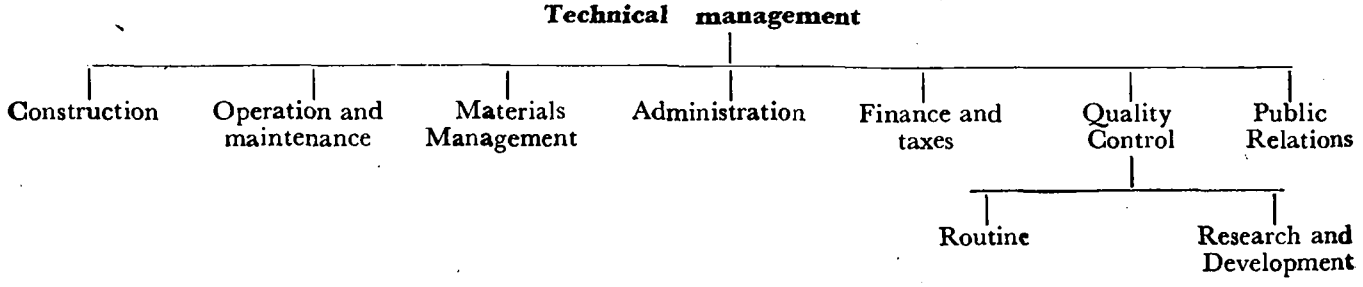
(*f*) Such an organisation can command expertise and adequate manpower to meet not only normal needs but even to meet emergencies and natural calamities.

(*g*) It is a sine quo non to attract external funding.

2. The above functions should be entrusted to an autonomous body headed by suitable technical management and vested with adequate powers including the power to collect water charges and taxes.

3. This body should develop and establish adequate engineering and financial organisation. These should include specialised wings for materials management, quality control, data processing, research and development and public relations.

The strength of the organisation and its components will depend on the magnitude and nature of the work handled.



ANNEXURE I

Agenda

5-2-1980		
8.30 hrs. to 10.30 hrs.	..	Registration
10.30 ,, 10.45 ,,	..	Tea
11.00 ,, 12.30 ,,	..	Inaugural meeting
12.30 ,, 14.00 ,,	..	Lunch
14.00 ,, 16.00 ,,	..	Session I
16.00 ,, 16.15 ,,	..	Coffee break
16.15 ,, 19.00 ,,	..	Field visit
6-2-1980		
9.00 hrs. to 10.30 hrs.	..	Session II
10.30 ,, 10.45 ,,	..	Coffee break
10.45 ,, 12.30 ,,	..	Session III
12.30 ,, 14.00 ,,	..	Lunch
14.00 hrs.	..	Departure to Kanyakumari and Halt
7-2-1980		
8.30 hrs. to 10.30 hrs.	..	Departure from Kanyakumari
10.30 hrs.	..	Arrival at Trivandrum
10.30 hrs. to 10.45 hrs.	..	Coffee break
10.45 ,, 11.30 ,,	..	Session IV
11.30 ,, 12.30 ,,	..	Concluding session
12.30 ,, 14.00 ,,	..	Lunch
14.00 ,,	..	Departure to Cochin
14.00 ,, 20.00 ,,	..	Arrival at Cochin
8-2-1980		
8.00 hrs. to 10.00 hrs.	..	Inspection of Cochin Port W. S. Scheme
10.00 ,,	..	Proceed to Alwaye
10.30 ,,	..	Arrival at Alwaye
11.00 ,, 12.00 ,,	..	Inspect Alwaye Head Works
12.00 ,,	..	Departure for Cochin
12.30 ,,	..	Arrival at Cochin
12.30 ,, 14.00 ,,	..	Lunch
14.00 ,, 16.00 ,,	..	Local inspection in Cochin of Greater Cochin W.S. Scheme

Disperse

ANNEXURE II

IX. WORKSHOP CHIEF ENGINEER (P.H.) AND SENIOR ENGINEERS (5—8th FEBRUARY 1980) TRIVANDRUM

List of Participants

Sl. No.	*Name and Designation*	*Address*	*Telephone No.*	
			Office	*Res.*
(1)	(2)	(3)	(4)	(5)
	Ministry of Works and Housing CPHEEO—			
1.	Mr. P. K. Chatterjee, Adviser	Nirman Bhavan, New Delhi.	..	..
2.	,, V. A. Ananda Doss, Dy. Adviser	do.	381418	675626
3.	,, V. Venugopal, Dy. Adviser	do.	388515	674099
4.	Dr. S. R. Shukla, Asst. Adviser	do.	..	..
	Ahamedabad Municipal Corporation—			
5.	Mr. A. H. Gandhi, Dy. Municipal Commissioner	Ahamedabad Municipal Corporation, Ahamedabad.	..	..
	Andhra Pradesh, P.H.E.D—			
6.	Mr. Krishna Rao Naram, Chief Engineer	3.4.612, Narayangoda, Hyderabad	32900	34605
	Bihar P.H.E.D—			
7.	Mr. P. K. Lahiri, Chief Engineer	P.H.E. Department, Bihar, Patna.	24570	24604
8.	,, L.B. Lal, Addl. Chief Engineer	do.	..	..
	Bombay Municipal Corporation—			
9.	Mr. G. F. Khambati, Chief Engineer	Bombay Municipal Corporation, Head Office, Bombay-1.	265149	..
	C.M.D.A. Calcutta—			
10.	Dr. D.M. De, Dy. Director	10, Camac Street, Calcutta-17.	448597	..
11.	,, A. K. Dutta, Dy. Director	do.	..	..
12.	,, U. N. Mandal, Addl. Director Delhi W.S. and Sewerage	9A, Bod. bag East, Calcutta-1.	230267	..
	Disposal undertaking link house—			
13.	Mr. J. D. Cruz, Addl. Chief Engineer	Bungalow No. 6, Jal Vihar, New Delhi-110024.	..	..
	Delhi—			
14.	Mr. Mallinath Jain, Chief Engineer (Water)	1, Daya Ganj, Ansari Road, New Delhi-2.	274333	273136
	Gujarat Health and Family Welfare Department—			
15.	Mr. S. K. Shah, Chief Engineer, P.H. and Joint Secretary	Sachivalaya, Gandhinagar, Gujarat State.	752	..
16.	Mr. B. B. Thumber, Superintending Engineer	Gujarat Health and Family Welfare Department, Gujarat.	..	..
	Haryana Urban Development Authority—			
17.	Mr. A. N. Mehendale, Chief Engineer	Primary School Buildings, Sector 8, Panchkula, Haryana.	..	..
18.	,, O. K. Sharma, Superintending Engineer	Water Works, Sector 16A, Faridabad.	..	..
	Haryana P.W.D. (P.H.)—			
19.	Mr. L. M. Chowdhiri, Chief Engineer	Sector 19B, Chandigarh	23596	24073
20.	,, S. S. Bola, Superintending Engineer	28, Park Road, Ambala, Cantt.	..	..
	Himachal Pradesh, P.W.D—			
21.	Mr. I. D. Mirchandani, Chief Engineer	Himachal P.W.D. V.S. Club, Simla-1.	2404	2406
	Hyderabad R.W.S—			
22.	Mr. U. R. K. Moorthy, Chief Engineer (P.R.)	R.W.S. and Administration, Hyderabad-500 020.	64953	..

Sl. No.	Name and Designation	Address	Telephone No.	
			Office	Res.
(1)	(2)	(3)	(4)	(5)
	Jammu and Kashmir P.H.E.D—			
23.	Mr. A. R. Mir, Chief Engineer	P.H.E.D., Jammu and Kashmir	73594 (Srinagar) 5544 (Jammu)	78307 3711
	Karnataka Urban Water Supply and Drainage Board—			
24.	Mr. P. L. Nanjundaswami, Chief Engineer	Karnataka Water Supply and Drainage Board, Bangalore.	..	..
	Kerala P.H.E.D—			
25.	Mr. N. S. Bhaskaran, Chief Engineer	P.H.E.D., Trivandrum-695 001	62797	63416
26.	,, K. Govindan Nair, Dy. Chief Engineer (Projects)	do.	62313	60165
27.	,, K. Mathen Thomas, Superintending Engineer	P.H. Investigation Planning and Design Circle, Alwaye.	4152	3131
28.	,, B. Sankarasubramonia Iyer, Superintending Engineer	P.H.E.D. South Circle, Trivandrum.	61931	62458
29.	,, S. Govindan Potti, Superintending Engineer	P.H.E.D. Circle, Cochin-11.	31645	31012
30.	,, M. M. George, Superintending Engineer	P.H.E.D. Central Circle, Trichur.	23230	23471
31.	,, K. Thulasidas, Superintending Engineer	P.H. Peppara Dam Circle, Vithura, Trivandrum.	83	..
32.	,, S. P. James, Dy. Chief Engineer (G and A)	P.H.E.D. Trivandrum.	62725	61260
33.	,, V. Abraham, Superintending Engineer	Public Health North Circle, Calicut.	76046	72438
	Lakshadweep Administration—			
34.	Mr. Arumugham, Executive Engineer	P.W.D. Kavarathi Island (L.D.)	..	-
	Madras Metropolitan Water Supply and Sewerage Board.—			
35.	Mr. S. Daivamani, Chief Engineer (O and M)	Metropolitan Water Supply and Sewerage Board, Madras-6.	86851	..
	Meghalaya.—			
36.	Mr. P. Arunachalam, Chief Engineer	Chief P.H. Engineer, Meghalaya, Shillong-793 001.	6897	3840
37.	,, Chacko, Asst. Executive Engineer	P.H.E.D. Meghalaya.	..	..
	Manipur P.H.E.D.—			
38.	Mr. Bijayakumar Singh, Chief Engineer	P.H.E.D. Government of Manipur, Imphal.	163	16
	Madhya Pradesh—			
39.	Mr. P. N. Qazi, Engineer in Chief	E. 1/173, Arera Colony, Bhopal-462 014.	..	..
40.	,, Vaidya, Chief Engineer	E. 2/127, Arera Colony, Bhopal-462 014.	..	..
	Maharashtra Industrial Development Corporation.—			
41.	Mr. G. R. Lele, Superintending Engineer	Maharshi cave road, Bombay-400 093.	578978	578798
	Nagaland.—			
42.	Mr. A. V. Akang Meru, Superintending Engineer	Kohima, Nagaland.	..	..
	Orissa P.H.E.D.—			
43.	Mr. D. N. Singh Deo, Chief Engineer	Chief Engineer P.H. Bhubaneswar, Orissa.	51825	51815
	Punjab P.W.D.—			
44.	Mr. H. S. Puri, Chief Engineer	7 B, Bhupindra Road, Patiala, Punjab.	329	3666
45.	Mr. N. S. Kalsi, Executive Engineer	Office of the Chief Engineer, P.H. Patiala (Punjab).	..	..

Sl. No.	Name and Designation	Address	Telephone No.	
			Office	Res.
(1)	(2)	(3)	(4)	(5)
	Punjab Water Supply and Sewerage Board—			
46.	Mr. M. S. Sandhu, Managing Director	65 Sector, 11 Chandigarh.	..	..
47.	,, S. S. Sangha, Superintending Engineer	Water Supply and Sewerage Board, Bhattinda, Punjab.	..	..
	Pondicherry P.W.D—			
48.	Mr. J. Deivasigamany, Director	P.W.D., Pondicherry.	163	967
	Tamil Nadu Water Supply and Drainage Board—			
49.	Mr. G. Rajangam, Executive Engineer	T.W.A.D. Board, Annasalai, Madras-2.	..	..
50.	,, Govindaraj, Superintending Engineer	Kanyakumari Circle, Tirunnelveli	..	..
51.	,, George Mathew, Project Engineer	Sirvani Project, Coimbatore-11.	31839	..
	Tripura Irrigation and Flood Control Department—			
52.	Mr. S. K. Roy, Chief Engineer	Agartala	98	..
53.	,, S. Sarkar, Executive Engineer	Spl. Investigation Unit, A.R.W.S., Agartala.	..	..
	Uttarpradesh Jal Nigam—			
54.	Mr. B. P. Varma, Managing Director	U. P. Jal Nigam Lucknow-226 001.	40171 40175	..
55.	,, R. C. Asthana, Dy. Secretary (Planning)	do.	..	..
	West Bengal—			
56.	Mr. S. K. Neogi, Superintending Municipal-Engineer	Local Government and Urban Development and Department of Municipal Engineering, 1 Garstin place, Calcutta.	..	..
	W.H.O—			
57.	Mr. William Finlay, Sanitary Engineer	World Health House, New Delhi	270181-88	..
58.	,, G. Heyland, Financial Analyst	do.	..	..
	UNICEF—			
59.	Mr. John D. Skoda, Senior Programme Officer	11, Jor Bagh, New Delhi-110 003.	618371	..
	NEERI Nagpur—			
60.	Dr. B. B. Sundaresan, Director	NEERI, Nagpur-20.	23993	25222
	Other Agencies—			
61.	Mr. K. R. Rangarajan, Sales Manager	Wavin India Ltd., Ambattur, Madras-58.	..	..
62.	,, Krishnaswamy Karayalar, IISCO	Karayala Bungalow, Thycaud, Trivandrum.	..	..
63.	,, Ponnaya Pillai, Latha Agencies	do.	..	..
64.	,, T. Madhava Rao, Engineer	Atlasco (India) Ltd., M. G. Memorial building, Netaji Subhas Road, Bombay-400 002.	315623	..
65.	,, Suresh, Engineer	do.	..	..
66.	,, Narayanaswamy, Sales Officer	Wavin India Ltd., 28/275/1, Thondayil Road, Cochin-16.	..	..
67.	,, S. Bhoothalingam, Chairman	Kerala State Board for Prevention and Control of Water Pollution, Trivandrum.	60702	..
68.	,, S. Balu, Easland Combines	C.T.T. Road, Trivandrum.	..	..
69.	,, K. K. Kamath, Managing Director	Kerala Premo-Pipe Factory Ltd., Quilon-9, Kerala.	..	..
70.	,, K. S. Ramakrishnan, Dy. Sales Manager	Lekashmi Cement Distributors Pvt. Ltd., Trivandrum.	65768	..

ANNEXURE III (i)

Inaugural Address by Sri E. K. Nayanar, Chief Minister, Kerala State

I am very happy to be here in your midst this morning to inaugurate the All India Conference of Chief Engineers of Public Health. At the very outset, I would like to extend on behalf of the Government of Kerala and on my own behalf a very warm welcome to the delegates assembled here from various parts of the country and wish them a pleasant stay in Kerala.

The decade 1981–90 has been designated by the U.N. Water Conference as the International Drinking Water Supply and Sanitation Decade. According to the recommendations of the Water Conference, this ten-year period should be devoted for implementing national plans for drinking water supply and sanitation with the aim of providing clean water and sanitation facilities for all the people by the end of the decade. India participated in this Conference and agreed to these recommendations. Your conference, meeting as it does on the eve of the decade, naturally assumes great importance. We are in the preparatory phase of the programme and our preparedness for the implementation of this global scheme will naturally form part of the deliberations being held here.

The problem of supplying drinking water and providing sanitation facilities is a major one for any country, especially one like India, with its vast area, its teeming population and in the throes of planned, accelerated economic and social development. Despite all our plans, there is no gainsaying the fact that we have by and large failed in this crucial sector. The Accelerated Rural Water Supply Programme has made some progress in a number of States—Kerala is one such State—But most of our villages, whether in the coastal areas, the mid-land region or in the high-land region, are often in the grip of acute scarcity of drinking water during the summer months. In our urban centres and towns, the problem is even more acute, especially in the wake of the absence of even the most elementary sanitation facilities. The people are clamouring for protected water supply and adequate sanitation facilities. All these point to the pressing need for stepping up our efforts in this direction on a war-footing. The Decade suggested by the U.N., therefore, comes at a very appropriate time and should give us in this country a rallying point and leverage of projecting our programmes and implementing them.

The major handicap that almost all States face in this respect is that of lack of financial resources. In Kerala we have drawn up an ambitious scheme of covering all problem villages within a reasonable period with drinking water facilities. We had been promised increased allocation from the Centre for implementing these programmes. But, contrary to these expectations, the allotment so far promised by the Centre for this year falls short of even the allocation made last year. Our villages are comparatively larger in size compared to villages elsewhere in the country. Also they are smaller in number. In the coastal plains and in the high land regions it is extremely difficult to locate perennial water source. In order to ensure a steady supply round the year, water will necessarily have to be conveyed over long distances. The cost of rural water supply schemes will necessarily be higher. States which are faced with this problem, laid down by the Centre to the effect that the number of priority problem villages remaining to be covered and the population in these villages will mainly govern the distribution of funds under the Accelerated Rural Water Supply Programme. In view of local circumstances and conditions, such States deserve ad hoc allocation for covering problem villages within the time limit.

Considering the gigantic dimension of the problem of ensuring drinking water supply and sanitation within the shortest possible span of time, bilateral and World Bank assistance plays a pivotal role in the successful implementation of these programmes. In Kerala, there are areas like Kuttanad which are water logged and where drinking water supply and sanitation pose a formidable challenge. The people of these areas of are forced to drink polluted water and live in highly insanitary conditions. Similarly, there are many pockets in the coastal areas where the surface and ground water turns brackish during the summer months. We have not been able to solve these problems of water scarcity and inadequate sanitation facilities owing to the paucity of financial resources. Kerala has not been favoured with any bilateral assistance or World Bank aid for its water supply and sewerage schemes. It is Quite possible that other States are similarly placed in regard to aid and assistance from external financial agencies. Unless large scale and liberal assistance is forthcoming from such agencies, these States will not be able to provide the basic amenities of water supply and sanitation to the people in the foreseable future, let alone the coming decade.

There are other areas also which demand assistance from external sources in the shape of equipments. For instance, in the high land regions of our country, granite rock formation is met with at very shallow depths. In such places, tube wells are the only effective answer to the problem of water scarcity. Sophisticated drilling rigs are a must for such operations. A number of States have benefited from gift of drilling rigs from the UNICEF. I strongly feel that the centre should take immediate measures to bring all States requiring tube wells within the ambit of this programme of UNICEF.

It has been estimated that Kerala would require an outlay of about Rs. 600 crores to achieve the Decade goals. In view of this large investment especially, there is no doubt that external financing is a must. With a view to attracting the interest of organisations like the W.H.O. and financing institutions like H.U.D.C.O., L.I.C. etc., the formation of an autonomous water supply and sewerage board vested with functions of investigation, planning, execution and management of water supply sewerage schemes on commercial lines would be of considerable help. In fact, the Government of Kerala proposes to constitute a Water Supply and Sewerage Board Shortly. It is our expectation that this Board would be able to contribute substantially towards the smooth implementation and management of schemes.

I am sure that most of the Chief Engineers gathered here today would agree with me that the scarcity of cement, iron rods, etc., affects the timely progress of their work. In order to ensure that water supply and sanitation projects get priority in the allocation of such controlled materials, it would be advisable to include water

supply and sewerage schemes also in the core sector of our plans. It is also necessary to step up the production of pipes by utilising the installed capacities of our plants fully and to create additional capacities to meet the demand in full.

I have indicated in broad outline some of the major problems be setting the water supply and drainage sectors. I have no doubt that this conference will make an indepth study of the entire gamut of problems set against the backdrop of the IDWSSD. The broad outlines of the Decade goals are quite evident—providing clean water and sanitation for all the people. In the process, you will have to evolve suitable strategies and a practical plan of action for achieving this objective and also identify firm resources external and internal, for implementing the programme within the stipulated time. I understand that among the topics coming up for discussion at this conference are the need for integration and co-ordination of water supply and sanitation programmes with developmental programmes in other sectors of the economy and the co-ordination of development of water supply for drinking purposes with the development of water resources. I may add that these aspects are crucial in the successful implementation of long-term programmes of water supply and sanitation.

With these few words, I have great pleasure to inaugurate this All India Conference of Chief Engineers of Public Health. I wish the Conference and your deliberations all success.

ANNEXURE III (ii)

Presidential address.—By Sri. A. C. Shanmugha Das, Minister for Community Development and Sports

I am very happy and privileged to be with you and to talk to you on this occasion of the Annual Meet of State Chief Public Health Engineers and Senior Engineers. I understand that this Conference is going to be mainly devoted to a review of the preparatory activities for the International Water Supply and Sanitation Decade 1981–1990, with the object of assessing the constraints and finding solutions thereof and to evolve strategies, plans and programmes for achieving the Decade Goal, viz., provide clean water and sanitation for all the people. India being a party to the resolutions of the U.N. Water Conference in Mar del Plata, Argentina, has necessarily to go all out to achieve the goals set by the Conference for the decade and in this context this conference assumes great importance. I am sure your deliberations will help to speed up the preparatory activities to enable the commencement of the programme in right earnest, in time.

Kerala State is deeply interested in this programme of providing the basic amenities of safe water and sanitation to all the people in view of the fact that most parts of the State are in the grip of acute scarcity for drinking water during the summer months. In between the Arabian Sea on the West and the mighty Western Ghats on the East, lies Kerala State, a narrow strip of lush green lands ranging in width from 35 to 120 kilometres and extending for about 580 km. from North to South, interspersed with lakes and criscrossed by inland water ways. The topographical and physical features very distinctly and markedly from east to west within this small width. From the Western Ghats rising to an elevation of 2,500 metres, the land slopes down steeply to the Arabian Sea on the West. With a present population of 26 million, Kerala ranks foremost among the various States in the country, in density of population. The average density of 549 sq. km. is more than three times the average for the country.

The State has the benefit of both the North-east and South-west Monsoon. Nevertheless, most areas of the State experience acute scarcity of potable water during the summer months. This happens because the rainfall is not evenly distributed round the year. On the coastal areas, the slopes are flat and saline intrusion travels as far as 20 km. from the sea. The river in this stretch gets brackish. The midland areas have hard laterite formation and ground water sources like shallow wells go dry. The upland areas have granite rock formation at shallow depths.

The pattern of development is also rather unique and different from the rest of the country. The entire State is one huge urban sprawl and development is continuous and it is rather difficult to delienate between the Urban and Rural areas, since one merges with the other. Under such conditions the provision of unfailing supply of water and sanitation to all of its people poses a great challenge.

While about 65 per cent of the Urban population have been provided with adequate protected water supply, hardly 25 per cent of the rural population, has access to safe drinking water supply. Excepting Trivandrum City which has about half the areas covered by sewerage scheme and the Cochin City which has about 5 per cent of the area covered by the scheme now under implementation, all the other cities and towns totally lack this important facility, which alone can safeguard the health of the people. This is a very depressing situation which falls very much short of the status obtaining in this field in many other parts of the country and calls for special attention and assistance from the Government of India in the coming years to enable the State to catch up with the other advanced States in the country.

It has been assessed that it for achieving the target of providing drinking water and sanitation to all the community, an investment of the order of Rs. 600 crores will be required during the decade, which calls for more than quadruplicating the present rate of investment. The resources of the Government alone will not be enough for this rate of investment and this will have to be supplemented with liberal aids from International Financing Agencies like World Bank, with bilateral assistance and with loans from domestic financing institutions like L.I.C., H.U.D.C.O. etc.

Most of the financing institutions insist on the formation of an autonomous Board vested with functions of Planning, Investigation Execution and Management of Water Supply and Sewerage Schemes, as a pre-requisite for extending financial assistance. Only an autonomous Board will be in a position to execute and manage these schemes on commercial lines by implementing appropriate water rates, in order to make the schemes economically self supporting. The Government of Kerala is deeply seized of this matter and a Water Supply and Sewerage Board will be constituted in this State very soon.

The objective of providing drinking water and sanitation to the entire population within a reasonable time can be achieved only if bold and imaginative steps are taken, without further loss of time. The people will not wait indefinitely for these basic amenities. Even the people in the rural areas are quite conscious and educated about the benefits of protected water supply and they take to the scheme quite readily. That way, there is absolutely no need for any health education to persuade the people of Kerala to make good use of these schemes and derive full benefits therefrom. More than half the memoranda, I have received from the people contain mainly demands for protected water supply schemes. If we fail to provide adequate water supply and sanitation, we are sure to run into difficult situation inhibiting growth all round. We have to plunge into action on a war footing to achieve the task ahead, with the shortest possible time.

I do not want to go into further details at this stage as I am sure the Hon'ble Chief Minister who will be delivering the inaugural address will touch upon all the various aspects.

I hope this conference will be able to evolve a suitable strategy and plan of action, as a result of your deliberations. Let me wish this Conference all success.

"JAI HIND"

ANNEXURE III (iii)

Opening Address by Sri P. K. Chatterjee, Adviser (PHEE), Ministry of Works and Housing, Government of India, at the IX Workshop on Water Supply and Sanitation at Trivandrum on 5th to 8th February 1980

The U. N. Water Conference held at Mar del Plata, Argentina, in March 1977, decided to provide clean water and sanitation for all human beings during the Decade 1981-90. It was also recommended that the decade should be designated as 'INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE'—India was a party to these decisions and the 31st U.N. General Assembly endorsed the recommendations of the Water Conference.

India made an impressive beginning to tackle the problem soon after the Mar del Plata resolution. A clear picture of the problem remaining to be tackled, emerged out of the rapid assessment surveys conducted W.H.O. with the help of the Government of India. The sector studies of the States, one after the other, have already been taken up and has been completed in respect of certain States. The sector study helps us to assess the States preparedness with the accelerated pace of development, the constraints likely to hamper the developed activities in the sector, to take action required for preparation of the plans well ahead of the beginning of the Decade and to assess the overall needs for the sectors upto 1990, and to explore the total finding sources; both bilateral and international, other than the local resources.

The sector study helps the Chief Engineer as a useful tool to assess the gap between the total requirements of his State and the existing actual plan provisions therefore, and enables him to take up with the planning authority both in State and national levels to increase the plan outlays in the current and future plans. This report helps him also to comprehensively assess his manpower and material requirements for the implementation of the proposals during the decade.

You are aware, the National Water Supply and Sanitation Programme was included as part of the National First Five Year Plan of Development in 1954. The outlay in the First Five Year Plan was hardly Rs. 18 crores. As compared to that, the outlay for the Sixth Five Year Plan namely 1978-83 is of the order of Rs. 2,700 crores (Rs. 1,888 crores for rural and about Rs. 1,324 crores for urban sectors). In respect of physical coverage, about 83 per cent of the urban population is proposed to be provided with water supply. In the rural water supply, out of 1·58 lakh problem villages about 58,000 villlages have been covered upto March 1978 leaving about one lakh villages yet to be covered. In the field of urban sewerage and rural sanitation, very little has been done in the last 25 years and it is expected that this will get greater attention during the next decade with a view to achieve complete coverage. It is our hope that sewerage of Class I cities will be completed in full and also 80 per cent of the urban population will be covered in all with either sewerage system or sanitary toilets connected to safe disposal system (Please refer to statements I to IV) on status of water supply and waste disposal in class I and class II cities. In respect of rural water supply our objective is to cover the remaining problem villages on a priority basis and then cover the rest of the villages in full during the decade. In rural sanitation, at least 25 per cent or more coverage of the population may be aimed at. It was expressed by the participants in earlier meetings that for rural areas it should be possible to achieve a percentage higher than 25 per cent of coverage with sanitary latrines in view of the cheapness.

We have already circulated various requests and, I am sure, you would have all made a rough assessment in respect of funds and materials required for the decade programme and will be presenting them at this conference during further deliberations of this meeting. We would also like you to indicate brief notes on the assumptions made at the levels of service and the basis of working out the requirements for these development projects in terms of financial and material resources.

As you are aware, at the workshop co-sponsored by the Government of India and the World Health Organisation held in Delhi in November 1978, certain tentative figures were furnished by you to indicate the magnitude of funds to be ploughed in during the decade to achieve the goal set by the U.N. General Assembly (Please refer to statement at Annexure I). The projected fund requirement for urban water supply and sewerage is of the order of Rs. 5,475 crores while for rural water supply it would be of the order of Rs. 7,057 crores. In relation to this and the actual outlay provided in the water supply and sanitation sector of the Sixth Five Year Plan, the provisions in the Seventh and Eighth Five Year Plans should be considerably stepped up to achieve our goals. It may also be observed that there is no provision for rural sanitation in the Sixth Plan period and also the provision made in the urban sector relates mostly to water supply only and very little for sewerage. It is, therefore, absolutely necessary that lot of efforts will have to be made in the Seventh and subsequent plans for better coverage of population with urban sewerage and rural sanitation.

Since the provisions made in the various State and National Plans are directly depend on the sources that can be generated within the country, it is necessary that adequate funds from bilateral and international agencies will have to flow in a greater measure during the decade if our country is to achieve the said goals by 1990. We have representatives of various international agencies present here who will have an opportunity to understand our problem in great detail during the deliberations of this meet and, I am sure, they will consider sympathetically in deciding any quantum of financial assistance from their agencies during the decade.

We have also to consider the material resources and the manpower needs that are necessary if we are to meet the challenge before us (Please refer to blueprint on material resources in the country). The industrial progress of this country has been going ahead side by side and the country is at present producing most of the

essential materials and equipment such as pipes, steel, cement, rigs, power pumps and pumps, etc., and exporting some of the items. We may come across shortage of some of the abovementioned items. It is, therefore, necessary to assess the overall requirements of material and equipment required for the programme in the country and take into account the export requirements and policies that will have to be evolved for streamlining the production of such items on a long-term basis. We have also to make a realistic estimate of our technical manpower requirements and programme in advance to train and get them ready to meet the requirements during the decade.

I am sure, this workshop will come out with concrete suggestions and recommendations regarding the future requirements of funds, material and manpower requirements for the water supply sector during the decade. Such a picture will amply help the national government in planning the future activities and as well help the international agencies like UNDP, WHO, UNICEF, WORLD, BANK, etc., and other bilateral agencies to come forward with technical and financial assistance to assist us in achieving the goals set for 1990.

INTERNATIONAL DRINKING WATER AND SANITATION DECADE, 1981-90

Projected requirements of funds

(Amount in Rs. millions)

Serial number	States	Urban water supply	Urban sewerage	Rural water supply	Rural sanitation
1	2	3	4	5	6
1	Andhra Pradesh ..	5,800	1,110	4,000	..
2	Assam ..	350	807	2,165	4,357
3	Bihar ..	1,000	3,000	7,640	2,000
4	Gujarat ..	495	666	590	323
5	Haryana ..	571	565	2,887	2,000
6	Himachal Pradesh ..	211	220	1,628	323
7	Jammu and Kashmir ..	344	1,363	..	2,000
8	Karnataka ..	900	400	1,710	380
9	Kerala ..	600	650	3,100	..
10	Madhya Pradesh ..	3,900	1,600	10,150	1,000
11	Maharashtra ..	1,085	2,341	3,900	1,000
12	Manipur ..	60	50	276	1,750
13	Meghalaya ..	150	..	370	1,000
14	Mizoram ..	..	..	..	..
15	Nagaland ..	..	..	..	..
16	Orissa ..	1,000	600	..	..
17	Punjab ..	720	1,000	4,000	..
18	Rajasthan ..	1,000	2,000	4,050	400
19	Tamil Nadu ..	*1,000	4,090	6,500	2,500
20	Tripura ..	..	..	1,500	2,000
21	Uttar Pradesh ..	1,150	1 950	..	1,000
22	West Bengal ..	1,000	2,000	16,000	..
23	Arunachal Pradesh ..	..	..	600	6,300
24	Sikkim ..	..	..	..	7,000
				..	
	Total ..	20,436 +10,000	24,322	70,566	33,010

*Another 10,000 million for Madras City.

STATEMENT I

State-wise Water Supply Situation in Class I Cities

Sl. No.	State	No. of Class I Cities		Population	Ground Source (M.L.D.)	Surface Source (M.L.D.)	Combined ground and Surface source (M.L.D.)	Total Supply (M.L.D.)	Per Capita Supply (Lit/day)
		Surveyed	Reply received						
1	2	3	4	5	6	7	8	9	10
1	Andhra Pradesh ..	13	13	4,063,447	..	382.02	51·75	433·77	107·00
2	Assam ..	1	1	200,377	..	34·05	..	34·05	170·00
3	Bihar ..	11	11	2,557,148	138·46	228·68	19·98	387·12	151·00
4	Gujarat ..	7	7	3,564,535	43·13	59·47	481·14	583·74	164·00
5	Haryana ..	2	2	227,248	6·81	11·35	..	18·16	80·00
6	Jammu and Kashmir ..	2	2	587,460	..	64·69	38·14	102·83	175·00
7	Karnataka ..	11	11	3,517,497	..	467·61	..	467·61	133·00
8	Kerala ..	5	5	1,467,046	24·97	167·52	..	192·49	131·00
9	Madhya Pradesh ..	11	11	3,006,558	10·88	203·84	179·33	394·05	131·00
10	Maharashtra ..	17	17	11,117,117	..	2256·65	9·08	2265·73	204·00
11	Manipur ..	1	1	100,366	..	12·30	..	12·30	123·00
12	Orissa ..	4	4	601,414	35·23	50·49	6·81	92·53	154·00
13	Punjab ..	4	4	1,306,300	247·69	..	..	247.69	190·00
14	Rajasthan ..	7	7	1,902,212	..	31·78	212·02	243·80	128·00
15	Tamil Nadu ..	17	17	7,309,746	..	349·49	55.39	404·88	55·00
16	Uttar Pradesh ..	22	22	7,059,754	166·71	8·80	903·69	1079·20	171·00
17	West Bengal ..	5	5	7,783,887	6·90	47·67	625·16	679.73	87·00
18	Delhi ..	1	1	3,647,023		885·30	..	885·30	243·00
19	Chandigarh ..	1	1	232,940	113.50	..	..	113·50	487·00
	Total	142	142	6,0,252,075	794·28 (9%)	52,61·71 (61%)	25,82·49 (30%)	86,38.48 (100%)	143·37 Say 145·00

STATEMENT II

State-wise Waste Water Collection and Treatment Situation in Class I Cities

Sl. No.	State	No. of Class I City		Population	Sewerage		Water Supplied (M.L.D.)	Waste Water (M.L.D.)		
		Surveyed	Reply received		Population with sewerage facility	Population without sewerage facility		Generated	Collected	Treated
1	2	3	4	5	6	7	8	9	10	11
1	Andhra Pradesh	13	13	4,063,441	12,00,778	2,862,663	433·77	347·01	254.26	246·29
2	Assam	1	1	200,377	..	200,377	34·05	27·24	..	..
3	Bihar	11	11	2,557,148	6,86,109	1,871,039	387·12	309·69	195.93	226.65
4	Gujarat	7	7	3,564,535	26,12,725	951,809	583·74	538·18	538·18	521·86
5	Haryana	2	2	227,248	31,189	196,059	18·16	14·52	2·84	..
6	Karnataka	11	11	3,517,497	23,12,524	1,004,973	467·61	398·73	398·73	374·99
7	Jammu and Kashmir	2	2	587,460	..	587,460	102·83	82·26	..	..
8	Kerala	5	5	1,467,046	3,14,581	1,152,465	192·49	154·00	43·12	..
	Madhya Pradesh	11	11	3,006,588	6,40,568	2,363,990	394·05	315·40	118·09	40·86
10	Maharashtra	17	17	11,117,117	60,69,160	5,017,957	2265·73	1812.58	1104·10	860·67
11	Manipur	1	1	100,366	..	100,366	12.30	9.84	..	..
12	Orissa	4	4	601,414	1,73,685	427,729	92.53	74.02	24·82	..
13	Punjab	4	4	1,306,300	6,02,813	703,487	247·69	198·15	140·40	27·70
14	Rajasthan	7	7	1,902,212	5,82,388	1,319,824	243·80	195·04	68.96	..
15	Tamil Nadu	17	17	7,309,746	30,06,060	4,303,686	404·88	323·90	159·30	52·98
16	Uttar Pradesh	22	22	7,059,754	40,76,485	2,983,269	1079·20	863·36	575·12	2·27
17	West Bengal	5	5	7,783,887	6,63,687	7,130,200	679·73	543·78	61·02	34·05
18	Delhi	1	1	3,647,023	27,35,268	911,755	885.30	708·24	531·00	444·92
19	Chandigarh	1	1	232.940	2,32,940	..	113·50	90·80	90·80	22.70
	Total	142	142	60,252,970	26,920,970 (43·4%)	34,089,108 (56·6%)	8638·48	7006·74	4306·67 (59%)	2,755·94 (37%)

STATEMENT III

State-wise Water Supply Situation in Class II Cities

Serial number	State	No. of Class II Cities		Population	Water supply from			Total Water Supply (M.L.D.)	Per capita Water Supply (Lit/Day)
		Surveyed	Reply received		Ground source (M.L.D.)	Surface source (M.L.D.)	Combined (Ground+Surface) source (M.L.D.)		
1	2	3	4	5	6	7	8	9	10
1	Andhra Pradesh ..	17	17	1,121,533	12·39	98·75	..	111·14	99·09
2	Assam ..	5	5	315,066	0·004	10·00	0·025	10·029	31·83
3	Bihar ..	9	9	609,563	58·58	8·10	..	66·68	109·39
4	Gujarat ..	18	18	1,223,887	58·80	43·00	17·00	118·80	97·07
5	Goa, Daman, Diu ..	1	1	59,258	..	7·50	..	7·50	126·56
6	Haryana ..	9	9	704,821	88·73	9·90	12·20	110·80	157·24
7	Himachal Pradesh ..	1	1	55.368	..	14·00	..	14·00	252·85
8	Karnataka ..	9	9	587,056	2·70	37·63	4·14	44·47	75·75
9	Kerala ..	7	7	463,704	1·70	56·17	..	57·87	124·79
10	Madhya Pradesh ..	14	14	870,877	..	137·81	8·16	145·97	167·61
11	Maharashtra ..	19	19	1,296,268	..	379·30	2·45	381·75	294·49
12	Orissa ..	1	1	72,674	8·50	..	..	8·50	116·96
13	Punjab ..	8	8	505,020	53·98	9·00	..	62·98	124·71
14	Rajasthan ..	7	7	488,251	21·45	31·39	..	52·84	108·22
15	Tamil Nadu ..	27	27	1,756,660	6·28	146·21	9·86	162·35	92·42
16	Uttar Pradesh ..	20	20	1,341,435	92·44	18·06	12·20	122·70	91·47
17	West Bengal ..	18	18	1,298,791	43·39	11·17	..	54.56	42·01
	Total ..	190	190	12,770,232	448·94 (29·29%)	1017·99 (66·41%)	66·035 (4·31%)	1532·94 (100%)	120·04

STATEMENT IV

State-wise waste water collection and situation in Class II Cities

Serial number	State	No. of Class II Cities		Population	Unsewered population	Sewered population	Total water supply (M.L.D.)	Vol. of waste water (M.L.D.)		
		Surveyed	Reply received					Generated	Collected	Treated
1	2	3	4	5	6	7	8	9	10	11
1	Andhra Pradesh ..	17	17	1,121,533	1,121,533	..	111·14	86·35	..	..
2	Assam ..	5	5	315,066	315,066	..	10·029	8·023	..	..
3	Bihar ..	9	9	609,563	609,563	..	66·68	53·34	..	..
4	Gujarat ..	18	18	1,223,887	1,063,888	159,999	118·80	95·04	20·00	20.40
5	Goa, Daman, Diu ..	1	1	59,258	29,629	29,629	7·50	6·00	2·00	3·00
6	Haryana ..	9	9	704,821	320,781	384,040	110·80	88·32	51·54	..
7	Himachal Pradesh ..	1	1	55,368	13,842	41,526	14·00	11·20	8·40	..
8	Karnataka ..	9	9	587,056	390,895	196,161	44·47	35·57	14·65	14·65
9	Kerala ..	7	7	463,704	463,704	..	57·87	46·30	..	..
10	Madhya Pradesh ..	14	14	870,877	816,955	53,922	145·97	116·77	25·42	11·53
11	Maharashtra ..	19	19	1,296,268	1,126,896	169,372	381·75	305·44	18·98	15·06
12	Orissa ..	1	1	72,674	72.674	..	8·50	6·80	..	..
13	Punjab ..	8	8	505,020	353,331	151,689	62·98	50·38	12·67	2·40
14	Rajasthan ..	7	7	488,251	465,741	22,510	52·84	42·27	2·30	..
15	Tamil Nadu ..	27	27	1,756,660	1,713,655	43,005	162·35	129·87	3·12	..
16	Uttar Pradesh ..	20	20	1,341,435	1,060,483	280,952	122·70	97·68	28·76	..
17	West Bengal ..	18	18	1,298,791	1,298,791	..	54·56	43·63	..	..
	Total ..	190	190	12,770,232	11,237,427 (88%)	1,532,805 (12%)	1832·94	1223·00 (100%)	188·84 (15·44%)	67·04 (5·48%)

Assessment of requirement of pipes for water supply and sanitation sector during 1979-80 and 1980-83

Serial number	Type of pipes	Requirement of pipes (In M.T.)												Price per M.T. of pipes in Rs.
		1979-80				1980-83				1980-83 (Annual Average)				
		R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total	R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total	R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	C.I. ..	84,000	1,46,240	2,438	2,32,678	3,82,400	5,65,480	9,426	9,57,306	1,27,440	1,88,480	3,142	3,19,062	2,500
2	A.C. ..	1,16,666	32,500	2,708	1,51,874	5,31,111	1,25,666	10,473	6,67,250	1,77,044	41,911	3,491	2,22,446	4,500
3	G.I. ..	35,000	6,100	..	41,100	1,59,333	23,566	..	1,82,899	53,100	7,850	..	60,950	6,000
4	P.V.C. (Polythene) LDPE & HDPE ..	6,563	4,569	380	11,512	29,875	17,672	1,472	49,019	9,963	5,891	490	16,344	16,000
5	Steel ..	..	8,133	..	8,133	..	31,422	..	31,422	..	10,467	..	10,467	4,500
6	P.S.C./Concrete..	..	1,12,462	89,071	1,99,533	..	4,35,000	3,36,642	7,71,642	..	1,45,000	1,12,214	2,57,214	700
7	Stoneware ..	..	..	40,633	40,633	..	..	1,57,100	1,57,100	..	..	52,366	52,366	900
	Total ..	2,42,229	3,10,004	1,33,230	6,85,463	11,02,719	11,98,806	5,15,113	28,16,638	3,67,547	3,99,599	1,71,703	9,38,849	

Assessment of requirement of pipes for water supply and sanitation sector during 1979-80 and 1980-83—(*cont.*)

Serial number	Type of pipes	Cost of Pipes (Rupees in Crores)												Present annual production capacity of pipes (in M.T.)	Remarks
		1979-80				1980-83				1980-83 (Annual Average)					
		R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total	R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total	R.W.S. schemes	Urban W.S. schemes	Urban sanitation schemes	Total		
		16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	C.I. ..	21·00	36·56	0·6095	58·1695	95·60	141·37	2·3665	239·3365	31·86	47·12	0·7855	79·7655	3,67,560*	For current year production is sufficient to meet the demand.
2	A.C. ..	52·50	14·625	1·219	68·344	239·00	56·55	4·713	300·263	79.67	18·86	1·571	100·101	1,27,000**	Production is not sufficient to meet even current year demand. Production is to be steped up to meet demand of current year as well as subsiquent years.
3	G.I. ..	21·00	3·66	..	24·66	95·60	14·14	..	109·74	31·86	4·71	..	36·57	6,00,000†	Production is sufficient to meet the demand. No need of further expansion.
4	P.V.C. (Polythene) LDPE & HDPE ..	10·50	7·31	0·6095	18·4195	47·80	28·275	2·3665	78·4415	15·94	9·425	0·7855	26·1505	22,000‡	Current year Production capacity of P.V.C. Pipes sufficient to meet current year demand provided resins are made available in time.
5	Steel ..	..	3·66	..	3·66	..	14·14	..	14·14	..	4·71	..	4·71	..	Production capacity is yet to be ascertained.
6	P.S.C./Concrete..	..	7·31	6·095	13·405	..	28·275	23·565	51·840	..	9·425	7·855	17·28	3,34,000x	Production is sufficient to meet current year demand.
7	Stoneware ..	..	..	3·657	3·657	..	..	14·139	14·139	..	..	4·713	4·713		
	Total ..	105·00	73·125	12·19	190·815	478·00	282·75	47·15	807·90	159·33	94·25	15·71	269·29		

NOTE: * Licensed and installed capacity. ** Licenced capacity is 1,02,000 M.T. the industry has the capacity to increase production by 25 per cent thus making total availability of 1,27,000 M.T. † Capacity available to manufacture 13,00,000 M.T., but actual production is 6,00,000 M.T. out of which assured supply is 5,00,000 M.T. per year. But all these Pipes are not available for W.S. schemes only about 15 per cent i.e. 5,00,000 × 0·15 = 75,000 M.T./year are available for W.S. schemes. Raw materials procurement are great problems for these Pipes by the manufacturers. ‡ 20,000 M.T. from organised sector and 2,000 M.T. from small scale sector. x Installed capacity is about double of the production capacity i.e. 3,34,000 × 2 = 6,68,000 M.T.

ANNEXURE III (iv)

Speech by Sri M. Dandapani, Special Secretary, Government of Kerala

I am very happy to participate in the All India Conference of Chief Engineers of Public Health Engineering. I extend my warm greetings to the delegates to this conference who have come from various parts of the country. The convening of this meeting at Trivandrum just before the beginning of the water supply and sanitation decade is of particular significance to us in Kerala where we look forward to more concerted efforts in improving water supply and sanitation arrangements especially in rural areas. Of the present estimated population of 26 millions in Kerala roughly 80 per cent live in rural areas and the remaining 20 per cent in urban areas. While 65 per cent of the urban population have access to drinking water supply, in rural areas hardly 25 per cent are served with reasonably safe drinking water supply. The position regarding sanitation facilities is even worse. Only the two cities viz Trivandrum and Cochin can boast of these facilities and even here only portions of the city are covered Rural water supply which is covered under the Minimum Needs Programme of the State Plan is our major concern, Unlike other States in India, our settlement pattern in rural areas is vastly different. There are no cluster of houses in villages. Decentralised garden land civilization obtaining in our State has created a scattered settlement of houses. This involves serious problems in extension of water supply and sanitary arrangements, adding of course to the cost of provision of these facilities. Having regard to the wide-spread salinity in coastal areas and low water table in upland areas, the need for providing safe drinking water to the large sections of the people who reside in rural areas cannot be over emphasised. Similarly, the rural urban continuum which one can see if one drives through Kerala, imposes the additional constraint that there is very little difference between rural and urban areas and with the result the expectation of the rural population is as high as the urban population.

Against this background our investment in rural water supply scheme continues to be below the requirements based on our needs. The physical and financial magnitude of the tasks ahead poses a big challenge and calls for swift and radical action. If the goal of the decade has to be achieved we have to work our specific action programmes, which will have to be split up into investment proposals, manpower arrangements, etc. On the resource side we need more money from financial institutions like LIC. We are also posing a few schemes for assistance from international agencies like the World Bank. These efforts are to be pursued with greater vigour if we are to achieve the goal of providing clean and safe water and sanitation to all by the end of the 1990.

Similarly adequate technological expertise and skills required for implementing a big programme like this has to be mobilised. The technical competence of the P.H.E.D. should be strengthened on the planning and design side. Fortunately we have no shortage of technical manpower in the State. What is required is to have a comprehensive Manpower Development Programme and upgrading the skill of the technical Manpower already available.

There are always constant shortages in respect of critical inputs like cement, steel, piping material, etc. These items should be anticipated and advance action taken if shortages of physical inputs do not hold up out programme. I am sure that this conference will deliberate on these aspects and help to prepare a national plan for the decade which will meet the aspirations of the people. I thank the organisers once again in giving me the opportunity to participate in the conference.