ITN

INTERNATIONAL TRAINING NETWORK FOR RURAL WATER & WASTE MANAGEMENT IN INDIA

I.T.N. CENTRE INDIA
ALL INDIA INSTITUTE OF HYGIENE AND PUBLIC HEALTH, CALCUTTA

QUARTERLY REPORT

2ND & 3RD QUARTER
(JULY TO SEPT & OCT TO DEC' 91)

A Joint initiative of : *Ministry of Rural Development, Government of India ; Government of the United Kingdom ; Government of the Netherlands ; United Nations Development Programme ; World bank ; All India Institute of Hygiene and Public Health, Calcutta.*

I.T.N. CENTRE, INDIA

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With Compliments from :

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INTERNATIONAL TRAINING NETWORK

FOR

RURAL WATER & WASTE MANAGEMENT IN INDIA

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I.T.N. CENTRE. INDIA

DEPARTMENT OF SANITARY ENGINEERING
AND
DEPARTMENT OF BIOCHEMISTRY & NUTRITION

ALL INDIA INSTITUTE OF HYGIENE AND PUBLIC HEALTH

CALCUTTA

CONTENTS

ANNEXURE

1.0. INTRODUCTION

1.1. THE GLOBAL FRAME WORK

The International Training Network for Water Supply and Waste Management (ITN) is a joint initiative of bilateral and multilateral development agencies in support of the goals of the International Drinking Water Supply and Sanitation Decade. Its principal objective is to promote needed improvements in both the effectiveness of water supply and sanitation investments and the extension of service coverage, particularly to low-income population groups in the urban fringe and rural areas of developing countries. Investments to benefit this user population must be directed towards the use of lower-cost technologies that are cost-effective, affordable, easily maintainable and culturally acceptable.

The Network will ultimately consist of at least 15 Centres located in established institutions in developing countries. The Network Centres are supposed to carry out training, dissemination of information and research activities on low-cost water supply and sanitation. Each Network centre is assisted in the technical, administrative and financial aspects by an Associated Institution. The Network's Coordination Unit, located in the World Bank, provides overall support for the Network. Network centres are operational in India, Indonesia, The Philippines, Kenya,Zimbabwe, Ghana, Brazil, among others.

1.2. I.T.N. IN INDIA

The training network forms a part of the national manpower development programme for rural water supply and sanitation in India. The Network Programme in India consists of "Participating Institution", which is the regional focal point in this training effort, and "Key Institution" which perform similar functions at the state or provincial level. The task of the participating institution is to train instructors of Training Institutions to teach the use of appropriate technology, to similarly train the trainers of sector agencies, consultants and NGO's. Socio-cultural and community participation aspects which are of great importance but often neglected, are particularly emphasised. Simultaneously, with the task of training the trainers, the Participating Institute also provides continuing education to professionals from sector agencies, like administrators, planners, public health engineers, social scientists, environmental scientists, chemists, health educators etc.

The Network was launched in India in 1988, with the All India Institute of Hygiene and Public Health, Calcutta designated as the Network Centre (participating Institute). The Department of Sanitary Engineering and Environmental

Sanitation in collaboration with the Department of Biochemistry and Nutrition of the Institute is carrying out the functional activities of the ITN Centre. The Ministry of Rural Development, (previously known as the Department of Rural Development, under the Ministry of Agriculture) Government of India has been co-ordinating in India as The Nodal Ministry. The International Training Network Programme in India is being funded by Government of United Kingdom and Netherlands. World Bank acts as the Global Co-ordinator of the Network Programme.

2.0. OBJECTIVE

2.1. GENERAL OBJECTIVE

The general objective of International Training Network is to sensitize decision makers,educate and train practising and student engineers and other field staff and teachers and trainers of engineering colleges and polytechnics in the low cost water supply and sanitation technologies, to promote multidisciplinary approach emphasising socio-cultural and health consideration in planning, implementation and maintenance of water supply and sanitation systems; to support collection and achieve dissemination of information in low cost technologies and their successful application; and to undertake research leading to further improvements in the cost effectiveness, large scale implementation and replication of basic water supply and sanitation programme.

2.2. SPECIFIC OBJECTIVE

The main tasks of the training network centre are -

- To develop information communications with the decision makers and to educate and to train practising engineers,student engineers, teachers & trainers in Engineering Colleges / Polytechnics and other field staff in the use of low cost appropriate water supply and sanitation technologies.

- To promote the introduction of a multi-disciplinary approach emphasising the socio-culture and health considerations in the planning, implementation and maintenance of water supply and sanitation system.

- To support the collection and dissemination of information on low cost technologies and their successful application.

- To undertake research leading to further improvements in cost-effectiveness large scale implementation and replication of basic water supply and sanitation programme.

3.0. ACTIVITY :

The training courses originally scheduled for 1991 included 17 training and faculty orientation courses, 4 mass awareness camps apart. Due to lack of time and proper flow of funds, 5 courses and 1 mass awareness camp were deferred. The revised activity chart for 1991 is given in Annexure - I. The number of participants scheduled in the postponed courses will be included in the courses of 1992.

Activities of the 1st quarter of 1991 have been reported in the First Interim Report (June'91). During the 2nd and 3rd quarters (July to December) six training courses for the inservice engineers and other professionals, one training course for trainers/instructors of polytechnics and one faculty orientation course for engineering colleges have been conducted. The summary sheet of activities of this period is given in Annexure - II. The schedule of activities for the year 1992 is given in Annexure - III.

3.1. Brief Report of Individual Courses :

3.1.1. Training Course for Practising Engineers and Other Professionals :

3.1.1.1. Health, Socio-Cultural and Communication Aspects of Rural Water Supply and Environmental Sanitation : (Two courses)

A. First Course : 5.8.91 to 10.8.91

Venue : ITN Conference Room, A.I.I.H. & P.H., Calcutta.

Participants :

Government Organisations :

PHED, Orissa	- 2
PHED, Madhya Pradesh	- 1
PHED, Nagaland	- 1
PHED, West Bengal	- 3
Maharashtra Water Supply & Sewerage Board	- 1
Calcutta Metropolitan Water & Sanitation Authority	- 3
Municipal Engineering Directorate,Calcutta	- 1
Budge Budge Gram Panchayat	- 1
Deptt. of Sanitary Engg. AIIH & PH	- 1
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NGOS

Womens' Coordinating Council, Calcutta	- 2
Paschim Banga Vigyan Mancha, Murshidabad District, West Bengal	- 1
	3
Total :	17

Status of the participants :

Sex	Working Area		Category	
Male - 15	West Bengal		Suptd. Enggr.	- 1
Female- 2	Calcutta	- 8	Execut.Enggr.	- 3
	Murshidabad	- 1	Asstt. Enggr.	- 5
	Budge Budge	- 1	Chemist /Biologist	-2
	Coochbehar	- 1	Sub Asstt. Enggr.	- 3
	Eastern Circle	- 1	Coordinator	- 1
		12	Health Educator	- 1
	Orissa	- 2	Lecturer	- 1
	Madhya Pradesh	- 1		
	Nagaland	- 1		
	Maharashtra	- 1		

Course Contents :

Health Aspects of Water Supply and Sanitation :

Classification of diseases related to water supply and sanitation; Routes of diseases transmission and control methods; Evaluating health impact of water supply and sanitation.

Socio-Economic and Communication Aspects :

Socio-economic survey - methods of data collection and analysis; planning communication supports in water supply and sanitation projects; participation of women in water supply programmes; Methods of planning and implementing hygiene education.

Water Quality Surveillance :

Methods of sampling from different sources of water; Water treatment procedures; Principal activities for initial and advanced levels of surveillance.

Methodology :

The course consisted of lectures by resource groups followed by discussions with the participants. All the lectures were supported by adequate audio-visual aids including appropriate audio-visual modules produced under the Word Bank publication on "Information and Training for Low-Cost Water Supply and Sanitation".

Special case study presentations were made and field visits were organised to the rural areas and to low cost pilot projects for rural water supply and sanitation.

Practical and field demonstrations were also organised during the course.

Resource Personnel :

		Topics
i)	Prof. K. J. Nath Prof. of Environmental Sanitation & Head,Deptt. of Sanitary Engineering A.I.I.H. & P.H.,Calcutta.	a) Technology options :- Health & Socio - Economic considerations. b) Principle and Objectives of Water Quality Surveillance
ii)	Prof. Indira Chakravarty Prof. & Head, Deptt. of Bio-chemistry & Nutrition, A.I.I.H. & P.H., Calcutta.	a) Water-Sanitation-Nutrition and Health linkage. b) Role of women in Rural Water Supply & Sanitation
iii)	Prof. A. K. Chakraborty Director-Prof & Head, Deptt. of Epidemiology,A.I.I.H.& P.H.	Transmission of water borne & excreta related diseases and its control.
iv)	Prof.A.K.Adhya Prof. of Sanitary Enginering, Deptt. of Sanitary Engineering, A.I.I.H. & P.H., Cal.	Role of NGO's & user's participation : A case study.
v)	Shri Arunabha Mazumdar Associate Prof., Deptt. of Sanitary Engineering, A.I.I.H. & P.H., Calcutta.	Water Quality Surveillance Strategy.
vi)	Dr. A. K. Poddar Head & Associate Prof. Deptt. of Health Education A.I.I.H.& P.H.	Hygiene education and Community Awareness Practice.
vii)	Dr. A. K. Kundu Instructor, I.T.N. A.I.I.H. & P.H. Calcutta.	Monitoring and Impact Evaluation

viii)	Shri Santanu Lahiri Project Officer cum Senior Instructor, ITN A.I.I.H. & P.H.,Calcutta.	Socio-Economic Survey and Data Collection.
ix)	Shri S. Lahiri, Dr.A.K.Kundu	Field Visit to village Singur for KAP survey and evaluation
x)	Shri A.Dutta, Shri N. Das	Practical Class : Demonstration of field kits and mobile laboratory
xi)	Ms. Aloka Mitra Hony. Secretary Women's Co-ordinating Council 5/1 Red Cross Place Calcutta - 700 062.	Socio-Cultural Aspects of Water Supply & Sanitation and it's impact.
xii)	Shri K. R. D. Mahapatra Programme Officer Luthern World Service (INDIA) 84, Suresh Sarkar Road Calcutta - 700 014.	Knowledge, attitude & Practice
xiii)	Dr. Aloke Sen Asstt. Station Director Dooradarshan Kendra, Calcutta Golf Green, Calcutta.	Planning of Communication Supports in Water and Sanitation Projects.
xiv)	Dr.S.S.Chakraborty Director, Ramakrishna Mission Lokasiksha Parisad, Narendrapur, South 24 Parganas, West Bengal.	Social Mobilization & People's Participation : A case Study Presentation.
xv)	Dr. V. P. Sharma Director, Malaria Research Centre, 22, Shamnath Marg, New Delhi - 110 054.	Bio-Environmental control of vector borne diseases.

B. <u>Second Course</u> : 11.12.91 to 16.12.91

Venue : I.T.N. Conference Room, A.I.I.H. & P.H., Calcutta.

Participants :

Government Organization :

C.M.W.S.A.	= 2
P.H.E.D. (W.B.)	= 2
Municipal Engineering Directorate	= 1
S.E. Railway	= 1
A.I.I.H. & P.H.	= 1
Panchayat Samity Murshidabad	= 4
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N.G.O.

Paschim Banga Vigyan Mancha	= 1
Total	12

Status :

Male	= 12
Female	= Nil

Working Area :

West Bengal	
Calcutta	= 6
Kharagpur	= 1
Murshidabad	= 5

Category :

Exe. Engineer	= 1
Asst. Engineer	= 4
Chief Health Inspector	= 1
Social Scientist	= 2
Panchayat Member	= 2
Panchayat Social Worker	= 2

Course Content & Methodology :

Course content and methodologies followed were the same as in the first course. In this course the participants prepared a questionaire for a KAP survey among villagers which was carried out at Singur.

This course was particularly interesting as there were Local Government representatives (Panchayat members) who interacted freely with the professionals (Engineers) and problems of rural water supply were looked into from different angles.

Resource Persons :

i)	Prof. K.J. Nath Prof. of Environmental Sanitation & Head, Deptt. of Sanitary Engineering. A.I.I.H. & P.H., Calcutta.	a) Technology Options : Health & Socio-economic Considerations. b) Principle and Objectives of Water Quality Surveillance. c) Role of NGOs and People's Participation.
ii)	Prof. Indira Chakravarty Professor and Head, Deptt. of Biochemistry & Nutrition A.I.I.H. & P.H. Calcutta.	a) Water-Sanitation-Nutrition & Health Linkage. b) Role of Women in Rural Water Supply and Sanition.
iii)	Mr. A. Majumder Associate Professor of Environmental Sanitation Deptt. of Sanitary Engg. A.I.I.H. & P.H. Calcutta.	Water Quality Surveillance Strategy.
iv)	Dr. A.K. Poddar Associate Professor & Head, Deptt. of Health Education, A.I.I.H. & P.H. Calcutta.	Hygiene Education & Community Awareness Practice.
v)	Dr. B. Sanjeeva Reddy Asstt. Professor, Behavioural Sciences, Deptt. of Health Education, A.I.I.H. & P.H. Cacultta.	Socio-cultural Aspects of Water Supply & Sanitation and its Impact.
vi)	Dr. S.K. Satpathy Associate Professor Deptt. of Epidemiology A.I.I.H. & P.H. Calcutta.	Transmission of Water Borne & Excreta Related Diseases and its Control
vii)	Dr. Krishna Mitra Asstt. Professor of Medical Social Work, Deptt. of Public Health Administration, A.I.I.H. P.H. Calcutta.	Knowledge, Attitude and Practice.
viii)	Mr. S. Lahiri Project Officer cum Senior Instructor, I.T.N. A.I.I.H. & P.H. Calcutta.	a) Socio-economic Survey & Data Collections. b) Field visit to village Singur for KAP survey and Evaluation.

ix)	Dr. A.K. Kundu Instructor, I.T.N. A.I.I.H. & P.H., Calcutta.	Monitoring and Impact Evaluation.
x)	Dr. Aloke Sen Asstt. Station Director Dooradarshan Kendra, Calcutta.	Planning of Communication Supports in Water Supply and Sanitation Projects.
xi)	Dr. S.S. Chakrabarty Director Ramakrishna Mission Lokasiksha Parisad.	Social Mobilisation and People's Participation : A Case Study Presentation
xii)	Shri S.B. Dey and Shri S.K. Dasgupta	Practical Class : Demonstration of field kits and mobile laboratory.

3.1.2. Operation & Maintenance of Rural Water Supply - Hand Pump : (Two Courses)

A. First Course : 26.8.91 to 31.8.91

Venue : I.T.N. Conference Room, A.I.I.H. & P.H.

Participants :

Government Organisations

PHED, Madhya Pradesh	- 2
PHED, Rajasthan	- 1
PHED, West Bengal	- 4
Maharashtra Water Supply & Sewerage Board	- 2
Calcutta Metropolitan Water & Sanitation Authority	- 3
Calcutta Metropolitan Development Authority	- 2
Chandannagar Municipal Corporation	- 1
Panchayat Raj, Dept. Andhra Pradesh	- 1
Total :	16

Status of the participants :

Sex	Working Area		Category	
Male - 16	West Bengal		Suptd. Enggr.	- 1
Female -Nil	Calcutta	- 5	Execut.Enggr.	- 8
	Coochbehar	- 1	Asstt. Enggr.	- 7
	Purulia	- 1		
	Tamluk	- 1		
	Chandannagar	- 1		
	Northern circle	- 1		
		10		

Madhya Pradesh	- 2
Maharashtra	- 2
Rajasthan	- 1
Andhra Pradesh	- 1

Course Content :

Water, Sanitation and Health :

Classification, description and transmission of water and excreta related diseases; the necessities and methodologies of hygiene education.

Technology Options :

Choice of community water supply technology and ground water evaluation; Handpump technologies; India Mark II Handpumps, Tara Hand Pumps, etc.

Operation and Maintenance :

Handpump project planning and implementation; Village Level Operation & Maintenance; Principles of pumping a water well; water quality surveillance.

Socio-economic Aspects :

Social feasibility analysis in rural water supply system; methods of socio-economic survey; participation of women in water supply sanitation programmes; hygiene education.

Methodology :

Generally the usual procedures were followed. The key point was the lively interaction between the participants and the resource personnel at the end of the lectures. Some case studies were presented on users' participation.

The field visit to Singur Rural Health Unit and Training Centre, A.I.I.H. & P.H., was of particular interest due to the demonstration installation of a local make handpump.

Resource Personnel :	Topics
i) Prof. K. J. Nath Prof. of Environmental Sanitation & Head,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	Sanitary protection & quality control

FIELD DEMONSTRATION

TARA HANDPUMP INSTALLATION
AT SINGUR

ii)	Prof. Indira Chakravarty Head, Deptt. of Biochemistry & Nutrition, A.I.I.H. & P.H.,Calcutta.	Water and Health
iii)	Prof.A.K.Adhya Professor , Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Shallow well type hand pumps b) Deep well type hand pumps c) Tara hand pump d) Village level O & M.
iv)	Shri Arunabha Mazumdar Associate Professor, Deptt. of Sanitary Engg., A.I.I.H. & P.H.,Calcutta.	a) Organisational aspects related to R.W.S. b) Users' participation & manpower developement.
v)	Dr. A.K.Poddar Associate Professor & Head, Deptt. of Health Education, A.I.I.H. & P.H.,Calcutta	Health and hygiene education
vi)	Shri D.Guin, Asstt. Prof.,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Construction of well-I b) Construction of Well-II c) Field visit to Singur
vii)	Shri D.Kahali Demonstrator,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	Community involvement specially role of women
viii)	Shri Santanu Lahiri Project Officer cum Senior Instructor, ITN, A.I.I.H. & P.H.,Calcutta.	Cost Analysis
ix)	Dr. S.P.Sinha Roy, Director,Central Ground Water Board, 24 B, Park Street,Calcutta.	Ground Water Exploration
x)	Shri Debu Dasgupta Adviser,National Drinking Water Mission,M.R.D., 25 A,Jatin Bagchi Road, Calcutta - 700 029.	a) India Mark II Hand Pump - 2 Classes b) Selection of pumps
xi)	Shri S.B.Dey, Consultant,N.D.W.M., A.I.I.H. & P.H.,Calcutta.	Disinfection of wells and tube wells

B. Second Course : 23.9.91 to 28.9.91.

Venue : I.T.N. Conference Room, A.I.I.H. & P.H. Calcutta.

Participants :

Government Organisations :

PHED, Madhya Pradesh	- 2
PHED, Rajasthan	- 1
PHED, West Bengal	- 5
PHED, Orissa	- 1
PHED, Andaman & Nicobar Island	- 2
Maharashtra Water Supply & Sewerage Board	- 2
Calcutta Metropolitan Water & Sanitation Authority	- 2
Calcutta Metropolitan Development Authority	- 1
Development Block, Budge Budge, W. Bengal	- 2
Total :	18

Status of the participants :

Sex	Working Area		Category	
Male - 17	West Bengal			
Female - 1	Calcutta	- 5	Execut.Enggr.	- 2
	Coochbehar	- 1	Asstt. Enggr.	- 8
	Murshidabad	- 1	Sub-Asstt. Enggr.	- 7
	Tomluk	- 1	Chemist	- 1
	Budge Budge	- 2		
		10		
	Madhya Pradesh	- 2		
	Maharashtra	- 2		
	Rajasthan	- 1		
	Andaman & Nicobar	- 2		
	Orissa	- 1		

Course Content :

Course Contents were the same as in the First Course.

Methodology :

The methodologies followed, the audio-visual presentations and the field demonstrations were similar to the first course.

Resource Personnel :

		Topics
i)	Prof.A.K.Adhya Professor, Deptt. of Sanitary Engineering, A.I.I.H. & P.H., Calcutta.	a) Shallow well type hand pumps b) Deep well type hand pumps c) Tara hand pump d) Village level O&M e) Field Visit to Singur
ii)	Shri Arunabha Mazumdar Associate Professor Deptt. of Sanitary Engg. A.I.I.H. & P.H., Calcutta.	a) Organisational aspects related to Rural Water Supply b) Users' participation & manpower development
iii)	Dr. A.K.Poddar Associate Professor & Head, Deptt. of Health Education, A.I.I.H. & P.H.,Calcutta	Health and hygiene education
iv)	Shri D.Guin Asstt. Prof.,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Construction of well-I b) Construction of Well-II
v)	Shri D.Kahali Demonstrator,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	Community involvement specially role of women
vi)	Shri Santanu Lahiri Project Officer cum Senior Instructor, ITN, A.I.I.H. & P.H.,Calcutta.	Cost Analysis
vii)	Dr. S.P.Sinha Roy, Director,Central Ground Water Board. 24 B, Park Street,Calcutta.	Ground Water Exploration
viii)	Shri Debu Dasgupta Adviser,National Drinking Water Mission,D.R.D., 25 A,Jatin Bagchi Road, Calcutta - 700 029.	a) India mark II Hand Pump - 2 Classes b) Selection of pumps - 2 Classes
ix)	Shri S.B.Dey, Adviser,N.D.W.M., A.I.I.H. & P.H., Calcutta.	Disinfection of wells and tube wells

3.1.1.3. Low Cost Sanitation : (Two Courses)

A. First Course : 2.9.91 to 7.9.91

Venue : I.T.N. Conference Room, A.I.I.H. & P.H. Calcutta.

Participants :

Government Organisations :

PHED, Orissa	- 1
PHED, Madhya Pradesh	- 1
PHED, Nagaland	- 1
PHED, West Bengal	- 4
PHED, Rajasthan	- 1
Calcutta Metropolitan Water & Sanitation Authority	- 2
Calcutta Metropolitan Development Authority	- 1
Andhra Pradesh Mandal Praja Parishad	- 1
Total :	12

Status of the participants :

Sex	Working Area		Category	
Male - 12	West Bengal		Suptd. Enggr.	- 1
Female -Nil	Calcutta	- 6	Execut.Enggr.	- 1
	Murshidabad	- 1	Asstt. Enggr.	- 8
		7	Sub-Asstt. Enggr.	- 2
	Orissa	- 1		
	Madhya Pradesh	- 1		
	Nagaland	- 1		
	Rajasthan	- 1		
	Andhra Pradesh	- 1		

Course Content :

Concept of Sanitation :

Environmental Sanitation Status; Determining Priorities in Sanitation; Integrated Approaches in Sanitation.

Health Aspects :

Water and excreta related diseases - their transmission and control; Necessities and approaches to hygiene education.

Technological Aspects :

Technology options of rural sanitation; Different types of latrines - their components, design, construction & costings; small bore sewer system, community latrines and land application of waste water.

Operation and Maintenance :

Operation and Maintenance of Low Cost Latrines; Social feasibility analysis; Pollution aspects of pour flush pit toilets :

Resource Recovery :

Biogas, Aquaculture, composting and its public health aspects.

Methodology :

The usual methodologies were followed. During the field visit the participants were taken to Singur Rural Health Unit & Training Centre, All India Institute of Hygiene and Public Health and shown the construction of two pit pour flush latrine.

Resource Personnel :

		Topics
i)	Prof.A.K.Chakrabarty, Director-Professor & Head, Deptt. of Epidemiology, A.I.I.H. & P.H.,Calcutta	Health aspect of water and sanitation
ii)	Prof.A.K.Adhya, Professor , Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Concept of sanitation & present status of excreta disposal b) Criteria of selection for the sanitary technology c) On site sanitation technology option d) Ground water & soil pollution from on site sanitation. e) Operation & Maintenance of community latrine f) Liberation & rehabilitation of scavengers
iii)	Shri Arunabha Majumdar, Associate Professor, Deptt. of Sanitary Engg., A.I.I.H. & P.H.,Calcutta.	a) Off site sanitation technology option : Low cost sewage treatment b) Resource recovery : Biogas/composting/aqua-culture

iv)	Shri D.Guin, Asstt. Prof.,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	On site sanitation technology option : Aqua privy & septic tank
v)	Shri D.Kahali Demonstrator,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	Off site sanitation technology option : Sewarage & drainage.
vi)	Ms.Aloka Mitra Hony. Secretary,Womens' Coordinating Council 5/1A Red Cross Place, Cal-62.	Socio-cultural aspects of rural sanitation
vii)	Prof. N. Mazumdar Former Prof. & Head, Deptt. of Sanitary Engg. AIIH&PH Former Director, NEERI 48/60 Swiss Park, Cal-33.	Onsite sanitation tech- nology option : Conven- tional pit latrine,bore hole latrine, dug well latrine,VIP latrine.
viii)	Shri R. M. Chatterjee Suptd. Enggr.,CMW & SA. 32A B.B.D. Bag, Calcutta.	On site sanitation technology option : Pour flush latrine design & construction
ix)	Shri Bibhas Chakrabarty Executive Enggr., CMW & SA	Land application of waste water
x)	Shri S.K.Neogy Member,Municipal Assessment Tribunal, Calcutta Municipal Corporation, 36 Ballygaung Circular Road, Cal-19.	Materials & construction cost analysis of latrines
xi)	Dr.Aloke Sen Asstt. Station Director, Dooradarshan Kendra, Calcutta.	Community education : Users' participation Role of Women
xii)	Shri B.K.Sengupta, Addl. Director-in-charge, M.D.P.Sector, C.M.D.A.,6-A Raja Subodh Mallick Square, Cal-13.	Project planning, insti- tutional development & financing of low cost sanitation.
xiii)	Shri Santanu Lahiri and Dr. A. K.Kundu.	Field Visit To Singur

B. Second Course : 4.12.91 to 9.12.91

Venue : I.T.N. Conference Room, A.I.I.H. & P.H.

Participants :

Government Organisations :

P.H.E.D. Orissa	- 1
C.M.W.S.A.	- 2
S.E. Railway	- 1
A.I.I.H. & P.H.	- 3
W.H.O. Fellow (Burma)	- 1
	8

N.G.O.

Paschim Banga Vigyan Mancha (Murshidabad)	- 2
Total :	- 10

Status of Participants :

Sex	Working Area		Category	
Male = 9	West Bengal		Executive Engineer	- 1
Female = 1	Calcutta =	6	Asst. Engineer	- 3
	Murshidabad =	2	Chief Health Inspector	- 1
	Orissa =	1	Social Scientist	- 1
	Burma =	1	Draftsman	- 3
			Social Worker	- 1

Course Content & Methodology :

Course content and methodologies were same as in the first course. In the field visit the participants were demonstrated the construction of pan and trap of a two pit pour flush latrine at Singur.

Resource Persons :

	Topics
i) Prof. K.J. Nath Professor of Environmental Sanitation & Head, Deptt. of Sanitary Engineering A.I.I.H & P.H. Calcutta.	a) Criteria of Selection for the Sanitary Technology b) Ground Water & Soil Pollution from On-site Sanitation c) Liberaton & Rehabilitation of Scavengers.

ii)	Prof. Indira Chakravarty Professor & Head, Deptt. of Biochemistry & Nutrition, A.I.I.H. & P.H. Calcutta.	Water and Health
iii)	Prof. A.K. Chakrabarty Director-Professor and Head, Deptt. of Epidemiology A.I.I.H. & P.H. Calcutta	Transmission of Water Borne & Excreta Related Diseases and its Control
iv)	Prof. A.K. Adhya Professor of Sanitary Engg. A.I.I.H. & P.H., Calcutta.	a) Concept of Sanitation and Present Status of Excreta Disposal b) On-site Sanitation Technology Options : Pour Flush Latrine c) Operation & Maintenance of Community Latrine
v)	Mr. A. Majumder Associate Professor Deptt. of Sanitary Engg. A.I.I.H & P.H., Calcutta.	a) Low Cost Sewage Treatment b) Resource Recovery : Biogas/composting/Aqua culture
vi)	Shri D. Kahali Demonstrator Deptt. of Sanitary Engg. A.I.I.H. & P.H., Calcutta.	Off-site Sanitation Technology Option : Sewerage & Drainage and Small Bore Sewer System.
vii)	Shri S.K. Dey Asstt. Engineer, Singur	Demonstration of different types of latrine models and construction of pan & trap for two pit pour flush latrine.
viii)	Shri B. Chakrabarty Executive Engineer C.M.W. & S.A.	Land Application of Waste Water
ix)	Prof. N. Majumder Former Director, NEERI	On-site Sanitation Technology Options
x)	Shri R. M. Chatterjee Suptd. Engineer C.M.W. & S.A.	Design & Construction of Pour Flush Latrine
xi)	Shri S.K. Neogy Member Municipal Assessment Tribunal, C.M.C.	Materials and Construction Cost Analysis of Latrines

xii)	Dr. Aloke Sen Assistant Station Director Science Division Calcutta Dooradarshan	Community Education & Users' Participation
xiii)	Shri B.K. Sengupta Addl. Director-in-Charge M.D.P. Sector, C.M.D.A.	Project Planning, Institution Development & Financing of low cost sanitation

3.1.1.4. Operation and Maintenance of Rural Water Supply Scheme - Gravity Feed Water Supply and Rain Water Harvesting : (16.9.91 to 21.9.91)

Venue : I.T.N. Conference Room, A.I.I.H. & P.H., Calcutta.

Participants :

Government Organisations :

PHED, Orissa	- 1
PHED, Punjab	- 2
PHED, Rajasthan	- 1
PHED, West Bengal	- 3
PHED, Nagaland	- 1
Maharashtra Water Supply & Sewerage Board	- 3
Calcutta Metropolitan Water & Sanitation Authority	- 3
Panchayat Raj. Deptt., Andhra Pradesh	- 2
Municipal Engineering Directorate, West Bengal	- 1
Total :	17

Status of the participants :

Sex	Working Area		Category	
Male - 17	West Bengal		Dy. general Enggr.	- 1
Female -Nil	Calcutta	- 6	Execut.Enggr.	-10
	Cooch Behar	- 1	Asstt. Enggr.	- 6
		7		
	Orissa	- 1		
	Punjab	- 2		
	Nagaland	- 1		
	Rajasthan	- 1		
	Andhra Pradesh	- 2		
	Maharashtra	- 3		

Course Content :

Introduction to G.F.S. :

Components of the System and its Advantages and Disadvantages.

Health Aspects :

Diseases related to Water and Excreta - Their Transmission Routes and Methods of Control; Hygiene Education - its necessities and approaches.

Technical Aspects :

Types of G.F.S.; Different Elements of GFS and their design considerations; Rain water harvesting.

Disinfection :

Procedures for disinfection of gravity feed systems, sampling methods and monitoring.

Methodology :

The usual methodologies were followed. This training course was particularly noticeable as the participants were mostly senior engineers from different states of India, and everybody were exposed to widely variant types of experiences. There was one full day field visit to a Water Treatment Plant. The participants came up with various suggestions during evaluation in the concluding session.

Resource Personnel :

		Topics
i)	Prof. B.N.Ghosh Director, A.I.I.H. & P.H.,Calcutta.	Community participation
ii)	Prof.A.K.Chakrabarty, Director-Professor & Head, Deptt. of Epidemiology, A.I.I.H. & P.H.,Calcutta	Health aspect of water and sanitation
iii)	Prof.A.K.Adhya, Professor, Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Construction, operation & maintenance of Break pressure tank and public tap stand. b) Rain water roof catchment system. c) Design, construction and O&M of rain water roof catchment system.

		d) Role of NGOs.
iv)	Shri Arunabha Majumdar, Associate Professor, Deptt. of Sanitary Engg., A.I.I.H. & P.H.,Calcutta.	a) Water quality and need for surveillance. b) Design, construction & maintenance of sedimentation tank. c) Design, construction & maintenance of Slow Sand Filter.
v)	Shri D.Guin, Asstt. Prof.,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	a) Sources of water & its protection and intake works and its maintenance. b) Reservoir tank : design, construction and O&M. c) Pipe line design. d) Construction and O & M of pipeline.
vi)	Shri D.Kahali Demonstrator,Deptt. of Sanitary Engineering, A.I.I.H. & P.H.,Calcutta.	Design, construction and O & M of community catchment areas for rain water harvesting.
vii)	Dr. B.Meerabai Asstt. Professor, Department of Sanitary Engg., A.I.I.H. & P.H.,Calcutta.	Disinfection
viii)	Dr. A.K.Kundu Instructor,ITN, Deptt. of Sanitary Engg., A.I.I.H. & P.H.,Calcutta.	Socio-economic aspects of village level maintenance.
ix)	Shri R. M. Chatterjee Suptd. Enggr.,CMW & SA.	Pipe materials
x)	Shri B.K.Sengupta Additional Director-in-Charge, M.D.P. Sector, C.M.D.A., 6A Raja Subodh Mallick Square, Cal-13.	Institutional & organisational aspects of village level operation & maintenance.
xi)	Shri S. Lahiri and Shri A.K.Dey	Field Visit to Belur Water Treatment Plant.
xii)	Shri S.K. Sarkar and Smt. Sita Chatterjee	Practical class on Water Quality Testing and demonstration of field kit.

3.1.2. Training Course for Trainers/Instructors of Polytechnics & Community Polytechnics of West Bengal on Rural Water & Waste Management : (3.9.91 to 12.9.91)

Venue : Technical Teachers Training Institute, Salt Lake City Calcutta.

Participants :

Sree Ramakrishna Silpa Vidyapith, Suri, Birbhum	- 1
Murshidabad Institute of Technology, Berhampore	- 1
Hooghly Institute of Technology, Hooghly	- 2
Ramakrishna Mission Shilpamandira (Community Polytechnic), Belur Math, Howrah	- 1
Jagadish Chandra Polytechnic, Berachampa, North 24 Paraganas	- 1
J.C. Ghosh Polytechnic, South 24 Paraganas	- 1
I.C.V. Polytechnic, Jhargram, Midnapore	- 1
B.P.C. Institute of Technology, Krishnanagar, Nadia	- 1
	9

Status of the participants :

Sex	Working Area		Category	
Male - 9	West Bengal		Associate Prof.	- 1
Female -Nil	Calcutta	- 1	Lecturer	- 8
	Hooghly	- 1		
	Howrah	- 1		
	Birbhum	- 1		
	Murshidabad	- 1		
	North 24 Para -ganas	- 1		
	South 24 Para -ganas	- 1		
	Nadia	- 1		
	Midnapore	- 1		

Course Contents :

Health Aspects of Water Supply and Sanitation :

Classification, transmission and control of water and excreta borne diseases; Pollution aspects of on-site sanitation; Necessities and approaches to hygiene education.

Technological Aspects of Water Supply :

Technological options in rural settings; Handpump technologies and India Mark II handpumps; Methods of disinfection; Water quality surveillance.

Technological Aspects of Sanitation :

Technological Options; VIP Latrines and Pour Flush toilets; Operation and Maintenance of Latrines; Community Latrines; Resource Recovery and its Public Health Aspects.

Socio-economic aspects of water supply and sanitation :

Socio-economic surveys; Planning communication support in water supply and sanitation projects; Role of women.

Methodology :

This training course for trainers was organised with the supportive efforts of Technical Teachers Training Institute, Calcutta. It was attended by lecturers of Polytechnic and Community Polytechnics of West Bengal.

The course consisted of lectures by resource groups followed by discussions with the participants. All the lectures were supported by adequate audio-visual aids including appropriate audio-visual modules produced under the Word Bank publication on "Information and Training for Low-Cost Water Supply and Sanitation".

Special case study presentations were made and field visits were organised to the rural areas and to low cost pilot projects for rural water supply and sanitation.

Practical and field demonstrations were also organised during the course.

Resource Personnel :

a) Prof. A.K.Adhya, Prof. of Sanitary Engineering, Deptt. of Sanitary Engineering, A.I.I.H. & P.H., Calcutta.
b) Shri A. Majumdar, Associate Professor, Deptt. of Sanitary Engineering, A.I.I.H. & P.H., Calcutta.
c) Prof. N. Majumdar, Former Prof. of Sanitary Engineering and Former Director, NEERI.
d) Dr.A.K.Poddar,Associate Professor & Head,Deptt. of Health Education, A.I.I.H. & P.H., Calcutta.
e) Prof. P.K. Bhattacharjee, Prof. & Incharge of Community Polytechnics, T.T.T.I., Calcutta.

f) Ms Aloka Mitra, Hony Secretary, Women's Coordinating Council.
g) Shri S.B. Dey, Consultant, N.D.W.M., A.I.I.H. & P.H.
h) Shri P.K. Chatterjee, Consultant, Sulabh International.

Topics :

1) Curriculam design : Basic issues & existing status
2) Need for the trainers
3) Water, waste & health aspects
4) Need for alternate technology
5) Role of Community Polytechnics in Rural Water Supply & waste Disposal
6) Modalities of technology transfer in R.W.S. & W.D.
7) On-site sanitation
8) Low cost sanitation system
9) Water quality monitoring
10) Users' participation - Role of women
11) Wells & hand pumps
12) Off-site sanitation
13) Sanitation technology selection
14) Educational communication
15) Co-ordination & community participations
16) Hygiene education
17) Socio-economic & behavioural components
18) Role of nodal agencies
19) Water quality surveillance & sanitary survey
20) Role of training institutions
21) Media utilisation & soft ware development
22) Development of human resource modalities & organisations
23) Pollution control & solid waste management
24) Project preparation & management
25) Operation & maintenance of R.W.S. & W.D.
26) Organisation & management of competency based non-formal training in R.W.S. & E.S.

3.1.3. Faculty Orientation Course for Engineering Colleges on Rural Water and Waste Management : 19.12.91 to 24.12.91

Venue : I.T.N. Conference Room, A.I.I.H. & P.H. Calcutta.

Participants :

The participants of this Faculty Orientation Course were Senior Teachers (Professors, Associate Professors and Assistant Professors) of Engineering Colleges of West Bengal and Senior Members of Institution of Engineers and Institution of Public Health Engineers.

Course Content :

Health Aspects :

Water and Excreta Related Diseases : Disease description, transmission and control, pollution aspects of on-site sanitation.

Technological Aspects of Water Supply :

Technological options in rural settings; Handpump technologies and India Mark II handpumps; Methods of disinfection; Water quality surveillance.

Technological Aspects of Sanitation :

Technological Options; VIP Latrines and Pour Flush toilets; Operation and Maintenance of Latrines; Community Latrines; Resource Recovery and its Public Health Aspects.

Social and Communication Aspects :

Modification of technology transfer; Planning communication support in Rural Water Supply and Sanitation; Social mobilisation and communication support; Scope of introducing appropriate and low cost technologies in the curricula in the context of existing and future national programme.

Methodology :

This course was essentially meant for orientation and sensitisation of the faculty members of engineering colleges towards low cost technologies, appropriate for the actual needs of rural India. Essentially, the renowned resource persons delivered lectures on topics which initiated debates and discussions among the participants.

All the lectures were supported by adequate audio-visual aids including appropriate audio-visual modules produced under the Word Bank publication on "Information and Training for Low-Cost Water Supply and Sanitation".

Special case study presentations were made and field visits were organised to the rural areas and to low cost pilot projects for rural water supply and sanitation.

An interesting part of the course was the audio-visual presentation by Dr. V.P. Sharma on the subject of Bio-environmental Control of Vector Borne Diseases particularly of Malaria.

In the concluding session the participants joined a round table discussion along with other invited experts of different fields on the Need for Changes in the curricula of under graduate engineering courses.

Resource Persons :

i)	Prof. K.J. Nath Professor & Head Deptt. of Sanitary Engg. A.I.I.H. & P.H., Calcutta.	a) Water Quality Surveillance. b) Pollution aspects of On-site Latrines.
ii)	Prof. Indira Chakravarty Professor & Head, Deptt. of Biochemistry & Nutrition A.I.I.H. & P.H. Calcutta.	Participation of Women in Water Supply & Sanitation Programme.
iii)	Prof. B. N. Ghosh Director A.I.I.H. & P.H. Calcutta.	Health and Hygiene Education.
iv)	Prof. A.K. Adhya Professor of Sanitary Engg. A.I.I.H. & P.H., Calcutta.	a) Modification of Technology Transfer b) Technology Options in Rural Water Supply.
v)	Prof. N. Majumder Former Director NEERI	Technology Options for Low Cost Sanitation
vi)	Shri A.K. Sengupta Deputy Adviser, Ministry of Rural Development Government of India	Scope of Introducing Appropriate and Low Cost Technologies in the curricula in the Context of Existing and Future National Programme. - 2 Classes
vii)	Dr. V.P. Sharma Director Malaria Research Centre	Bioenvironmental Control of Vector Borne Diseases - 2 Classes.
viii)	Shri Y.D. Mathur Zone Representative UNICEF, Calcutta.	Social Mobilisation and Community Support
ix)	Dr. S.P. Sinha Roy Director, Central Ground Water Board	Ground Water Exploration
x)	Shri D. Dasgupta Adviser National Drinking Water Mission	India Mark II Handpump

xi)	Dr. Aloke Sen Asstt. Station Director Doordarshan Kendra, Calcutta.	Planning of Communication Support
xii)	Shri S.B. Kundu Former Chief Engineer P.H.E.D., West Bengal.	Handpump Technology - Maintenance & Management
xiii)	Shri P.K. Chatterjee Consultant, Sulabh International.	Two Pit Pour Flush Latrine

Round Table Discussion on Need for Changes in the Curricula of Engineering Colleges : 24.12.91

A round table discussion was held to discuss the need for changes in the curricula of engineering colleges. It was chaired by Prof. N. Majumder, Former Professor of Sanitary Engineering of A.I.I.H. & P.H. and Former Director, NEERI, and the participants included faculty members of undergraduate and post-graduate engineering colleges of West Bengal, Senior Members of Institution of Engineers (India) and Institution of Public Health Engineers (India) and experts from different fields. The list of participants of the round table discussion is given in Annexure - IV. For convenience the discussion was limited to undergraduate syllabus of engineering colleges.

While all the participants including the experts felt the need for reorientation of the course curricula, the faculty of I.I.T. Kharagpur, B.E. College - Sibpur and R.E. College - Durgapur pointed out that there was already some scope in the syllabi to devote more time in the teaching of low cost appropriate technologies, but that the students were reluctant to study these subjects and were more inclined to sophisticated "high tech" subjects.

On the whole, however, the participants agreed on the need for reorienting the approach and for alterations in the curricula. Several suggestions were put forward which included (i) specific changes in the curricula to give more stress on subjects dealing with rural water and sanitation, (ii) Summer camps and reorientation courses for the undergraduate students with appropriate field excercises and (iii) preparation of suitable modules on these subjects for engineering students.

ROUND TABLE DISCUSSION ON NEED FOR CHANGES
IN THE CURRICULA OF ENGINEERING COLLEGES
[24.12.1991]

3.1.4. Workshop of Key Institutions for the International Training Network : 2.7.91 to 5.7.91

Objective :

a) To review the activities of the I.T.N. Centre and Key Institutes in India.

b) To review the course curricula and to suggest various ways of improving the same, including the use of audio-visual aids.

c) To prepare recommendations on the various aspects of future activities and scopes of I.T.N. and Key-Institutes.

Proceedings :

The workshop, which was attended by various representatives of key institutes of ITN India, Coordinator and Joint Coordinator of the participating Institute, Foreign and Government of India representatives studied the various aspects of I.T.N. Programme in India (The participant list is supplied in Annexure - V). Both the present and future activities were discussed along with the role of various institutions namely D.R.D., National Coordination Committee, I.T.N. Centre, Key Institutions etc. On the 3rd day of the workshop, the participants divided themselves into smaller working groups. The working group reports were placed on the final day followed by the discussions on each report. Finally, the recommendations of the workshop were presented.

Recommendations of the Workshop :

1. The areas to be covered by the Institutions shall be as follows :

a. The All India Institute of Hygiene and Public Health, Calcutta (Network centre): Bihar, Orrissa, Sikkim, West Bengal and the Andaman and Nicobar Islands;

b. Sri Jayachamarajendra College of Engineering,Mysore and Gandhigram Rural Institute, Gandhigram, Madurai (Key Institution) : Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Pondichery and Tamil Nadu;

c. Gujrat Jalseva Training Institute Gandhinagar and Safai Vidyalaya ESI Ahmedabad (Key Institution) : Daman and Diu, Goa, Gujarat, Madhya Pradesh, Maharashtra and Rajasthan;

d. Motilal Nehru Regional Engineering College and Institute of Engineering and Rural Technology, Allahabad (Key Institution) : Chandigarh, Delhi, Haryana, Himachal, Jammu and Kashmir, Punjab, Uttar Pradesh.

A further Key Institution shall be selected to cover Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. (The Network Centre and Key Institutions are the Network Institutions)

2. The Network shall be concerned with training, research and development of training material, relating to appropriate technology of rural supply and sanitation and relevant software such as health and disease, management, community participation, operation and maintenance and the role of women.

3. Topics which are suitable for including in courses offered by the Network Institutions are given in Annexure - VI.

4. The courses to be provided by the Network Institutions may include the following :

a. Courses for academic staff of Colleges of Engineering should be offered by all Network Institutions.

b. Network Institutions may collaborate with Technical Teachers' Training Institutes for courses for staff of institutions training sub-professionals and community workers.

c. Network Institutions may provide courses for training engineering and other professional staff of PHEDs, rural development and other allied departments and local bodies.

d. Depending on local conditions Network Centres may provide courses for trainers of community workers, including those in non-government organizations and the Integrated Child Development Service. Training for these groups shall be limited to trainers.

5. Courses for trainers should include instruction in training methodology. The format and content of courses should be standardized and should include an introduction of 'awareness' and elements of management.

6. Orientation of Network staff should be undertaken nationally at the top level and should include the following :

a. an orientation workshop at one of the Network Institutions for staff from all Institutions, with resource persons from the Associate Institution (the "expatriate institution' - the Water, Engineering and Development Centre (WEDC));

b. courses at the individual Network Institutions with assistance and guidance in both preparation and presentation from the Associate Institution and visits to Network Institutions by the Associate Institution for planning programmes, discussing activities and monitoring progress;

c. 'refresher' workshops for staff of all Network Institutions nationally from time to time.

There should be regular meetings of staff of Network Institutions and regional (that is, south Asian) activists of ITN such as meetings of Directors.

7. It was noted that a national seminar for very senior decision-makers had been approved by the NCC for the end November with inputs by RWSG - SA and the Associate Institution. Regional seminars for other decision-makers and for State curriculum-makers may be organized by Network Institutions.

8. Training materials to be used by all Network Institutions in their ITN courses should be developed to ensure high standards and to avoid the duplication of effort that would be inevitable if individual Institutions prepare their own materials. The materials might include notes for course participants, additional notes for instructors, case studies, slides, transparencies (for showing on overhead projectors), sound tapes and videos. These materials should normally be used by all Network Institutions.

9. Notes and other materials should be specifically relevant to the Indian situation and should be supplemented by materials prepared by individual Institutions in both English and local languages. Good material already produced in India by UNICEF and other organizations should be incorporated when appropriate.

10. A start should be made immediately to produce good printed 'notes for participants' for some modules to be included in courses at all Institutions. The notes should be printed on A4 size paper and should use 'MKS' units. An Expert Committee from the Network Institutions should be formed to prepare standardized training material as quickly as possible.

11. A small working group should be constituted to consider proposals for research submitted by Network Institutions.

12. Resources for the implementation of programmes of the Network Institutions should be made available as quickly as possible.

13. The National Network Coordinating Cell should be made functional as soon as possible so that proper coordination amongst Network Institutions can be effective.

3.1.5. Seminar on "Drinking Water Supply Decade in West Bengal - A Retrospective Analysis

A seminar was organised on 10th December, 1991 at Sir R. N. Mukherjee Hall of Institution of Engineers (India) Calcutta. This programme was organised by Institution of Engineers (India) in collaboration with ITN Centre, All India Institute of Hygiene and Public Health, Calcutta.

Objective :

The objective of the seminar was to examine in retrospect the following aspects of the Drinking Water Supply Decade in the context of West Bengal :

- The goals set out in the Master Plan at the onset of the Decade
- Areas not covered by the Decade Master Plan
- The fiscal and organisational resources which would have been necessary to fulfill the said goals
- The resources which were actually available
- What has been achieved during the Decade
- The gap between the initial goals and achievements
- Were the available resources optimally utilised
- Achievements in West Bengal vis-a-vis other States
- The lessons of the Decade
- A programme for the future

Participants :

About 150 professionals from the field of Public Health and Environmental Engineering from different states of India, participated in the Seminar.

3.1.6. Mass Awareness Camp on Safe Drinking Water and Environmental Sanitation : 1.7.91 to 5.7.91

Venue : Vivekananda Pally Seva Sansthan, Ballydewangunj, Hooghly.

Participants :

There were 29 health workers and social service activists from various organisations.

Course Content and Methodology :

This camp was organised in collaboration with Ramakrishna Mission Samaj Sevak Sikshanamandira, Belur Math, West Bengal. The participants were village level community organisers, actively involved in water supply and sanitation activities. The discussions were held in the local language (Bengali) and the topics discussed centered around the need and approaches to rural water supply and environmental sanitation, their health aspects etc. The participants also carried out a survey in some adjoining villages to identify specific problems of water supply and sanitation.

Resource Persons :

Resource persons for this camp were both from ITN Centre and Ramakrishna Mission Sevak Sikshanamandira.

4.0. Course Materials :

As part of the training activities, the following course materials have been developed for each of the courses for distribution among the participants :

1) Low Cost Sanitation.

2) Water Quality Surveillance

3) Health, Socio-cultural and Communication Aspects of Rural Water Supply & Environmental Sanitation.

4) Operation and Maintenance of Rural Water Supply - Hand Pump.

5) Operation and Maintenance of Rural Supply Scheme - Gravity Feed Water Supply and Rain Water Harvesting.

6) Rural Water Supply and Waste Management for Trainers/Instructors of Polytechnics and Community Polytechnics.

7) Rural Water and Waste Management for Faculty Orientation Course of Engineering Colleges.

The materials are still being modified for further improvements. It is expected that the final edition of the written materials will be ready by the end of 1992 and will be published from I.T.N. Centre, India.

5.0. Newsletter :

International Training Network Centre, India at the All India Institute of Hygiene and Public Health is publishing a quarterly Newsletter for dissemination of information among the professional engineers, scientists, administrators, programme managers.

The first issue of the Newsletter was published in August'91 and was widely circulated among various individuals and organisations in India and abroad. The second issue was delayed due to unavoidable reasons and is due to be published in January, 1992.

6.0. Research Activities :

The manpower development programme of the ITN participating institute (AIIH&PH) include R & D activities for the development of appropriate technologies on water and waste management. Though the I.T.N. budget does not have specific provision for applied research, I.T.N. Centre is planning to take up a few studies under the sponsorship of different agencies. The Centre is also benefitted by the on-going research activities of the Institute.

6.1. On-going Research :

The following is a list of on-going research projects related to water supply and sanitation :

1. Conservation and Utilisation of Traditional Surface Water Sources in Rural Bengal.

2. Development of Appropriate Field Model for Arsenic Removal from Ground Water.

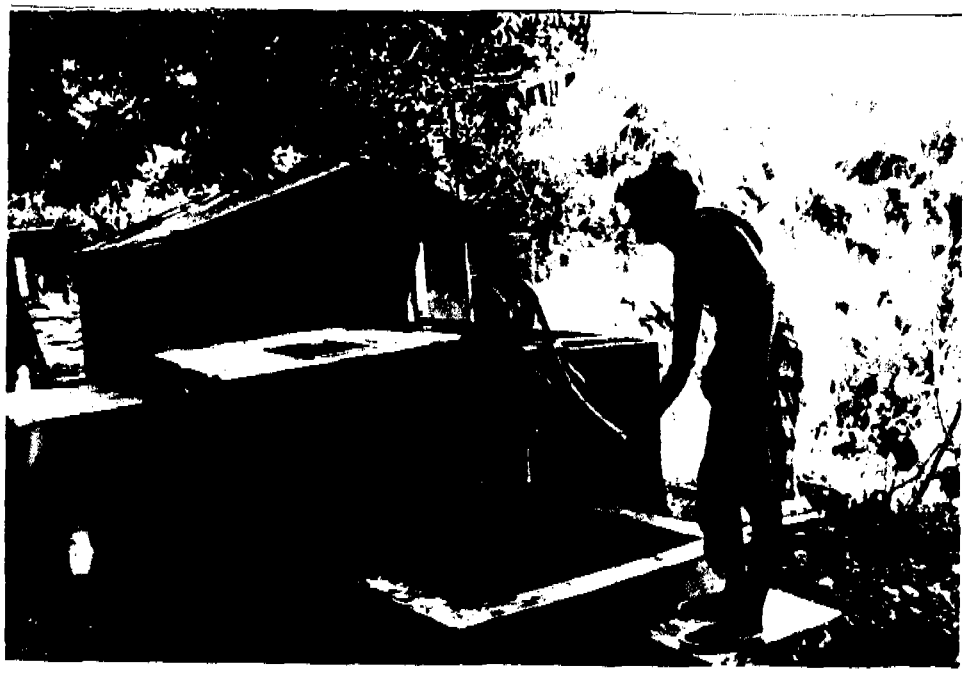
3. Impact Assessment of Ganga Action Plan on Public Health.

4. Execution of Solid Waste Management Programme of CMDA for the Municipal Areas Outside Calcutta and Howrah.

5. Monitoring and Evaluation of the Performance of Sewage Treatment Plants.

CONSERVATION AND UTILISATION OF TRADITIONAL
SURFACE WATER SOURCES IN RURAL BENGAL

HORIZONTAL ROUGHING FILTER
AND SLOW SAND FILTER



DOUBLE ACTION SINGLE OPERATION HANDPUMP
[D A S O]

6. A Feasibility Study on Treatment of Municipal Waste Water in Pilot Scale Laboratory and Field Model of Duckweed Pond.

7. Monitoring and Evaluation of Tara Pump based "Community Water Supply Programme in Singur Villages, West Bengal".

8. Production and Field Testing of newly designed Prototype Suction Hand Pump and Monitoring.

9. Chemical and bacteriological analysis of Water samples in the districts of West Bengal.

10. Evaluation of the Effluent Treatment Plant of Coal India Complex at Dunkuni.

11. Water Quality Surveillance in Rural areas : Development of a model for community based management.

6.2. Recently Completed Research :

1. Feasibility Study on Rural Sanitation.

2. Bacteriological Quality and Performance Monitoring of Rural Water Supply Systems in Purulia District.

3. Investigation of Causes of Arsenic Pollution in Ground Water.

4. Ground Water Pollution from On-site Sanitation.

5. Socio-economic and Health Aspects of Recycling of Urban Solid Waste through scavenging.

6. Evaluation of the Impact on Community Health and Environment of the River-valley Project, Kangshabati.

7. Evaluation of health risk from on-site sanitation.

8. Evaluation of Gravity Feed Water Supply Schemes in India.

9. Water Quality Assessment for West Bengal Rural Water Supply and Sanitation Demonstration Project.

* * *

Annexure - I

ALL INDIA INSTITUTE OF HYGIENE AND PUBLIC HEALTH, CALCUTTA

TRAINING NETWORK FOR RURAL WATER AND WASTE MANAGEMENT IN INDIA

SCHEDULE OF ACTIVITIES FOR THE YEAR 1991

ACTIVITIES	1991 JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
A. ORGANISATION & INTERNAL DEVELOPMENT OF THE CENTRE												
1. Recruitment of Staff	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX											
2. Training & Orientation				XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX						
B. TRAINING NEEDS ASSESSMENT	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX											
C. TRAINING ACTIVITIES												
1. Training Courses for Practising Engineers & Other Professionals												
i) Water Quality Surveillance					29-4							
ii) Low Cost Sanitation				17-24	24-1				2-7			4-9
iii) O & M of Rural Water Supply - Handpump								26-31	23-28			
iv) Health, Socio-cultural & Communication Aspects of R.W.S. & E.S.								5-10				11-16
									16-21			

of RWSS-Gravity Feed Water Supply System & Rain Water Harvesting												
2. Training Courses for Trainers												
i) Orientation - Workshop for Trainers of Key Institutions							2-6 IIC Delhi					
ii) Faculty Orientation Course for Engg.Colleges												15-24
iii) Training Course for Trainers/Instructors of Polytechnics/Community Polytechnics									3-12			
3. Seminar on Retrospective Analysis of Drinking Water Supply Decade												10
4. Mass Awareness Campaign					14-18 Mandra	31-5 Mandra	1-5 Arambagh					
D. APPLIED RESEARCH												
1. Planning & Programming			XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX					
2. Implementation								XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX

* In Addition about 120 inservice professionals would be trained in the existing M.E.(P.H.), D.P.H. and D.H.E. courses would be held each year.

ANNEXURE - II

SUMMARY: 2ND & 3RD QUARTER (JULY TO DECEMBER)

NAME OF THE COURSE	CLASSES			LECTURERS		No. OF PARTI-CIPANTS
	THEORY	PRACTICAL	FIELD	GUEST	FACULTY	
A.TRAINING COURSE FOR PRACTISING ENGINEERS & OTHER PROFESSIONALS :						
1.HEALTH,SOCIO-CULTURAL & COMMUNICATION ASPECTS OF RURAL WATER SUPPLY & ENVIRONMENTAL SANITATION 5TH TO 10TH AUGUST 1991	15	2	1 FULL DAY	5	10	17
2.OPERATION & MAINTAIN -ANCE OF RURAL WATER SUPPLY - HAND PUMP 26TH TO 31ST AUGUST 1991	18	-	1 FULL DAY	3	8	16
3.LOW COST SANITATION 2ND TO 7TH SEPTEMBER 1991	18	-	1 FULL DAY	7	7	12
4.OPERATION & MAINTENANCE OF RURAL WATER SUPPLY SCHEME - GRAVITY FEED WATER SUPPLY & RAIN WATER HARVESTING 16TH TO 21ST SEPTEMBER 1991	18	1/2 DAY	1/2 DAY	2	12	17
5.OPERATION & MAINTENANCE OF RURAL WATER SUPPLY - HAND PUMP 23RD TO 28TH SEPTEMBER 1991	17	2	1 FULL DAY	3	6	18
6. LOW COST SANITATION 4TH TO 9TH DECEMBER 1991	17	-	1 FULL DAY	6	7	10
7. HEALTH, SOCIO-CULTURAL & COMMUNICATION ASPECTS OF RURAL WATER SUPPLY & ENVIRONMENTAL SANITATION.	14	2	1 FULL DAY	3	10	12

B. TRAINING COURSE FOR TRAINERS/
INSTRUCTORS OF POLYTECHNICS & COMMUNITY POLYTECHNICS
FOR WEST BENGAL :

1. RURAL WATER AND WASTE MANAGEMENT IN INDIA 3RD TO 12TH SEPTEMBER 1991	27	3	1/2 DAY	5	3	9

C. TRAINING COURSE FOR TRAINERS OF ENGINEERING COLLEGES :

1. FACULTY ORIENTATION COURSE FOR ENGINEERING COLLEGES ON RURAL WATER & WASTE MANAGEMENT. 19TH TO 24TH DECEMBER 1991	17	3 (ROUND TABLE)	1 FULL DAY	9	4	10

D. WORSHOP :

1. WORKSHOP OF KEY INSTITUTIONS FOR THE I.T.N. 2ND TO 5TH JULY, 1991	-	-	-	-	-	28

E. SEMINAR :

1. SEMINAR ON DRINKING WATER SUPPLY DECADE IN WEST BENGAL - A RETROSPECTIVE ANALYSIS 10TH DECEMBER, 1991	-	-	-	-	-	150

F. MASS AWARENESS CAMP

1 .MASS AWARENESS CAMP AT BALLYDIWANGANGE 1ST TO 5TH JULY 1991	10	4	1 FULL DAY	4	5	29

Total : 328

Contd...

ANNEXURE - I

DISTRIBUTION OF PARTICIPANTS IN DIFFEREN

NAME OF THE COURSE	GOVERNMENT					ORGANI
	W.BENGAL	MAHARASHTRA	ORISSA	M.P.	NAGALAND	RAJASTHAN
A.Training Course for Practising Engineers & Other Professionals :						
1) LOW COST SANITATION (FOR ONLY WEST BENGAL) 17TH TO 24TH APRIL 1991	11	-	-	-	-	-
2) LOW COST SANITATION 24TH APRIL TO 1ST MAY 1991	15	-	-	-	-	-
3) WATER QUALITY SURVEILLANCE 29TH MAY TO 4TH JUNE 1991	8	-	-	-	-	-
4) HEALTH, SOCIO-CULTURAL & COMMUNICATION ASPECTS OF RURAL WATER SUPPLY AND ENVIRONMENTAL SANITATION 5TH TO 10TH AUGUST 1991	9	1	2	1	1	-
5) OPERATION & MAINTENANCE OF RURAL WATER SUPPLY - HAND PUMP 26TH TO 31ST AUGUST 1991	10	2	-	2	-	1
6) LOW COST SANITATION 2ND TO 7TH SEPTEMBER 1991	7	-	1	1	1	1
7) OPERATION & MAINTENANCE OF RURAL WATER SUPPLY SCHEME - GRAVITY FEED WATER SUPPLY & RAIN WATER HARVESTING 16TH TO 21ST SEPTEMBER 1991	7	3	1	-	1	1
8) OPERATION & MAINTENANCE OF RURAL WATER SUPPLY - HAND PUMP 23RD TO 28TH SEPTEMBER 1991	10	2	1	2	-	1
9) LOW COST SANITATION 4TH TO 9TH DECEMBER 1991	6	-	1	-	-	-
10) HEALTH SOC.CULT. & COM. ASPECTS OF RWS&ES 11TH TO 16TH DECEMBER 1991	11	-	-	-	-	-
TOTAL	94	8	6	6	3	4

2

(Contd.)

TRAINING COURSES : (April to December)

TIONS					NGOs	TOTAL
IKKIM	ARUNACHAL PRADESH	ANDHRA PRADESH	PUNJAB	A & N ISLANDS		
-	-	-	-	-	9	20
1	1	-	-	-	5	22
1	1	-	-	-	3	13
	-	-	-	-	3	17
	-	1	-	-		16
	-	1	-	-		12
	-	2	2	-		17
	-	-	-	2		18
	-	-	-	-	3	10
	-	-	-	-	1	12
2		4	2	2	24	157

Contd.....

ANNEXURE - II (Contd.)

DISTRIBUTION OF PARTICIPANTS IN DIFFERENT TRAINING CO

NAME OF THE COURSE	GOVERNMENT					ORG
	W.BENGAL	DELHI	GUJRAT	TAMILNADU	ASSAM	MEG
B. TRAINING COURSE FOR TRAINERS/ INSTRUCTORS OF POLYTECHNICS & COMMUNITY POLYTECHNICS FOR WEST BENGAL :						
1. RURAL WATER AND WASTE MANAGEMENT IN INDIA 3RD TO 12TH SEPTEMBER 1991	9	-	-	-	-	
C. TRAINING COURSE FOR TRAINERS OF ENGINEERING COLLEGES :						
1. FACULTY ORIENTATION COURSE FOR ENGINEERING COLLEGES ON RURAL WATER & WASTE MANAGEMENT. 19TH TO 24TH DECEMBER 1991	10	-	-	-	-	
D. WORSHOP :						
1. WORKSHOP OF KEY INSTI TUTIONS FOR THE I.T.N. 2ND TO 5TH JULY. 1991	3	10	4	2	1	
E. SEMINAR :						
1. SEMINAR ON DRINKING WATER SUPPLY DECADE IN WEST BENGAL - A RETROS- PECTIVE ANALYSIS 10TH DECEMBER, 1991	138	2	2	3	1	
F. MASS AWARENESS CAMP						
1 MASS AWARENESS CAMP AT BALLYGUNGE 1ST TO 9TH JULY 1991	94	-	-	-	-	
TOTAL :	254	12	6	5	2	
GRAND TOTAL :						

ASES : (April to December)

ISATIONS				TOTAL
ALAYA	KARNATAKA	UTTAR PRADESH	UNITED KINGDOM	
-	-	-		9
-	-	-		10
1	4	1		28
1	1	-		150
-	-	-		94
2	5	1		291
				448

ANNEXURE - III

ALL INDIA INSTITUTE OF HYGIENE AND PUBLIC HEALTH, CALCUTTA

TRAINING NETWORK FOR RURAL WATER AND WASTE MANAGEMENT IN INDIA

SCHEDULE OF ACTIVITIES FOR THE YEAR 1992

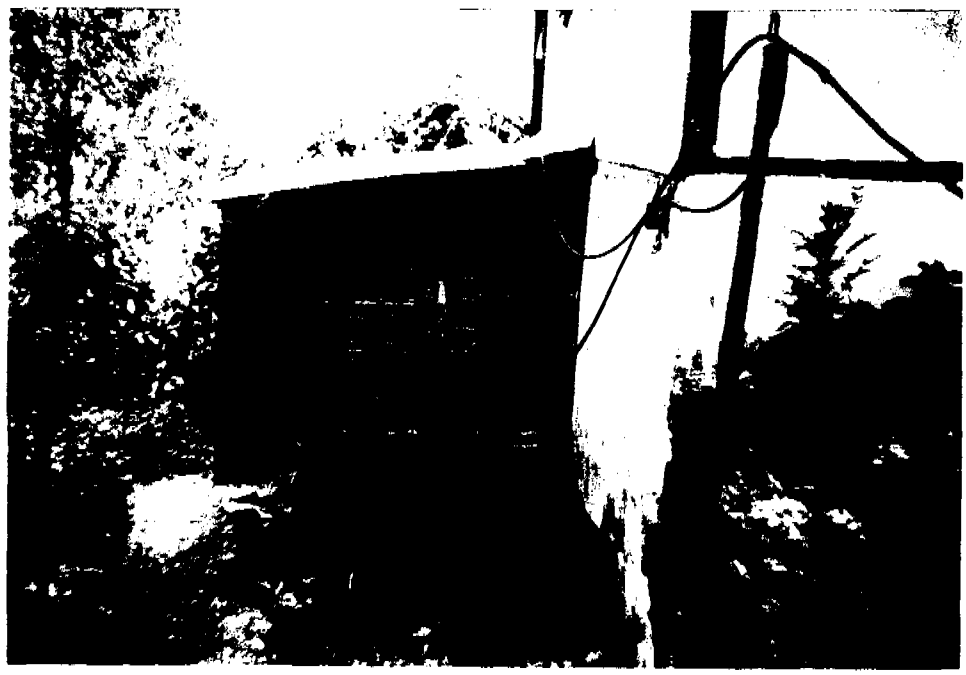
ACTIVITIES	1992											
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
A. TRAINING ACTIVITIES												
1. National Workshop for Decision Makers												16-18
2. National Workshop for Course Directors of Engineering Colleges											4-6	
3. Training Courses for Practising Engineers & Other Professionals												
i) Water Quality Surveillance							6-11				23-28	
ii) Low Cost Sanitation		24-28		20-25				3-8				
iii) O & M of Rural Water Supply - Handpump	6-11						20-25		14-19			
iv) Health,Socio-cultural & communication aspects of Rural Water Supply & EnvironmentalSanitation		17-22										
v) Operation & Maintenance of RWSS-Gravity Feed Water Supply Systea		27-1										

vi) Low Cost options of Solid Waste Management & drainage systems in peri urban and rural areas.						1-6						
vii) Project Management & Community Participation								24-29				
4. Training Courses for Trainers												
i) Faculty Orientation Course for Engineering Colleges					18-23							7-12
ii) Training Course for Trainers/Instructors of Polytechnics & Community Polytechnics			4-13									
iii) Training Course for Instructors of Community Polytechnics				2--11								
5. Mass Awareness Campaign	14-18				4-8				1-5			1-5
B. SECTOR REVIEW & CONCURRENT TRAINING NEED ASSESSMENT	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
C. DEVELOPMENT OF TRAINING AIDS & COURSE MATERIALS	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
D. APPLIED RESEARCH	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX

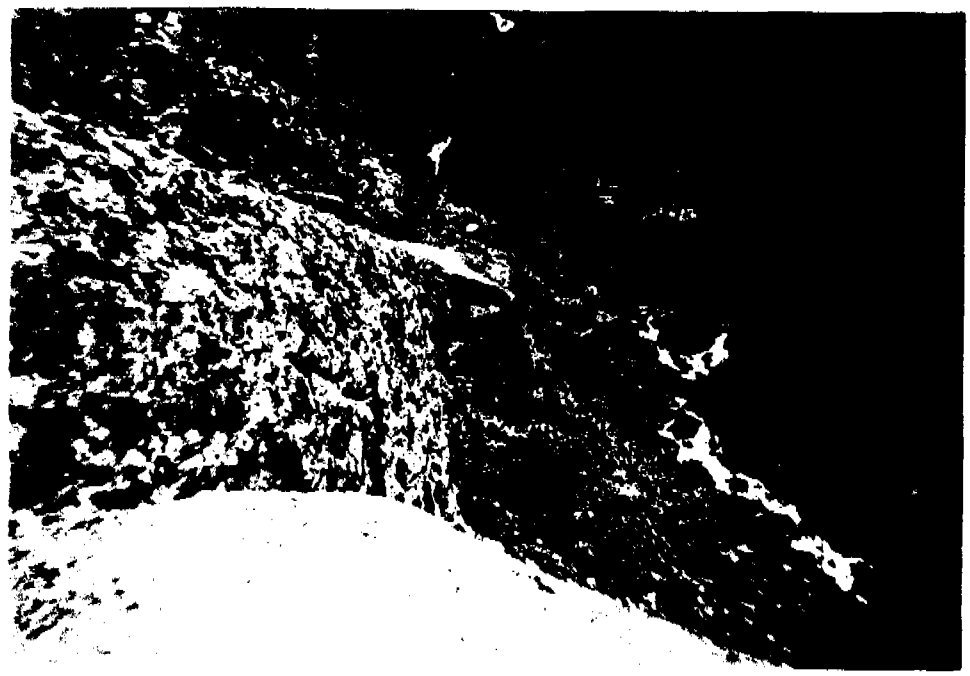
*In Addition about 120 inservice professionals would be trained in the existing M.E.(P.H.),D.P.H. and D.H.E. courses would be held each year.

MIDDLEMAN BUYERS SHOP - THE ULTIMATE DESTINATION OF THE SCAVENGERS

SCAVENGERS IN OPERATION



Village bathroom with
temporary pipe-line connection.(Sikkim)
G.F.S.



A typical water source for G.F.S.(Sikkim)

Annexure - IV

LIST OF THE PARTICIPANTS OF

ROUND TABLE DISCUSSION ON 24.12.91

(Resource Person and Participants)

Sl. No.	Name	Designation
1.	Dr. B. N. Ghosh	Director, A.I.I.H. & P.H. Calcutta - 700 073.
2.	Prof. K. J. Nath	Prof. Environmental Sanitation & Head Deptt. of Sanitary Engg. A.I.I.H.& P.H. Calcutta- 700 073.
3.	Prof. A. K. Adhya	Prof. Deptt. of Sanitary Engg. A.I.I.H.& P.H. Calcutta- 700 073.
4.	Dr. V.P. Sharma	Director, Malaria Research Centre New Delhi.
5.	Shri A.K. Sengupta	Deputy Adviser, Ministry of Rural Development, Govt. of India.
6.	Mr. Y. D. Mathur	Zone Representative, UNICEF, Eastern India.
7.	Mr. P. K. Chatterjee	Consultant, Sulabh International.
8.	Mr. M. Bandopadhaya	Head, Environmental Engg. Section, IIT, Kharagpur.
9.	Mr. M. Bandopadhaya	Former Professor & Head, Deptt. of Civil Engg.,R.E.College Durgapur.
10.	Dr. Mahendra Dutta	Consultant, W.H.O.
11.	Prof. N. Majumdar	Former Professor of Sant. Engg. A.I.I.H. & P.H. Calcutta & Former Director NEERI.

Sl. No.	Name	Designation
12.	Dr. Tapan Kr. Dutta	Assistant Professor, B. E. College.
13.	Dr. Amal Kr. Datta	Assistant Professor, B. E. College
14.	Shri Somenath Mukherjee	Asstt. Professor I.I.T., Kharagpur
15.	Shri Gautam Banerjee	Asstt. Professor I.I.T., Kharagpur
16.	Shri S. Bhattacharya	R. E. College, Durgapur
17.	Shri Arunabha Majumdar	Associate Professor A.I.I.H & P.H. Calcutta
18.	Shri Dinabandhu Guin	Asstt. Professor A.I.I.H & P.H. Calcutta
19.	Shri S. K. Banerjee	Senior Member, Institution of Engineers (Asstt. Engineer, Agri. Irrigation, Planning Division).
20.	Shri M. A. Khan	Senior Member, Institution of Engineers (Maintenance Engineer, Bengal Potteries Ltd.)
21.	Shri S. N. Sarkar	Senior Member Institution of Public Health Engineers, India.

ANNEXURE - V

Participants List of the Workshop of Key Institutions :

1. Ms. Sarala Gopalan, Joint Secretary, Ministry of Rural Development, GOI.

2. Prof. K.J.Nath, Head of Sanitary Engineering, All India Institute of Hygiene & Public Health

3. Mr. Jagadish Chander, Deputy Secretary, Ministry of Rural Development - GOI

4. Mr. A.N.Asthana, Direcctor
   National Drinking Water Mission
   Minstry of Rural Development-GOI

5. Mr. V. Raghu
   Deputy Adviser (PHE)
   Ministry of Rural Development-GOI

6. Mr. C.Ganapathy, Asst. Adviser
   National Drinking Water Mission
   Ministry of Rural Development-GOI

7. Prof. Indira Chakravarty, Professor &
   Head, Dept. of Bio-Chemistry & Nutrition,
   A.I.I.H. & P.H., Calcutta.

8. Dr. J. C. Srivastava, Consultant
   National Drinking Water Mission

9. Mr. Ishwerbhai J. Patel
   Environmental Sanitation Institute

10. Mr. Y. N. Nanjundaiah
    Environmental Sanitation Institute

11. Mr. C. M. Christi, Joint Director
    Gujarat Jalseva Training Institute

12. Mr. S. N. Bhatnagar, Training Officer
    Gujarat Jalseva Training Institute

13. Prof. P. K. Bhattacharya
    Environmental & Community Development
    Technical Teachers' Training Institute
    Govt. of India

14. Dr. A. V. Jalota, Principal
    Motilal Nehru Regional Engineering College

15. Mr. R. B. Singh
    Motilal Nehru Regional Engineering College

16. Mr. H. C. Srivastava, Dean
    Institute of Engineering & Rural Technology

17. Prof. I. C. Agarwal
    Motilal Nehru Rural Engineering College

18. Mr. R. B. Purkayastha, Superintending Engineer
    Public Health Engineering Dept. (Rural Circle)
    Govt. of Meghalaya

19. Mr. C. K. Hazarika, Secretary,
    Public Health Engineering Dept.
    Govt. of Meghalaya

20. Dr. T. P. Halappa Gowda, Professor
    Environmental Engineering Dept.
    Sri Jayachamarajendra College of Engineering

21. Dr. S. Ponnuraj, Dean
    Faculty of Rural Health & Sanitation
    Gandhigram Rural Institute

22. Mr. V. Kandasamy
    Gandhigram Institute of Rural Health

23. Mr. Prakriti Kr. Chakroborty, Superintending Engineer
    Public Health Engineering Deept.
    Govt. of Assam

24. Mr. Peter M. Filk, First Secretary (RWS)
    Royal Netherlands Embassy

25. Ms. Sunita Vasudeva
    Communications & Community Development Specialist
    Regional Water & Sanitation Group-South Asia
    UNDP/World Bank Water & Sanitation Program

26. Mr. A. K. Sen Gupta, Sanitary Engineer (Consultant)
    Regional Water & Sanitation Group-South Asia
    UNDP/World Bank Water & Sanitation Program

27. Prof. John Pickford, Consultant
    Overseas Development Administration of UK
    Water, Engineering and Development Centre (WEDC)
    Loughborough University of Technology

28. Mr. Alan Digby Davies, HRD Specialist
    Regional Water & Sanitation Group-South Asia
    UNDP/World Bank Water & Sanitation Program.

ANNEXURE - VI

Workshop of Key-Institutions for the ITN

Topics suitable for courses offered by the Network Institutions as per recommendation of the Workshop

1. Introduction

1.1 ITN and the Sector
   a. International Training Network
   b. Rural water and sanitation sector in India

1.2 Introduction to ITN ideas
   a. Water, wastes and health
   b. Alternative technologies
   c. Project planning and community health

2. Management and Community Participation

2.1 Project preparation and implementation
   a. Project identification and implementation
   b. Project approval,implementation, operation and evaluation
   c. Developing a programme

2.2 Institutional and financial aspects
   a. Institutional aspects
   b. Financial aspects
   c. Human resources development

2.3 Economic appraisal of projects
   a. Time value of money
   b. Economic appraisal

2.4 User participation
   a. Importance of user participation
   b. User assesment and feasibility
   c. Implementing the user participation programme

3. Health and hygiene

3.1 Health aspects of water supply and sanitation
   a. Disease description
   b. Transmission routes
   c. Disease control

3.2 Hygiene education
   a. Team effort
   b. Understanding the community
   c. Developing the programme for change

4. Water supply

4.1 Rainwater roof catchment systems
- a. Feasibility
- b. Design and construction

4.2 Wells and handpumps
- a. Introduction
- b. Construction of wells and boreholes
- c. Handpumps

4.3 Gravity-flow water supply
- a. Introdution
- b. Construction

4.4 Water distribution networks
- a. Introduction to water distribution systems
- b. Problems with conventional design methods

4.5 Water treatment
- a. Low-Cost rapid filtration plants for water treatment
- b. Rural water supply treatment

5. Sanitation

5.1 On-site sanitation
- a. Ventilated improved pit latrines
- b. Pour-flush toilets
- c. Other sanitation technologies

5.2 Waterborne sanitation
- a. Septic tanks
- b. Small bore sewerage

5.3 Sanitation technology selection
- a. Site investigations
- b. Water and sanitation interactions
- c. Technology selection and upgrading

5.4 Waste treatment and resource recovery
- a. Waste stabilization ponds
- b. Resource recovery : biogas/aquaculture/composting

(Number refer to the ITN modules prepared by the World Bank)

Annexure - VII

PERSONNEL INVOLVED IN REPORT PREPARATION

Prof. K.J. Nath
Chief Co-ordinator, I.T.N., India
and Head, Department of Sanitary
Engineering, A.I.I.H. & P.H.
Calcutta.

Prof. Indira Chakravarty
Joint Co-ordinator, I.T.N., India
and Head, Department of Biochemistry
& Nutrition, A.I.I.H. & P.H.
Calcutta.

Shri Arunabha Majumdar
Associate Professor
Department of Sanitary Engineering
A.I.I.H. & P.H., Calcutta.

Assistance

Shri S. Lahiri
Project Officer cum Senior Instructor
I.T.N., A.I.I.H. & P.H., Calcutta.

Shri D. Kahali
Demonstrator
Department of Sanitary Engineering
A.I.I.H. & P.H., Calcutta.

Dr. A.K. Kundu
Instructor, I.T.N.
A.I.I.H. & P.H.
Calcutta.

Shri T.P. Bagchi
Programme Assistant
I.T.N., A.I.I.H. & P.H.
Calcutta.

Shri A.K. Dey
Technical Assistant
I.T.N., A.I.I.H. & P.H.
Calcutta.

Shri Goutam Dutta
Scientific Assistant, N.D.W.M.
A.I.I.H. & P.H., Calcutta.