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WATER QUALITY SURVEILLANCE & MONITORING

- CUM -

TESTING KIT DEMONSTRATION PROGRAMME

- ORGANISED FOR -

ASSISTANT / JUNIOR ENGINEERS

OF

PUBLIC HEALTH ENGINEERING DEPARTMENT, BIHAR.

- SPONSORED BY -

UNICEF, BIHAR.

- TRAINERS -

CREATIVE CONSULTANTS (CRECON), BIHAR.

PATNA 1994-95.

ACKNOWLEDGEMENT

OUR ORGANISATION IS EXTREEMLY THANKFUL TO **UNICEF, BIHAR** FOR HAVING GIVEN US AN OPPORTUNITY TO SHOULDER THIS CHALLANGING & RESPONSIBLE TASK OF TRAINING CONCERNED WATER SUPPLY PERSONNEL. WE ARE SPECIALLY THANKFUL TO **SRI S.R. MENDIRATTA, UNICEF, BIHAR** FOR THIS INITIATIVE. IT IS HIS EVER HELPING & EXPERIENCED ENRICHED GUIDING INSPIRATIONS AND KEEN INTEREST WHICH HAS HELPED US IN SUCESSFUL COMPLETION OF THIS TRAINING.

WE ARE ALSO MUCH THANKFUL TO SRI **GOPI T. MENON,** UNICEF, BIHAR FOR THE ENCOURAGEMENT GIVEN FOR CONTINUING THIS ENDEVOUR. HIS CAREFUL LISTENING & INTERACTIONS, THOUGH BRIEF, BUT HAS BEEN MUCH VALUEABLE & HAS INSPIRED US MUCH.

FINALLY, WE EXTEND OUR HEARTIEST THANKS TO SRI **M.L. DAS,** TECHNICAL SECERETARY TO CHIEF ENGINEER, PHED, BIHAR FOR HIS TIME TO TIME COOPERATIONS & COORDINATIONS.

MANY HAS CONTRIBUTED IN COMPLETING THIS REPORT. WE EXPRESS OUR SINCERST THANKS TO ALL OF THEM.

K P Bhawsinka
29.03.95

ER. K.P. BHAWSINKA,
PRINCIPAL CONSULTANT,
CREATIVE CONSULTANTS (CRECON),
PATNA.

The present report originates from the experiences & feedback obtained during various training programmes organised for Drinking Water Quality Improvment utilizing DRDO developed field testing kits under the Water Quality Surveillance Programme organised for the benifits of Assistants /Junior Engineers of various divisions of Public Health Engineering Department in Bihar. The Programme initiated in 1994 under an arrangement between **UNICEF.Bihar & M/S CREATIVE CONSULTANTS.PATNA.** Informations summarised in this report were obtained through on site observations, feedback & interactions with participants & others during the organisation of these Training Programmes.

Though there had been slight variations in the Contents of the Training programmes at different places & even some specially devised sub topics suiting individual group needs were also formulated, the basic skeleton of the Training module remained, however, same. Various sub topics were structured in such way as to give an overall broader concept of Water Quality. It was specially attempted not to view Water Quality merely in terms of few quality related standards & consequently in utilisation of tests facilities available in field testing kit type mobile laboratory. Through sequential arrangements of various sub topics, overall considerations of various quality related issues like sicknesses, Costs, availability & reliability were discussed in detail. Human activity impacts were also discussed so that appropriate yet cost effective quality preservation interventions may be devised by individual members of the society even at local levels.

Efforts were made to Armour the participants with these attitude building concepts in such a way that an action oriented empowered individual is available as contributor in the task of Water Quality Surveillance programme.

Necessary skill building, in terms of their ability enhancement to utilise various testing facilities, remained, however, the main focus of the training. The participants, after acquaintance with the test procedures, were asked to practically perform each tests themselves, present test reports & interpret them. Audio-Video Combinations, film shows, Structured exercised were used in all such discussions during training programmes. Quiz-Competition on Water Quality, Attitude Surveys, etc. were also done at appropriate intervals to make this training meaningful.

A definite relation between water & diseases has been well established. At east some 20-30 severely infective diseases can be controlled by controlling Water quality. An adequately trained personnel engagged in Water supply programmes can contribute much in upkeeping the community health.

Currently it appears that Water Quality concepts are almost forgotten. Improvement upon this almost inadequate Water Quality concepts to the desired level requires carefully planned strategies coupled with tactful plans. It is apprehended that any incompatibility in terms of people's concepts of quality may have a negative effect on this task of Water Quality Management.

Though many such training programmes for different levels of participants are yet required to take place at higher frequencies, still it is hoped that the training programmes conducted would create at least an atmosphere wherein Water Quality aspects would find more attention in future Water Supply Programmes.

It is hoped that efforts would be made to utilise these field testing kits in more rationale & meaningful ways in the years to come.

K.P.Bhawsinka
29.03.95

Er. K.P. BHAWSIKA,
Principal Consultant,
Creative Consultants (Crecon)

P.B. No. 102, G.P.O.
Patna-800 001.

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SUMMARY OF THE TRAINING PROGRAMMES CONDUCTED

TRAINING OF WATER QUALITY SURVEILLANCE & MONITORING

- CUM -

DEMONSTRATION OF WATER TESTING FIELD KIT.

PLACE OF TRAINING	BETTIAH	KHAGARIA	GUMLA	ARRAH	SASARAM	DEOGARH	RANCHI
DURATION OF TRAINING	2 DAYS	2 DAYS	2 DAYS	2 DAYS	2 DAYS	2 DAYS	2 DAYS
DATES OF TRAINING	30-05-94/ 31-05-94	30-09-94/ 01-10-94	19-10-94/ 20-10-94	28-10-94/ 29-10-94	15-11-94/ 16-11-94	22-11-94/ 23-11-94	2-3-95/ 3-3-95.
VENUE OF TRAINING	DDC CONFERENCE ROOM,BETTIAH	AGANWADI SEVIKA TRAINING CENTRE, KHAGARIA		KSHTRIYA HIGH SCHOOL, ARRAH	HOTEL SHERSHAH, SASARAM.	JYOTI HOTEL, B. DEOGARH	INSTITUTION OF ENGINEERS RANCHI
TRAINING SPONSORERS	UNICEF BIHAR	UNICEF BIHAR	UNICEF BIHAR	UNICEF BIHAR	UNICEF BIHAR	UNICEF BIHAR	UNICEF BIHAR
TRAINING ORGANISERS	PH DIVISION, BETTIAH	DISTRICT COUNCIL FOR CHILD WELFARE, KHAGARIA	PH DIVISION, GUMLA	PH DIVISION, ARRAH	PH DIVISION, SASARAM	PH DIVISION, DEOGARH	PH DIVISION, RANCHI
TARGET GROUP PARTICIPANTS	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED	ASSISTANT/ JUNIOR ENGINEERS PHED
TRAINING ORGANISATION	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA	CREATIVE CONSULTANTS (CRECON) PATNA
PRINCIPAL FACULTY	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA	ER. K.P.BHAWSINKA

TRAINING SCHUDULE

ON

WATER QUALITY SURVEILLANCE & MONITORING - CUM - WATER TESTING KIT FAMILIARISATION / DEMONSTRATION PROGRAMME

TOPIC NO.	DETAILS OF TOPIC	TIME SCHEDULE	DETAILS OF DISCUSSION.
	Registeration of Participants	9.30 to 10.00 A.M.	
WQTM-1.01	Inaugural Session	10.00 to 10.30 A.M.	Addresses by Invitee, Officials & Faculty about the need for organising this training.
	TECHNICAL SESSION -I		
WQTM-1.02	An Introduction to Water Quality.	10.30 to 11.00 A.M.	a. Water Quality & objectives of Water supply programmes- challanges, difficulties & solutions. (Process/ Situation analysis). b. Situation analysis of temperate & tropical countries & the role of Water supply authorities.
	Film show on 'Water'	11.00 to 11.15 A.M.	JAL KI KAHANI.
WQTM-1.03	Conceptualising Water Quality	11.15 to 12.45 P.M.	a. Conceptualisation of Water Quality (as seen by the common masses) b. Meaning of Quality & broader concepts of Water Quality. c. Understanding Water Quality dynamics.
	Film show	12.45 to 01.00 P.M.	BEHTAR SWASTHA KEE AUR.
	Lunch Break	01.00 to 02.00 P.M.	
	TECHNICAL SESSION -II		
WQTM-1.07	Laboratory infra structures for Water Quality monitoring -their existing status & future plans.	02.00 to 02.15 P.M.	a. National, District & Village level setup & programmes of Water Technology mission.
WQTM-1.08	Familiarisation with DRDO Water testing field kits.	02.15 to 03.00 P.M.	Details of kits.
	PRACTICAL WATER TESTING	03.00 to 05.30 P.M.	Sample analysis.
WQTM-1.09	Discussion on Water analysis -process of analysis, use of standards & associated health risks.	04.00 to 04.30 P.M.	a. Testing methods & techniques for analysis of each parameter. b. Dosages & health risks. c. Rationale of standards & their flexibility.
	TEA	04.30 to 04.45 P.M.	
	Distribution of attitude survey formats.	05.30 to 05.45 P.M.	

SECOND DAY PROGRAMME

TECHNICAL SESSION -III

WQTM-1.05	Priority concerns for monitoring Water Quality Practical session continued	10.00 to 11.30 A.M.	a. Health risks of Water uses-Quality & quantity related issues. b. Microbial quality of Water & the processes for preserving its quality. c. Cost effective control basises for desired Water Quality. d. Understanding the mechanism of disease spreading with Water as efficient vector. e. Water Quality standards & specifications- their rationale & relationship with community health. f. Formulation of oppropriate Water Qulity

			Surveillance strategy.
	Film show Practical session continued	11.30 to 11.45 A.M.	
WQTM-1.04	Water Quality changes & impact of Natural/human activities on it.	11.45 to 01.00 P.M.	a. Sources & availability of Water on earth & the existence of hydrological system of nature -its impact on Water Quality. b. Various human activities, their beliefs, habits, perceptions, actions & attitudes-their impact on Water Quality (Understanding them through the process of Water collection, storage, distribution & uses practices).
	LUNCH BREAK	01.00 to 02.00 P.M.	

TECHNICAL SESSION -IV

WQTM-1.06	Techniques of Water Quality Surveillance. Practical continued.	02.00 to 03.00 P.M.	a. Components of surveillance. (Discussion on aims & potential benifits of Water Supply). b. Application of surveillance techniques to acheive objectives of Water Supply Programmes.
WQTM-1.09	Techniques of Water analysis -procedure, use of standards & associated health risks.	03.00 to 0.400 P.M.	a. Testing methods/Techniques of analysis. b. Chemical Dosage & heath risks. c. Rationale of standards/their flexibility.
	TEA	04.00 to 04.15 P.M.	
	Collection of Attitude Survey formats & discussion.	04.15. to 04.30 P.M.	
	QUIZ	04.30 to 04.45 P.M.	
	TEST REPORT FORMAT FILLING.	04.45 to 05.00 P.M.	
	EVALUATION OF TRAINING AND DISCUSSIONS ON REACTIONS.	05.00 to 05.30 P.M.	
	VALIDECTORY SESSION	05.00 to 06.00 P.M.	

SPECIAL TOPICS DISCUSSED ON REQUEST

WQTM-1.10	Availability of Low Cost Treatement Technologies for Drinking Water.	20 Minutes	Various do it yourself type techniques.
WQTM-1.11	Decision making.	20 Minutes	An approach towards local need based solutions & optimisation of options.
WQTM-1.12	Understanding Corrosion Process.	20 Minutes	Discussions on mechanism of corrosion process.

NOTE : TOPIC WQTM-1.10 WERE DISCUSSED AT BETTIAH, KHAGARIA, SASARAM, DEOGARH, ARRAH AND GUMLA.

TOPIC WQTM-1.11 WERE DISCUSSED AT ARRAH, SASARAM, DEOGARH

TOPIC WQTM-1.12 WAS DISCUSSED AT DEOGARH.

ABOUT THE PROGRAMME

Under drinking Water supply Programme village level Water testing facilities were planned & such portable kits which can work even in village conditions were developed. Many such kits were also supplied to different divisions of PHED in Bihar but were still not in use.

It was planned to familiarise the participants with the techniques & procedures of Water testing so that the kits can be put in use & useful data can be obtained for improvement in Water Quality, especially for use in Rural Water Supply. The training module was formulated in such a way as to give an overall view of Water Quality through both theoretical & practical sessions. A skilled & knowledegable empowered Water Quality concious individual was aimed through this training programme.

COLLABORATING AGENCIES

An initiative took place in 1994 to conduct various training programmes at different places of Bihar for the benifits of PHED Engineers. Accordingly, an arrangement between Unicef, Bihar & Creative Consultants (Crecon), Bihar was made. Under the arrangement Unicef agreed to sponsor this project & later took the responsibility of training.

Unicef is a well known name working for child welfare at international level. Need based child welfare oriented programmes are sponsored by Unicef. Unicef, Bihar, in addition to its many other children welfare oriented programmes, has been implementing Watsan Strategy to control Diarr-hoeal diseases in which improvements in both Sanitation & Water services are aimed. A difinite relation between Water & child mortality has been established & this can be arrested by improving Water Quality.

Creative Consultants (Crecon) is a professional consultancy organisation enggagged in research, planning, Training & other management areas of people oriented technologies. Useful planning assistance are provided using Survey, Design, Forecasting & apllied Research tools on both Engineering & Human power related Non Engineering aspects on regular basis.

Er. K. P. Bhawsinka, Principal Consultant of Crecative Consultants is a Chemical Engineer associated with Environment, Energy & Safety related technologies & is a visiting management faculty for Enter preneurship development & other Management courses at leading institutions of Bihar. He has been associated with different projects both at institutional & organisational levels.

TARGET GROUP

Assistant & junior Engineers of PHED & other Water Supply related agencies were the target group for this training programme & the training module was formulated keeping in view their needs.

DURATION OF TRAINING COURSE

A day two non residential training programme.

NON TARGET GROUP PARTICIPANTS

Sr. Government officials, Administrators, viz., S.E. & E.E. along with field staffs of PHED & NGO representatives.

TRAINING SCHEDULE & TOPICS DISCUSSED

The basic skeleton of the training remained same, as is presented in this report, though some modifications, additions or subtractions were also made as per the local needs & group aspirations.

METHODOLOGIES FOLLOWED

The training was conducted on both theoretical & practical issues using class room lectures & conducting practical sessions on Water Testing. OH projector, charts & diagramatic presentations on black board were used during the class room sessions. Instruments like Film shows, Attitude Surveys, Quiz, etc. were used in between different lectures.

Practical session on Water Quality testing was conducted using DRDO Water testing kit. During kit familiarisation session, participants were asked to recognise items of kits after their names were announced.

MATERIALS & UTILITY REQUIRED FOR TRAINING

i) Field Water testing kit alongwith all necessary Chemicals in useable form - 1 No.
ii) Overhead Projector (with Screen / Stick - 1 No.
iii) Black Board - 1 No.
iv) Duster - 1 No.
v) Chalks
vi) Transparencies
vii) Transparency pen/ink/erasing fluid.
viii) Kit containing Instructional materials / pen/pad/name plates for participants.
ix) Class room equipped with chairs/tables etc.
x) Sampling bottles for Water Collection
xi) Video film projector/VCR/(for film show)
xii) Films on Water related topics.

LINES OF DISCUSSIONS

WQTM-1.01

In the introductory remarks, an overview of the sicknesses prevalent in India was presented. Of these sicknesses, Children are the ones most vulnerable. Still considerable deaths of children occur due to diseases like Diarhoea. Estimated productivity losses & casually magnitudes were then explained. Lack of sufficient quantity of potable Water, poor Sanitation services & lack of awareness on hygiene were some significant contributory factors for these prevalent sicknesses.

Under 5 mortality rates were stated to be responsible for higher births & lower birth spacings, consequences of which were also explained in detail. Providing merely the services is not likely to reduce mortality rates & morbidity rates, until & unless a systematic implementation of such a carefully developed strategy is made which brings desirable behavioral changes among people within the system delivering Water Supply & Sanitary Services. Only then, the crisis like situation of keeping the no. of people unserved may be contained to some extent.

OBJECTIVE To warm up the participants.
To introduce the wider perspectives of Water Quality & the relevant attitude & habit forming issues.

METHODOLOGY Lecture coupled with visual presentations of graphical & statistical data through OHP transparencies.

The Need for Training :

Since the improvements in water quality can affect the water borne components of the Faceal-Oral loads. Further, Conventional engineering wisdom has held that all water supplies, except those using high quality ground water sources, should be treated to improve their quality, which, however, would mean new factors of increased risks & failures.

Economic value of human life or sufferings has found little attention to water supply design schemes. There is little merit in providing Water Supply & related facilities if it is beyond the capacity of the community to use & sustain them properly, it is desireable to be fully concious of limitations upon otherwise desireable course of action.

WQTM-1.02

The first discussion of the first technical session started with the discussion on the nature of crisis situation prevailing with respect to water supplies for low-income communities including rural ones. As Water supply development has not been able to keep pace with population growth especially in rural areas of developing countries, to keep the no. of people unserved constant is a big challange which, unfortunately has been ever worsening & now perhaps has reached a crisis situation, Under the very conditions, the universally accepted goal of reasonable access to safe water has been endangered & the reasonableness & accessiblity has been modified to such as extent that accessibility has become virtualy the only objective now a days, with almost no significance attached to Quality of water.

As part of probable solution efficient & rational resource allocation & planning for water supply developments was stressed, an urgent need for closely defining such agreed objectives was felt & the discussion continued whether any such objective exist at all & if not what is the process.

Objective :

1. To identify intervening agents for better Water Quality management through Community involvement, Committment & Support.
2. To stimulate individual thinking process so as to remove disease causing factors.

3. To under stand people's action & behavior which can take care in the direction of effecive change in behavior.

In view of the population growth & the rising pollution, almost a crisis like situation has developed while keeping the no. of people unserved with adequate quantity of safe Water. while discussing the possible & eminent solutions for the crisis, identification of resources, the approach & means towards there efficient utilisation has become a primary consideration. Defining & clear understanding of the basic objective of Water supply alongwith purposefulness was considered essential. A basic change in attitude, especially while supplying Water for Low Income group was considered essential. The mechanism by which the conditions in these neglected areas affect the whole drinking water supply system was also discussed in length. In continuation to this, various stages of potential benifits of Water supply inprovements vis-a-vis aims of Water supply improvent were also explained in detail during this session.

The basic objective of the Water Supply 'Reasonable Access to Safe Water' was then explained in detail. The terminological concepts of this objective, viz Acessilibity, Reasonableness & safety of water supply was also explained. This conceptual explaination was then linked with the crisis scenario facing water supply authorities of many countries. Solution, rationality & effeciency concepts were then discussed while allocating resources. A strong need for existance of a closely defined agreed objectives was also felt.

A detailed analysis of differing domestic Water Supply situations in temperate & tropical Countries was presented. As conclusion, it was felt that the task of Engineers, administrators & planners engagged in drinking water supply activities in tropical under developed countries were more challageing, diverse & difficult than their counterparts in temperate developed countries, which may be primarily attributed to the low affordability & larger complexities, diversity & numerousity of diseases related to Water Supplies.

WQTM- 1.03 For conceptual purposes, different Water samples were displayed & the participants were asked to recognise drinking grade Water. By visual perceptions, it was found difficult to recognise them. On basis of this, Water Quality concepts were built in terms of its properties.

Later, broader meaning & Quality was explained & matched with the participant's perceptions of Water Quality.

A discussion on Water Quality dynamics revealed possible variations in Water quality due to seasonal & topographicall effects & human activity impacts. Stringency of Water quality standards were seen as an optimisation between affordability & health expectations because higher is the stringency of Water quality standards, higher will be the cost of Water supplies.

Adoption of various parametes as Water quality indicator & their safe limits is only an extension of above considerations. Details were discussed on how safe the standards are! Various infective disease causing aspects, their charactestics & mode of disease spread with Water were also discussed. Illustrations of commonly occuring Water borne, Water Based, Water Washed & Water related diseases were also presented. Finally, a Low cost functional strategy was also discussed to improve Water quality & health standards.

Methodology Class room discussions using OHP transparencies.

Printed literature distribution & interactions.

WQTM-1.04 Details of hydrological system were discussed to explain the mechanism by which water balance on earth is maintained. Also a full length discussion was held on how this process of maintaining water balance can be disturbed through any human intervention.

In this context, Global & Indian Water availability data were also presented with printed copies of these data being circulated among the participants.

Various Water Sources, their characteristics & pertinent factors were also discussed, in order of their abundance, Volume & usefulness. The influence of topographic & metrological Conditions were also discussed.

OBJECTIVES

The discussions were aimed to activise the thinking process of the participants to diagnose the prevailing situation & to alter them, if required, through exclusion , elimination or reinforcement of the causative activities.

The discussion on various Water Sources were aimed to manage & perceive the Water Quality in terms of quantity contained therein on national/regional basis.

The discussions on Topographic & Metrologcial conditions were aimed to understand why Water availability pattern varies regionally & locally.

METHODOLOGY USED

(i) Scenario depicting Lecture coupled with diagrammatic explainations on Black Board using Chalk/OHP Transparencies.

(ii) Printed hand out circulations.

WQTM-1.04 A discussion on Collection, Storage & Uses of Water was held, The discussions focussed on people's beliefs, habits & practices & analysis in detail of the mechanism involved was held. Also attributes of 'good' & 'bad' quality of Water, as perceived by the rural consumers, were discussed. Survey data were also presented to explain various behaviors of people at different places & efforts were made to explain how their various need & activites affect the drinking Water Quality. Also were discussed various costs, direct & indirect, that are borne by the communities.

In order to have overall inproved community health, better Water Quality needs were felt, which, however has to be supplemented by better sanitary services & higher hyeigenic awareness.

Methodology Adopted Class room discussions using OHP transparencies (Pictorical & qraphical displays) followed by question-answer session.

Since, Water quality can not be seen in isolation with its Quantity, various issues which form the basis of water Uses were also discussed. Various habit forming concerns with respect to the water Collection, Uses, Storage, etc. were discussed. Also was discussed how these affect the productivity levels of the people and their life style. Consumption pattern of Water-activity wise, were also discussed. How the rural masses take their decisions with respect to the water source selection and how their perceptions about the water Quality influences such decisions. Various intensities of Health & Hygeine, were also discussed. How the people's perceptions affect the quality of Water in everyday life was also discussed. Finally, various cost contributions, direct and indirect, for providing the safe and adequate quality of Water was also discussed to make appropriate trade offs as and when required.

In past these quality, quanbtity and cost aspects were seen in isolation and not in an Integerated style. The Water Supply agencies also limited their roles almost to the task of providing contineous pipe Water only.

The discussions pointed that, though, the volume of Water useage in a household is a function of many factors, chiefly it is a function of people's income & material wealth. Through different situational analysis, the process of opinion formation and behavior change was explained.

Also delivery vs user oriented philosophy & Quality requirements of Water was discussed. The degree of rigidity in standards was discussed in background of degree of protection required.

WQTM- 1.05 Importance of microbial quality of Raw Water was discussed in detail. While discussing the various informations required for the study of sanitary quality of Water. It is in this conection, use of Coliform test as primary standard for Drinking Water Quality was explained.

WQTM-1.06 Drinking Water Quality was then seen in terms of standards for Inorganic chemical presence & for Microbiological Quality. Quality surveillance programme for Drinking Water was explained to include vigiliant public health assessment & overview of safety & reliability of drinking Water supply. Protection of Public health through water supply has source, treatment, storage & distribution reliability. Various Surveillance components of Engineering, Physical, Biological, Chemical & Instituitional examination of Water Supply were then explained.

Under these dicussions, aims & potential benifits of Water Supply Improvements in stagewise manners were explained. Complementary imputs & needs were then identified so that various aims & benifits may be acheived.

Specific benifits as goals of a Water Supply Scheme may consider design-benefits in terms of time, energy savings & health improvements.

Methodology Class room discussions using OHP Transparencies followed by interaction session.

Objectives

1. To understand the process of effective utilisation of scarce resources.
2. To increase commitment towards Low income communities.
3. To reduce the cost to Consumers.

WQTM-1.07 Availability of analytical facilities are very much important before unertaking the programme of Water Analysis. The instruments, however, differ considerably in sophistications, Cost & accouracy. The participants were explained their differences & availability of different facilities for which some details of Water Technology Mission were also explained.

Objectives : To recognise the limitations of test kit & data likely to be generated.

WQTM-1.08 Familiarisation of DRDO Water testing kit.

Methodology adopted :

The item names were first repeatedly described. Print out of kit content were then distributed, items circulated amongst the participants & then the participants were asked to idenitify the stated iems.

WQTM-1.10 Various low cost treatment technologies for common masses were discussed in brief which included Aeration, Bleaching, Absorption, Chlorination, etc. with a view to adopt them locally if alternate Water sources are difficult to develope.

Objective : To provide low cost alternates for improving Water Quality.

WQTM-1.11 The quality of the best available raw Water will have an important influence on the decision to treat or not to treat. Further, if impurities can be prevented from polluting the Water in a source, its quality will be improved. The sucess of Water Quality Management depends upon Health & Pollution status of a community vis-a-vis its affordibility.

So Community acceptable decisions are required. The proces of decision making was explained with the help of Tree diagram using OHP transparencies.

Objective : To understand the process of Community acceptable decision making.

WQTM-1.12 Riser pipe failures were frequently reported in Deogarh region which, it was apprehended also detoriorate Water Quality. Executive Engineer, Deogarh was much interested to understand the causative factors & find their solutions, if posible at local levels. A specially devised condensed module on this topic was discussed amongst the participants. The discussion included the input & mechanism required for initiation & propogation of Corrosion. Th discussion interested large no. of participants.

PRACITICAL SESSION

Paticipants were asked to collect water samples from their respective areas of operations. During practical session, depending upon the no. of Water Analysis kits available & the no. of samples available for analysis, participants were then divided in different groups & the group was asked to perform detailed analysis of the Water Samples, observe its results & records them.

Methodology followed : The Analysis was done parameter wise. Standards & testing method of each parameter was first explained, test procedure demonstrated first by the trainer & then the participants were asked to the perform the test-themselvs with their group sample. Efforts were made to provide an opportunity to all the participants for analysis. During analysis, associated health risks, dosage levels & remedial solutions were also discussed in brief.

Objectives :

To provide the participants an opportunity to acquire analytical skill using do it yourself techniques.

Test report preparations

Test data reporting/recording is essential to understand Water Quality variations. They be presented in standard forms for which printed formats were circulated amongst the participants so that they can record test data generated in interpretable form.

Evaluation Session

Objectives & Methodology adopted :

As part of evaluation & to get critical feddback, printed structured questionnaires were circulated amongst the participants at the end of each training sessions. Different questions were structured in such a way as to give an idea about the feelings of the individual trainee at the end of training. These feelings related to general expression in terms of good or Bad, feeling about the degree to which their knowledge enhanced, felings of satisfaction & felings about their own abilities in handling the kits themselves. Question nos. 1, 2, 3, 7 & 8 respectively were directed to get feedback on above issues.

The second get of question nos. 4, 6, & 5 were directed to know about the quality of training in terms of adequacy of training period, style of presentation use of proper combination of Audio - Video techniques & about the relative likings of individual sub topics. Question nos. 2 & 9 were directed to get some reactions & quidance for future.

Quiz Session "Water Quality Related Aspects" were targeted to get some feedback about how the participants absorbed the details of various theoretical & practical aspects of the training. This consisted of two type of questions : One of objectives types & others narrative types. The narrative questions were formulated in such a way as to know the basics of personal & household hyqiene related knowledge of the participants. All the questions related to the discussions during the training.

Materials used : Printed handouts.

Methodology used : Fill & return.

Attitude Surey It was a quick attempt to get preliminary knowledge about the implementor's perception on Water Collection, Storage, Uses, Habits & Beliefs.

Materials Used : Printed handouts.

Methodology used : Fill & return followed by a discussion.

Film Shows Following films on 'Water' were shown at different places with a view to provide an opportunity to the participants to visualing the critical aspects of training topics & memorise them. Following films were shown during the training :

PANI KI KAHANI
BEHTAR SWASTHA KI AUR
PRERNA
PARIVARTNA
HAND PUMP MECHANIC

SUMMARY CHART OF THE FEED BACK OBTAINED DURING THE TRAINING

Place of Training	Khaqaria	Gumla	Arrah	Sasaram	Deoqhar	Ranchi	Bettiah	Total
Attitude Survey Respondents								
No. of Respondents	29	32	13	10	18	19	-	121
Officials	-	-	-	-	-	-	-	-
Executive Engineer	-	1		-	1	-	-	2
Assistant Engineer	6	6		3	3	1	-	19
Junior Engineer	16	18		2	9	8	-	53
Other Dept. Personnel	7	-		5	2	2	-	16
NGO Representatives	-	6		-	-	8	-	14
Unidentified	-	1	13	-	3	-	-	17
Quiz Summary								
No. of Respondents	32	24	13	12	18	27	18	144
Officials	-	-	-	-	-	-	-	-
Executive Engineer	-	-		-	1	-	-	1
Assistant Engineer	7	6		1	4	3	2	23
Junior Engineer	15	13		5	9	12	9	63
Other Dept. Personnel	9	-		4	4	4	7	28
NGO Representatives	-	5		-	-	8	-	13
Unidentified	1	-	13	2	-	-	-	16
Evaluation Session Summary								
No. of Respondents	32	17	13	13	19	28	17	139
Officials	-	-	-	-	-	-	-	-
Executive Engineer	-	1	-	-	2	1	-	4
Assistant Engineer	8	2	4	2	3	2	2	23
Junior Engineer	15	8	9	6	8	12	8	66
Other Dept. Personnel	9	-	-	4	4	4	7	28
NGO Representatives	-	6	-	-	-	9	-	15
Unidentified	-	-	-	1	2	-	-	3
Laboratory Test of Water Sample								
No. of Respondents	33	11	14	8	18	12	15	111
Officials	-	-	-	-	-	-	-	-
Executive Engineer	-	-	-	-	1	-	-	1
Assistant Engineer	7	1	3	1	4	-	1	17
Junior Engineer	15	9	9	4	9	6	7	59
Other Dept. Personnel	8	-	1	3	4	-	7	23
NGO Representatives		1	-	-	-	5	-	6
Unidentified	3	-	1	-	-	1	-	5
Total No. of samples tested	5	4	7	4	6	4	3	33

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT VARIOUS PLACES.

Altogether more than 232 participants participated in the different training programmes & to them different printed questionnaires were Circulated at different time intervals during these trainings. The composition of the respondents are as follows:

S. No.	Desiqnation of the Respondents	Number of Respondents responded to Attitude Survey	Laboratory Test	Quiz Report	Evaluation
1.	Executive Engineers	2	1	1	4
2.	Assistant Engineers	19	17	23	23
3.	Junior Engineers	53	59	63	66
4.	Other PHED Perrsonnel	16	23	28	28
5.	NGO Representative	14	6	13	15
6.	Desiqnations/Classes Unknown	17	5	16	3
	TOTAL :	121	111	144	139

RESPONSE & FEED BACK

OPINIONS EXPRESSED / DESIGNATIONS		EE	AE	JE	DEPT. PER	NGO	N.M*	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :								
(1) GENERAL FEELINGS	GOOD	4	23	66	28	15	3	139
	BAD	-	-	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	1	4	6	10	2	1	24
	MUCH	3	9	27	6	5	2	52
	AVERAGE	-	8	21	7	5	-	41
	SLIGHTLY	-	2	12	5	2	-	21
	NOT AT ALL	-	-	-	-	1	-	1
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	4	23	61	26	11	3	128
	UNSATISFIED	-	-	3	-	3	-	6
	NOT MENTIONED	-	-	2	2	1	-	5
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	4	23	63	25	10	2	127
	NO	-	-	2	1	4	1	8
	PARTIALLY	-	-	1	2	1	-	4

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PER	NGO	N.M*	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :								
(1) DURATION OF TRAINING	ADEQUATE	2	14	43	22	6	1	88
	INADEQUATE	2	9	21	6	9	-	47
	NOT MENTIONED	-	-	2	-	-	2	4
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	4	21	56	26	10	2	119
	NO	-	2	9	-	5	-	16
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	3	11	39	12	10	-	75
	b.	2	14	45	17	13	1	92
	c.	1	10	29	7	5	-	52
	d.	3	12	35	11	6	-	67
	e.	2	12	32	15	7	1	69
	f.	3	14	35	12	11	-	75
	g.	1	4	25	4	-	-	34
(C) FUTURE RELATED OPINIONS :								
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	4	23	66	25	14	3	135
	NO	-	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	3	1	-	4
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	1	7	13	-	1	-	22
	b.	2	6	14	12	2	8	44
	c.	1	3	7	4	2	2	19
	d.	1	1	2	2	1	3	10
	e.	2	8	14	6	2	4	36

* a. **Water Availability, Utility, Uses & Common beliefs.**
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

Various reactions & opinions expressed by the participants.

N.M. *– NOT MENTIONED.

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

25 Felt the need to update their informations on drinking Water.
7 Felt that pertinent knowldge about Water quality has been acquired.
1 Felt that enough experience has been gained.
20 Felt the training as important, useful, popular and mass welfare oriented.
36 Felt confident & better.
1 Felt it as a significant means of change.
6 Felt that they have learnt many new things.
1 Felt the training has created a new optimism in them.
1 Felt it considerably useful in understanding people and groups at grass root levels.
5 Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

a. Training should be organised at village/Block/Panchayat levels.
b. Training should be organised repeatedly at different time intervals.
c. Felt training should be of higher durations.
d. Felt for more time allocation on practical sessions/self work opportunity.

e.
3 Need for field visit.
2 Organisors should be more concious in creating proper training environment.
10 Kits be made available at their work place before training.
9 Training be organised at changed places.
1 There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
2 There should be better discipline during the training.
7 There is a need for organised data interpretation.
1 There is a need for seperate module for NGO'S.
1 Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

SUMMARY OF TEST RESULTS

No. of samples tested during training	31
No. of samples found beyond safe limits (one or more parameters)	22

Sources of Water tested :

DT/W	H/P	WELL	POND	TAP
11	6	5	1	8

Parameters found mostly beyond safe limits- Nitrate
No. of samples reported Bacterially unsafe 1

Inference :

1. Mostly Inorganic chemicals, especially Nitrate was found beyond safe limits.
2. Only one Sample was found bacterially unsafe.

GENERAL OBSERVATIONS

ABOUT TRAINING : All the participants felt better after training, some feeling confident, some recognising the need to update. Many considered this sort of training as useful means to understand behavior of people & groups at grass root levels & as a means of significant social change. Participants felt that they have learnt new things, gained experience. More than 85% respondants felt that they have learnt considerably which varied from very much to much to average gain for them. Almost 95% participants including NGO representatives felt that they can handle test kits. Style of presentation was also well received. Relative likings of various topics are presented elsewhere in tabular form. 'Use of Standards for Water & Health Quality Improvement' was the most popular topic amongst all the participants followed by practical session & topic on 'Water availability & uses'.

CONCLUSIONS :

1. Training has created a new optimism & zeal amongst participants & was well received by the participants. They welcomed repeated training of varying durations.
2. Significant nos. of trainee felt the need for longer duration training programmes. Almost 30% participants felt that training duration was short & be of longer durations. Some even felt for a week's training.
3. Presence of Senior officials during the training may help in creating more training oriented envionment.
4. It is felt that only participants of same levels should be put together in a single training programme for which suitable modules may be used.

ATTITUDE SERVEY :

Mostly the Water Sources were located in the user's premises or very near to them. So cost, time & energy consumptions may be of little considerations for them. As such the data presented may represent only those of typical implementors.

Trends observed from Attitude Survey :

1. Tap Water & Hand Pump were the main Water Sources reported in use by the respondents.
2. Water consumption figuers were higher than average in use. Large Water Consumption were reported due to such activities as Gardening, Floor washing & Bathing.
3. No or very little treatment practices are being adopted by the respondents.

QUIZ :

1. Most of the answers were approximately correct.
2. Wide differences in the perceptions about daily Water uses were observed.
3. All the participants had some sort of fixed opinions, which are reflected in their answers. Viz. Women as the only Water carrier in household, larger Water consumption/household (500 LPD), lesser time consumption in water collection & Hand pumps as the only identified source of Water in their area of operations.

Inference drawn :

1. Requires more frequent interactions & meaninqful applications of informations.
2. These fixed type of group opinions may indicate possible gap between implementor & the users.

ABOUT KIT QUALITY :

1. The overall quality of the kit requires improvement with respect to quality of Glassware & Chemicals contained therein.
2. As the kit is intended to be used frequently in field, a satisfactory container design is required.
3. Provision for spares should also be made in kit to under take mass sampling work.

RECOMMENDATIONS

1. The purpose for operating Water Quality Monitoring systems is to provide pertinent informations for decision making & planning. To provide informations in required formats & at appropriate time, its necessary to develope specific procedures for handling & analysis of data.
   PHED MAY UNDERTAKE THE COMPILATION, STORAGE & INTERPRETATION OF THE DATA LIKELY TO BE GENERATED. THE ORGANISATION SHOULD ALSO BE IN A POSITION TO PROVIDE APPROPRIATE SOLUTIONS FOR OVERALL IMPROVEMENT OF WATER QUALITY INCLUDING TECHNICAL DESIGNS.
2. EXISTENCE OF A PROGRAMME SUPPORT NETWORK UNDER A CENTRAL AGENCY IS DESIRED FOR SUCESS OF THIS PROGRAMME. HENCE, SUCH LOCAL INSTITUITIONS WHICH CAN PROVIDE BOTH FORWARD & BACKWARD LINKAGES MAY BE SUITABLY PROMOTED & ENCOURAGED.
3. SINCE, INVOLVEMENT, COMMITTMENT & PARTICIPATION OF USER COMMUNITIES IS ESSENTIAL IN ANY SUCESSFUL PROGRAMME WORKING ON A SUSTAINABLE BASIS, THE TASKS OF WATER QUALITY MONITORING MAY ULTIMATELY HAS TO BE SHOULDERED BY THE USER COMMUNITIES. PHED, AS CENTRAL AGENCY, MAY PROVIDE ALL NECESSARY SUPPORTS REQUIRED FOR THIS PURPOSE. SUCH MEMBERS OF VILLAGE COMMITTES, PANCHYATS, ETC., VIZ. HAND PUMP MECHANIC, ANGANWADI WORKER, HEALTH WORKER, ETC. MAY BE TRAINED SUITABLY TO COLLECT WATER QUALITY DATA IN THEIR RESPECTIVE AREAS OF OPERATIONS.

4. A TRAINING MANUAL ON WATER QUALITY SURVEILLANCE & MONITORING IS REQUIRED TO BE PREPARED.

5. EXISTENCE OF A CAREFULLY FORMULATED STRATEGY COUPLED WITH TACTICAL PLAN ON 'WATER QUALITY IMPROVEMENT' IS ESSENTIAL FOR THE SUCESS OF THIS PROGRAMME. THE STRATEGY SHOULD TAKE INTO ACCOUNT FOLLOWINGS :
   (A) PHYSICAL MEASURES.
   (B) IMPLEMENTATION INCENTIVES.
   (C) INSTITUTIONAL ARRAGEMENTS.

6. SUITABLE IMPACT ASSESSMENT MECHANISM MUST BE INCORPORATED AS COMPONENT OF WATER QUALITY MONITORING/IMPROVEMENT PROGRAMMES.

7. CONSTANT SUPERVISION OF FIELD ACTIVIES IS REQUIRED.

8. APPROPRIATE STRESS BE LAID ON FREQUENT & REPEATED TRAINING OF AGENCIES/ PERSONNEL LIKELY TO BE INVOLVED IN FUTURE WATER QUALITY MONITORING PROGRAMMES.

❄ ❄ ❄ ❄

TRAINING AT BETTIAH

REPORT ON BETTIAH

1. The above training programme started as per schedule on 30th May at 10A.M. at DDC Conferance room, Bettia. The programme was inaugrated by DDO, Bettiah. The programme schedule & topics coverd are annexed in in this report.

2. All together 49 participants participated in above training programme, which included the E.E., 3 Nos. of Assistant Engineers & 8 Nos. of Junior Engineers in the Bettiah region. In addition to above, 14 work Supervisors & one storekeeper of PHED also participated. Others who participated in the Training Programme included 3 Plumbers & Asst. Plumbers, Mistries, Contractors & other officials. Altogether, out of 49 participants 11 were from target group excluding officials and invitee. Rest were from non target group.

3. As adviced, the Faculty, Er. K.P. Bhawsinka, reached Bettiah on 29th May, 94 & reviewed the preparations made & to be made. Although the training material was in Transparency form because of the Non availability of the Overhead Projector, it was to be converted in conventional form.

4. During the course on 30th May, 94, sperate sessions were devoted for Familiarising the test kit & an informative session on other kits including National Programme on drinking Water Quality. In addition, two film shows were also arranged in between the lunch intervals on both days.

5. On 2nd day, i.e. on 31st May, 94, a practical demonstration of Kit with respect to each parameter preceeded by a theoretic discussion on various aspects of the standards was conducted for the participants. For practical, the whole groups was divided in two groups & each group carried testing of all parameters of the water sample brought by them (one from hand pump & another from tap water), Blank formats of test report were distributed wherein the entries of data obtained was also recorded. 16 participants responded to this reporting.

6. In addition, a quiz on various 'Water Apects' was also conducted. This covered the various topics discussed during training. Finally, a feed back session was also conducted. Accordingly, a questionnaire was distributed. This was responded again by 16 Nos. of partipants.

Virtually, all the participants were satisfied with the course content, its style of presentation & they felt confident in the utilisation of knowledge gained, virtually all assured to utilise the kit, either through their own testing capability or in its further spread. Even the course duration was felt sufficient by many, Some, however felt the need for a longer duration course. Many also felt the need for organisation of this type of programme more frequently in future. The course conducted was in Hindi/ English mixed language.

TRAINNG ON DRINKING WATER QUALITY SURVELLWANCE

LIST OF THE PARTICIPANTS OF THE TWO DAY TRAINING PROGRAMME CONDUCTED AT BETTIAH ON 30-31ST MAY, 1994.

S.NO.	NAME OF THE PARTICIPANTS	DESIGNATIONS	WORK PLACE
1	SRI BADRI DAS	E.E.	PHD, BETTIAH.
2	SRI VINOD KUMAR	A.E.	PH SD. RAMNAGAR.
3	SRI VISHWANATH SINGH	A.E.	PH SD. BETTIAH.
4	SIR R.P. RAM	A.E.	PH SD. NARKATIYA GANJ
5	SRI A. MANDAL	J.E.	PH SECTION. BETTIAH
6	SRI M. MANDAL	J.E.	PH SECTION. MANJHOLIYA.
7	SRI C.S. UPADHIYA	J.E.	PH SECTION. BAIRIYA.
8	SRI Z. HASSAN	J.E.	PH SECTION. RAMNAGAR.
9	SRI C.S. SINGH	J.E.	PH SECTION. BAGAHA.
10	SRI B.C. SHARMA	J.E.	PH SECTION. THAREHAN.
11	SRI S. PRASAD	J.E.	PH SECTION. CHANPATIYA
12.	SRI SHANKAR SHARMA	J.E.	PH SECTION. GOUNAHA
13.	SRI I. HUSSAIN	W/S	BETTIAH BLOCK.
14.	SRI H.S. TEWARY	W/S	MANJHOLIYA BLOCK.
15.	SRI B.P. SINGH	W/S	BETTIAH TOWN
16	SRI SITA RAM SHARMA	W/S	JOGAPATTI BLOCK
17.	SRI RAJENDRA PRASAD	W/S	NAUTAN BLOCK.
18.	SRI A.K. SINHA	W/S	BAIRIYA BLOCK.
19	MD. SAHID	W/S	NAUTAN BLOCK.
20.	SRI VISHWANATH PANDEY	W/S	LAURIYA BLOCK.
21.	SRI NAGESHWAR MAHTO	W/S	THAKRAHEN BLOCK.
22	SRI LALAN PRASAD YADAV	W/S	MADHUBANI BLOCK.
23	SRI SHRENDRA SINGH	W/S	NARKATIYA GANJ BLOCK.
24.	SRI RAMESHWAR CHOUBEY	W/S	MAINATAR BLOCK.
25.	SRI A.K. ROY	W/S	SIKTA BLOCK.
26	SRI AKHILESH SINGH	W/S	GAUNAHA BLOCK.
27.	SRI R.P. SRIVASTAVA	S/K	PH DIV. BETTIAH.
28.	SRI K.D. THAKUR	PLUMBER	BETTIAH
29.	SRI LAKSHMAN MAHTO	ASST. PLUMBER	BETTIAH
30.	SRI DWARIKA MAHTO	T/KHALASI	BETTIAH
31.	SRI MD. SHAKOOR	ASST. PLUMBER	BETTIAH.
32.	SRI SHRESH PRASAD	T/KHALASI	BETTIAH
33.	SRI PARMESHWAR MUKHIYA	T/KHALASI	BETTIAH.
34.	SRI NIRBHAYA KUMAR	T/MISTRY	BETTIAH
35.	SRI KAMAL PRASAD	SECT. PEON	BETTIAH.
36.	SRI KRISHAN BHAGAT	SECT. PEON	BETTIAH
37.	SRI SHARDHA NANADAN PD.	T/K	NARKATIYAGANJ.
38.	SRI PTAMBER RAM	T/K	THANAHAN
39.	SRI SITA RAM RAUT	B/M	BETTIAH.
40.	SRI MOHAN MISTRY	B/M	BETTIAH
41.	SRI RAVIKANT PD.	M/R	BETTIAH.
42.	SRI RAJENDRA RAM	B/M	BETTIAH
43.	SRI BIRENDRA PASWAN	B/M	BETTIAH.
44.	SRI RAMENDRA MANDAL	ZEEP DRIVER	BETTIAH.
45.	SRI GANESH ROY	ZEEP DRIVER	BETTIAH.
46.	SRI SETH TEWARY	M/R	RAMNAGAR.
47.	SRI MURARI PD.	CONTRACTOR	NARKATIYAGANJ.
48.	SRI RAJESWAR PD. SINHA	CONTRACTOR	BETTIAH

INVITEE :

49.	SRI MARANDI.	DDO.	BETTIAH

FACULTY :

50. ER. K.P. BHAWSINKA.

TRAINING CONDUCTED BY- M/S CREATIVE CONSULTANTS, PATNA.

PARTICIPATING ORGANISATION - PHED, BETTIAH.

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT BETTIAH

Altogether 49 participants participated in the training and to them different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows :

S. No.	Desiqnation of the Respondents	Number of Participants	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Officials & Invitee	1	--	--	--	--
1.	Executive Engineers	1	--	--	--	--
2.	Assistant Engineers	3	--	1	2	2
3.	Junior Engineers	8	--	7	9	8
4.	Other PHED Perrsonnel	36	--	7	7	7
5.	NGO Representative	--	--	--	--	--
6.	Desiqnations/Classes Unknown	--	--	--	--	--
	TOTAL :	49	--	15	18	17

RESPONSE & FEED BACK

OPINIONS EXPRESSED / DESIGNATIONS		AE	JE	DEPT. PERS.	TARGET GROUP	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :						
(1) GENERAL FEELINGS	GOOD	2	8	7	10	17
	BAD	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	-	1	1	1	2
	MUCH	2	3	2	5	7
	AVERAGE	-	4	4	4	8
	SLIGHTLY	-	-	-	-	-
	NOT AT ALL	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	2	8	7	10	17
	UNSATISFIED	-	-	-	-	-
	NOT MENTIONED	-	-	-	-	-
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	2	8	7	10	17
	NO	-	-	-	-	-
	PARTIALLY	-	-	-	-	-

DESIGNATIONS / OPINIONS EXPRESSED		AE	JE	DEPT. PERS.	TARGET GROUP	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :						
(1) DURATION OF TRAINING	ADEQUATE	2	7	4	9	13
	INDADEQUATE	-	1	3	1	4
	NOT MENTIONED	-	-	-	-	-
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	2	8	7	10	17
	NO	-	-	-	-	-
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	1	5	4	6	10
	b.	1	7	2	8	10
	c.	1	5	2	6	8
	d.	1	5	2	6	8
	e.	1	5	2	6	8
	f.	2	5	5	7	12
	g.	-	5	2	5	7
(C) FUTURE RELATED OPINIONS :						
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	2	8	7	10	17
	NO	-	-	-	-	-
	NOT MENTIONED	-	-	-	-	-
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	2	2	1	4	5
	b.	-	5	4	5	9
	c.	-	1	-	1	1
	d.	-	1	-	1	1
	e.	-	-	-	-	-

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

\# Various reactions & opinions expressed by the participants.

BETTIAH

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

2 Felt the need to update their informations on drinking Water.
6 Felt that pertinent knowldge about Water quality has been acquired.
- Felt that enough experience has been gained.
- Felt the training as important, useful, popular and mass welfare oriented.
- Felt confident & better.
- Felt it as a significant means of change.
- Felt that they have learnt many new things.
- Felt the training has created a new optimism in them.
- Felt it considerably useful in understanding people and groups at grass root levels.
- Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

a. Training should be organised at village/Block/Panchayat levels.
b. Training should be organised repeatedly at different time intervals.
c. Felt training should be of higher durations.
d. Felt for more time allocation on practical sessions/self work opportunity.

e.
- Need for field visit.
- Organisors should be more concious in creating proper training environment.
- Kits be made available at their work place before training.
- Training be organised at changed places.
- There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
- There should be better discipline during the training.
- There is a need for organised data interpretation.
- There is a need for seperate module for NGO'S.
- Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES			
1.	Sample Sources	HT/W	HT/W	HP	HT/W
2.	TDS (Mg/l)	400	400	500	400
3.	Hardness	√	√	√	√
4.	Iron	√			
5.	Fluoride				
6.	Nitrate		√		
7.	Nitrite				
8.	Chloride				
9.	Bacterialogical test	x	Absent		

√ Indicates presence beyond safe limits.
x Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

BETTIAH

TRAINING AT KHAGARIA

प्रशिक्षणार्थी-सूची

दो दिवसीय जल गुणवत्ता जाँच विषय पर दिनांक 30.9.94 एवं दिनांक 1.10.94 को आयोजित प्रशिक्षण कार्यक्रम में भाग लेने वाले लोक स्वास्थ्य प्रमंडल, खगड़िया/बेगूसराय/समस्तीपुर के सहायक अभियन्ता/कनीय अभियन्ताओं/वर्क सरकारों की सूची :-

क्रमांक	प्रतिभागी का नाम	पदनाम	कार्य स्थल
1.	श्री किशुनदेव सिंगवा	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, दलसिंहसराय
2.	श्री नागेश्वर साह	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
3.	श्री विन्दु भूषण	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
4.	श्री सच्चिदानन्द सिंह	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, जमालपुर
5.	श्री देवेन्द्र प्रसाद	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
6.	श्री अभिनेश कुमार वर्मा	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
7.	श्री कृष्ण कुमार सिन्हा	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, बरौनी
8.	श्री सूर्यदीप सहाय	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
9.	श्री चन्द्र सहनी	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
10.	श्री रामस्वरूप प्रसाद	सहायक अभियन्ता	लो. स्वा. अवर प्रमंडल, रोसड़ा
11.	श्री शिव कुमार पाठक	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, दलसिंहसराय
12.	श्री सुभाष चन्द्र निराला	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, दलसिंहसराय
13.	अनिल कुमार सिन्हा	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, दलसिंहसराय
14.	श्री कैलाश प्रसाद देव	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
15.	श्री राम बालक राजहंस	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, मझौलिया
16.	श्री राज कुमार मंडल	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
17.	श्री राम दुलार राय	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, समस्तीपुर
18.	श्री सुलेन्द्र साह	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
19.	श्री गोविन्द साह	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
20.	श्री बालिकेश्वर प्रसाद	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
21.	श्री उमा शंकर प. श्रीवास्तव	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, बेगूसराय
22.	श्री गिरिजेश कुमार शर्मा	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, खगड़िया
23.	श्री दुलाल चक्रवर्ती	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, समस्तीपुर
24.	श्री शशि भूषण प्रसाद	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, समस्तीपुर
25.	श्री लखन प्रसाद	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, रोसड़ा
26.	श्री विद्या चन्द्र गुप्ता	कनीय अभियन्ता	लो. स्वा. अवर प्रमंडल, रोसड़ा
27.	श्री फूलेश्वर शर्मा	वर्क सरकार	लो. स्वा. अवर प्रमंडल, बेगूसराय
28.	श्री कृष्णानन्द झा	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, बेगूसराय
29.	श्री देवबल साह	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
30.	श्री पारसनाथ पासवान	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, चौथम
31.	श्री सुभाष चन्द्र शुक्ला	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
32.	श्री विजय कुमार सिंह	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
33.	श्री रमानाथ झा	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
34.	श्री अशोक कुमार सिंह	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
35.	श्री अखिलेश्वर प्रसाद सिन्हा	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, बेगूसराय
36.	श्री गंगा प्रसाद सिंह	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, गोगरी
37.	श्री अमरनाथ झा	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, बेगूसराय
38.	श्री विजय कुमार	कार्य निरीक्षक	लो. स्वा. अवर प्रमंडल, समस्तीपुर
39.	श्री विद्यानन्द चानदर	जलकर निरीक्षक	लो. स्वा. अवर प्रमंडल, खगड़िया
40.	श्री भूपेन्द्र ना. सिंह	स्वच्छता निरीक्षक	प्राथमिक स्वास्थ्य केन्द्र, चौथम
41.	श्री मोहन प्रसाद	स्वच्छता निरीक्षक	प्राथमिक स्वास्थ्य केन्द्र, खगड़िया
42.	श्री जगदीश प्रसाद	स्वच्छता निरीक्षक	प्राथमिक स्वास्थ्य केन्द्र, गोगरी
43.	सुश्री कुमारी सविता पोद्दार	अनुदेशिका	आ. वा. केन्द्र खगड़िया
44.	श्रीमती भारती शर्मा	अनुदेशिका	आ. वा. केन्द्र, खगड़िया
45.	श्रीमती रंजीता	अनुदेशिका	आ. वा. केन्द्र, खगड़िया
46.	सुश्री सुधा कुमारी	अनुदेशिका	आ. वा. केन्द्र, खगड़िया
47.	श्रीमती रजनी कुमारी	अनुदेशिका	आ. वा. केन्द्र, खगड़िया

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT KHAGARIA

Altogether 46 participants participated in the training and to them different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows :

S. No.	Desiqnation of the Respondents	Number of Participants	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Executive Engineers	1	--	--	--	--
2.	Assistant Engineers	10	6	7	7	--
3.	Junior Engineers	16	16	15	15	8
4.	Other PHED Perrsonnel	16	7	8	9	15
5.	NGO Representative	5	--	--	--	9
6.	Desiqnations/Classes Unknown	--	--	3	1	--
	TOTAL :	48	29	33	32	32

RESPONSE & FEED BACK

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PER	TARGET GROUP	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	-	8	14	9	22	31
	BAD	-	-	1	-	-	1
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	-	-	1	4	1	5
	MUCH	-	3	5	2	8	10
	AVERAGE	-	3	7	-	10	10
	SLIGHTLY	-	2	2	3	4	7
	NOT AT ALL	-	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	-	8	15	9	23	32
	UNSATISFIED	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	-	-	-
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	-	8	15	9	23	32
	NO	-	-	-	-	-	-
	PARTIALLY	-	-	-	-	-	-

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PERS.	TARGET GROUP	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	-	5	15	8	20	28
	INADEQUATE	-	3	-	-	3	3
	NOT MENTIONED	-	-	-	1	-	1
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	-	6	14	8	20	28
	NO	-	2	1	1	3	4
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	-	4	8	2	12	14
	b.	-	7	10	9	17	26
	c.	-	3	6	-	9	9
	d.	-	4	8	1	12	13
	e.	-	4	5	-	9	9
	f.	-	5	9	1	14	15
	g.	-	2	5	-	7	7
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	-	8	15	8	23	31
	NO	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	1	-	1
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	-	2	5	-	7	7
	b.	-	2	6	9	8	17
	c.	-	1	-	-	1	1
	d.	-	1	1	-	2	2
	e.	-	3	5	-	3	8

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

\# Various reactions & opinions expressed by the participants.

KHAGARIA

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

3 Felt the need to update their informations on drinking Water.
- Felt that pertinent knowldge about Water quality has been acquired.
1 Felt that enough experience has been gained.
3 Felt the training as important, useful, popular and mass welfare oriented.
15 Felt confident & better.
- Felt it as a significant means of change.
- Felt that they have learnt many new things.
- Felt the training has created a new optimism in them.
- Felt it considerably useful in understanding people and groups at grass root levels.
- Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

a. Training should be organised at village/Block/Panchayat levels.
b. Training should be organised repeatedly at different time intervals.
c. Felt training should be of higher durations.
d. Felt for more time allocation on practical sessions/self work opportunity.
e.

2 Need for field visit.
1 Organisors should be more concious in creating proper training environment.
4 Kits be made available at their work place before training.
1 Training be organised at changed places.
- There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
- There should be better discipline during the training.
- There is a need for organised data interpretation.
- There is a need for seperate module for NGO'S.
- Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

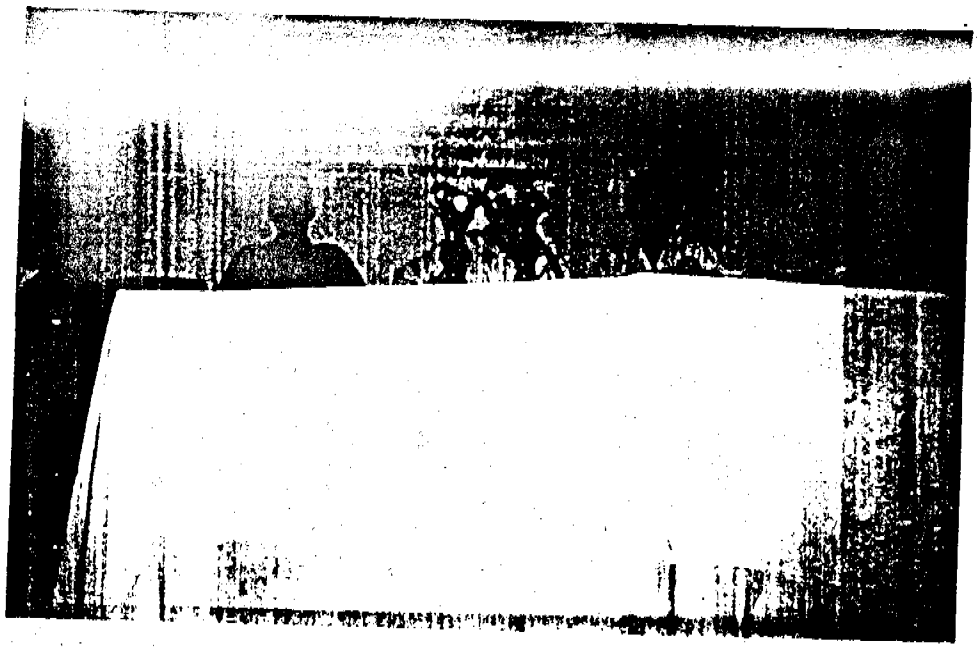
SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES					
1.	Sample Sources	HT/W	Tap	POND	HP	HP	WELL
2.	TDS (Mg/l)	50	350	250	200	200	300
3.	Hardness	√	√		√		
4.	Iron						
5.	Fluoride			√			
6.	Nitrate			√			
7.	Nitrite			√			
8.	Chloride						
9.	Bacterialogical test	x	x	√			x

√ Indicates presence beyond safe limits.
x Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

KHAGARIA

PEOPLE AT WORK



FACULTY (SITTING LEFT) WITH EXECUTIVE ENGINEER (SITTING RIGHT) WITH A.E. & J.E. PARTICPANTS DURING A PRACTICAL SESSION.

FACULTY ER K.P. BHAWSINKA (LEFT) WITH EXECUTIVE ENGINEER & ASST. ENGNEERS OF PHED DEMONSTRATING TRANSFER TECHNIQUE.

PARTICIPANTS WITH THEIR TEST SAMPLES.

PARTICIPANTS SIDE VIEW WHILE WORKING WITH OH PROJECTOR.

TRAINING AT GUMLA

LIST OF PARTICIPANTS OF TRAINING ON WATER QUALITY SERVEILLANCE, GUMLA

		Designation	Work place
A.	**Officials, Dignitaries & Invitee :**		
1.	Executive Officer,	Special Guest,	Gumla,
2.	Sri Hari Om Sudhanshu	Correspondent,	Desh Pran.
3.	Sri Om Prakash Chourasia	Correspondent,	Prabhat Khabar.
4.	Sri Ashok Mukul	Correspondent,	Aaj.
5.	Sri Ganpat Lal Chourasia	Correspondent	Ranchi Express.
6.	Sri V.L. Das,	Executive Engineer,	P.H.Division,Gumla.
7.	Sri Martin Khalko,	Executive Engineer,	P.H.Division, Lohardaga
8.	Sri G.M.Singh,	Executive Engineer,	P.H.Division, Simdega.
B.	**Target Group Participants :**		
9.	Sri S.K.Singh,	Assistant Engineer,	P.H. Division, Gumla.
10.	Sri Jhari Oraon,	Assistant Engineer,	P.H. Division, Gumla.
11.	Sri Ram Chandra Pd.	Assistant Engineer,	P.H. Division, Gumla.
12.	Sri Ram Pravesh Singh	Assistant Engineer,	P.H. Division, Gumla.
13.	Sri Samir Kumar Das	Assistant Engineer,	P.H. Division, Gumla.
14.	Sri Binay Kumar	Assistant Engineer,	P.H. Division, Simdega.
15.	Sri Herman Toppo,	AssistantEngineer,	P.H.Division, Lohardaga.
16.	Sri Eshak Mian	AssistantEngineer,	P.H.Division, Lohardaga.
17.	Sri S.K. Karunkar	Junior Engineer,	P.H. Division, Palkot.
18.	Sri G.N. Sharma	Junior Engineer,	P.H. Division,Gumla-1.
19.	Sri Balmiki Prasad	Junior Engineer,	P.H. Division,Chainpur.
20.	Sri B.K.Pandey	Junior Engineer,	P.H. Division, Dumri.
21.	Sri Arun Kumar Pd.	Junior Engineer,	P.H. Division, Gumla-2.
22.	Sri P.S. Ram	Junior Engineer,	P.H. Division, Sisai.
23.	Sri Kr. Umesh Singh	Junior Engineer,	P.H. Division,Ghaghare.
24.	Sri Anil Kumar	Junior Engineer,	P.H. Division, Bishunpur.
25.	Sri B.R. Pandey	Junior Engineer,	P.H. Division, Basia.
26.	Sri S.P. Choudhary	Junior Engineer,	P.H. Division, Kamdara.
27.	Sri R.K. Verma	Junior Engineer,	P.H. Division, Simdega.
28.	Sri Kumar Avinash	Junior Engineer,	P.H. Division, Simdega.
29.	Sri Birendra Kr.Singh	Junior Engineer,	P.H. Division, Simdega.
30.	Sri Hira Lal Ram	Junior Engineer,	P.H. Division, Simdega.
31.	Sri Rajendra Pd.Shukla	Junior Engineer,	P.H. Division, Simdega.
32.	Sri Kedar Nath Ram	Junior Engineer,	P.H. Division, Lohardaga.
33.	Sri Paras Pd. Singh	Junior Engineer,	P.H. Division, Lohardaga.
34.	Sri Ramashray Ram	Junior Engineer,	P.H. Division, Lohardaga.
35.	Sri Pashupati Upadhaya	Junior Engineer,	P.H. Division, Lohardaga.
36.	Sri Hari Narayan Gupta	Junior Engineer,	P.H. Division, Lohardaga.
37.	Sri Bipin Bihari Pd.	Junior Engineer,	P.H. Division, Lohardaga.
(C)	**Non Target Group Participants :**		
38.	Sri Ram Sagar Singh,	Work Sarkar,	P.H.Division, Gumla.
39.	Sri Chaturbhuj Singh,	Store Keeper	P.H.Division, Gumla.
40.	Sri T. Belong	N.G.O.,	Gramothan Kendra.
41.	Sri A.F. Kispotta	N.G.O.,	Gramothan Kendra.
42.	Miss. Shailley Kerketta	N.G.O.,	Arouse.
43.	Miss. Poonam Kachhap	N.G.O.,	Arouse.
44.	Sri Lokas Ekka	N.G.O.,	Vikash Maitri.
45.	Sri Mahendra Munda	N.G.O.,	Vikash Maitri.

Training Faculty : Sri K.P. Bhawsinka.
Organised on 19.10.94 and 20.10.94.

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT GUMLA

Altoqether 45 participants participated in the training and to them different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows :

S. No.	Desiqnation of the Respondents	Number of Participants	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Officials & Invitee	5	-	-	-	-
2.	Executive Engineers	3	1	-	-	1
3.	Assistant Engineers	8	6	1	6	2
4.	Junior Engineers	21	18	9	13	8
5.	Other PHED Perrsonnel	2	-	-	-	-
6.	NGO Representative	6	6	1	5	6
7.	Desiqnations/Classes Unknown	-	1	-	-	-
	TOTAL :	45	32	11	24	17

RESPONSE & FEED BACK

OPINIONS EXPRESSED / DESIGNATIONS		EE	AE	JE	NGO	TARGET GROUP	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	1	2	8	7	10	18
	BAD	-	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	-	-	-	-	-	-
	MUCH	1	-	5	2	5	8
	AVERAGE	-	2	-	3	2	5
	SLIGHTLY	-	-	3	2	3	5
	NOT AT ALL	-	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	1	2	7	2	9	12
	UNSATISFIED	-	-	1	4	1	5
	NOT MENTIONED	-	-	1	-	1	1
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	1	2	7	1	9	11
	NO	-	-	1	1	1	2
	PARTIALLY	-	-	-	5	-	5

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	NGO	TARGET GROUP	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	-	1	4	3	5	8
	INADEQUATE	1	1	4	3	5	9
	NOT MENTIONED	-	-	-	1	-	1
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	1	2	6	4	8	13
	NO	-	-	2	3	2	5
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	-	1	6	2	7	9
	b.	-	2	5	5	7	12
	c.	-	1	3	-	4	4
	d.	-	1	3	-	4	4
	e.	-	1	3	-	4	4
	f.	1	1	5	3	6	10
	g.	-	1	3	-	4	4
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	1	2	8	5	10	16
	NO	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	2	-	2
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	-	-	3	-	3	3
	b.	-	1	2	-	3	3
	c.	-	1	1	-	2	2
	d.	1	-	-	-	-	1
	e.	-	-	1	-	1	1

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

\# Various reactions & opinions expressed by the participants.

GUMLA

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

3 Felt the need to update their informations on drinking Water.
- Felt that pertinent knowldge about Water quality has been acquired.
- Felt that enough experience has been gained.
9 Felt the training as important, useful, popular and mass welfare oriented.
1 Felt confident & better.
1 Felt it as a significant means of change.
- Felt that they have learnt many new things.
1 - Felt the training has created a new optimism in them.
1 Felt it considerably useful in understanding people and groups at grass root levels.
- Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

a. Training should be organised at village/Block/Panchayat levels.
b. Training should be organised repeatedly at different time intervals.
c. Felt training should be of higher durations.
d. Felt for more time allocation on practical sessions/self work opportunity.

e.
- Need for field visit.
- Organisors should be more concious in creating proper training environment.
1 Kits be made available at their work place before training.
- Training be organised at changed places.
- There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
- There should be better discipline during the training.
- There is a need for organised data interpretation.
- There is a need for seperate module for NGO'S.
- Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

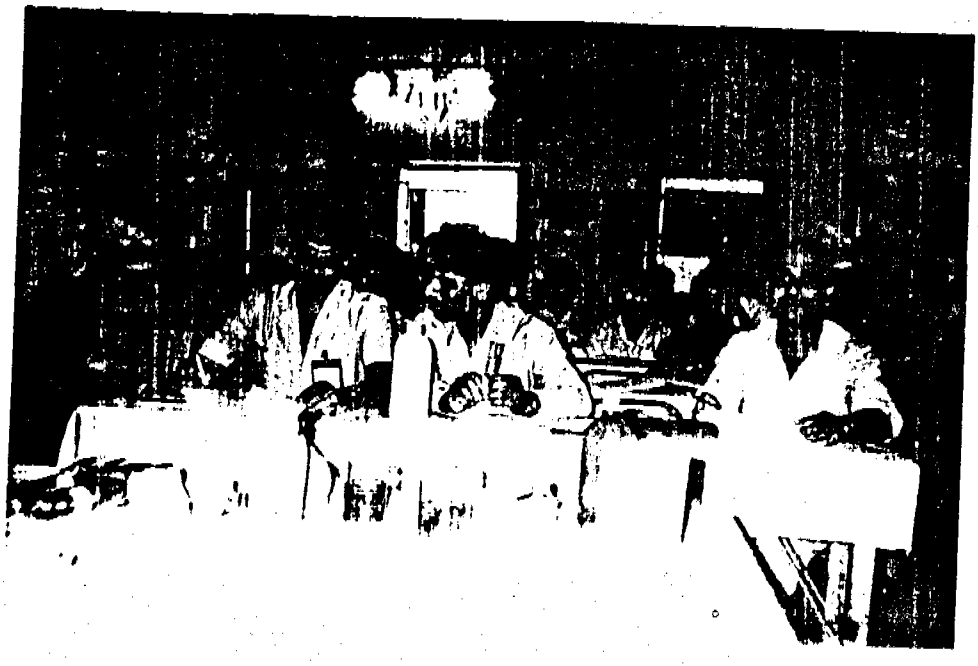
SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES			
1.	Sample Sources	DT/W	DT/W	DT/W	DT/W
2.	TDS (Mg/l)	500	150	100	750
3.	Hardness	√	√	√	
4.	Iron				
5.	Fluoride				
6.	Nitrate			√	
7.	Nitrite				
8.	Chloride				
9.	Bacterialogical test	×	Absent	×	×

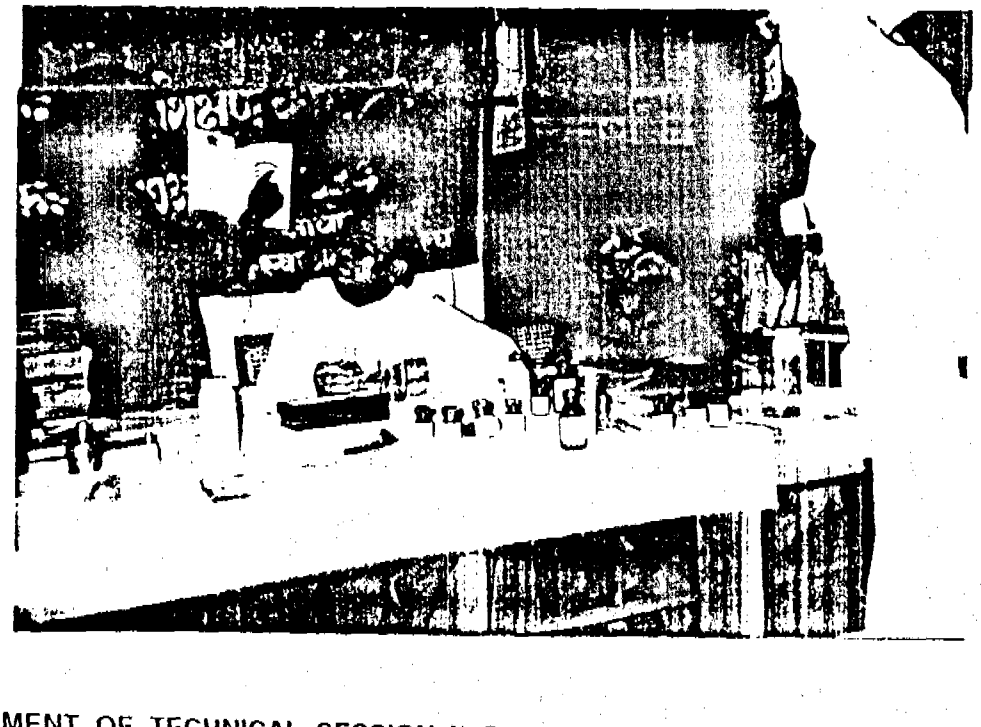
√ Indicates presence beyond safe limits.
× Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

PEOPLE AT WORK

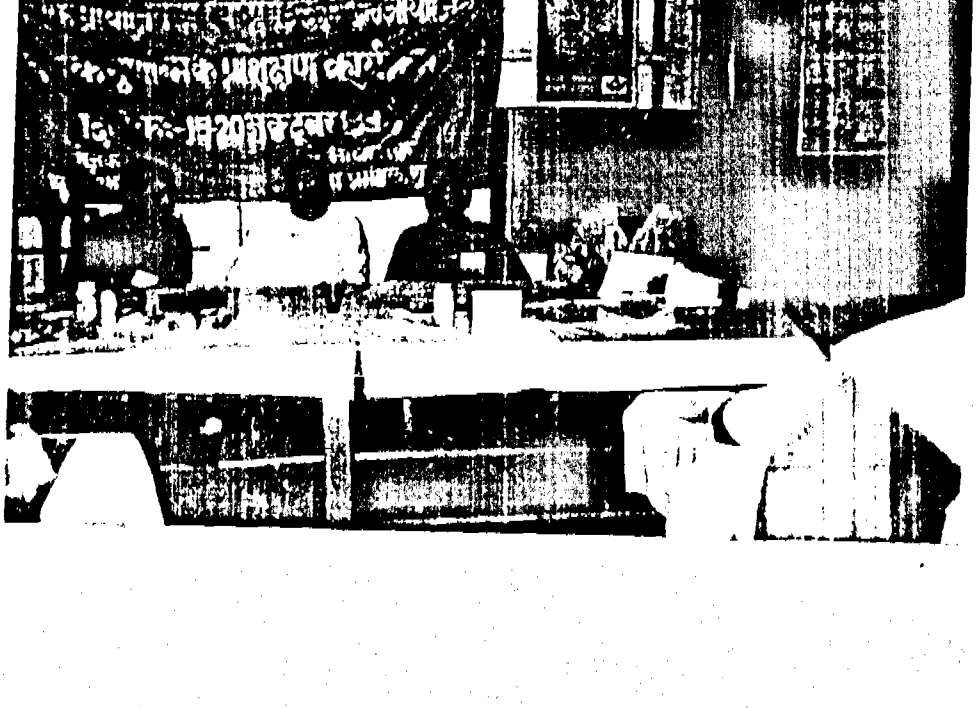
EXECUTIVE ENGINEER (IN CENTRE) WITH HIS TEAM OF PARTICIPANTS & TRAINING FACULTY (IN LEFT), JUST AFTER CONCLUDING SESSION.



PARTICPANTS IN ATTENTION DURING TECHNICAL SESSION.



A CRITICAL MOMENT OF TECHNICAL SESSION WITH EXECUTIVE ENGINEERS SEEN IN DEEP ATTENTION.



A BUSY MOMENT OF THE SESSION. SEEN FROM LEFT ARE– ER. K.P. BHAWSINKA, ER. V.L. DAS, ER. G.M. SINGH & ER. MARTIN KHALKO (ALL THREE EXECUTIVE ENGINEERS, PHED).

PARTICPANTS AT WORK.

PARTICIPANTS AT WORK DURING TRAINING.

TRAINING AT ARRAH

प्रशिक्षणार्थी-सूची

यूनिसेफ प्रयोजित दो दिवसीय जल गुणवत्ता जाँच प्रशिक्षण कार्यक्रम, भोजपुर दिनांक 28.10.94 से 29.10.94 ।

(अ) **पदाधिकारी और विशेष आगन्तुक :**

1.	श्री अमीर सुबहानी	जिलाधिकारी	भोजपुर
2.	श्री अनन्त प्रसाद सिन्हा	उप विकास आयुक्त	भोजपुर
3.	श्री आर. के. राम	अधीक्षण अभियंता	लोक स्वा. अंचल, आरा
4.	श्री शैलेश कुमार सिन्हा	कार्यपालक अभियंता	लोक स्वा. प्रमंडल, आरा

(ब) **लक्ष्य समूह (टारगेट ग्रुप) के प्रशिक्षणार्थी :**

5.	श्री तपेश्वर चौधरी	सहायक अभियंता	लोक स्वा. अवर प्रमंडल, आरा
6.	श्री के. एल. बैठा	सहायक अभियंता	लोक स्वा. अवर, प्रमंडल, पीरो
7.	श्री नन्दलाल प्रसाद वर्मन	सहायक अभियंता	लोक स्वा. अवर प्रमंडल बिहियाँ
8.	श्री एस. आर. नाहर	सहायक अभियंता	लोक स्वा. यांत्रिक अवर प्रमंडल, आरा
9.	श्री अखौरी अभिमन्यु प्र. सिन्हा	कनीय अभियंता	लोक स्वा. प्रशाखा, पीरो
10.	श्री अशोक कुमार	कनीय अभियंता	लोक स्वा. प्रशाखा, गड़हनी
11.	श्री सरयु प्रसाद	कनीय अभियंता	लोक स्वा. प्रशाखा, सहार
12.	श्री शन्तनु प्रसाद	कनीय अभियंता	लोक स्वा. प्रशाखा, सन्देश
13.	श्री प्रभाकर पाण्डेय	कनीय अभियंता	लोक स्वा. प्रशाखा, कोइलवर
14.	श्री बालेश्वर सिंह	कनीय अभियंता	लोक स्वा. प्रशाखा, आरा
15.	श्री हीरा शर्मा	कनीय अभियंता	लोक स्वा. प्रशाखा, भण्डार, आरा
16.	श्री रामजी प्रसाद	कनीय अभियंता	लोक स्वा. प्रशाखा, जगदीशपुर
17.	श्री रामकुमार ओझा	कनीय अभियंता	लोक स्वा. प्रशाखा, बिहियाँ
18.	श्री सिधेश्वर मण्डल	कनीय अभियंता	लोक स्वा. प्रशाखा, शाहपुर
19.	श्री साह जी	कनीय अभियंता	लोक स्वा. यांत्रिक प्रशाखा, आरा

(स). **अन्य अलक्ष्य समूह के भाग लेने वाले प्रशिक्षणार्थी :**

20.	श्री रामनरेश सिंह	कार्यदर्शक	लोक स्वा. प्रशाखा, आरा
21.	श्री इन्द्रदीप कुमार सिन्हा	कार्यदर्शक	लोक स्वा. प्रशाखा, आरा

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT ARRAH

To the 14 partjcipants participating in the training different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows:

S. No.	Desiqnation of the Respondents	Number of Participants	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Supritendent Engineer	1	--	--	--	--
2.	Executive Engineers	1	--	--	--	--
3.	Assistant Engineers	4	--	3	--	4
4.	Junior Engineers	10	--	9	--	9
5.	Other PHED Perrsonnel	2	--	1	--	--
6.	NGO Representative	N.M.*	--	--	--	--
7.	Desiqnations/Classes Unknown	--	13	1	13	--
	TOTAL :	18	13	14	13	13

RESPONSE & FEED BACK

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PER	TARGET GROUP	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	4	9			13	13
	BAD	-	-			-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	-	-			-	-
	MUCH	1	4			5	5
	AVERAGE	3	5			8	8
	SLIGHTLY	-	-			-	-
	NOT AT ALL	-	-			-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	4	9			13	13
	UNSATISFIED	-	-			-	-
	NOT MENTIONED	-	-			-	-
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	4	8			12	12
	NO	-	-			-	-
	PARTIALLY	-	-			-	-

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PERS.	TARGET GROUP	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	2	9			11	11
	INADEQUATE	2	-			2	-
	NOT MENTIONED	-	-			-	-
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	4	9			13	13
	NO	-	-			-	-
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	1	5			6	6
	b.	1	4			5	5
	c.	1	3			4	4
	d.	2	6			8	8
	e.	2	5			7	7
	f.	2	4			6	6
	g.	1	3			4	4
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	4	7			11	11
	NO	-	-			-	2
	NOT MENTIONED	-	2			2	2
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	1	1			2	2
	b.	2	-			2	2
	c.	-	1			1	1
	d.	-	1			1	1
	e.	1	4			5	5

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

Various reactions & opinions expressed by the participants.

N.M. *– NOT MENTIONED.

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

2 Felt the need to update their informations on drinking Water.
1 Felt that pertinent knowldge about Water quality has been acquired.
- Felt that enough experience has been gained.
2 Felt the training as important, useful, popular and mass welfare oriented.
4 Felt confident & better.
- Felt it as a significant means of change.
3 Felt that they have learnt many new things.
- Felt the training has created a new optimism in them.
- Felt it considerably useful in understanding people and groups at grass root levels.
- Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

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e.
1 Need for field visit.
- Organisors should be more concious in creating proper training environment.
1 Kits be made available at their work place before training.
2 Training be organised at changed places.
1 There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
2 There should be better discipline during the training.
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1 There is a need for seperate module for NGO'S.
1 Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

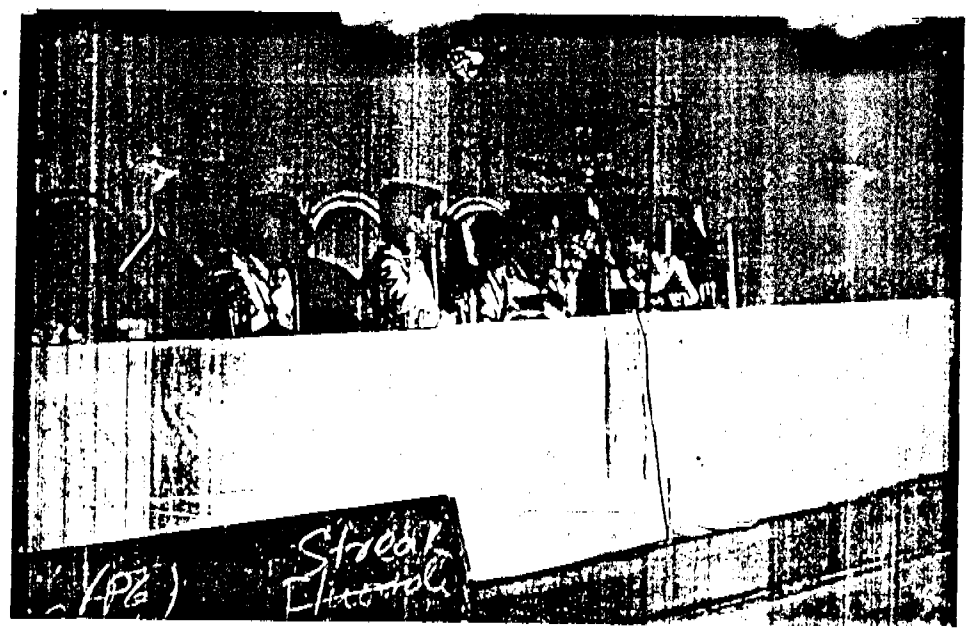
Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

SUMMARY OF TEST RESULTS

S.No,	Particulars	SAMPLE SOURCES						
1.	Sample Sources	Tap	Tap	Tap	Well	Well	T/W	T/W
2.	TDS (Mg/l)	250	250	350	550	1100	450	450
3.	Hardness			√	√			
4.	Iron	×	×		×	×	×	×
5.	Fluoride	×			×			
6.	Nitrate					√		
7.	Nitrite							
8.	Chloride					√		
9.	Bacterialogical test		×	×		×	×	×

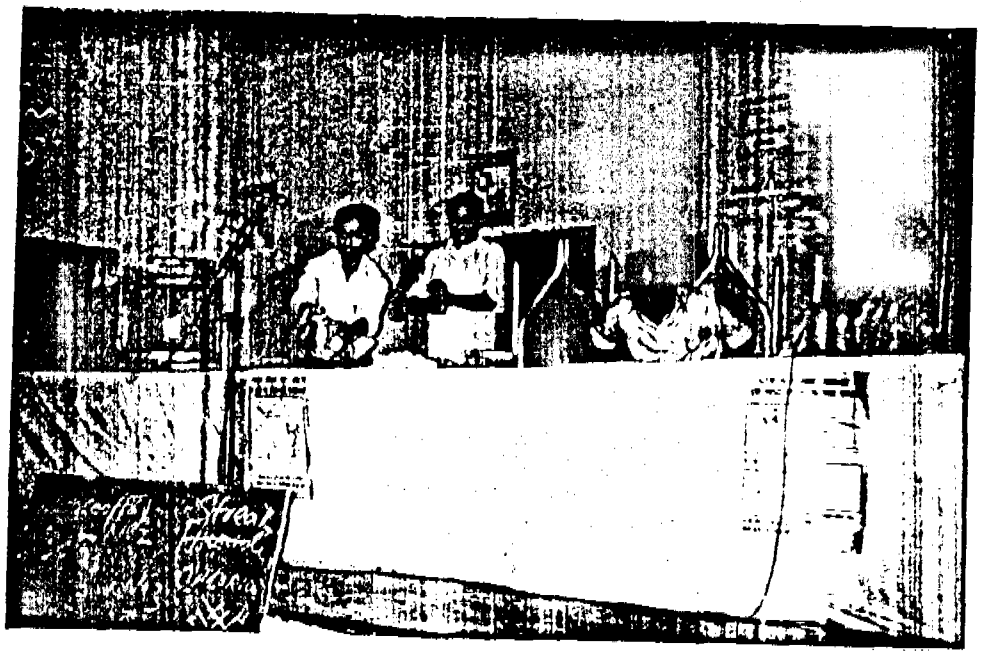
√ Indicates presence beyond safe limits.
× Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

PEOPLE AT WORK



ER. K.P. BHAWSINKA IN SERIOUS DISCUSSIONS WITH D.M, BHOJPUR, S.E & E.E., PHED.

D.M BHOJPUR NOTING DOWN THE SUGGESTIONS GIVEN BY FACULTY MR. BHAWSINKA. S.E & E.E., PHED PAYING ATTENTION.

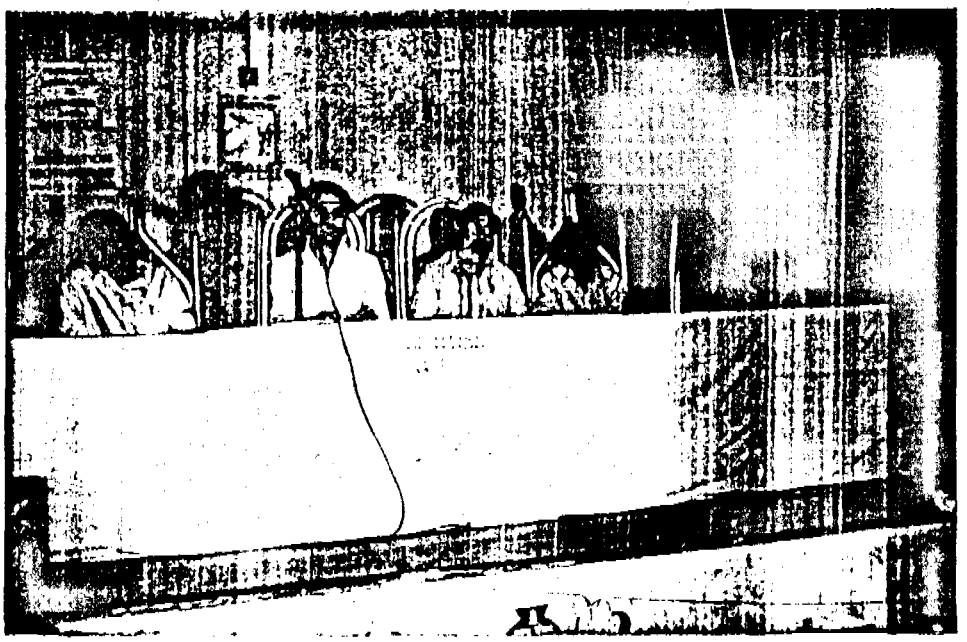


SRI A.P. SINHA, DDC, ARRAH (EXTREEM RIGHT) ALONG WITH THE EXECUTIVE ENGINEER, PHED, TRAINING FACULTY & OTHERS IN INAUGURAL SESSION.

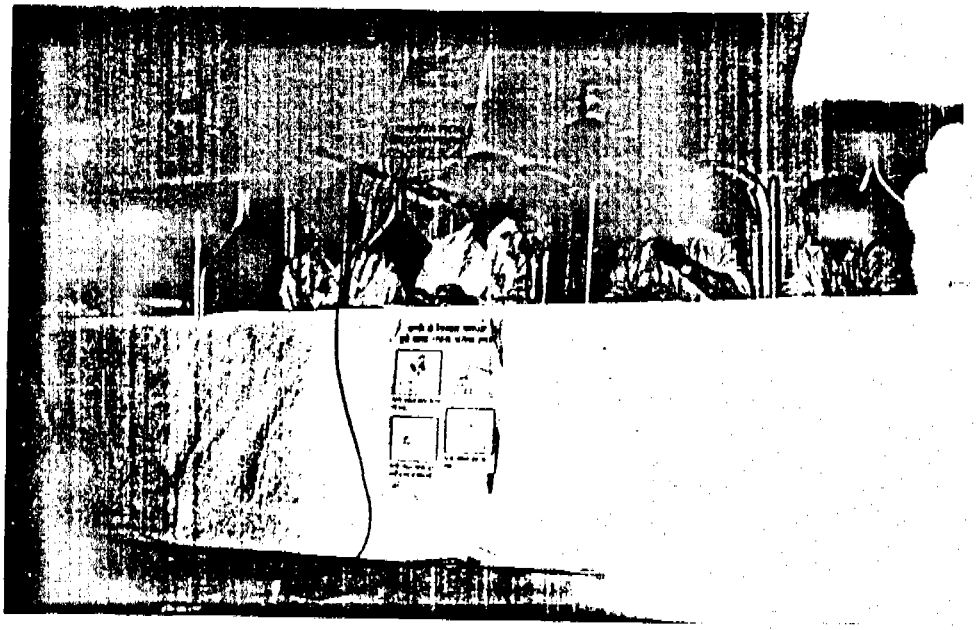
PARTICPANTS BUSY DURING THE TECHNICAL SESSION.

EXECUTIVE ENGINEER EXPLAINING THE DETAILS OF FILM ON WATER TO SRI AMIR SUBHANI, DM, BHOJPUR (IN CENTRE). ON RIGHT IS SEEN ER. R.K. RAM, S.E, PHED.

FACULTY AT WORK



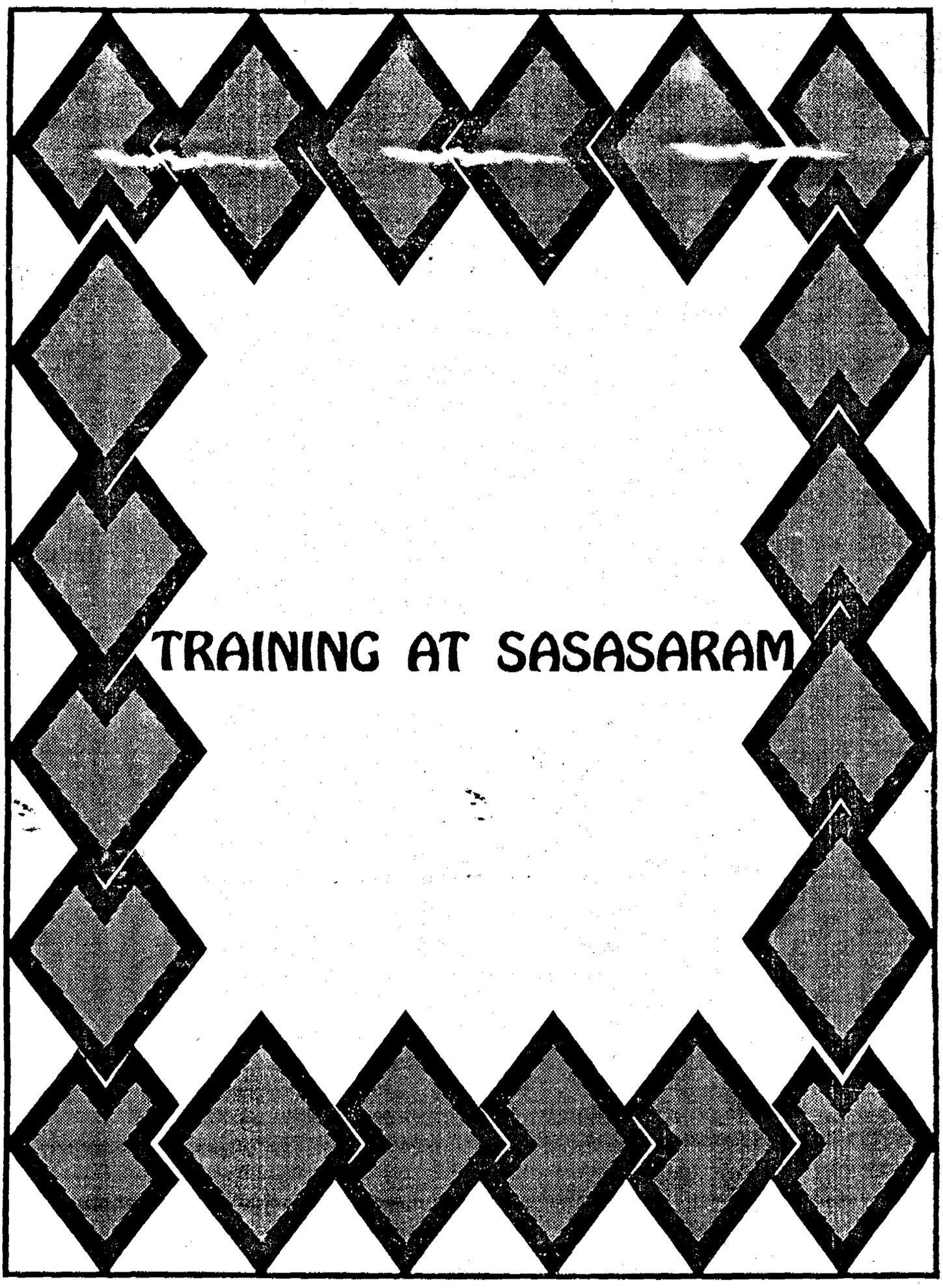
ANOTHER VIEW OF VALIDECTORY SESSION WITH D.M. ARRAH ADDRESSING THE PARTICIPANTS.



DM, BHOJPUR IN VALIDECTORY SESSION. ON RIGHT ARE S.E, PHED, ARAAH & TRAINING FACULTY ER. K.P. BHAWSINKA. ON LEFT IS EXECUTIVE ENGINEER, PHED ARAAH SRI S.K. SINHA.

PARTICPANTS BUSY IN TEST REPORT PREPARATIONS.

ANOTHER BUSY MOMENT OF THE TECHNICAL SESSION.


TRAINING AT SASASARAM

TRAINING ON WATER QUALITY SURVEILLANCE & MONITORING
- CUM -
WATER TESTING FIELD KIT DEOMONSTRATION.

HELD AT-SHERSHAH HOTEL, SASARAM ON 15.11.94 TO 16.11.94

S. NO.	NAME	DESIGNATION	WORK PLACE
1.	SRI DINESH KUMAR	SDO, PH SUB DIVISION	SASARAM
2.	SRI RAJ KISHORE SINGH	SDO, PH SUB DIVISION	DEHRI
3.	SRI RAM NATH SINGH	SDO, PH MECH. SUB DIVISION	DEHRI
4.	SRI SALIGARAM SINGH	JUNIOR ENGINEER, PH SEC.	SASARAM
5.	SRI VIJAY KUMAR SINGH	JUNIOR ENGINEER, PH SEC.	CHENARI
6.	MD. M. RAHMAN	JUNIOR ENGINEER, PH SEC.	NASARIGANJ
7.	SRI RANBIR SINGH	JUNIOR ENGINEER, PH SEC.	KARGHAR
8.	SRI RAJKISHOR GUPTA	JUNIOR ENGINEER, PH SEC.	NAUHATTA
9.	SRI DHARMCHAND PRASAD SINGH	JUNIOR ENGINEER, PH SEC.	ROHTAS
10.	SRI LAL MOHAN PRASAD KESHRI	JUNIOR ENGINEER, PH SEC.	SURJPURA
11.	SRI UMA SHANKAR PRASAD	JUNIOR ENGINEER, PH SEC.	SASARAM
12.	SRI MUKUND LAL	JUNIOR ENGINEER, PH SEC.	DEHRI
13.	SRI KAMLESH KUMAR SINGH	STORE KEEPER, PH DIVISION	SASARAM
14.	SRI RAMJANM RAM	WORK SARKAR, PH SEC., KARGHAR	BLOCK- NOKHA
15.	SRI MADHESWAR PRASAD SINGH	WORK SARKAR, PH SEC., KARGHAR	BLOCK- KAGHER
16.	SRI VISHNU BHAGAT	WORK SARKAR, PH SEC.	SASARAM
17.	SRI NARENDRA KUMAR SINGH	WORK SARKAR, PH SEC.CHENARI.	BLOCK- SHEO SAGAR
18.	SRI KEDAR SINGH	P.L.I. PH SEC.	SASARAM
19.	INDERJEET KUMAR SINGH	SDC, PH SUB DIVISION	SASARAM

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT SASARAM

To the participants participating in the training different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows:

S. No.	Desiqnation of the Respondents	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Executive Engineers	-	-	-	-
2.	Assistant Engineers	3	1	1	2
3.	Junior Engineers	2	4	5	6
4.	Other PHED Perrsonnel	5	3	4	4
5.	NGO Representative	-	-	-	-
6.	Desiqnations/Classes Unknown	-	-	2	1
	TOTAL :	10	8	12	13

RESPONSE & FEED BACK

DESIGNATIONS / OPINIONS EXPRESSED		TARGET GROUP	AE	JE	DEPT. PER	N.M.*	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	8	2	6	4	1	13
	BAD	-	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	4	1	3	3	-	7
	MUCH	4	1	3	1	1	6
	AVERAGE	-	-	-	-	-	-
	SLIGHTLY	-	-	-	-	-	-
	NOT AT ALL	-	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	7	2	5	2	1	10
	UNSATISFIED	-	-	-	-	-	-
	NOT MENTIONED	1	-	1	2	-	3
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	7	2	5	2	1	10
	NO	-	-	-	-	-	-
	PARTIALLY	1		1	2	-	3

DESIGNATIONS / OPINIONS EXPRESSED		TARGET GROUP	AE	JE	DEPT. PERS.	N.M*	TOTAL
(B) RELATED TO THE OPINIONS ABOUT * TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	5	1	4	3	-	8
	INADEQUATE	3	1	2	1	-	4
	NOT MENTIONED	-	-	-	-	1	1
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	7	2	5	2	-	9
	NO	-	-	-	-	-	-
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	5	1	4	1	-	6
	b.	6	1	5	1	-	7
	c.	5	1	4	1	-	6
	d.	5	1	4	2	-	7
	e.	5	1	4	1	-	6
	f.	6	1	5	1	-	7
	g.	5	1	4	2	-	7
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	8	2	6	3	1	12
	NO	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	1	-	1
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	1	-	1	-	-	1
	b.	2	1	1	2	-	4
	c.	1	-	1	1	-	2
	d.	-	-	-	-	-	-
	e.	3	1	2	-	-	3

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
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Various reactions & opinions expressed by the participants.

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SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

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Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES			
1.	Sample Sources	Tap	Tap	DT/W	HP
2.	TDS (Mg/l)	100	100	100	300
3.	Hardness		√		
4.	Iron	Absent	Very low	Absent	Absent
5.	Fluoride	Absent	Absent		
6.	Nitrate			√	
7.	Nitrite				
8.	Chloride				
9.	Bacterialogical test	Absent	×	×	×

√ Indicates presence beyond safe limits.
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Only Abnormal values are Reported. Values within safe limits are not mentioned.

TRAINING AT DEOGARH

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT DEOGARH

To the participants participating in the training different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows:

S. No.	Desiqnation of the Respondents	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Executive Engineers	1	1	1	2
2.	Assistant Engineers	3	4	4	3
3.	Junior Engineers	9	9	9	8
4.	Other PHED Perrsonnel	2	4	4	4
5.	NGO Representative	-	-	-	-
6.	Desiqnations/Classes Unknown	3	-	-	2
	TOTAL :	18	18	18	19

RESPONSE & FEED BACK

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PER	N.M *	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	2	3	8	4	2	19
	BAD	-	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	1	-	-	1	-	2
	MUCH	1	2	2	-	1	6
	AVERAGE	-	1	3	3	-	7
	SLIGHTLY	-	-	3	-	1	4
	NOT AT ALL	-	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	2	3	6	4	2	17
	UNSATISFIED	-	-	2	-	-	2
	NOT MENTIONED	-	-	-	-	-	-
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	2	3	8	3	1	17
	NO	-	-	-	1	1	2
	PARTIALLY	-	-	-	-	-	-

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PERS.	N.M *	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	1	1	2	4	1	9
	INADEQUATE	1	2	6	-	-	9
	NOT MENTIONED	-	-	-	-	1	1
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	2	3	5	4	2	16
	NO	-	-	3	-	-	3
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	2	2	3	4	-	11
	b.	2	2	5	5	-	14
	c.	1	2	3	3	-	9
	d.	2	2	4	4	-	12
	e.	1	2	3	5	-	11
	f.	1	2	6	4	-	13
	g.	1	-	-	-	-	1
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	2	2	7	4	2	17
	NO	-	-	-	-	-	-
	NOT MENTIONED	-	1	1	-	-	2
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	-	-	-	-	-	-
	b.	1	1	-	-	4	6
	c.	1	1	3	-	-	5
	d.	-	-	-	-	-	-
	e.	2	1	-	5	2	10

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
f. Practical on Water Analysis.
g. Film show.

Various reactions & opinions expressed by the participants.

N.M. *– NOT MENTIONED.

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

(A) General feelings of the trainee after the training :

9 Felt the need to update their informations on drinking Water.
- Felt that pertinent knowldge about Water quality has been acquired.
- Felt that enough experience has been gained.
1 Felt the training as important, useful, popular and mass welfare oriented.
9 Felt confident & better.
- Felt it as a significant means of change.
- Felt that they have learnt many new things.
- Felt the training has created a new optimism in them.
- Felt it considerably useful in understanding people and groups at grass root levels.
5 Felt essential to know techiniques.

#(B) General feelings about the future organisation of the training :

a. Training should be organised at village/Block/Panchayat levels.
b. Training should be organised repeatedly at different time intervals.
c. Felt training should be of higher durations.
d. Felt for more time allocation on practical sessions/self work opportunity.
e.

- Need for field visit.
- Organisors should be more concious in creating proper training environment.
1 Kits be made available at their work place before training.
2 Training be organised at changed places.
- There is a need for training manual.
- There is a need for organising a seperate training on treatment technologies.
- There should be better discipline during the training.
7 There is a need for organised data interpretation.
- There is a need for seperate module for NGO'S.
- Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

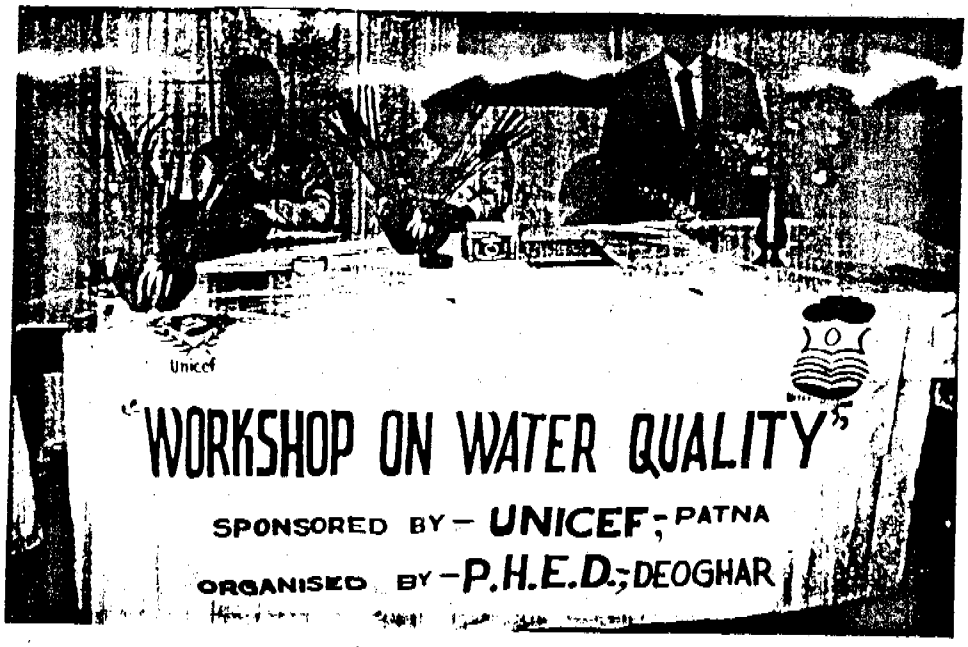
SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES					
1.	Sample Sources	HT/W	HT/W	HT/W	TAP	Well	HP
2.	TDS (Mg/l)	250	250	250	250	250	300
3.	Hardness	√	√	√			
4.	Iron						
5.	Fluoride						
6.	Nitrate						√
7.	Nitrite						
8.	PH	7.0	7.5	7.0	7.5	7.0	7.0
9.	Bacterialogical test	×	×	×	×		

√ Indicates presence beyond safe limits.
× Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

DEOGARH

PEOPLE AT WORK



A VIEW OF THE TRAINING.

TRAINING SESSION AT WORK IN DEOGARH. IN CENTRE IS E.E. SRI SUBODH KUMAR, PHED, DEOGARH. FACULTY K.P. BHAWSINKA DELIBERATING THE TECHNICAL SESSION.

PARTICPANTS JUST AFTER LUNCH BREAK.

OUT SIDE VIEW OF TRAINING VENUE.

TRAINING AT RANCHI

PARTICIPANT LIST

FOLLOWING PARTICIPANTS PARTICIPATED IN THE TWO DAY UNICEF SPONSORED TRAINING PROGRAMME ON 'WATER QUALITY SERVEILLANCE AND MONITORING' ORGANISED ON SECOND AND 3RD MARCH, '95 AT THE INSTITUTION OF ENGNEERS, [illegible], RANCHI.

S. NO.	NAME	DESIGNATION	WORK PLACE
1.	F. RAUT	EXECUTIVE ENGINEER, PH DIVISION,	RANCHI EAST
2.	TRIBHUWAN BAITHA	SDO, PH DIVISION	DORANDA
3.	AJAY KUMAR SINHA	ASSISTANT ENGINEER, PH DIVISION,	RANCHI EAST
4.	T. N. OJHA	ASSISTANT ENGINEER, PH DIVISION,	BUNDU
5.	SHIVJEE BAITHA	ASSISTANT ENGINEER, PH DIVISION,	KHARAGA (R)
6.	DINESH KUMAR SINGH	JUNIOR ENGINEER, PH SECTION	BUNDU
7.	PANKAJ PRASUN	JUNIOR ENGINEER, PH SECTION	SONAHALU
8.	BAGIRATH RAM	JUNIOR ENGINEER, PH SECTION	KANKE
9.	N. K. SINGH	JUNIOR ENGINEER, PH SECTION	ORMANJHI
10.	U. K. SINGH	JUNIOR ENGINEER, PH SECTION	ANGARA
11.	ASHOK KUMAR	JUNIOR ENGINEER, PH SECTION	RANCHI, WEST
12.	BINDESHWAR PRASAD	JUNIOR ENGINEER, PH SECTION,	BURMU
13.	MAHENDRA PRATAP SINGH	JUNIOR ENGINEER, PH SECTION,	CHANHA
14.	VIJAY KUMAR	JUNIOR ENGINEER, PH SECTION,	SILLY
15.	VIJAY SHANKAR SINGH	JUNIOR ENGINEER, PH DIVISION,	KHUNTI
16.	S. P. TANTI	JUNIOR ENGINEER, PH SECTION,	RATU
17.	JAY NARAYAN SINGH	JUNIOR ENGINEER, PH SECTION	NAMKUM
18.	A. K. SINGH	JUNIOR ENGINEER, PH SECTION	RANCHI
19.	RAKESH KUMAR SRIVASTAVA	FOR SDO, PH DIVISION,	MANDU
20.	NAVIN KUMAR CHOUDARY	WORK SARKAR, PH DIVISION	RANCHI, EAST
21.	RAJESH KUMAR	WORK SARKAR, PH SECTION	MONIAK
22.	NARESH PRASAD	WORK SARKAR, PH SECTION	RANCHI, WEST
23.	RAM KISHOR ROY	WORK SARKAR, PH SECTION	RANCHI, WEST
24.	NARESH PRASAD SINGH	WORK SARKAR, PH SECTION	KHUNTI
25.	KRUSTENE KUMAR	WORK SARKAR, PH SECTION.	BUNDU
26.	SURENDRA KUMAR	WORK SARKAR, PH SECTION	BERA (RANCHI)
27.	R. S. SRIVASTAVA	WORK SARKAR, PH SECTION	MANDER
28.	YUGAL KISHOR RAI	WORK SARKAR, PH SECTION	RANCHI, WEST
29.	ARUN KUMAR		CHOTANAGPUR SANGH, RANCHI
30.	A. K. MEHTA		CHOTANAGPUR SANGH, RANCHI
31.	SHARAN SINGH		JAN VIKASH KENDRA
32.	DR. A. K. SINGH		JAN VIKASH KENDRA
33.	PRAVIN KUMAR JHA		JAN VIKASH KENDRA
34.	J. K. MISHRA		SRI SRI THAKUR ANKUL CHANDRA SATSANG ASHRAM, RANCHI
35.	DEBI PRASAD MAHAPATRA		SRI SRI THAKUR ANKUL CHANDRA SATSANG ASHRAM, RANCHI
36.	INDU SINGH	C. S.	MATRI UDBODHAN SAMITEE, RANCHI
37.	RAKESH KUMAR TRIPATHI	C. S.	MATRI UDBODHAN SAMITEE, RANCHI
38.	RENUKA PATHAK	C. S.	MATRI UDBODHAN SAMITEE, RANCHI

SUMMARY DETAILS OF FEEDBACK OBTAINED DURING TRAINING AT RANCHI

Altoqether 38 participants participated in the training and to them different printed questionnaires were Circulated at different time intervals during the training. The composition of the respondents are as follows :

S. No.	Desiqnation of the Respondents	Number of Participants	Number of Respondents responded to Attitude Survey	Laboratory Test Report	Quiz	Evaluation
1.	Executive Engineers	1	--	--	--	1
2.	Assistant Engineers	4	1	--	3	2
3.	Junior Engineers	--	8	6	12	12
4.	Other PHED Perrsonnel	--	2	--	4	4
5.	NGO Representative	--	8	5	8	9
6.	Desiqnations/Classes Unknown	--	--	1	--	--
	TOTAL :	38	19	12	27	28

RESPONSE & FEED BACK

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PER	NGO	TOTAL
(A) RELATED TO TRAINEE'S FEELINGS AFTER THE TRAINING :							
(1) GENERAL FEELINGS	GOOD	1	2	12	4	9	28
	BAD	-	-	-	-	-	-
(2) GENERAL FEELINGS ABOUT THE DEGREE OF THEIR KNOWLEDGE ENHANCEMENT	VERY MUCH	-	1	1	1	2	5
	MUCH	1	1	5	-	3	10
	AVERAGE	-	-	2	2	2	6
	SLIGHTLY	-	-	4	1	2	7
	NOT AT ALL	-	-	-	-	-	-
(3) FEELINGS ABOUT THE DEGREE OF SATISFACTIONS AFTER THE TRAINING	SATISFIED	1	2	12	4	7	26
	UNSATISFIED	-	-	-	-	2	2
	NOT MENTIONED	-	-	-	-	-	-
(4) FELINGS RELATED TO CONFIDENCE ABOUT THEIR OWN ABILITY TO HANDLE KIT THEM SELVES & LET THE TECHNIQUES KNOWN TO OTHERS	YES	1	2	12	4	9	28
	NO	-	-	-	-	-	-
	PARTIALLY	-	-	-	-	-	-

DESIGNATIONS / OPINIONS EXPRESSED		EE	AE	JE	DEPT. PERS.	NGO	TOTAL
(B) RELATED TO THE OPINIONS ABOUT TRAINING COMPONENTS :							
(1) DURATION OF TRAINING	ADEQUATE	1	2	2	2	3	10
	INADEQUATE	-	-	8	2	6	16
	NOT MENTIONED	-	-	2	-	-	2
(2) PROPER USE OF AUDIO-VIDEO MIX	YES	1	2	9	4	7	23
	NO	-	-	3	-	2	5
(3) RELATIVE LIKINGS OF VARIOUS SUB TOPICS *	a.	1	1	8	1	8	19
	b.	1	-	9	1	8	19
	c.	-	-	5	1	5	11
	d.	-	1	5	1	6	13
	e.	1	1	7	4	7	20
	f.	1	2	10	1	8	22
	g.	-	-	-	-	-	-
(C) FUTURE RELATED OPINIONS :							
(1) WHETHER SUCH TRAININGS BE ORGANISED IN FUTURE ALSO	YES	1	2	12	4	9	28
	NO	-	-	-	-	-	-
	NOT MENTIONED	-	-	-	-	-	-
(2) SUGGESTIONS FOR FUTURE ORGANISATION #	a.	1	1	1	-	-	3
	b.	-	-	3	2	2	7
	c.	-	-	4	2	1	7
	d.	-	-	2	1	3	6
	e.	-	2	4	1	2	9

* a. Water Availability, Utility, Uses & Common beliefs.
b. Importance of standards in Water related health risks.
c. International & National Water standards.
d. Details of available scientific equipments for establishment of rural analytical laboratories.
e. Familiarisation & Utilisation of DRDO Water testing kit.
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Various reactions & opinions expressed by the participants.

Ranchi

SOME REACTIONS EXPRESSED BY THE PARTICIPANTS

No. of Respondents expressing their opinions

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1 Official's participation & involvement of private organisations be ensured.

Intensities of reactions :

Various reactions were obtained as to suggestions for future which are recorded in e column of feedback. Assuming equal intensities, summary results are reproduced

SUMMARY OF TEST RESULTS

S.No.	Particulars	SAMPLE SOURCES			
1.	Sample Sources	TAP	HP	WELL	WELL
2.	TDS (Mg/l)	50	50	50	50
3.	Hardness				
4.	Iron				Absent
5.	Fluoride				..
6.	Nitrate				
7.	Nitrite				
8.	Chloride				√
9.	Bacterialogical test	×	Absent	×	×

√ Indicates presence beyond safe limits.
× Indicates test not performed.
Only Abnormal values are Reported. Values within safe limits are not mentioned.

RANCHI

CONTENTS OF WATER TESTING FIELD KIT

S.No.	Details of the items	Nos.
1.	Lockable field kit Box with built-in Incubator,TDS meter complete with Probe and connecting wires.	1
2.	Reagent bottles for : (i) Fluoride (ii) Nitrate reagent (iii) Sulphuric Acid	4
3.	Graduated Glass cylinders	1
4.	Measuring cylinder (5ml)	1
5.	Graduated Inoculating Tubes	4
6.	Petri dishes, 5.5 cms. 3 pairs.	6
7.	Spirit lamp	1
8.	Dropper plastics	1
9.	Pointed glass rods	4
10.	Durham's tubes	4
11.	Plastic beaker (50ml)	1
12.	Glass Beaker	1
13.	Dropping Bottles Plastic (for acid/alkali Buffers)	2
14.	Magnifying glass	1
15.	Tong	1
16.	Scissor	1
17.	Manual	1
18.	Culture media packets	100
19.	Agar tablets	100
20.	Chloride tablets	100
21.	Nitrite packets/tablets	100
22.	Bio store Box	1
23.	Surgical Gloves	1 set
24.	Iron Reagent Tablets I&II	100 each
25.	Chloride testing tablets	100 each
26.	Nitrite/free chlorine testing tablets	100 each
27.	Chromate paper strips	1 Pkt.
28.	Thermometer (L-Tyne)	1
29.	External battery terminals for TDS meter	1
30.	Panel Switch for TDS meter	1
31.	AC main lead	1
32.	Electronic temperature circuit for incuberator	1

DISSOLVED SOLID DETERMINATION

The dissolved solids in the Water Samples are determined using a portable, 220 VAC/12 V battery operated meter.

Operation of Dissolved Solids Meter.

1. Connect Dissolved Solids meter with mains. This simultaneously connects meter as well as incubator. Operate individually or both as required or Connect the instrument to 12 V Car Battery with the help of wires at Battery terminals with +Ve point at black terminal and -ve point at red terminal.

2. Switch on the instrument. The indicating red bulb near the switch should glow, indicating it is set for use.

3. Connect the cell with the help of socket attached to it with the meter at cell point.

4. Take about 25 ml. water sample in a beaker and dip the cell and observe the deflection of the needle Accept the water for drinking, if the needle resets on green band. Reject the water, if the needle rests on red band.

5. Wash the cell and beaker with the next. Water sample under examination and repeat operation (iv).

Water containing upto 500 mg/l (mg/l is equivalent to ppm) of dissolved solids conform to normal standards of drinking water. However, water having dissolved solids upto 1500 mg/l have been recommended for drinking by WHO and ICMR. ICMR has also relaxed dissolved solids limits upto 3000 mg/L (covering green band) in cases where alternate sources are not available within reach.

PHYSICAL TESTS

Water should be Colourless, Odourless & Tasteless and should have clarity absent from suspended particles. PH should be in neutral range.

PROCEDURE FOR ASSESSMENT OF BACTERIOLOGICAL QUALITY OF WATER

This test is done by detecting the presence of Coliform group of organisms in two steps. Their presence in water constitutes public health hazards.

STANDARDS

As per ICMR, no sample should contain 10 Coliform Organism/100 ml sample or 1 Faecal Coliform (E.Coli)/100 ml sample.

STAGE 1 TEST (PRESSUMPTIVE TEST)

In 10 ml sample Water dissolve 1 pouch of Culture media powder in an inoculating tube. Slowly heat till media is completely dissolved (avoid charring due to excessive heat). Cool and add further 100ml of water to be tested (total volume 110 ml.) Fill Duraham's tube with this water so that no bubble remains in the tube and then keep it in inverted position in inoculating tube. Notice the Colour.

It Colour is Yellow add few drops of dilute Alkali solution with stirring till colour changes to blue green Cover with lid, Inoculate at 40° C in Incubarator for 3 - 10 hours, with stirring after every 2 hours. No change in original blue green colour shows absence of E.Coli.

If colour changes to yellow with turbidity and Gas formation in Durham's tube during 3 - 10 hours, it indicates positive preassumptive test containing more than 1 E. Coli or 10 Coliform per 100 ml water sample.

IF POSITIVE, CONDUCT STAGE II TEST

STAGE -II TEST Prepare a slurry in a glass beaker using 2.5 ml water sample and one Agar tablet. Boil on spirit lamp & pour it in a petri disc kept on a plane surface. Allow the agar media to set evenly in petri disc and streak the disc with fermented broth of stage - I using a pointed glass rod. Keep the disc in inverted position and incubate for 8-10 hours at 40° C. Typical Dark red centred 1-3 mm dia. colonies are indicative of presence of E Coli in water sample under examination.

CHEMICAL TESTS

1. FLUORIDE DETERMINATION:

To 20 ml water add 1 ml of fluoride reagent. Shake & keep it for 30 minutes. Observe Color after 30 Minutes
Voilet to pink color indicates fluoride presence upto 1.5mg/l.
Yellow color indicated fluoride in concentrations more than 1.5 mg/l
Safe limit of Fluoride for potable water -1.5mg/l

2. NITRATE DETERMINATION:

To 20 ml water Sample add 1 tablet of Nitrate reagent-I Shake for 1 minute. Then add one tablet of Nitrate reagent II. Notice Color. If color is light yellow to orange-red after 5 minutes, compare with color chart.
Safe limit for Potable water-100 ppm Orange Purple 50-100 ppm Light Pink 100-150 ppm
Yellow 150 ppm & more

3. CHLORIDE DETERMINATION:

TO 10 ml water sample add a teared portion of Chromate paper & Shake till yellow color developes. Then add 1 chloride reagent tablet. Notice Color.
Brick red color indicates chloride less than 1000 ppm (safe limit)
Yellow color indicated more than 1000 ppm chloride.

4. NITRITE & FREE CHLORINE DETERMINATION:

In 20 ml water sample dissolve one Nitrite reagent tablet. Notice color changes.
No change in color shows absense of Nitrite & free chlorine.
Yellow to Orange color shows Nitrite & blue color shows presence of free chloring. (develops within 3 minutes). Ignor Color change after 5 minutes.
Safe Limit for drinking water– for Nitrite — 0.1 mg/l
Yellow color — up to 0.1 ppm Brick red color — up to 2.0 ppm
(Presence of residual chlorine shows disinfected water)

5. HARDNESS DETERMINATION:

In 20 ml water sample dissolve one tabled of Hardness reagent I & pink with voilet tinge color may be noticed. Then dissolve one tablet of Hardness reagent II tablet. Notice the color.
Color changes to blue – Hardness upto 600 Ppm. Pink color with voilet tinge indicates Hardness above 600 ppm.
Limit for drinking water– 600 Ppm.

6. IRON:

In 10 ml water sample dissolve one tablet of Iron reagent tablet I & then dissolve one tablet of Iron reagent II tablet. Notice the color.
No color change – Iron absent, Pink – 0.1-0.3 ppm Magneta – 0.3-0.5 ppm
Orange – 0.5-2.0 ppm brick Red – 2.0-5.0 ppm Safe limit for Iron in drinking water – Up to 1 ppm
(Both Ferrous & Ferric Iron are indicated in this test)

7. ARSENIC SPOT TEST:

Insert a thin strip of filter paper impregnated with Mereuric Bromide into narrow glass tube untill the other end & then fold on top the remaing part of the stripe so as not to slide down. A Lead Acetate moistened ball of cotton Wool is then inserted in wide mouthed tube till cotton covers the narrow end. (acts as filter of Hydrogen Sulphide gas that may be produced during reaction.) Place the wide mouth tube with the tube along with its plug. Fill the bottle to the mark with water to be tested. Add 5 ml of Dil. Hydro Chloric Acid in bottle. Add one Zinc tablets in bottle. Immediately plug the bottle with the glass plug assembly. Effervescence may take place for 10-15 minutes.

If Arsenic is present, Mercuric Chloride paper will developd a Yellowsh Red color which rapidly rises to the length of paper in proportion to the amount of Arsenic present in bottle. (1mm stain length = 1µg Arsenic approx.).

TOTAL DISSOLVED SOLIDS (TDS) (CONT'D)

TDS AFFECTS : * TASTE
* HARDNESS
* CORROSION PROPERTIES
* SCALE FORMATION

TYPE OF SOIL	TDS RANGE OF WATER
* GRANITE * SILICEOUS SAND * WELL-LEACHED SOIL	30 - 60 ppm
* SEDIMENTARY ROCK FORMATIONS	200 - 1100 ppm
* SMALL STREAMS (DURING ARID SEASONS)	UPTO 15000 ppm
* LOCALIZED CONFINED ACQUIFERS	UPTO 35000 ppm

TDS AND PALATABILITY OF WATER

* BRUVOLD ET AL, HAVE RATED THE PALATABILITY OF DRINKING-WATER ACCORDING TO THE TDS LEVEL AS FOLLOWS :

TDS LEVEL	PALATABILITY
< 300 PPM	EXCELLENT
300 - 600 PPM	GOOD
600 - 900 ppm	FAIR
900 - 1200 ppm	POOR
> 1200 ppm	UNACCEPTABLE

* REFERENCE : BRUVOLD ET AL, "RATED ACCEPTABILITY OF MINERAL TASTE IN WATER", *JOURNAL OF APPLIED PSYCHOLOGY*, VOL. 50, P 22, 1966.

TOTAL DISSOLVED SOLIDS (TDS)

TDS
- MOSTLY INORGANIC SALTS
- SMALL AMOUNTS OF ORGANIC MATTER

PRINCIPAL IONS CONTRIBUTING TO TDS ARE :

- CARBONATE
- BI-CARBONATE
- CHLORIDE
- SULPHATE
- NITRATE
- SODIUM
- POTASSIUM
- CALCIUM
- MAGNESIUM

(Contd ..)

SPECIFICATION FOR DRINKING WATER
IS 10500:1983

SUBSTANCE	TDS (MAX)
REQUIREMENT (DESIRABLE LIMIT)	500 ppm
UNDESIRABLE EFFECTS OUTSIDE THE DESIRABLE LIMIT	BEYOND THIS, PALATABILITY DECREASES AND MAY CAUSE GASTROINTESTINAL IRRITATION
DESIRABLE/ ESSENTIAL	DESIRABLE
REMARKS	MAY BE EXTENDED UPTO 3000 PPM, IN THE ABSENCE OF ALTERNATE SOURCES.

PANEL FOR DRINKING WATER, CDS 26:P-II INCLUDED :

1) DR S.P. PANDE, NEERI/NAGPUR.
2) DR B.N. GUPTA, ITRC/LUCKNOW.

WHO GUIDELINE

"ALTHOUGH NO DELETERIOUS PHYSIOLOGICAL EFFECT HAS BEEN RECORDED WITH TOTAL DISSOLVED SOLIDS (TDS) IN WATER ABOVE 1000 ppm, *IT WAS CONSIDERED THAT IT WOULD, AS A RULE, BE UNACCEPTABLE TO EXCEED THIS LEVEL, WHICH IS RECOMMENDED AS GUIDELINE VALUE".*

From : Guidelines for Drinking - Water Quality, World Health Organization, 1984.

According to Dr. K.L.Rao following figures hold good for India.
Geographical area 3.28 million Km.Sq.

		(Million ha.m)
1.	Annual rainfall over whole [illegible]	370
2.	Evaporation losses	123
3.	Run off in River	167
4.	Seepage in Subsoil	80
	(a) Water absorption in topsoil layer	43
	(b) Recharge in Ground (from rainfall only)	37
5.	Total Ground water recharge including seepage from Canal irrigation	45
6.	Ground water possible to extract economically	27
7.	Current utilization of G.Water	13.5
8.	Unutilised G. Water	13.5

GLOBAL DATA

1.	Estimated Water supply on earth	1.46×10^8 ha.m
2.	Salty Water in Oceans & Seas	1.419×10^8 ha.m
3.	Available fresh water (as surface /ground water)	0.04088×10^8 ha.m
4.	Surface water	3.212×10^5 ha.m
5.	Ground water	0.876×10^6 ha.m
6.	Economic extraction of ground water by present technology	0.365×10^6 million ha.m
7.	Locked in Iceburgs & Glaciers	3.139×10^6 million ha.m
8.	Lakes and Streams	0.0146×10^6 million ha.m

The four mechanims of Water Related disease transmission and the prevention strategies appropriate to each mechanism.

Transmission Mechanism	Preventive Strategy
1. Water Borne	1. Improve Water quality 2. Prevent casual use. 3. Use other improved sources.
2. Water Washed	1. Improve Water quantity 2. Imrove Water accessibility 3. Improve hygiene.
3. Water Based.	1. Decrease need for Water contact 2. Control Snail population. 3. Improve quality.
4. Water Related Insect Vector	1. Improve surface water management 2. Destroy breeding sites of insects. 3. Decrease need to visit breeding sites.

A Classification of Water related Diseases.

Catogery	Example
1. Faecal-Oral (Water-Borne : or Water Wahed)	
(a) Low infective doses	Cholera
(b) High infective doses	Bacillary Dysentery
2. Water-Washed :	
(a) Skin and Eye infections	Trachoma, Scabies
(b) Others	Louse-borne fever
3. Water-Based :	
(a) Penetrating Skin	Schistosomiasis
(b) Ingested	Guinea Worm
4. Water-Related Insect Vectors :	
(a) Biting near Water	Sleeping Sickness
(b) Breeding near Water	Malaria.

Various Water Related Diseases, Water Associations and their Pathogenic Agents

Water-Related Disease	Pathogenic Agent.
Amoebic dysentery	C
Ascariasis	D
Bacillary dysentery	A
Balantidiasis	C
Cholera	A
Diarrhoeal diseases	H
Enteroviruses (some)	B
Gastroenteritis	H
Giardiasis	C
Hepatitis(infections)	B
Leptopirosis	E
Paratyphoid	A
Tularaemia	A
Typhoid	A
Conjunctivitis	H
Leprosy	A
Louse borne relapsing fevers	E
Scabies	H
Skin sepsis and Ulcers	H
Tinea	F
Trachoma	B
Fever louse tick-and mite Borne typhus	G
Yaws	E
Clonorchiasis	D
Diphyllobothriasis	D
Facilopsiasis	D
Guinea Worm	D
Paragonimiasis	D
Schistosomiasis	D
Arboviral infections (some)	B
Dengue	B
Filariasis	D
Malaria	C
Onchocerciasis	D
Trypanosomiasis	C
Yellow fever	B

A = Bacteria, B = Virus, C = Protozoa, D = Helminth, E = Spirochaete, F = Fungus, G = Rickettsiae, H = Miscellaneous

आज

शनिवार २९ अक्टूबर १९९४ सौर १२ कार्तिक सं. २०५१ वि.

प्रशिक्षण शिविर

पिछले दिनों यूनिसेफ, बिहार एवं लोक स्वास्थ्य प्रमंडल खगड़ियाके सौजन्यसे जिला बाल कल्याण परिषद खगड़ियाके तत्वावधानमें आंगनबाड़ी सेविका प्रशिक्षण केन्द्र खगड़ियाके सभागारमें पेयजल गुणवत्ता जांच विषय पर दो दिवसीय प्रशिक्षण शिविरका आयोजन किया गया। प्रशिक्षणमें खगड़िया, बेगूसराय एवं समस्तीपुर जिलेके कुल पचहत्तर प्रतियोगियोंने भाग लिया।

दो दिवसीय प्रशिक्षण कार्यक्रमका उद्घाटन पी.एच.ई.डी. खगड़ियाके कार्यपालक अभियंता भोला साहूने किया। प्रमुख अतिथिके रूपमें डा. के.पी. भवरीका, निदेशक कन्सल्टेंसी, पटना मौजूद थे। जिला बाल कल्याण परिषदके सचिव दिनेश कुमार देवने उक्त अवसरपर प्रतिभागियोंका स्वागत किया।

सचिव
जिला बाल कल्याण परिषद
अनुमंडल दुर्गास्थान के पश्चिम
खगड़िया (बिहार)

युनिसेफ बिहार/लोक स्वास्थ्य प्रमंडल खगड़िया
के सौजन्य से
जिला बाल कल्याण परिषद
खगड़िया

कार्यशाला में भाग लेने वाले प्रतिभागियों के लिए विहित

प्रपत्र फार्म :—

1. कार्यशाला का नाम–
2. अवधि–
3. दिनांक ... ... से दिनांक ... ... तक
4. प्रतिभागी का नाम–
5. पिता/पति का नाम–
6. पूरा पता–
7. प्रतिभागी किस पद पर कार्यरत हैं–
8. विभाग/संस्था का नाम–
9. कब से कार्यरत हैं–
10. विभाग/संस्था का पूरा पता–
11. कार्य करने की अवधि–
12. शैक्षणिक योग्यता–
13. उम्र–

मैं प्रतिज्ञा करता/करती हूं कि कार्यशाला प्रशिक्षण में पूरी अवधि तक भाग लूंगा/लूंगी बीच में छोड़कर नहीं जाऊंगा/जाऊंगी।

प्रतिभागी का हस्ताक्षर

स्थान :–

दिनांक :–

CERTIFICATE

This is certified that Mr/Mrs./Ms .....

of ..... has attended the training course on WATER QUALITY SURVEILLANCE AND MONITORING from 2-3-95 to 3-3-95 at Engineer's Bhawan, Doranda, Ranchi, organised by PHED, Ranchi and sponsored by UNICEF, Patna.

Executive Engineer
P.H. Division, Ranchi West
Ranchi

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Training Organisors : P.H. Division .....
Venue : ..... Date .....

EVALUATION SESSION

(Feedback for 2 days training programme on Water Quality Surveillance Training- Cum-Kit familiaristion/ Demonstration Programme)

1. आपको इस प्रशिक्षण के बाद कैसा महसूस हुआ ?

2. क्या आप चाहते हैं कि भविष्य में इसी तरह के प्रशिक्षण कार्यक्रम आयोजित किये जायें ?

3. क्या इस प्रशिक्षण के बाद आपको जल गुणवत्ता संबंधी जानकारी बढ़ा है ? कृपया उचित स्थान पर चिन्हित करें ।

   बहुत ज्यादा ज्यादा औसत थोड़ी बहुत बिल्कुल नहीं

4. क्या प्रशिक्षण अवधि ठीक थी ?

5. आपको प्रशिक्षण का कौन भाग अच्छा लगा । कृपया अपनी चुनाव के अनुसार नं० दिये गये बाक्स में लिखें ।

   ☐ जल उपलब्धि, व्यवहार, उपयोग और आम धारणाएँ ।

   ☐ जल और स्वास्थ्य में मानकों का महत्व ।

   ☐ अन्तराष्ट्रीय और राष्ट्रीय जल मानक ।

   ☐ ग्रामीण विश्लेषण शालाओं की स्थापना हेतु उपलब्ध वैज्ञानिक उपकरणों का विवरण ।

   ☐ डी०आर०डी०ओ० विश्लेषण कीट का परिचय और उपयोग ।

   ☐ व्यावहारिक जांच कार्यक्रम ।

   ☐ फिल्म प्रदर्शन ।

   ☐ .....

6. क्या प्रशिक्षण में श्रवण और दृष्य अंगों का उचित समावेश था ?

7. क्या आप इस प्रशिक्षण से सन्तुष्ट हैं ?

8. क्या अब आप स्वयं इस कीट का उपयोग कर सकते हैं और लोगों को समझा सकते हैं ?

9. भविष्य में आयोजित इस तरह के कार्यक्रम के लिए आपके क्या सुझाव है ?

नाम :

पदनाम :

स्थान : पता :

हस्ताक्षर :

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क्वीज

प्र. 1. कृपया गलत कथन पर निन्ह लगाये ।

(क) टाईफाइड बुखार जल से नहीं फैलता है । (ख) ब्लड डीसेन्टरी एक जल जनित रोग है ।

(ग) जॉनडीस एक जल जनित (वाटर बॉर्न) रोग हैं । (घ) हैजा के किटाणु धीरे-धीरे फैलते हैं ।

प्र. 2. आई सी. एम. आर. का टी. डी. एस मानक क्या है ?

(500 मिलीग्राम/लीटर) (1000 मी. ग्रा./लीटर)

(1200 मि.ग्राम/लीटर) (2000 मी. ग्राम/लीटर)

प्र. 3. डब्लू. एच. ओ. का टी.डी.एस. मानक क्या है ?

प्र. 4. पृथ्वी पर उपलब्ध कुल जल का कौन सा प्रतिशत सिर्फ पीने के उपयोग में लाया जा सकता है ।

(2.8 %) (4%) (6%) (80%)

प्र. 5. चीनी की बढ़ी हुई मात्रा जल में जाने पर कीट की टी.डी.एस. मीटर सूई क्या दर्शायेगी ?

(बढ़ी हुई मात्रा) (घटी हुई मात्रा) (कोई परिवर्तन नहीं)

प्र. 6. नमकीन जल का टी.डी.एस

(ज्यादा होगा) (कम होगा) (बिल्कुल नहीं होगा)

प्र. 7. कोलीफॉर्म की जांच फिल्ड जांच कीट में किस तापमान पर की जाती है ।

(20°सी) (30°सी) (40°सी) (50°सी)

प्र. 8. क्लोराइड की जल में निर्धारित मात्रा क्या है ?

(1000 मि.ग्रा./लीटर) (1.5 मि.ग्रा./ली.) (5 मि.ग्रा./ली.)

प्र. 9. जल में आर्सेनिक का मौजूदगी से स्वास्थ्य पर क्या प्रभाव पड़ेगा ।

(लाभदायक) (नुकसानदायक) (हानि रहित)

प्र. 10. रोगों के प्रसार के दृष्टिकोण से जलीय परिस्थितियों का वर्गीकरण लिखें ।

प्र. 11. अच्छा जल-

(क) मीठा होना चाहिये (ख) नमकीन होना चाहिये (ग) साफ होना चाहिये (घ) गन्दा होना चाहिये

प्र. 12. ग्रामीण इलाकों में पानी के मुख्य स्त्रोत क्या है ?

प्र. 13. ग्रामीण इलाकों में पानी की आपूर्ति ज्यादातर कौन करते हैं ?

(जवान महिलायें) (पुरुष) (बच्चे) (बृद्ध)

प्र. 14. जल को ग्रामीण इलाकों में इकट्ठा करने के लिये औसत आपके इलाके में कितना समय लगता है ।

(आधा घंटा) (दो घंटा) (चार घंटा) (तीन-साढ़े तीन घंटा)

प्र. 15. एक औसत परिवार के कितने जल की प्रतिदिन आवश्यकता होती है ।

(198 लीटर) (500 लीटर) (10 लीटर) (2000 लीटर)

प्र. 16. उल्टीयाँ, हैजा, कालरा, पेचिश आदि रोग कैसे फैलते हैं ?

प्र. 17. हमें पीने का साफ़ पानी कहाँ से भरना चाहिये ?

प्र. 18. हैण्डपम्प में पानी कहाँ से आता है ?

प्र. 19. पीने और खाना पकाने के लिए कहाँ का पानी ठीक रहता है ?

प्र. 20. पीने के पानी को साफ कैसे रखा जा सकता है ?

प्र. 21. साफ पानी भरकर रखते समय क्या सावधानियाँ बरतनी चाहिए ?

प्र. 22. शौच के बाद हाथ-साफ रखने के लिए क्या करना चाहिए ?

प्र. 23. हमें रोजमर्रा की जिन्दगी में सफाई के लिए क्या-क्या करना चाहिए ?

नाम :

स्थान : पदनाम :

हस्ताक्षर: पता :

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ATTITUDE SURVEY

प्रश्नावली

(1) आपके घर में पानी कौन लाता है ?

(क) घर के सदस्य ------ (ख) घरेलू नौकर -----

(2) पानी लाने वाले सदस्य कौन हैं ?

(क) पुरुष ----- (ख) महिला ------- (ग) बच्चे-------

(3) पानी कहाँ से इकट्ठा किया जाता है ?

(क) हैण्डपम्प------ (ख) कुआँ ------- (ग) सरकारी नल ---- (घ) बोरिंग ------

(4) पानी किस पात्र में लाया जाता है ?

(क) घड़ा ------ (ख) बाल्टी ------ (ग) खाने का पात्र------ (घ) अन्य -------

(5) पानी के स्रोत की आपके निवास से दूरी कितनी है ?

(क) घर में ही ------ (ख) 20 मी. के अन्दर ---- (ग) 50 मी. के अन्दर ------ (घ) 100 मी. के अन्दर -----
(ङ) 150 मी. के अन्दर ----- (च) 200 मी. के अन्दर ---- (छ) 200-500 मी.------- (ज) 500-1000 मी. ------
(झ) 1 कि. मी. से अधिक --------

(6) पानी के स्रोत तक जाने में एक बार में लगने वाला समय कितना होता है ?

(क) 1 मिनट---- (ख) 2 मिनट ----- (ग) 3 मिनट------ (घ) 5 मिनट----- (ङ) और अधिक.

(7) पानी लाने वाले वर्तन में पानी कितना अंटता है ?

(क) 1 ली.------ (ख) 2 लीटर -------- (ग) 5 लीटर-------- (घ) 10 लीटर------ (ङ) 10 ली. से ज्यादा

(8) पानी इकट्ठा करने में कितना समय (भरने में) लगता है ?

(क) 1 मि.------ (ख) 2 मि. ------ (ग) 3 मि.------- (घ) 5 मिनट--------

(9) पानी भरने के लिए कितनी प्रतीक्षा करते हैं ?

(क) 1 मिनट ------ (ख) 2 मिनट----- (ग) 5 मिनट ------ (घ) 10 मिनट------ (ङ) 15 मिनट से अधिक
(च) आधा घंटा ------ (छ) एक घंटा ---- (ज) बिल्कुल नहीं ----

(10) एक बार स्रोत से पानी भरकर लाने में कुल कितना समय लगता है ?

(क) 3 मिनट---- (ख) 5 मिनट------ (ग) 8 मिनट------ (घ) 12 मिनट (ङ) 12 मिनट से अधिक---

(11) एक बार में कुल कितना पानी आता है ?

(क) 2 ली. ----- (ख) 5 ली. ----- (ग) 10 ली. ---- (घ) 10 ली. से ज्यादा -----

(12) प्रतिदिन पानी लाने के लिये कितनी बार जाते हैं ?

(क) एक बार----- (ख) दो बार------ (ग) तीन बार ------- (घ) पाँच बार (ङ) पाँच बार से ज्यादा ----

(13) आपको जल की दैनिक घरेलु आवश्यकता कितनी है ?

(क) 80 ली. ----- (ख) 120 ली. ----- (ग) 150 ली. ------ (घ) 175 ली. ----- (ङ) 200 ली. -----
(च) 225 ली. ---- (छ) 250 ली. ------ (ज) और अधिक ---- (झ) ----------

(14) आपके घर में सदस्यों की संख्या कितनी है ?

(क) 2----- (ख) 3----- (ग) 5------ (घ) 7------ (ङ) 7 से अधिक------

(15) आप कितना जल किस काम में खर्च करते हैं ?

(क) पीने में------ (ख) खाने-पकाने में---- (ग) स्नान करने में----- (घ) बर्तन धोने में---- (ङ) कपड़ा धोने में-----

(च) घर धोने में----- (छ) जानवरों को नहलाने में----- (ज) बागवानी में---------- (झ) जानवरों को खिलाने में ------

(ट) अन्य काम में -----

(16) आपके कितने सदस्य जल लाने के लिये जल स्रोत तक जाते आते हैं ?

सदस्यों की संख्या---- जवान महिलायें-------- बच्चे---------- पुरुष--------

(17) आपके द्वारा दैनिक खर्च के लिये कुल जल-संग्रहण में लगा समय कितना है ?

(क) 1 घंटा---- (ख) 2 घंटा----- (ग) 2.30 घंटा------ (घ) 3 घंटा------ (ङ) 3 घंटा से ज्यादा-----

(18) आपके घर में पानी के कितने स्रोत हैं ?

(क) एक----- (ख) दो----- (ग) तीन----- (घ) चार----- (ङ) चार से अधिक-----

(19) आप पानी के कौन-कौन से स्रोत पर आश्रित हैं ?

(क) चापाकल----- (ख) कुआं------ (ग) सरकारी नल----- (घ) तालाब------ (ङ) अन्य कोई------

(20) आपके द्वारा संग्रहित जल आपकी आवश्यकता के अनुकूल है या नहीं ?

(क) हां-------- (ख) नहीं---------

(21) अगर नहीं तो और कितने जल की आवश्यकता है ? ---------

(22) आप जल इकट्ठा करने में प्रतिमाह कितना खर्च करते हैं ? ---------

(23) क्या आप जल उसी पात्र में रखते हैं जिसमें ढोकर लाते हैं ? अगर नहीं तो कहां रखते हैं ? ---------

(24) आप जल भूमि पर रखते हैं या भूमि से ऊपर ? ---------

(25) जल पात्र को ढककर रखते हैं या खुला ? ---------

(26) जल छानकर रखते हैं या बिना छाने ? ---------

(27) जल उबालकर पीते हैं या बिना उबाले ? ---------

(28) जल में फिटकिरी या ब्लीचिंग पाउडर इस्तेमाल करते हैं या नहीं ? ---------

(29) जल पीने योग्य है या नहीं, इसका निर्धारण कैसे करते हैं ? ---------

(क) पानी की रंगत देखकर ----- (ख) पानी के स्वाद से----- (ग) पानी के गंध से-----

(घ) खाना पकने में लगे समय से------- (ङ) पानी में तैरते कणों को देखकर------- (च) कीटाणु रहित--------

(30) क्या आप जल एवं स्वास्थ्य में कोई संबंध पाते हैं ? हां या नहीं । ---------

(31) आप जल एवं सफाई में कोई संबंध पाते हैं या नहीं ? ---------

(क) इच्छित ----- (ख) इच्छित किन्तु कठिन आदर्श--------- (ग) अनावश्यक------

(32) आपने सफाई की अवधारणा सर्वप्रथक कहां से पायी ?

(क) देखकर----- (ख) कहे जाने पर----- (ग) स्वयं करके----- (घ) अपने विचार से-----

(33) क्या आप मल-मूत्र को जल में मिल जाना खतरनाक समझते हैं ? हां या नहीं ? ---------

(34) जल की सफाई का स्वास्थ्य पर पड़ने वाले प्रभाव को देखकर भी आप सफाई नहीं रख पाते हैं क्यों ?

(क) आर्थिक कमी के कारण------ (ख) समयाभाव के कारण------ (ग) अस्वस्थता के कारण--------

(घ) मूलभूत सुविधाओं के अभाव के कारण---------- (ङ) अज्ञानता वश---------

(35) स्वच्छता पसन्द करने / न करने के कारण लिखें । ----------

नाम :

पदनाम :

स्थान :

पता :

हस्ताक्षर :

Drinking Water Quality Surveillance Training-Cum-Kit
Familiaristion/Demonstration Programme.
For PHED Junior/Assistant Engineers.
Programme Sponsorers : UNICEF, BIHAR.
Training Conducted by : CREATIVE CONSULTANTS, PATNA.
Training Organisors : P.H. Divisio..... .....
Venue : ..... Date .....

TEST REPORT OF WATER QUALITY USING

DRDO VILLAGE LEVEL TESTING KIT

SAMPLE SOURCE ---------- LOCATION OF SAMPLE POINT ----------

DATE OF COLLECTION ----------TIME OF COLLECTION ----------

DATE OF TESTING ----------PLACE OF COLLECTION----------

(I) PHYSICAL TESTS :

	Whether acceptable or not	
(a) Color - Colourless/Colored	A	U
(b) Taste - Tasteless/Sweet/Sour/Salty/Bitter	A	U
(c) Appearence - Clear/Turbid/Muddy	A	U
(d) Odour, if any- No Smell/Foul Smell/Typical Smell (Mention)	A	U
Intensity- Mild/Strong	A	U

(e) Temperature (Ambient) ---------- Temperature of Sample ----------

(II) CHEMICAL TESTS :

Color Change after reagent addition	Probable Value	Remarks *	
a) T.D.S. Value :	Mg/l	A	U
b) Nitrate :	Mg/l	A	U
c) Nitrite :	Mg/l	A	U
d) Chloride :	Mg/l	A	U
e) Free Chlorine :	Mg/l	A	U
f) Fluorine :	Mg/l	A	U
g) Hardness :	Mg/l	A	U
h) Iron :	Mg/l	A	U
i) Arsenic :	Mg/l	A	U

III BACTERIOLOGICAL TESTS

a) Pressumptive Test Result :	Color Changes to ----------	A	U
	Gas Formation ----------	A	U
	Turbidity Appearence ----------	A	U
a) Coliform Count :-	Present/Absent	A	U
b) E. Coli-	Present/Absent	A	U

Result - Acceptable/Rejected
Remarks- Safe for Drinking/Unsafe for Drinking
(Site reasons)

Name of Analyser : ----------
Signature : ---------- Place : ----------
Designation : ---------- Date : ----------

Results of samples tested at .....

* A. Acceptable U. Unacceptable