

PROCEEDINGS OF THE
WORKSHOP ON
**WATER AND
SANITATION
PRIORITIES FOR
THE 1990's**

November 23-26, 1991



Bilqis A.H.
Sack R.B.
Bateman M.
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Cover photo: *The traditional practice of cleaning a child after defecation is a potential source of fecal contamination of hands and the environment.*

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A community meeting on hygiene education.

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Preface

The International Centre for Diarrhoeal Diseases Research (ICDDR,B) is an autonomous, non-profit making organization for research, education, training and clinical service.

ICDDR,B's mandate is to undertake and promote research on diarrhoeal diseases and the related subjects of nutrition and fertility, with the aim of preventing and controlling diarrhoeal diseases and improving health. The ICDDR,B has also been given the mandate to disseminate knowledge in these fields of research, to provide training to people of all nationalities and to collaborate with other institutions in its fields of research.

The Centre has its headquarters in Dhaka, the capital of Bangladesh, and operates a rural field station in the Matlab sub-district of Chandpur District. The Centre is organized into four scientific divisions: Community Health,

Population Science and Extension, Clinical Sciences, and Laboratory Sciences. The Centre is funded by organizations and nations which share its concern for the health problems of developing countries.

The Community Health Division has been recently organized into five scientific interest groups according to major research activities; the Environmental Health Science group is one of these. The members of this inter-disciplinary group aim to work on environmental health problems, including descriptive and intervention studies, risk factor analysis, other applied research studies, promotion and dissemination of research findings, and provision of appropriate training. Organizing workshops is one of its activities. This was the group's first workshop and was meant to assist both them and fellow professionals in drawing up plans for applied research at the regional level.

Summary

The International Drinking Water Supply and Sanitation Decade (1981–90) has ended but the momentum created needs to be sustained to realize "Health for All by the year 2000". In order to design effective applied research plans through the next decade this workshop on "Water and Sanitation Priorities for the 1990's" was organized, with the following aims:

- ** To identify and prioritize the applied research needed to improve the health impact of water supply and sanitation (WSS) programmes in developing countries of the Asian region.
- ** To identify opportunities for collaboration in WSS applied research.

The workshop was held at Comilla, Bangladesh, November 23–26, 1991 and was conducted by the Environmental Health Sciences Group, Community Health Division, ICDDR,B and funded by the Swiss Development Corporation. There were participants from 11 countries: India, Bhutan, Myanmar, Malaysia, China, Vietnam, Indonesia, Thailand, and Bangladesh. Additional resource persons and facilitators came from North America. The workshop design was participatory, emphasizing the identification of gaps in knowledge and prioritizing applied research needs in small group sessions. Although the major part of

these tasks was undertaken in 3 small groups (Water supply, Sanitation, and Water supply and Sanitation during disaster), the results were presented and discussed in plenary sessions.

The research priorities identified include: development of appropriate water supply and sanitation technologies, methods for increasing community participation, development of appropriate education packages, and development of appropriate emergency preparedness plans. Sanitation problems were recognized as being most acute in urban slums. Technologies for providing water and sanitation during disaster were noted to be lacking in those countries of the region which are most disaster prone.

The participants agreed on the need for inter-country regional collaboration. They felt that this collaboration would help to increase the exchange of information, resource-sharings, the development of appropriate technology and applied research programmes, and improve the effectiveness of water supply and sanitation programmes in the region.

The suggestions presented here were developed from the views of the individual participants and do not necessarily reflect any country's official opinion.

Women carrying food during a flood.





Rural women volunteers maintaining a Tara handpump.

Introduction

Background:

The International Drinking-Water Supply and Sanitation Decade (1981-90) has made a substantial impact on issues related to water supply and sanitation (WSS) from global to country levels. During this period significant achievements have been made in several areas, including: technology development, information documentation and networking, and increasing access to WSS provisions. Less progress has been made in other areas, such as operations and maintenance of systems, community participation, and monitoring and evaluation of hygiene education programmes. One of the important outcomes of the decade has been the realization that WSS is a complex, multidisciplinary problem.

At the beginning of the decade most WSS projects were designed following methods and technologies which had previously been found to be successful in other countries, many times on another continent. However, many social, cultural, economic, geographic and other differences exist between countries and between regions or communities within countries. Where these differences were ignored, projects led to unacceptable standards, inappropriate implementation strategies, and doubtful achievements. The decade taught us to envisage WSS issues with realistic approaches, and to recognize the inevitable relationships between local physical and human factors and their consequent multidisciplinary facets. In the 1990s the overall challenge should be to continue our efforts for Health for All by the year 2000 and to address the problems experienced during the decade, taking advantage of the experiences both within and between countries.

In the Asian region some developing countries with high morbidity rates have shown remarkable success in rural water supply coverage. India and Bangladesh have shown significant success in developing appropriate technologies and increasing access to safe water supplies. However, the morbidity rates from water related diseases are still very high in these and other similar countries. Natural disasters, like floods, cyclones, tornadoes, and hurricanes, and man-made problems, like refugees, are also common in many of these countries. However, little information is available on environmental health conditions and appropriate interventions related to disasters. The International Decade for Disaster Management (1990-99) indicates that there is an immediate need to work on disaster-related crises, particularly in WSS in order to reduce post-disaster epidemics of infectious diseases related to poor WSS.

Although we face certain common regional problems in water and sanitation there are also differences which make collaboration and comparison particularly rewarding. The varied social, cultural and economic conditions within the region mean that concepts such as community participation may take different forms in each context. In each country, for example, ideas about gender vary and influence the strategies that must be adopted to fully involve women in these issues. We all have in common enormous human resource potential. The time has come to use this strength and apply ourselves to making water and sanitation a priority. Applied WSS research conducted by professionals in this region with collaboration between countries can help to develop guidelines for strategies which will have implications for planners and policy



Making a pit latrine.

tions followed by the overview lectures by our external resource persons. The programme for the workshop was explained to the participants by the organizers, who played the role of facilitators during the small group and plenary sessions.

Three small groups of about 6-8 members each were formed according to the 3 main topics: water supply, sanitation, and WSS in disasters. These were formed by allowing the participants to choose their major interests as much as possible. The small group participants discussed their specified problems in detail and reported their findings to the plenary session, where further discussion then took place.

These small group meetings and plenary sessions were designed to guide the participants through 3 activities, which applied to each of the 3 main topics.

Defining the problem:

- * Discuss and list the major problems facing our populations in _____ (water supply, sanitation, or WSS in disasters).

- * Identify and list the current gaps in relevant knowledge and applied research.

Setting Priorities:

- * Discuss the goals for improving the health impact of each main topic.
- * Develop a list of topics for applied research to address these goals in the 1990s.
- * Review and refine the criteria for prioritizing the list of applied research topics.
- * Rank each applied research topic as high, medium or low for each country.

Identifying Collaborative Projects:

- * Given the regional priorities established, identify one project of cross country interest from each of the three major topics of the workshop.
- * Outline the steps needed to push cross-country collaboration forward.

Defining the problems

Safe water and adequate sanitation are basic necessities for assuring minimal standards of health and quality of life, but unfortunately these are usually associated only with industrialization and economic development. In developing countries increasing population pressures and constraints in natural resource management have made the provision of these services increasingly difficult. In spite of the advances of the past decade, much of the world's population still remains unserved. We have attempted to outline the problems and gaps in knowledge which are faced in providing these services.

The major problems identified are tabulated under the three main topics of the workshop: Water supply, sanitation, and water supply and sanitation in disasters (Tables 1-3). The types of disasters which were considered included cyclone and tidal surge, flood, tornado, earthquake, drought, and war. This exercise was done by listing all the important issues for the participating countries. All problems were not necessarily applicable to all countries.

The problems and their associated factors are presented in the following tables. The gaps in applied research related to these problems are listed in appendices 2-4.

Table 3: Problems in Water and Sanitation in disaster affected areas

Problems	Related Issues.
1. Water availability	1. Shortage of safe water 2. Disruption of existing water supply and sanitation provisions 3. Delay in availability of alternative provisions and in restoration of predisaster facilities
2. Water quality	1. Water pollution
3. Disruption of personal hygiene practices	1. Water availability 2. Water quality
4. Increased risk of communicable diseases	1. Disruption in provisions and their use 2. Lack of public health knowledge
5. Lack of appropriate disaster preparedness and planning	1. Lack of ability to form quick and accurate needs assessments 2. Lack of water – sanitation and epidemiological data bases

Setting priorities for the 1990's

In order to continue to improve strategies for the implementation of WSS programmes in the 1990's, many of the problems and knowledge gaps identified in the previous section will need to be addressed. Nonetheless, a number of constraints exist that limit our ability to address these long lists of issues. First the lists themselves are not complete; many other problems and knowledge gaps could be added. Second, resources for conducting applied research are constrained. This includes not only financial resources, but also time and human resources. At the same time, resources for the implementation of WSS programmes are, in relative terms, diminishing. As the population grows and economic resources become more constrained in the 1990's, resources allocated for the implementation of WSS programmes will fall woefully short of what is needed (New Delhi

Global Consultation on Water and Sanitation, 1990). We are challenged to develop more creative strategies for the efficient use of available resources.

The identification of regional priorities for applied research in WSS provides us with the basic structure to plan creative activities for developing practical applications in the next few years. In addition, the identification of common priorities will facilitate regional collaboration on common problems. In this exercise lists of goals for applied research in the 1990's were developed, lists of related applied research topics were developed, and the applied research topics were prioritized for each country in the region, according to the judgement of the participant from that country. The goals for applied research for each main topic are listed in Tables 4.5 & 6.

Table 6: Applied Research Goals: Water & Sanitation in Disaster Areas

1. Reduce morbidity and mortality associated with water and sanitation in the disaster-affected area.
 2. Supply enough safe water to prevent communicable diseases related to water.
 3. Promote use of available safe water through health education.
 4. Review/restore the available facilities of safe water.
 5. Ensure safe disposal of human excreta, solid wastes, corpses, chemical waste and other health hazardous waste.
 6. Promote the use of available sanitation facilities.
 7. Promote domestic, personal and food hygiene.
 8. Improve the capability to conduct quick and accurate need assessment.
 9. Establish water supply, sanitation, and epidemiological databases in the disaster prone area.
 10. Develop disaster preparedness programmes
 11. Ensure the development of the capability of the affected population to sustain themselves through vulnerable periods.
-

The lists of applied research topics related to these goals and the prioritized ranking of these topics are presented in Appendices 5-7. In the priority matrices (Appendices 8-10), based on the identified problems and research gap issues, the participants identified applied research priorities for their countries by grading them as 'high', 'medium' and 'low,' according to their individual judgment.

Here we represent the priorities of the

topics by an arbitrary numerical system (Tables 7, 8 and 9). We have scored them as "High"=3, "Medium" = 1 and "Low" = 0.

We assumed the denominator (the highest score) to be 33 (11 countries X 3=33 points) for any topic and computed the percent of the total scored by the participants. The topics which were given more than 50% scores are listed in Table 7.

Table 9: Priorities in Applied Research for WS in Disaster.

Topics	Score (%)
1. To develop appropriate emergency preparedness plans	91
2. To develop appropriate waste disposal technologies	76
3. To develop appropriate water treatment methods	73
4. To improve self-help during the vulnerable periods of disasters	67
5. To develop health education related to water, sanitation and hygiene (food and personal)	64
6. To efficiently distribute safe water	58
7. To recondition existing water sources	55
8. To replicate country level experiences	55

The topics of highest priority are generally consistent with the global suggestions developed during the past decade. The impor-

tance of community participation, the role of women, operations and maintenance and the general issue of sustainability are once again emphasized. Hygiene education and a focus on human behaviour are also emphasized. It is interesting to note that after extensive work on appropriate technologies during the past decade, there continue to be major needs for technological development.

Water supply and sanitation issues following disasters were not addressed in depth during the International Decade for Drinking Water Supply and Sanitation. This lack is reflected in the basic applied research needs for this area, including preparedness planning, technology development, and education strategies.

Running through the list of priorities are common themes which have been of high priority during the past decade, and which continue to include the major concerns and challenges for the future. One of these challenges is to determine what is locally appropriate and to evaluate and respond to local customs, beliefs, and behavior when developing programmes—both the technological and the hygiene education aspects. Another is to better understand how to target WSS services to maximize health impact. Related to these is the identification of target groups with special needs that require new strategies, such as disaster affected populations and urban slum dwellers.

Inter – country Collaboration

The third objective of the workshop was to develop guidelines for inter – country collaboration. All the participants agreed that such collaboration would help to increase networking and information exchange, appropriate technology development, and resource sharing. The development of applied research programmes, both in individual countries and regionally, would be facilitated, and the effectiveness of WSS programmes would improve. It was suggested that in this regional collaboration, international resource – persons from outside the region should also be included.

The recommendations of the group were the following :

1. Establish a regional working group. The collaboration should be a two – phased approach:
 - a. Country groups in each participant country.
 - b. A regional group to be made up of people committed to and involved in the applied research agenda.

Participants from this workshop could be regional group members or could identify appropriate candidates for this position.

The group could start with countries represented at the workshop and expand later to involve additional countries of the region, particularly Pakistan, Sri Lanka, Maldives, Laos and Cambodia.

2. Identify a dynamic organization and person to provide leadership. ICDDR,B was thought to be a possible candidate for this.
3. Explore potential funding sources.

Based on these recommendations, it was decided that ICDDR,B would prepare the workshop proceedings and lead the search for funding for a regional working group. Individual participants will also explore the possibility and mechanism for developing country – level working groups.

Acknowledgement

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Appendix 2

GAPS IN APPLIED RESEARCH: WATER SUPPLY

1. Determination of optimal acceptable distance from source of water and the time women spend fetching it.
2. Definition of optimal microbiological, physical, and chemical qualities required for health impact.
3. Understanding of community requirements for quality and community definitions of safe water.
4. Determination of minimum quantity of water per capita for health impact. (number of users per source).
5. Identification of specific barriers to appropriate water use: beliefs, women's mobility, users' alternate source preference, and storage.
6. Identification of existing practices and beliefs.
7. Identification of sources of pollution and contamination
8. Appropriate technology trial & development:
 - a. salinity, minerals
 - b. storage, containers
 - c. disinfection
 - d. filtration (treatment)
9. Operation And Maintenance.
 - a. Increase community participation in maintenance of water systems
 - b. How to create awareness and involvement in all stages of development
 - c. Reliability analysis of all types of interventions (hand pump, tube well, etc.)
 - d. How to sustain and finance water supply

-
17. Quantification of health risks of animal faeces in the environment
 18. Investigation of health benefits of integrated water & sanitation programmes
 19. Investigation & development of appropriate low cost technology for urban solid waste disposal/management
 20. Investigation & development of appropriate package for hygiene education at various levels of:
 - awareness
 - demand
 - usage
 - maintenance
 21. Investigation into ways to increase coverage & improve functioning (e.g. willingness to pay/financing mechanisms, types, policies)
 22. Investigation of the feasibility of community (emphasizing the women) involvement in planning/design/implementation/monitoring maintenance
 23. Study of the role of women in promoting sanitation & hygiene education
 24. Situation specific studies on pathogen survival in the environment
 25. Discovery of alternatives to protect water for personal use by community people in areas where sanitary latrines are not implementable/affordable

Appendix 5

TOPICS FOR APPLIED RESEARCH: WATER SUPPLY

1. Examination of how provision of safe water supply becomes a priority
2. Measurement of economic and social health benefits of w/s programmes
3. Establishment of the minimum and maximum quantity of water for optimizing health benefits
4. Identification of acceptable levels of contamination: –
 - Microbiologically
 - Chemically
 - Taste
 - Appearance
5. Measurement of how close the water point should be from the household
6. Discrimination of the optimal number of people per water point for health impact & access of use
7. Identification of sources of crucial pollution and contamination from water source to mouth
8. Definition of the critical pathogenic indicators
9. Development of a methodology to identify appropriate interventions
10. Environmental impact assessment (EIA) of the water supply
11. Identification of social & technical elements for involving the community creating sustainable systems
12. Determination of how to identify factors to increase participation in community management
13. Reliability analysis of all types of W/S interventions
14. Development of locally appropriate technology
15. Study of waste/leaks in water supply

-
13. Investigation and development of appropriate technology for waste water and solid waste disposal/drainage at the household and small community level
 14. Study of current beliefs and practices relating to food hygiene (household, vendors/restaurants)
 15. Investigation of risks of various treatment/disposal options for:
 - a. solid waste
 - b. waste water
 - c. animal wastes
 - d. nightsoil

Appendix 8

REGIONAL APPLIED RESEARCH PRIORITIES: WATER SUPPLY

Sl.No.	Topics	*BAN	BHU	CHI	IND	INDO	MAL	MYAN	NEP	PHIL	THAI	VIET
01.	To examine how other programmes became priority	1	1	0	1	1	0	3	1	0	0	1
02.	To measure other Eco/Soc/Health benefits of water supply	3	1	1	1	1	1	3	1	1	0	1
03.	To establish minimum and maximum quantity of water for optimizing health benefits	1	1	0	1	1	1	1	0	1	0	0
04.	To identify acceptable contamination – microbial, chemical, physical	0	3	1	1	1	1	0	1	0	3	1
05.	To measure how close the water point should be to the household	3	1	0	0	0	0	1	0	0	0	0
06.	To find optimal number of users per water point for health impact	1	1	0	1	0	0	1	0	1	0	1
07.	To identify source of crucial pollution and contamination from source to mouth	1	1	0	1	0	3	3	3	3	0	3
08.	To define the critical pathogenic indicator(s)	0	1	1	1	1	1	0	0	1	3	1
09.	To develop methodology to identify appropriate interventions	0	1	0	1	3	3	0	0	1	1	3
10.	To assess environmental impact of water supply	0	3	1	3	1	1	1	1	0	1	1
11.	To identify social and technical elements for involving community to create sustainable systems for maintenance	1	1	1	1	3	3	3	1	3	3	3
12.	To determine if water should be included in a package of interventions	1	1	0	0	1	0	1	0	1	1	1

continued....

Appendix 9

REGIONAL APPLIED RESEARCH PRIORITIES: SANITATION

Sl.No.	Topics	BAN	BHU	CHI	IND	INDO	MAL	MYAN	NEP	PHIL	THAI	VIET
01.	a) To determine minimum level of community coverage to achieve optimum health impact b) Minimum level of community sanitation necessary to achieve optimum health benefits from water supply	3	3	1	3	1	1	1	0	3	3	3
02.	To study ways of monitoring success of sanitation programmes to included not just coverage but usage & hygiene behaviours	1	1	3	1	1	1	3	3	1	0	0
03.	To quantify health benefits of sanitation under variety of conditions (Including cost-benefit analysis).	0	0	3	3	1	0	1	0	1	0	1
04.	To investigate how to increase coverage & improve functioning (user participation in management & financing)	1	1	1	3	3	1	3	3	3	1	3
05.	To study the role of women in promoting sanitation/hygiene education & operation and maintenance	0	1	1	0	0	0	3	1	0	3	0
06.	To develop applied research on: a) filling - up of pits b) lining of pits c) life span of components d) emptying of pits	1	3	3	1	1	3	0	3	1	3	1
07.	To develop appropriate sanitation facilities for a) slum areas b) institutions - schools, markets	3	3	0	3	3	3	3	3	3	3	3
08.	To study current beliefs, practices of people with regard to children's and adults' faeces and defecation habits	0	1	0	0	0	3	3	1	1	0	0

continued...

Appendix 10

REGIONAL APPLIED RESEARCH PRIORITIES: DISASTERS

Sl.No.	Topics	BAN	BHU	CHI	IND	INDO	MAL	MYAN	PHIL	THAI	VIET	NEP
01.	Water Supply & Sanitation epidemiological data base of the Disaster prone area	3	3	1	3	0	1	0	1	1	1	0
02.	Appropriate sources of safe water	1	1	1	1	1	1	1	1	1	1	1
03.	Appropriate water treatment methods	1	1	3	0	3	3	3	3	3	3	1
04.	Quick water quality test	0	0	1	1	1	3	1	0	0	1	1
05.	Efficient distribution of safe water	3	1	1	1	3	3	3	3	0	1	0
06.	Health education related to safe water	0	0	0	1	0	0	0	0	1	1	0
07.	Health education related to sanitary practices	0	1	0	1	0	0	0	0	1	1	0
08.	Health education related to WSS (food & personal) practices	3	3	3	3	3	0	0	1	1	1	3
09.	Reconditioning of existing water sources	1	1	0	1	1	3	3	1	3	1	3
10.	Appropriate waste disposal technology	1	1	3	3	3	3	1	3	3	3	1
11.	Appropriate environmental preparedness plan	3	3	3	3	3	0	3	3	3	3	3
12.	Replicability of country level experiences	1	1	1	3	0	1	3	1	3	3	1
13.	Self-help during vulnerable period	3	3	3	1	1	1	1	3	0	3	3
14.	Community participation for sustainability of practices	1	3	0	3	1	0	0	0	0	1	3
15.	Appropriate food sources	1	1	0	1	0	3	0	1	1	1	0

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