



International Centre for Diarrhoeal Disease Research, Bangladesh  
Mohakhali, Dhaka 1212, Bangladesh

**CENTRE**  
FOR HEALTH AND  
POPULATION RESEARCH

# WATER AND SANITATION ISSUES IN DISASTER MANAGEMENT

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Proceedings  
of a Workshop  
GARNET Activities in Bangladesh



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GARNET Activities in Bangladesh

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### **Summary**

A two-day workshop aimed at bringing together government and non-governmental organizations, universities, UN and donor agencies, active in water and sanitation (WS) issues in disaster mitigation programmes was held on 22-23 April 1996 at ICDDR,B, the Centre for Health and Population Research, to analyze the existing WS issues in disaster situations. The participants in the workshop defined disaster as events associated with flood, cyclone, and tornado.

The topics of discussions were grouped into five disciplines: water, sanitation, education and dissemination, coordination, and general programme. WS activities that received negligible attention so far but need immediate attention were identified by the participants to be: raising of latrine above flood level, dewatering of ponds, disposal of dead bodies, promotion of actions following signal, rainwater harvesting, standardization of WPT, quality control of WPT, school programme, appropriate management of water resources in drought, exploration of acceptable surface water sources, quality of education materials, latrine distribution at the household level and action-oriented education programme on water and sanitation.

# Chapter 1

## **Introduction**

Disasters like cyclone, tornado, and flood are almost regular annual events in Bangladesh. The United Nations General Assembly, in its Resolution 44/236 of December 1989, proclaimed 1990-1999 as the International Decade for Natural Disaster Reduction. In accordance with this recognition and interest shown by the international community, Bangladesh is encouraged to undertake short-term and long-term programmes to control disaster-related problems.

One such problem is the frequent occurrence of post-disaster diarrhoea epidemics (1). The association between water-sanitation and diarrhoea transmission is well known (2, 3). In many instances, people are forced into crowded unsanitary conditions, which can lead to outbreaks of diseases in epidemic form. The presence of high-quality water or the provision of safe drinking water will not, alone, prevent diarrhoea outbreaks in areas like Bangladesh where other parallel routes of diarrhoea transmission exist. It may be pointed out that diarrhoea is endemic in Bangladesh, and the disasters may increase transmission of diseases that already exist. Therefore, WS programmes relating to disaster management has implications in public health, in addition to relief operations and development.

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We present here the experiences of a group of government organizations (GO) and non-governmental organizations (NGO), universities, UN and donor agencies, involved in WS programmes in disaster situations, who participated in a workshop “Water and Sanitation in Disasters of Bangladesh.” These participants included programme managers, physicians and engineers. These participants analyzed the WS situations that exist in disaster mitigation activities. This workshop was organized as a part of Global Applied Research Network (GARNET) activities in Bangladesh. The aim of GARNET is to strengthen the application of research into practice, and improve the quality of applied research. Its Bangladesh Chapter includes a group of about 150 representatives from government and non-governmental organizations, universities, UN and donor agencies. This group meets quarterly to share information and pursue GARNET activities in Bangladesh. The participants meet at their own cost, and the Environmental Health Programme (EHP) of ICDDR,B coordinates their activities. One of the earlier suggestions from the Bangladesh Chapter of GARNET was to organize this workshop.



# CHAPTER 2

## **Methodology and Participation**

The workshop continued for two days from 22 April to 23 April 1996. About thirty-three representatives from various government and non-governmental organizations, universities, UN and WHO agencies involved in disaster-related programmes participated in the workshop (Appendix).

The participants selected three major disasters that commonly occurred in last 5 years, and they also identified the issues whereon immediate attention should be given with respect to WS-related activities. These are: cyclone, flood, and tornado. They also discussed drought as a major concern. They identified the WS issues which were observed and/or felt important during their activities in the affected rural areas. It was decided that the period immediately after and within 2-3 weeks of the disaster would be covered in the discussion.

Important issues as observed and recorded in their field activities were grouped by the participants into five disciplines: (i) water, (ii) sanitation, (iii) education and dissemination, (iv) coordination, and (v) general programme. It was decided that the findings of this workshop would be published and distributed among programme managers and policy makers in the concerned

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sectors. All participants expressed the view that WS activities are identified as a priority in the relief agenda but lack of appropriate knowledge, technology and techniques, and coordination has been hampering effective implementation of the programme. The participants individually categorized every WS issues as 'adequate', 'inadequate' or 'negligible/absent' based on their observational estimation of the on-going activities.

# CHAPTER 3

## Findings

### Water

The availability and sources of water were categorized under three groups: tubewell (TW) water, non-tubewell water for domestic purposes, and treatment of water for drinking purposes. Local people commonly drink tubewell water and use pond water for bathing, washing and purposes. When a disaster occurs, it would not be reasonable to expect that adequate number of tubewells could be installed to meet the total demand for domestic water; thus the roles of other water sources need to be considered. Observations on the above are recorded in Table 1, 2 and 3.

**Table 1: Water**

Issue	Adequate (%)	Inadequate (%)	Absent/Negligible (%)
1. TW repair or re-sinking	8	92	0
2. TW installation (New)	14	79	7
3. Availability of spare parts	0	58	42
4. Availability of maintenance tools	8	54	38
5. TW installation for alternate use (in drought-prone areas)	0	45	55

Attempts to repair the existing tubewells and installation of new ones by the Government and NGOs were more or less made but non-availability of spare parts and maintenance tools was

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mentioned by more than one-third of the participants (Table 1). This was reported to cause severe problems in repairing private tubewells in some affected areas, especially when the Government and NGOs decide to provide service to their clients before they did this to other private users. During a disaster, the users of public and private facilities are equally affected. In drought-prone areas, two wells are installed — one at lower depth for use in wet season and another at greater depth for use in dry season. The tubewell head is moved from one well to the other as needed. This is referred to as alternate tubewell installation. During drought this arrangement has been reported to be useful.

Installation of devices other than tubewells or tapping of ground water in drought-affected areas was reported to be absent by a majority of the participants. The majority (>64%) felt that exploration of existing surface water sources and/or its resolution was rarely attempted (Table 2).

Following disaster, some ponds may become highly polluted due to increased salinity by sea-water, decaying biomass, etc. This necessitates dewatering of the pond by pumping out its water content, and is subsequently filled by groundwater recharging and/or rain water. Pond water is used for domestic purposes by about 80% of the people. This demand for pond water is difficult to be met with tubewell water. Scarcity of domestic water has direct public health implications since hygiene practices are affected.

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**Table 2: Sources of domestic water other than tubewells**

Issue	Adequate (%)	Inadequate (%)	Absent/Negligible (%)
1. Exploration of available surface water sources	9	27	64
2. Ponds	0	0	100
3. Transportation of water	0	0	100
4. Rain water harvesting	0	20	80

**Table 3: Treatment of drinking water**

Issue	Adequate (%)	Inadequate (%)	Absent/Negligible (%)
1. Availability of WPT	0	92	8
2. Standardization of WPT	0	25	75
3. Quality control of WPT	0	17	83
4. Other options for water treatment	9	46	45
5. Transportation of water	0	0	100

Although the majority reported availability of water purifying tablets (WPT) to be inadequate, the standardization and quality of available WPT was felt to be the most important concern (Table 3). Tests conducted (4) following the cyclone of 1991 and those conducted recently show that the two problems associated with WPTs -- inadequate potency and variation in types -- prevail at an alarming level.

### SANITATION

Overall, the sanitation/latrine distribution activities were reported as poor (Table 4). Although almost all documents advised the users to install latrines above flood level, it was hardly practised. The lack of appropriate technology complicates the whole concept of

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affordable latrine in flood-affected areas. Disposal of dead bodies that pollute ponds and other surface water sources is a major problem but received negligible attention so far.

**Table 4: Sanitation**

Issue	Adequate (%)	Inadequate (%)	Absent/ Negligible (%)
1. Ring-Slab-distribution at household level	0	50	50
2. Appropriate latrine technology	0	83	17
3. Disposal of dead bodies	0	10	90
4. Raising of latrine above flood level	0	0	100

## **Education and Dissemination**

Table 5 shows that attempts for education and dissemination are more or less made but there is scope for improvement in strategy to approach people.

**Table 5: Disaster education**

Issue	Adequate (%)	Inadequate (%)	Absent/ Negligible (%)
1. Programme (general health)	0	94	6
2. Education material (quantity)	0	79	21
3. Education material (quality)	10	40	56
4. Action-oriented education programme	21	29	50
5. School programmes	7	22	71
6. Literacy programmes	8	38	54

Health education activities are going on but school and literacy programmes are reported to be lacking in this regard. These institutions could play the most influential role in any community activities considered appropriate. These are indeed linked with provision of communications material. It may be noted that lack of

appropriate literature relating to action was reported by 80% of the participants.

### Coordination

The coordination between GO and NGO was indicated to be inadequate (Table 6). It is an important activity in order to achieve effective and timely results. It is possible that the follow-on actions are not properly understood by the NGOs and/or community people because of the coordination gap. It is encouraging to find that about a half of the participants felt local community was being adequately involved in the programmes.

**Table 6: Coordination and follow-on actions**

Issue	Adequate (%)	Inadequate (%)	Absent/ Negligible (%)
1. Between NGOs	50	50	0
2. Between government organizations (GO)	60	30	10
3. Between GO and NGO	0	100	0
4. Monitoring and evaluation	36	50	14
5. Appropriate warning/signal number	0	54	46
6. Promotion of coordinated actions following signal	0	17	83

### General Programme

The general operations which may directly or indirectly affect the WS activities were discussed (Table 7). The participants contended that the official declaration of disaster is often delayed. This means there is no National Act in this regard. This may affect the immediate WS relief activities and programme effectiveness. For example, delay in certain WS activities may contribute to outbreak of disease epidemics. Training of relief personnel is inadequate. The local capabilities to undertake immediate actions to cope

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with the disaster situation were also reported to be inadequate/negligible, and this obviously indicates absence of such training.

**Table 7: Programme**

Issue	Adequate (%)	Inadequate (%)	Absent/ Negligible (%)
1. Need for timely declaration by Government	15	62	23
2. Manpower (Technical)	13	80	7
3. Finance	14	79	7
4. Training of relief personnel	18	64	18
5. Selection of appropriate personnel	33	67	0
6. Involvement of local community:			
in Planning	50	29	21
in Activities	33	50	17
7. Capability of local community to cope with the situation (Training)	0	64	36
8. Involvement of local masons/semi-skilled	0	91	9
9. Disaster mitigation planning	25	50	25
10. Access to information at local level	0	75	25
11. Access to information at central level	10	70	20
12. Prompt mobilization of resources	0	92	8
13. Assessment of available and needed tubewells and other water sources	0	64	36
14. Installation of DTW/Deep set (Drought)	0	22	78
15. Appropriate management of water sources (Drought)	0	33	67
16. Shelters lacking water and sanitation facilities	0	60	40
17. Inappropriate placement of latrine and water facilities in shelter and camps	0	89	11



# Chapter 4

## **Discussion**

Although this report presents the views of the participants, in this section we would like to discuss the findings in general perspectives.

The participants based their activities on the situations observed and reported in terms of adequacy, inadequacy and absence/negligible. We would have liked to prioritize the need for WS activities in relation to disaster but due to time constraint, we decided to know about only the existing situations as much as possible.

If we compare the two identified extreme situations--adequate and absent/negligible--we may have an idea about the priority of issues. We reviewed the issues that were identified adequate by at least half of the participants. Out of the 47 identified issues, three were adequate, thirteen were absent/negligible, and the rest were reported to be inadequate. Involvement of community in the planning process of post-disaster activities (50%), coordination between NGOs (50%) and coordination between government organizations (60%) were identified as adequately practiced.

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Issues that are related to distribution of sanitary latrines, treatment of water, various options of water sources and appropriate WS education were categorized as “absent/negligible” by 50% or more of the participants. We think that these issues should be addressed on immediate priority basis in accordance with the participants’ views (Table 8). These findings are similar as mentioned by the participants of a regional workshop in 1991, and it is unfortunate that the situations in this sector more or less remained the same (5).

The need for priority actions will vary according to the local situations. It is recommended that the issues noted here be considered appropriately under two categories: (i) for disaster-prone areas, the needs should be met on urgent basis, and (ii) on the national level, the needs may be met based on available resources.

**Table 8: Absent/negligible WS activities**

1. Raising of latrine above flood level	100
2. Dewatering of ponds	100
3. Disposal of dead bodies	90
4. Promotion of actions following signal	83
5. Rainwater harvesting	80
6. Standardization of WPT	75
7. Quality control of WPT	75
8. School programme	71
9. Appropriate management of water resources in drought	67
10. Exploration of acceptable surface water source	64
11. Quality of education materials	56
12. Latrine distribution at household level	50
13. Action-oriented education programme on WSS	50

## **Recommendations**

1. Workshop on ways and means of mitigating the identified problems should be held with concerned policy makers, programme managers and personnel with field expertise.
2. Workshops be held on water and sanitation management in other frequently occurring disasters such as tornado, river erosion, drought, fire, etc.
3. Operations Research on appropriate strategy for disaster management is also needed so that programmes and frameworks may be developed based on real experience.

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## **Appendix**

### List of Participants

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SECO, Jessore
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9. Mr. Firoz Khan  
PRATYASHA
10. Mr. Md. Kamal Uddin  
G.K. Savar

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