Government of the People's Republic of Bangladesh
Ministry of Local Government Rural Development &Co-operatives

OPERATIONAL GUIDELINES FOR WASH
(Water Sanitation and Hygiene)
IN EMERGENCIES - BANGLADESH

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WASH Cluster
Water Sanitation Hygiene

Secretary
Local Government Division
Ministry of Local Government Rural Development & Co-operatives
Government of the People's Republic of Bangladesh

Foreword

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Abbreviations

AILA	:	Name of a Cyclone in 2009
ART	:	Arsenic Removal Technology
CCDMC	:	City Corporation Disaster Management Committee
CPP	:	Cyclone Preparedness Programme
CPPIB	:	Cyclone Preparedness Programme Implementation Board
CSDDWS	:	Committee for Speedy Dissemination of Disaster related Warning Signal
DC	:	Deputy Commissioner
DDM	:	Department of Disaster Management
DDMC	:	District disaster Management Committee
DG	:	Director General
DMC	:	Disaster Management Committee
DMTATF	:	Disaster Management Training and public Awareness building Task Force
DND	:	Dhaka- Narayanganj- Damra
DPHE	:	Department of Public Health Engineering
DWASA	:	Dhaka water and Sewerage Authority
ED	:	Excreta Disposal
EOC	:	Emergency Operation Center of DDM
EPAC	:	Earthquake Preparedness Awareness Commottee
EPP	:	Emergency Preparedness Plan
EWS	:	Early Warning System
FAP	:	Flood Action Plan
FPOCG	:	Focal Point Operation Co-ordination Group
HCTT	:	Humanitarian Co-ordination Task Team
HH	:	House Hold
HTH	:	Name of a Non Chlorinating Oxidizer (powder)
HWT	:	Home Water Treatment
IMDMCC	:	Inter-Ministerial Disaster Management Co-ordination Committee
INGO	:	International Non-Governmental Organization
JNA	:	Joint Need Assessment
KII	:	Key Information Interview
LCG	:	Local Consultative Group
LCG-DER	:	LCG Disaster and Emergency Response
LGD	:	Local Government Division
LGRD	:	Local Government and Rural Development
NDMAC	:	National Disaster Management Advisory Committee
NDMC	:	National Disaster management Council
NFI	:	Non Food Item
NGO	:	Non Governmental Organization
NGOCC	:	NGO Co-ordination Committee
NPDRR	:	National Platform Disaster Risk Reduction

NDRCC	:	National Disaster Response Co-ordination Center of DDM
ORS	:	Oral Rehydration Salt
PDMC	:	Pourashava Disaster Management Committee
PIO	:	Project Implementation Officer
PSF	:	Pond Sand Filter
RAB	:	Rapid Action Battalion
RWHS	:	Rain Water Harvesting System
SAE	:	Sub Assistant Engineer
SAG	:	Strategic Advisory Group
SIDR	:	Name of Cyclone in 2007
SOD	:	Standing Order on Disaster
SOS	:	Name of the form for Loss and Damage and Emergency Requirement
SW	:	Solid Waste
TWG	:	Technical Working Group
UDMC	:	Union Disaster Management committee
UN	:	United Nations
UNICEF	:	United Nation's Children Fund
UNO	:	Upazila Nirbahi Officer
UzDMC	:	Upazila Disaster Management Committee
VC	:	Vector Control
VDP	:	Village Defense Police
WASA	:	Water and Sewerage Authority
WASH	:	Water, Sanitation and Hygiene
WATSAN	:	Water and Sanitation
WB	:	World Bank
WPT	:	Water Purification Tablet
WS/WSS	:	Water Supply/Water Supply & Sanitation
WT	:	Water Treatment

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Chapter 1: Introduction

CHAPTER OUTLINE

1.1 Disasters in Bangladesh

Natural disasters like cyclone, storm surge, flood, tornado, earthquake, riverbank erosion and landslide have been threatening mankind since history. With the rapidly rising global population the impact of natural disasters is becoming more severe. Moreover, with the increasing effects of climate change, including sea level rise, the magnitude and frequency of natural disasters like flood and cyclone are apprehended to increase and make people more vulnerable to them.

Disaster[1] means any such incidents mentioned below created by nature or human or created due to climate change and its massiveness and devastation cause such damage to cattle, birds and fisheries including life, livelihood, normal life, resources, assets of community and the environment of the damaged area or create such level of hassle to that community whose own resources, capability and efficiency is not sufficient to deal this and relief and any kind of assistance is needed to deal that situation, such as: -

a) Cyclone, northwester, tornado, sea high tides, abnormal tides, earthquake, tsunami, excessive rains, shortfall of rains, flood, erosion of river, erosion of coastal area, drought, excessive salinity, excessive pollution of arsenic, building slide, landslide, hill slide, gushing water from hills, hailstorm, heat wave, cold wave, long term water logging etc.;
b) Explosion, fire, capsize of vessel, massive train and road accident, chemical and nuclear radiation, pilferage of oil or gas, or any mass destruction incident;

[1] As defined in the Disaster Management Act, 2012

c) Disease causing pandemic, such as pandemic influenza, bird flu, anthrax, diarrhea, cholera, etc.;
d) Harmful microorganism, poisonous materials and infection of life active object including infection by bio based or biological infectious object;
e) Ineffectiveness or damage of essential service or disaster protection infrastructure; and
f) Any unnatural incident or a misfortune causing massive life loss and damage;

The unique geographical location of being located in the delta region where in, one hand, the mighty rivers of the Brahmaputra, Ganges and Meghna basis drains an areas of about 1.5 million sq. km and is susceptible to frequent flooding. On the other hand, it is exposed to sea makes it vulnerable to cyclone and storm surges. Further, the flat topography, multiplicity of rivers and the monsoon climate increased the vulnerability of Bangladesh to natural disasters. The coastal morphology of Bangladesh influences the impact of natural hazards on the area. Especially in the south western area, natural hazards increase the vulnerability of the coastal dwellers and slow down the process of social and economic development.

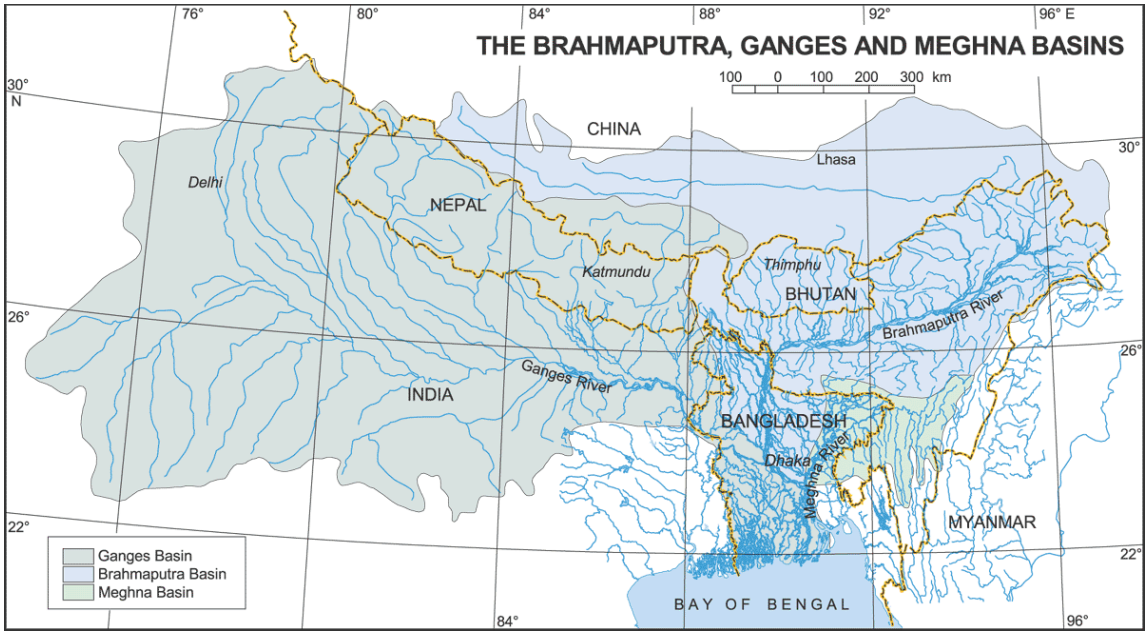


Figure 1 The Ganges Brahmaputra and Meghna basin

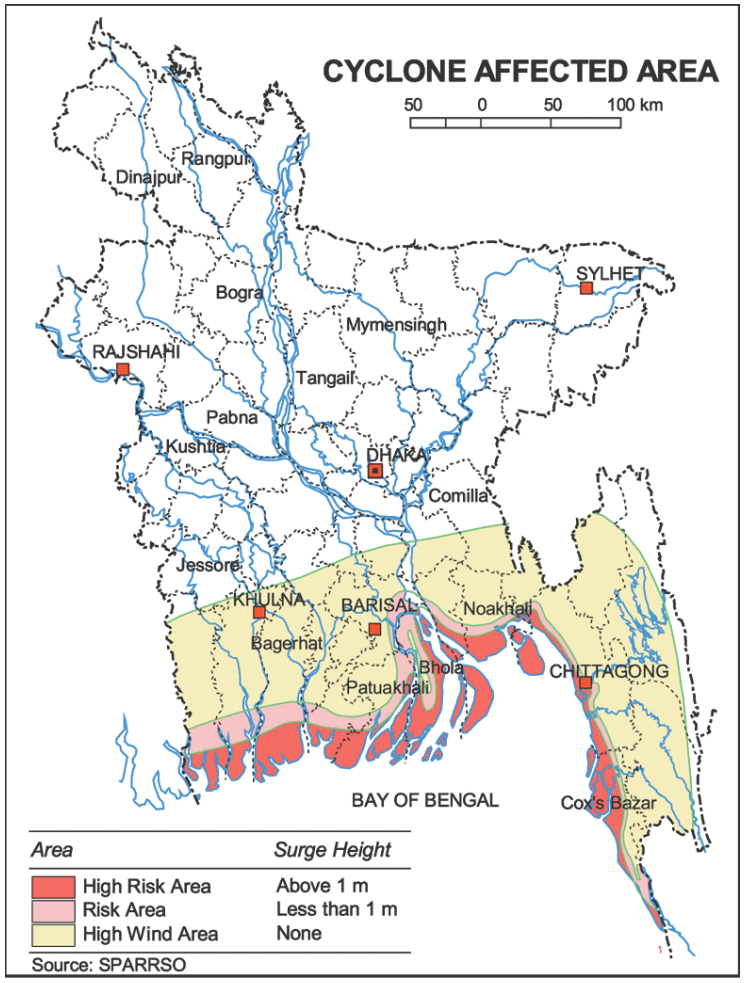
Natural and human induced hazards --- flood, cyclone, drought, tidal surge, tornado, earthquake, river erosion, fire, infrastructure collapse, high arsenic level of groundwater, water logging, water and soil salinity, epidemic, and various forms of pollution--- are frequent occurrences.

Some of the common disasters in Bangladesh where WASH interventions are important are described below.

Storm: A violent disturbance of the atmosphere, taking the form of high winds, often heavy rainfall, thundering and lightning, rough conditions with high foaming waves at sea. Tropical

cyclone, tornado, thunderstorm, tropical depressions are the common types of storm that occur in Bangladesh.

Cyclone: Almost every year the coastal areas of Bangladesh are hit by devastating cyclones usually accompanied by high-speed winds, sometimes reaching 250 km/hr or more and 3-10m high waves, causing extensive damage to life, property and livestock. Cyclones in the Bay of Bengal occur in two seasons, April-May and October-November – i.e. before and after the monsoon. Cyclones enter the Bay as the remnants that originate in the South China Sea. They gain moisture and latent heat from the Bay of Bengal, and consequently rejuvenate into full-blown phenomenon. Following a curvilinear path, they reach the coast of Myanmar, Bangladesh or East Coast of India. Due to the funnel shaped coast, Bangladesh repeatedly becomes the landing ground of cyclones formed in the Bay of Bengal. The Bay cyclones also move towards the eastern coast of India, towards Myanmar and occasionally into Sri Lanka. But they cause the maximum damage when they come into Bangladesh and West Bengal of India. This is because of the low flat terrain, high density of population and poorly built houses. Most of the damage occurs in the coastal regions of Khulna, Patuakhali, Barisal, Noakhali and Chittagong and the offshore islands of Bhola, Hatiya, Sandwip, Manpura, Kutubdia, Maheshkhali, NijhumDwip, Urir Char and other newly formed islands.



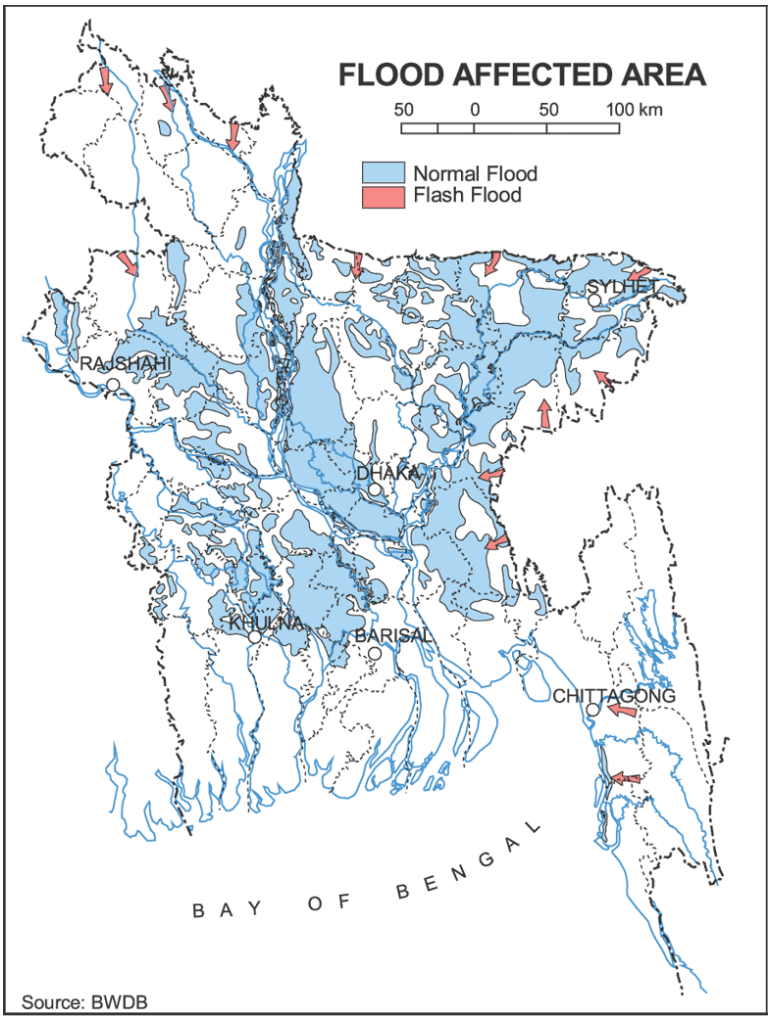
Tornado: It occasionally occurs in Bangladesh during the pre-monsoon hot season, especially in the month of April when the temperature is the highest. The diameter of a tornado varies from a few meters to about two kilometers. The rotating winds attain velocity of 300 to 480 km/hr and the updraft at the centre may reach 320 km/hr. A tornado is usually accompanied by thunder, lightning, terrifying roaring and heavy rain. Tornado is a very short-lived disturbance which may last 10-20 minutes and the length of their travel path may vary from 10 to 15 km. Although small in size, wherever they hit, they make a complete devastation. They are more common in the central part of Bangladesh than in the other areas. Most of the

severe tornadoes are recorded in the districts of Faridpur, Rajbari, Gopalganj, Madaripur, Pabna, Gazipur, Tangail and Dhaka.

Nor'wester: Generally blows over Bangladesh in April-May from the north-westerly direction, locally known as *Kal-Baishakhi*. The difference between an ordinary shower and this storm is that it is always associated with thunder and lightning. Hail is common with a nor'wester. From mid-March to April the temperature in Bangladesh rises sharply. In the middle of April the whole country, especially the north-western part, records a sharp rise of day temperature. Nor'westers are more frequent in late afternoon because of the influence of surface heating in producing convection currents in the atmosphere. In the western region of Bangladesh, nor'wester comes in the late afternoon and before evening but in the eastern side it comes generally after evening coinciding its movements from north-westerly to easterly and south-easterly direction. The average wind speed of nor'wester is 40-60 km per hour, but in exceptional circumstances the wind speed may exceed 100 km. The duration of nor'wester is shorter but sometimes may last over an hour.

Storm surge and tidal bore: The storm surges that accompany the cyclones of the Bay of Bengal cause more destruction in the coastal areas and offshore islands of Bangladesh than the very strong winds that are associated with the cyclones. Such destruction includes the widespread demolition of houses, uprooting of trees and damageof crops, roads, buildings and structures, and death to human and loss of livestock. Tidal bore is also known as *ban* in Bangla. In Bangladesh, tidal bore is observed in the Meghna estuary and other southern coastal areas in the months of April-May and also between September-December. It is much more devastating in Chittagong, Cox's Bazar, Barisal, Noakhali, Patuakhali, Barguna and Khulna. In the Meghna estuary, the 1970 Cyclone (Nov 12-13) with cyclonic surge of 3.05m to 10.6m high and wind speed of 222 km/h occurred during high tide causing the most appalling natural disaster claiming 0.3 million human lives. On the 29 April 1991 a devastating cyclone hit Chittagong, Cox's Bazar, Barisal, Noakhali, Patuakhali, Barguna and Khulna along with tidal bore of 5-8m high with wind speed of 240 km/h which killed 150,000 human beings, 70,000 cattle head, and the total loss was about Taka 60 billion.

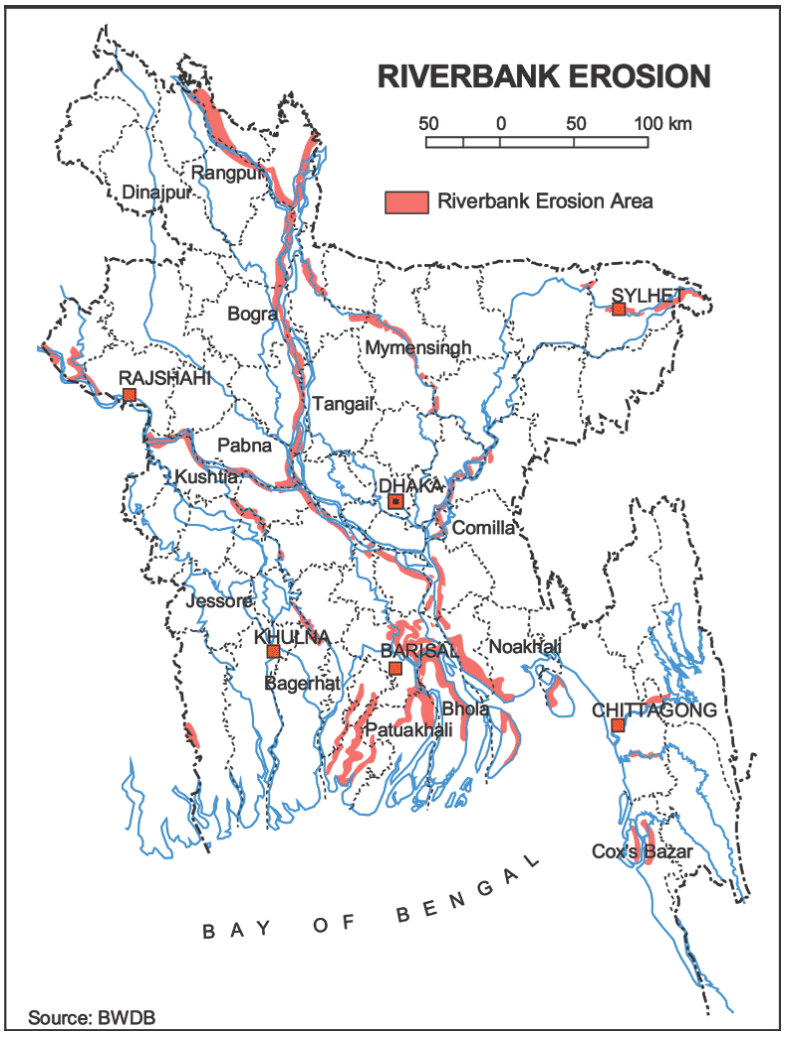
Flood: Inundation of land by the rise and overflow of a body of water. Floods occur most commonly when water from heavy rainfall, from melting ice and snow, or from a combination of these exceeds the carrying capacity of the river system, lake or ocean into which it runs. Every year about one-fifth of Bangladesh undergoes flood during the monsoon season. The geographic position, structural set-up,physiographic and geomorphology are jointly responsible for flooding in the country. A flood season in Bangladesh may start as early as May and can continue until November. Last Fifty years saw six extensive and devastating floods and these were the floods of 1955, 1974, 1987, 1988, 1998 and 2004. The harrowing condition caused by these floods (particularly of 1987 and 1988) aroused the conscience of the international community, which lead to the formation of Flood Action Plan (FAP).



Floods of Bangladesh can be divided into three categories: (i) monsoon flood - seasonal, increases slowly and decreases slowly, inundates vast areas and causes huge loss to the life and property; (ii) flash flood from sudden torrential flows, following a brief intense rainstorm or the bursting of a natural or manmade dam or levee; and (iii) tidal flood - short duration, height is generally 3-6m, prevents inland flood drainage. The possible contributing factors for causing floods in Bangladesh are: (a) general low topography of the country with major rivers draining through Bangladesh including congested river network system, (b) heavy rainfall in the up-country or in-country, (c) snow melt in the Himalayas and glacial displacement (natural), (d) river siltation, lateral river contraction or landslides, (e) synchronization of major river peaks and influences of one river on the other, (f) human interference, (g) tidal and wind effects on slowing down the river outflow (back water effect), (h) effect of sea level change, (i) possible rise in sea bed and land subsidence, (j) tectonic anomalies (earthquake, change in river flow/ morphology etc.), (k) possible greenhouse effect, and (l) experiments on melting of glaciers in the Himalayas.

A flood affected village home

Riverbank erosion: Every year millions of people of the country are affected by riverbank erosion that destroys standing crops, farmland and homestead land. It is estimated that about 5% of the total floodplain of Bangladesh is directly affected by riverbank erosion. During monsoon extensive overbank spills, bank erosion and bank line shifts have become typical. The unpredictable shifting behavior of the rivers and their encroachments not only affect the rural floodplain population but also the urban growth centers and infrastructures. The rivers that are highly susceptible to riverbank erosion are Ganges, Jamuna, Padma and Lower Meghna.



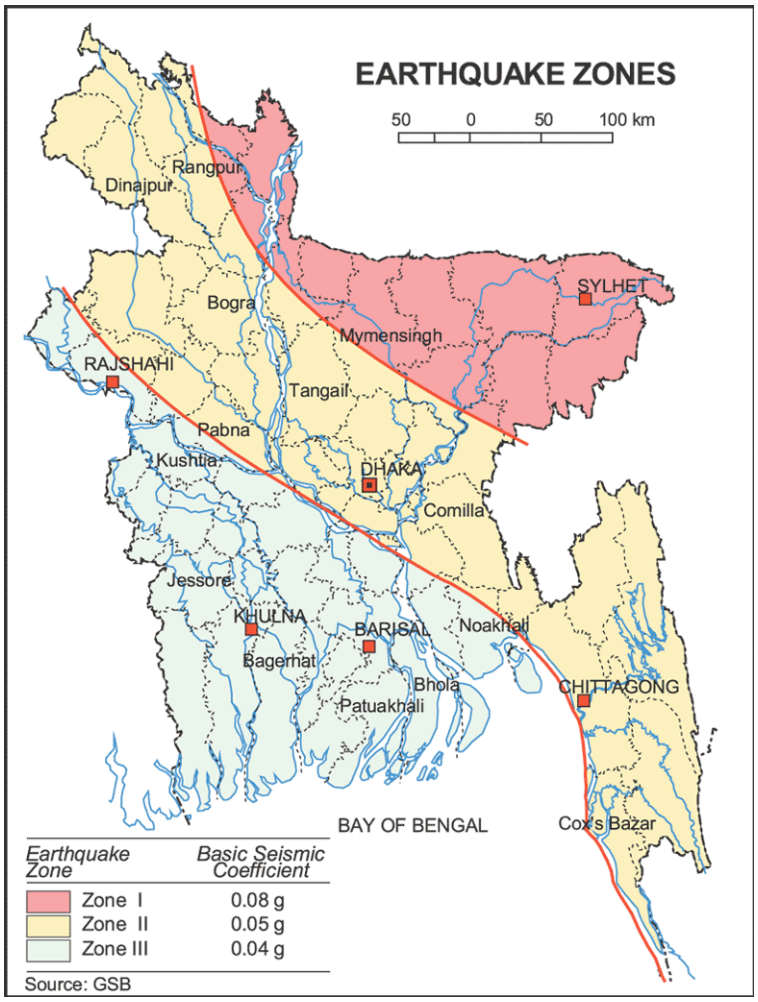
River bank erosion

Coastal erosion: The deltaic coastline of Bangladesh can be recognized as consisting of two basic physiographic units: the inactive or abandoned Ganges tidal plain and the active Meghna deltaic plain. While the Ganges tidal plain is relatively old, the Meghna deltaic plain is geologically very young. The Meghna deltaic plain extends from the Chittagong coast in the east to Tentulia Channel in the west. The erosion-accretion processes take place much more within this part. Broad map comparisons indicate that the delta of the Ganges-Brahmaputra rivers has not grown significantly towards the sea over last two centuries. Changes can be noticed in Sandwip and adjacent islands, in Hatiya Island, in Bhola Island, and in the coastline of the Noakhali mainland. Sandwip Island reduced in size in about 200 years. Sandwip channel was nearly isolated from the main distributaries network of the rivers in 1764-1793. The Hatiya Island elongated and migrated considerably southward during this period. Bhola Island is also elongated north-south. The islands, in general, protruded by about 50 km southward.

Landslide: Common in the hilly areas of south-eastern Bangladesh, especially in Bandarban, Rangamati, Khagrachhari and Cox's Bazar. Every year, especially in the rainy season, landslides take place in both natural and human-induced slopes. The major roads connecting Bandarban town with the rest of the country is affected by landslides almost every year isolating the town and surrounding areas. Not only roads but also a considerable number of infrastructures are damaged and valuable lives lost. Landslides due to the construction of buildings and other infrastructure occur mostly in the urban and semi-urban areas of the hill districts. The effect of Jhum cultivation and other forms of cultivation on steep slopes also play a significant role in the occurrence of landslide. Hill cutting is a major cause of landslide. Common engineering techniques for landslide prevention include provision for surface and subsurface drainage, removal of unstable slope materials, construction of retaining walls, or some combination of these. Many of them are currently used in Bangladesh.

Earthquake: In the north and northeast of Bangladesh, there are areas of high seismic activity and some of the major earthquakes originating in these areas have affected the adjacent regions of the country. The whole of Bangladesh is divided into three seismic zones. The northern part of the country that includes the greater districts of Rangpur, Mymensingh, and Sylhet are in the Zone-I where earthquake shock of maximum intensity of IX of the Modified Mercalli Scale is possible. The Zone-II includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong and the shocks of intensity of VIII are possible. The southern part of the

country, the least active region, where the maximum intensity is not likely to exceed VII, is in the Zone-III. The experts suggest not to construct normal buildings with more than 60m height.



There is only one earthquake recording station in Bangladesh, which is in Chittagong city and is under the Meteorological Department of Bangladesh.

Draught: Shortage of rainfall coupled with its erratic distribution during rainy season causes severe water deficit conditions resulting in drought of various intensities. It usually prevails in the northern part and some areas of south western part of Bangladesh. The rivers are dried up, ground water level falls down making many suction mode hand pump (mostly shallow tubewells with Number 6 hand pumps) become inoperative. This creates shortage of drinking water supply.

Water Logging: In Bangladesh, a mostly flat country, lack of adequate drainage is an inherent problem. With the growth of urbanization, the increase of built up areas also causes obstruction to the natural water flow. As a result of concentration of heavy rainfall during the monsoons, the cities and towns are regularly flooded. The carrying capacity of rivers is being reduced due to siltation, causing serious drainage congestion, especially in the coastal areas.

The Improper drainage, due to construction of infrastructure like roads, causes retention of flood and rain water in many parts of the country. For example, within the Dhaka-Narayanganj-Demra (DND) embankment near Dhaka city serious problem of water logging has been noticed during flood time.

Tsunami: Underwater strong earthquakes, volcanic eruption or other submarine landslide usually causes tsunamis. When earthquake occur offshore at seduction zones (places where a tectonic plate that carries an ocean is gradually slipping under a continental plate). Some tsunamis can be very large. In coastal areas their height can be as great as 30 feet or more (100 feet in extreme cases), and they can move inland several hundred feet. A tsunami consists of a series of waves. Often the first wave may not be the largest. The danger from a tsunami can last for several hours after the arrival of the first wave. Tsunamis can move faster than a person can run. Tsunamis can occur at any time, day or night. The experience of tsunami is terrifying and causes great loss of life and extensive destruction to properties.
The 2004 great tsunami originating in Sumatra, Indonesia awarded Bangladesh and many other coastal countries.

Considering the state of tsunami vulnerability and potential seismic sources, Geological Survey of Bangladesh has divided the Bangladesh coastal belt into three zones:

a) Tsunami Vulnerable Zone- I (Chittagong-Teknaf coastline): Most vulnerable. The intra deltaic coastline is very close to the tectonic interface of Indian and Burmese plates. The active Andaman-Nicobar fault system is often capable of generating tsunami waves.
b) Tsunami Vulnerable Zone- II (Sundarban-Barisal coastline): Moderately vulnerable. This old deltaic belt is extremely vulnerable to local tsunamis
c) Tsunami Vulnerable Zone- III (Barisal-Sandwip estuarine coastline): Low vulnerability. The estuarine coastal belt considered to be less vulnerable due to presence of numerous islets and shoals in the upper regime of the continental shelf.

Infrastructure Collapse: Sudden collapse of infrastructure like building and bridges can cause severe damage to life and property and a large number of people may remain trapped in the ruins of the infrastructure. The 2005 Rana Plaza industrial building collapse left hundreds of people dead. The incidence of infrastructure collapse in on the rise.

1.2 Impacts of Disasters on WASH

Among different kinds of natural hazard; flood, cyclone, coastal cyclone surge, river bank erosion, water logging and draught hamper the water supply, sanitation and hygiene facilities in the affected areas for a prolonged period, ranging from weeks to months. In case of other calamities, shorter period disruption in the WASH facilities occurs.

During flood and river bank erosion, the areas on the river bank start to inundate and people have to evacuate their homes and take shelter in embankment and in other flood shelter like school building. In order to meet the situation temporary tubewells, mobile water treatment units are deployed and water purification tablets are distributed. For sanitation facilities

temporary latrines and solid waste disposal systems are provided. And to maintain hygienic environment various health and hygiene education materials are provided.

In case of cyclone, people take shelter in the temporary cyclone centers and normally similar WASH facilities are provided. When cyclone with tidal surge comes, it inundated the fresh water sources for drinking and makes the water supply and sanitation situation very vulnerable. People do not have water to drink, latrine to defecate and no place to dispose the solid waste. It becomes very difficult to provide WASH support on an emergency basis for the affected people. Cleaning ponds, treating water in a distant fresh water source and trucking to the affected sites or trucking bottle water become necessary. Due to staying in the cyclone centre or on the raised land for a longer time, sanitation facilities (latrines) often required de-sludging and disposing them in a safe place. Hygiene materials are also required.

During river bank erosion, people become homeless and landless. They take shelter in nearby government land and it requires long term WASH facility provision through emergency and rehabilitation programmes. Water logged areas faces acute sanitation problem as there remains no suitable land to construct latrines. Particularly women are become the most vulnerable because of the absence of privacy.

In draught non availability of water creates crisis. Installation of new water points with deep set pump or motorized pump become essential to maintain the water supply. However, this type of situation is a rare happening in Bangladesh.

1.3 Impacts in Rural and Urban areas

The impact of disasters and their effects on WASH is often different for rural and for urban areas. They are discussed below.

Rural: The impact of disaster of any kind, rural areas of Bangladesh are much more vulnerable than urban areas. This is because the infrastructure is more affected due to flood and cyclone hit, population are poorer than urban areas and knowledge to cope with the disaster is less. On the other hand, rural areas are vast and majority of the population are living there. So the effect of disaster in respect of magnitude and extent is large. People in most of the cases need to be migrated temporarily to a safe place particularly in the flood or cyclone centers. People live there in a concentrated manner and the need for WASH (Water Supply, Sanitation and Hygiene) facilities on an emergency become very high. The biggest challenge is the scale of disaster where hundreds of thousands of people are affected.

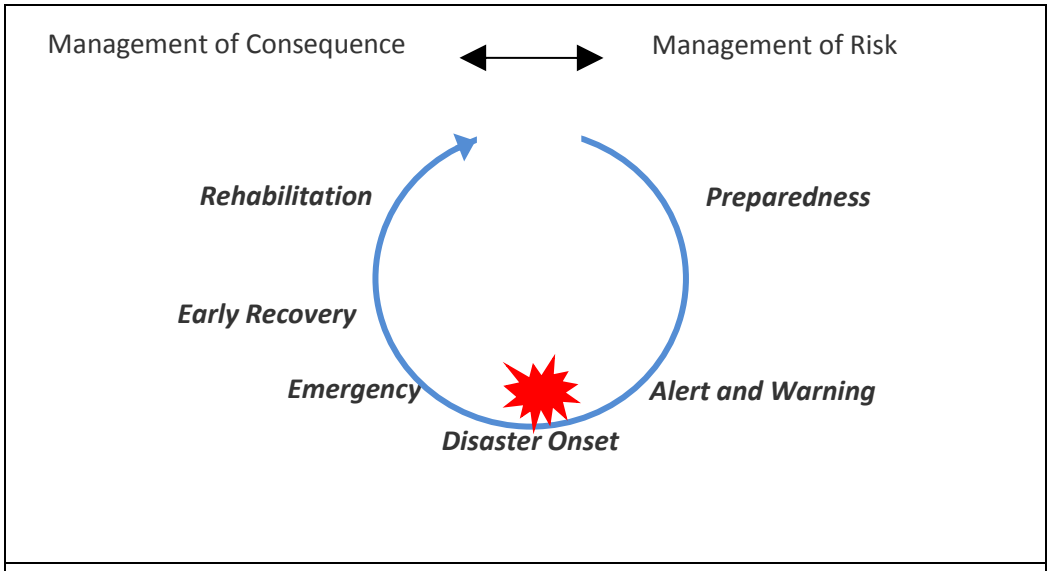
Food and cyclone hit areas in rural settings

Urban: In urban areas storm and Nor'wester, locally known as Kal- Baishakhi or any other cyclonic storm sometime damages trees and electric posts and temporarily disrupts the smooth water supply in the towns. But usually the emergency action taken by the concern authority re-activates the water supply within short time. In case any delay in restoration occurs emergency water supply is provided by carriers. However, due to improper drainage system sometimes water logging creates inconvenience. In many cases prolonged flood make the urban life more difficult to get proper water supply and sanitation facilities. People in urban areas are usually very much reluctant to move from the house because of security of their properties and as such they bring water from outside of the affected areas. In this situation not only WASH facilities but also cooked food become scarce and are required to be supplied on emergency basis. Flood of 1987 and 1988 was remarkable when two thirds of the Dhaka city was inundated.

Bangladesh is vulnerable to earthquake and any earthquake would affect much more the urban areas then the rural ones. Although severe disaster has not occurred for last 100 years, the casualty in urban areas, if it happens, is feared to be very serious. WASH activities will then be needed on an emergency basis.

Food hit areas in urban settings

1.4 Disaster Management Cycle



Disaster management cycle

The above figure shows the disaster management cycle and consists of a continuous chain of activities. The right side of the diagram show how the management of risk is done through preparedness and warnings. After the onset of a disaster, the left side show the management of the consequence of disaster which include emergency response, early recovery and rehabilitation. Learning from disasters provides inputs to increase the effectiveness of disaster preparedness.

The various activities of the disaster management cycle are termed and defined in various ways by different national and international agencies like the Disaster Management Department and the UN Agencies. The disaster management activities and their definition

used in this Guideline are presented in the following table. The nomenclature and definitions are broadly similar to those used by the Disaster Management Department and for the Joint Needs Assessment (JNA) of the LCG.

Some activities are clustered into phases. The durations of the activities are flexible depending on the situation.

Table: Definitions of disaster management activities.

Phases	Disaster management activities	Definition
Phase 0 Preparedness Phase	Preparedness	To increase awareness and capability among the communities and disaster management related agencies to deal the affect of hazards and to undertake disaster response programmes. This period is also refer as normal-time.
	Alert and Warning	The period from the issuing of an alert or public warning of an imminent disaster threat to its actual impact, or the passing of the threat and the lifting of the warning. Alerts and warnings are usually issued in case of predictable events like cyclones and floods but could not be issued in case of unpredictable events like earthquake, infrastructure collapse and fire.
Phase 1 Emergency Response	Disaster Onset	The period during which the direct impact of a natural calamity is felt. The onset period is long in the case of slow onset disasters (droughts, normal monsoon floods) and short in the case of rapid on-set disasters (flash floods, cyclones, earthquakes, fires, industrial accidents, landslides, etc.)
	Emergency response	Reduce the impact on critical services and provision of immediate humanitarian assistance like food, water and shelter. Emergency response may start during onset phase in case of slow onset disaster. The response period may start during disaster onset in case of slow onset disasters and the duration may vary from days to weeks.
Phase 2 Early Recovery	Early recovery	Rapid Service level restoration and ensure victims to resume essential elements of normal life and livelihood. Early recovery may start during the latter part of emergency response period and the duration may vary from weeks to months.
Phase 3 Rehabilitation and development	Rehabilitation and development	To bring back the affected community to a normal life and the damaged infrastructure to previous condition or better condition. Rehabilitation may start during the latter part of the early recovery period and the duration may vary from months to years.

1.5 Code of conduct in disaster response activities

The Code of conduct seeks to guard the standard of behavior and to maintain the high standards of independence, effectiveness and impact. Bangladesh government's activities alsoadhere with the Code of Conduct of the International Red Cross and Red Crescent Movement in disaster relief. The Code of Conducts are as follows.

1. The humanitarian imperative comes first
2. Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone
3. Aid will not be used to further a particular political or religious standpoint
4. We shall endeavor not to act as instruments of government foreign policy
5. We shall respect culture and custom
6. We shall attempt to build disaster response on local capacities
7. Ways shall be found to involve programme beneficiaries in the management of relief aid
8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs
9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources
10. In our information, publicity and advertising activities, we shall recognize disaster victims as dignified humans, not hopeless objects

1.6 Cross-cutting issues

The cross-cutting issues focus on particular areas of concern in disaster management and address individual, group or general vulnerability issues. These cross-cutting issues are to be considered during planning and implementation of disaster response activities, the issues are briefly discussed below.

Children: Special measures must be taken to ensure all children are protected from harm and given equitable access to basic services. As children often form the larger part of an affected population, it is crucial that their views and experiences are not only elicited during emergency assessments and planning but that they also influence humanitarian service delivery and its monitoring and evaluation. Children are prone to the harmful impact of vulnerability in certain situations, such as malnutrition, exploitation, and abduction and lack of opportunity to participate in decision-making.

Gender: Gender refers to the fact that people experience a situation differently according to their gender Women and men have the same entitlement to humanitarian assistance and protection, to respect for their human dignity, to acknowledgement of their equal human capacities including the capacity to make choices, to the same opportunities to act on those choices and to the same level of power to shape the outcome of their actions. Humanitarian responses are more effective when they are based on an understanding of the different needs, vulnerabilities, interests, capacities and coping strategies of women and men, girls and boys of all ages and the differing impacts of disaster or conflict upon them.

Older people: Older men and women are those aged over 60 years but a definition of 'older' can vary in different contexts. Older people are often among the poorest in developing countries and comprise a large and growing proportion of the most vulnerable in disaster and yet they are often neglected in disaster management. Isolation and physical weakness are significant factors intensifying vulnerability along with disruption to livelihood strategies and to family and community support structures, chronic health and mobility problems, and declining mental health. Special efforts must be made to identify and reach housebound older people and households headed by older people.

Persons with disabilities: Persons with disabilities face disproportionate risks in disaster situations and are often excluded from relief and rehabilitation processes. Such exclusion makes it more difficult to effectively use and participate in standard disaster support services. Importantly, persons with disabilities are a diverse population including children and older people, whose needs cannot be addressed in a 'one size fits all' approach. Humanitarian responses, therefore, must take into consideration the particular abilities, skills, resources and knowledge of individuals with different types and degrees of impairments. It is also important to remember that persons with disabilities have the same basic needs as everyone else in their communities. In addition, some may also have specific needs, such as replacement of aids or appliances, and access to rehabilitation services. Furthermore, any measures targeting persons with disabilities must not lead to their separation from their family and community networks.

1.7 Purpose and scope of the Guidelines

The purpose of this operational guideline is to increase the capacities and preparedness of the agencies involved in disaster management. The guideline would facilitate a well-coordinated disaster management activities involving government agencies, local government institutions and NGOs. The guideline is within the Bangladesh Government's institutional and regulatory frameworks. The guideline is also in line the operating strategies of the UN Agencies and development partners working in disaster management in Bangladesh.

The WASH Cluster in Bangladesh has made considerable progress in the cluster management; this was particularly evident in handling of WASH interventions after cyclone SIDR in 2007 and AILA in 2009. It was noticed that cluster members have been using many different operational modalities in terms of WASH technical options (water and sanitation), hygiene promotion and WASH cluster information management for emergency interventions. Many technical issues were resolved in Technical Working Groups (TWGs), many were resolved in Strategic Advisory Group (SAG) during implementation WASH activities for SIDR & AILA. Since then the cluster co-ordination felt to have an agreed and official operational guideline for WASH emergency for all sector partners. Accordingly, cluster co-ordination with the support of key partner (DPHE, UN, National and International NGOs) prepared this document.

As mentioned in Table 1, the emergency responses during disaster include various phases. The scope of this guideline covers the requirements for immediate attention, as such, the guideline includes during preparedness phase, emergency phase and early recovery, and it does not include the rehabilitation phase. The guideline would, however, be also helpful for the rehabilitation period.

In the first version of the Guidelines was published in 2011. This second version is prepared after a period of about five years. This version reflects the new policies, acts and plans and institutional arrangements developed since the first version. The international experiences and some national experiences in disaster management are also reflected. No major natural disaster occurred in Bangladesh in the last five years and as such the first version could not be rigorously tested case of its application in large scale disaster.

1.8 Contents of the Operational Guidelines

This guideline has three parts. Part A consists of following six chapters. The first chapter is Introduction which narrates the context of disaster in Bangladesh, the disaster management cycle and defines the various disaster management phases. The second chapter is on Institutional and Regulatory Framework for Disaster Management. The third chapter, Preparedness for WASH, describes the measures needed for reducing the effect of disaster. The forth chapter, WASH Emergency Response, narrates the measures needed for emergency situation while the fifth chapter, WASH Early Recovery, narrates those for the period just after emergency interventions. The sixth chapter, decommissioning of WASH facilities recommends actions that steps are to be taken to decommission the WASH facilities after when they are no longer needed.

Part B consist a set of 6 guidelines for WASH facilities and non-WASH but related facilities.

Part C gives design and cost estimates for water supply facilities for disaster management.

Chapter 2: Institutional and Regulatory Framework for Disaster Management

CHAPTEROUTLINE

The Disaster Management Vision of the Government, as narrated in the National Disaster Management Policy 2015, is to reduce the risk of people, especially the poor and the disadvantaged, from the effects of natural, environmental and human induced hazards, to a manageable and acceptable humanitarian level, and to have in place an efficient emergency response system capable of handling large scale disasters. There are two overarching national objectives

- risk reduction
- strengthening systems and procedures for effective response management

The first objective of risk reduction would be achieved through, among others, integration with climate change adaptation, strengthening community based programmes and promoting livelihood strategies and options for the poor. The second objective of strengthening systems and procedures for effective response management, which is more relevant to the scope of this Guideline, is achieved through, among others, legal and institutional framework for effective response management and enhancing response management capacities at all levels. The following sections narrate the institutional regulatory frameworks for disaster management.

2.1 National Disaster Management Institutional Framework

The National Disaster Management Institutional Framework in Bangladesh is outlined in the Disaster Management Act, 2012 and includes a series of inter-related institutions at both national and sub-national levels to ensure effective planning and coordination of disaster risk reduction and emergency response management. The disaster management institutional framework is shown in Figure 2.1

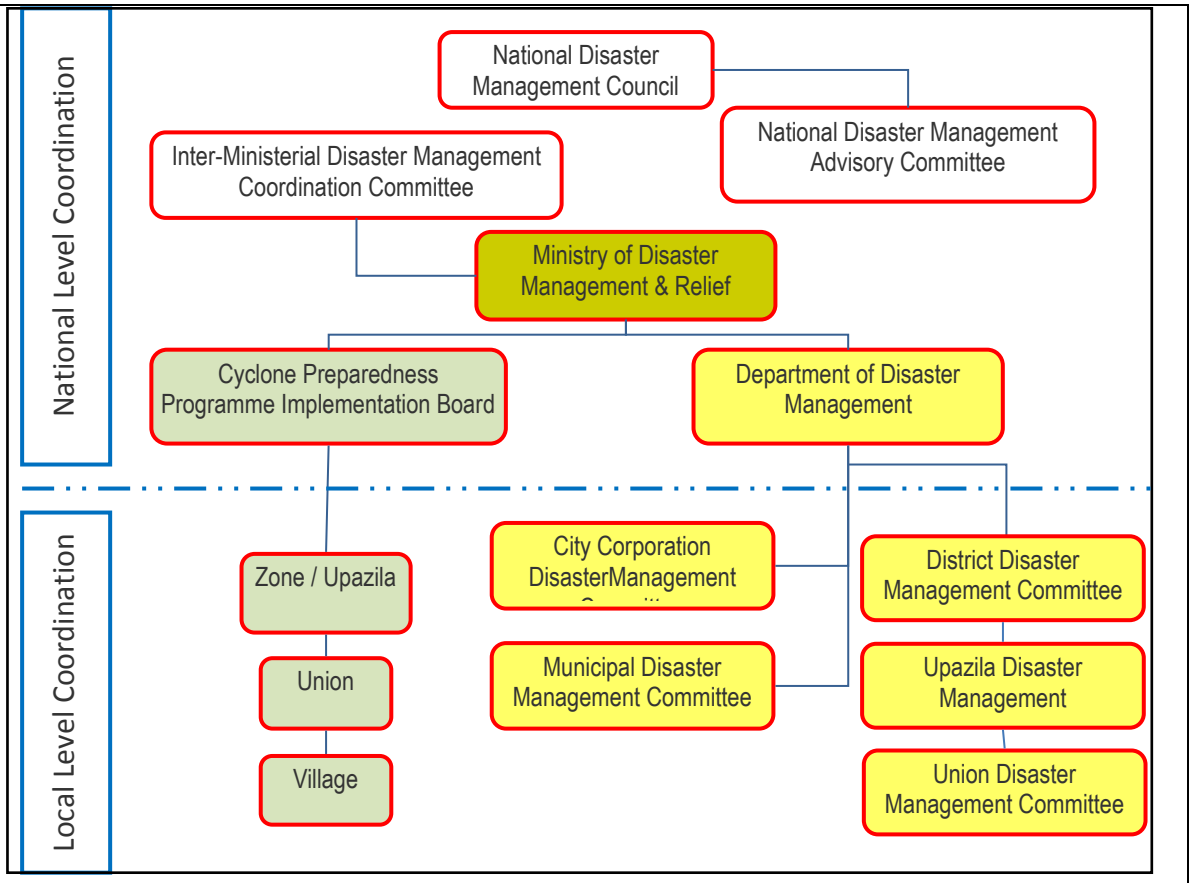


Figure 2.1 Institutional framework for disaster management

Under the disaster management institutional framework, the different entities at national level and local level and their functions are narrated below.

At the national level

1. National Disaster Management Council (NDMC) headed by the Honorable Prime Minister to formulate and review the disaster management policies and issue directives to all concerns.

Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC) headed by the Hon'ble Minister in charge of the Ministry of Disaster Management and Relief (MoDMR) to implement disaster management policies and decisions of NDMC/ Government.

2. National Disaster Management Advisory Committee (NDMAC) headed by an experienced person having been nominated by the Honorable Prime Minister with 8 members of parliament as its members advises the ministry and DDM to formulate management policies to face the disasters.
3. National Platform for Disaster Risk Reduction (NPDRR) headed by Secretary, MoDMR and DG, DDM functions as the member secretary. This platform coordinates and provides necessary facilitation to the relevant stakeholders.
4. Earthquake Preparedness and Awareness Committee (EPAC) headed by Honorable minister for MoDMR and DG, DDM act as member secretary

5. Cyclone Preparedness Program Implementation Board (CPPIB) headed by the Secretary, MoDMR to review the preparedness activities in the face of initial stage of an impending cyclone.
6. Cyclone Preparedness Programme (CPP) Policy Committee headed by Honorable Minister, MoDMR and Secretary, MoDMR act as member secretary. Disaster Management Training and Public Awareness Building Task Force (DMTATF) headed by the Director General of Department of Disaster Management (DDM) to coordinate the disaster related training and public awareness activities of the Government, NGOs and other organizations.
7. Focal Point Operation Coordination Group of Disaster Management (FPOCG) headed by the Director General of DDM to review and coordinate the activities of various departments/agencies related to disaster management and also to review the Contingency Plan prepared by concerned departments.
8. NGO Coordination Committee on Disaster Management (NGOCC) headed by the Director General of DDM to review and coordinate the activities of concerned NGOs in the country.
9. Committee for Speedy Dissemination of Disaster Related Warning/ Signals (CSDDWS) headed by the Director General of DDM to examine, ensure and find out the ways and means for the speedy dissemination of warning/ signals among the people.

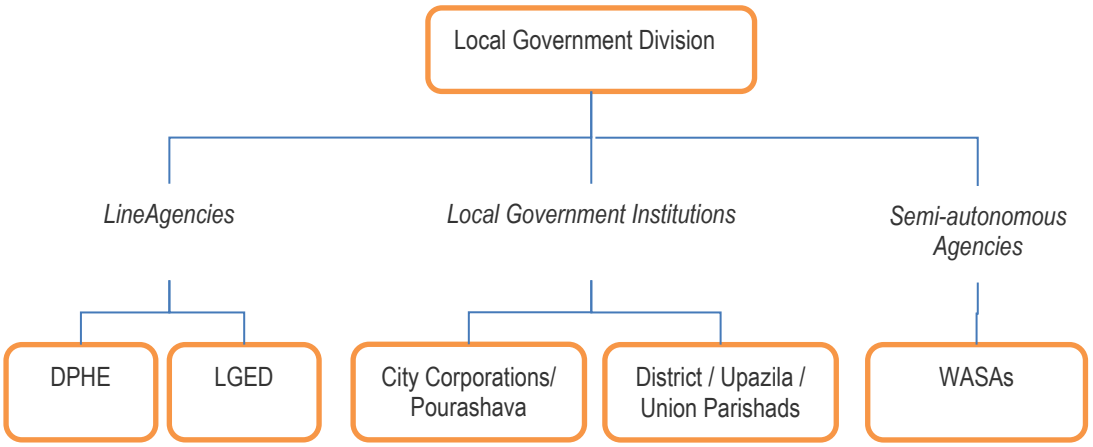
At sub-national levels

1. District Disaster Management Committee (DDMC) headed by the Deputy Commissioner (DC) to coordinate and review the disaster management activities at the District level.
2. Upazila Disaster Management Committee (UzDMC) headed by the Upazila Chairman to coordinate and review the disaster management activities at the Upazila level.
3. Union Disaster Management Committee (UDMC) headed by the Chairman of the Union Parishad to coordinate, review and implement the disaster management activities of the concerned Union.
4. Pourashava Disaster Management Committee (PDMC) headed by Mayor of Pourashava (municipality) to coordinate, review and implements the disaster management activities within its area of jurisdiction.
5. City Corporation Disaster Management Committee (CCDMC) headed by the Mayor of City Corporations to coordinate, review and implement the disaster management activities within its area of jurisdiction.

2.2 National Water Supply and Sanitation Institutional Framework

At the national level, the Local Government Division (LGD) of the Ministry of Local Government, Rural Development & Cooperatives (MoLGRD&C) is responsible for the overall development of the WSS sector. The DPHE and the WASAs function under the administrative control of the LGD. The DPHE is responsible for implementation of the water supply and sanitation projects of the public sector in the rural and the urban areas outside the areas

covered by the WASAs. In addition to the DPHE, the Local Government Engineering Department (LGED), also under the LGD, implements the water and drainage projects in the urban areas as part of the urban infrastructure development projects. The national-level coordination among the sector stakeholders, such as the government agencies, the NGOs, the development partners and the private sector is done by the National Forum for Water Supply and Sanitation established within the LGD. The Secretary, the LGD, is the chairperson of the National Forum.



Institutional arrangement for organizations under the Local Government Division

In the rural areas, the coordination of water and sanitation service provision is the responsibility of the Local Government Institutions (LGIs) at the district, upazila and union levels. The Water Supply and Sanitation (WATSAN) committees of the upazila parishads and the union parishads discharge the responsibility of coordinating the activities of the DPHE, the NGOs and other stakeholders.

In the urban areas (except for the cities with WASAs), the DPHE is usually responsible for planning and infrastructure construction which are handed over the city corporations and paurashavas (municipalities) for operation and maintenance. At present there are four WASAs which are Dhaka WASA (covering both Dhaka city and adjacent Naraynganj city), Chittagong WASA, Khulna WASA and Rajshahi WASA. WASAs are semi-autonomous bodies fully responsible for planning, implementing and managing the water supply systems.

2.3 Coordination between Bangladesh Government and Development Partners

Disaster management principally concerns to disaster mitigation and preparedness. In case of any devastating natural disaster, government agencies, Armed Forces and law and order protection forces (Rapid Action Battalion (RAB), Bangladesh Police, Coast Guard, Border Guard Bangladesh, Ansar and Village Defense Police (VDP) and similar para-military and non-military forces), NGOs, UN agencies and other international organizations play a vital role in terms of massive emergency response and post-disaster recovery of the affected people. The various government agencies including the national security forces coordinate their activities disaster

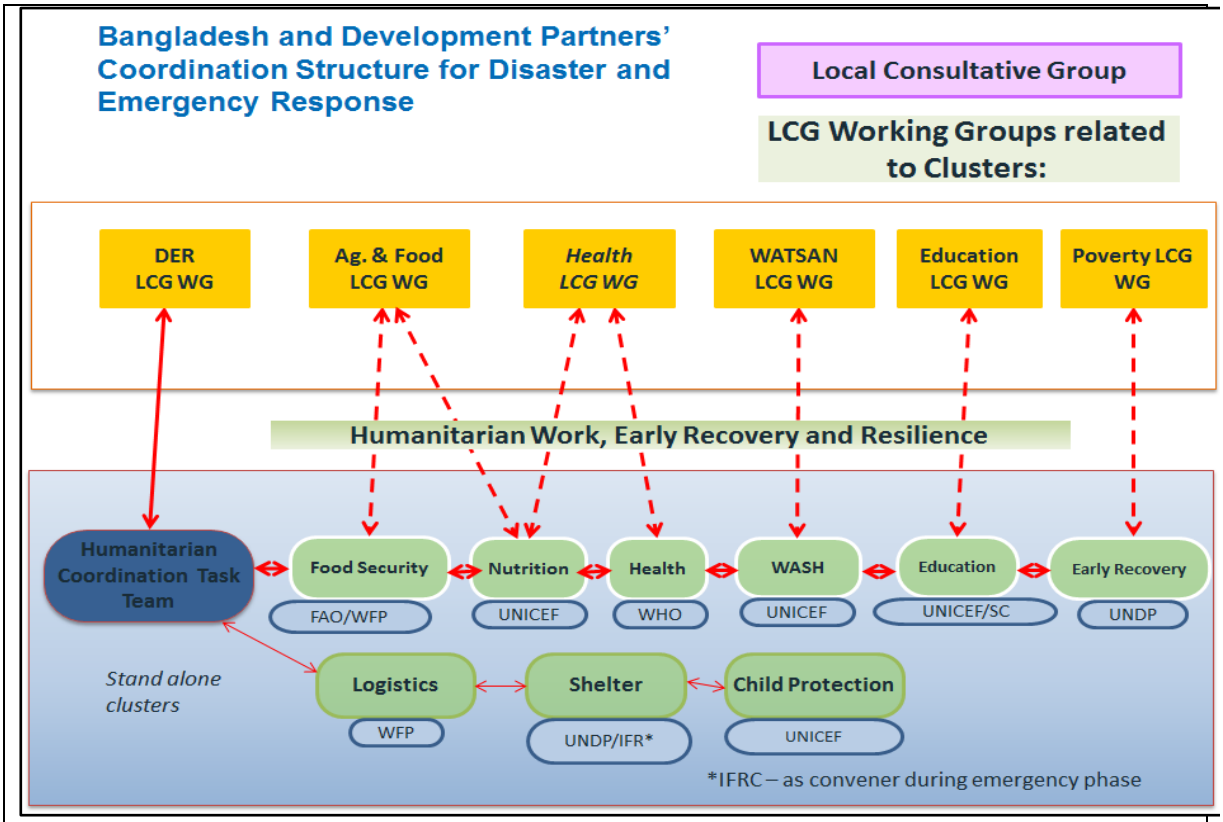


Figure 2 LGD-DER coordination structure

management through various platforms under the national institutional framework mentioned above. The different development partners and NGOs coordinate their disaster management activities with the government mechanisms.

umbrella of the Local Consultative Group (LCG) in order to engage in dialogue on development and humanitarian issues with the Government of Bangladesh. There are 18 thematic working groups under LCG, one of such LCG Working Group is on Disaster and Emergency Response (LCG-DER). The LCG-DER is mandated to ensure effective coordination of the national and international stakeholders in the broader scope of disaster management (risk reduction, preparedness, relief/response, and recovery/rehabilitation). The LCG-DER is Chaired by the Secretary, Ministry of Disaster Management and Relief; and Co-Chaired by the UN Resident Coordinator.

The LCG-DER formulated Humanitarian Coordination structure which includes the Humanitarian Coordination Task Team (HCTT) and 9 Humanitarian Clusters. Each Cluster has one or two lead agencies from development partners and linked to a government ministry or agency. The HCTT acts as an advisory group to the LCG-DER providing advice, taking forward agreed actions on behalf of, and feeding back to, the wider LCG-DER group.

2.4 The WASH Cluster

The WASH Cluster is one of the 9 Clusters formed under the LCG-DER. The Cluster is formed with members from NGOs having work plans for WASH related disaster management

activities. The WASH Emergency Cluster is co-chaired by DPHE and UNICEF. The WASH Cluster members prepare themselves to support the national and local disaster management initiatives. Under the WASH Cluster a Technical Working Groups (TWGs) and a Strategic Advisory Group (SAG) was created.

The WASH Cluster in Bangladesh has made considerable progress in the Cluster management; this was particularly evident in handling of WASH interventions after cyclone SIDR in 2007 and strengthened after AILA in 2009. All the agencies which were working in SIDR and AILA affected areas, were brought under a common platform to work together for better service provision in a coordinated manner for the affected population. Members of the WASH Cluster were provided with training through national and international agencies. WASH Cluster is now a forum to manage WASH activities in the disaster in Bangladesh.

2.5 Regulatory Framework

The regulatory framework for disaster management in Bangladesh consists of a set of Acts, policies, plan, executive orders and guidelines from various agencies. These are explained below.

Disaster Management Act, 2012

The Disaster Management Act, 2012 provides the legal basis under which disaster preparedness and post-disaster management takes place in Bangladesh. It creates mandatory obligations and responsibilities on Ministries, committees and appointments.

The Act stipulates the organizational structure for disaster management which is outlined in the institutional framework diagram (Figure *), declaration of disaster zone and roles of Armed Forces and law and order protection forces, disaster management funding modalities and reward and punishment systems.

National Disaster Management Policy, 2015

The National Disaster Management Policy was prepared under the purview of the Disaster Management Act 2012 and SOD 2010 and it articulates the government's disaster management vision of reducing the risk of people especially the poor and disadvantaged, to the effects of natural, environmental, and human induced hazards. The intent is to minimize the effects to a manageable and acceptable humanitarian level and establish an efficient emergency response system capable enough to manage large scale disasters.

Disaster Management Plans

The Bangladesh National Plan for Disaster Management is a strategic document to be effective for a certain period of time. This is an umbrella plan that provides the overall guideline for the relevant sections and the disaster management committees at all levels to prepare and implement their areas of roles specific plans. The present available plan is the National Plan for Disaster Management 2010-2015 and the government is in the process of preparing the Plan for 2016-2020. The Disaster Management Plan 2010-2015 states that, "All

Ministries, Divisions/Departments and Agencies shall prepare their own Action Plans in respect of their responsibilities under the Standing Orders for efficient implementation."

Standing Order on Disaster

Standing Order on Disaster (SOD) 2010 is the most important instrument for operationalizing disaster management and was prepared with the avowed objective of making the concerned persons understand their duties and responsibilities regarding disaster management at all levels, and accomplishing them. The SOD outlines the disaster management arrangements in Bangladesh and describes the detailed roles and responsibilities of Committees, Ministries, Departments and other organizations involved in disaster risk reduction and emergency response management. The directives of the SOD have been legalized by the Disaster Management Act, 2012.

The SOD describes the roles and responsibilities of each ministry or agency for i) Risk reduction (Preparedness Phase), ii) Emergency response during normal times (Preparedness Phase), alert and warning stage (Preparedness Phase), disaster stage (Emergency Response Phase), and iii) Rehabilitation stage (Rehabilitation Phase). The DPHE and WASAs are the key government agencies related to WASH in emergencies.

The roles and responsibilities of Department of Public Health Engineering (DPHE) and Dhaka WASA (other WASAs are not mentioned in SOD but may be assumed to be same), as described in the SOD, are presented below.

DPHE

Ensuring safe drinking water due to arsenic contamination in the ground water and also salinity in the surface water in the coastal belt become a huge challenge for the Department of Public Health Engineering (DPHE). The issue becomes more important especially during disaster period when in absence of safe drinking water people are forced to use polluted water due to which diarrhea disease breaks out in epidemic form. Besides performance of normal duties DPHE should carry out the following.

Risk Reduction:

(a) Identify local level risks related to safe drinking water, sanitation and hygiene practices through community consultation and prepare the risk reduction action.
(b) Develop joint strategy to utilize the resources of the government, NGOs and other private sector actors in ensuring implementation of the risk reduction action plan developed.
(c) Coordinate activities of NGOs and other private sector actors to ensure synergies and avoid duplication.
(d) Provide technical support to promote hygiene and maintain the standards.
(e) Establish an effective monitoring and evaluation mechanism to ensure effective utilization of resources.

Emergency response:

Normal Times

(a) Identify disaster areas and ensure sinking of sufficient number of tube-wells for continuous supply of safe drinking water.

(b) Keep stock of spare parts for repairing the tube-wells likely to be damaged in disaster (tidal-bore/floods).
(c) Keep stock of sufficient quantity of bleaching powder in disaster areas.
(d) Fix up technical/repair team for employment in cyclone/flood-prone areas.
(e) Review the stock position of spare parts and bleaching powder every six months and ensure for sufficient stock.
(f) Encourage construction of hygienic low cost water resistant latrines for disaster areas.
(g) Keep reserve tube-wells and water resistant latrines for distribution in relief camps, cyclone shelters or in areas where such facilities have been damaged.
(h) Ensure the availability of cash funds for meeting contingency expenditure in emergency.
(i) Provide training to the potentially vulnerable population for the effective use of Water Purification Tablets (WPT) and beaching powders.

Alert and Warning Stage:

(a) Form tube-well repair teams and keep them on stand-by for traveling to possible distressed areas.
(b) Examine the position of spare parts of tube-wells in areas threatened by disaster and if necessary arrange for additional stock.

Disaster Stage:

(a) Order repair teams for traveling to the affected areas washed away by tidal bore/flood waters for repairing/tending/cleaning of tube-wells/water supply lines.
(b) Arrange for the supply of drinking water on emergency basis to areas where normal supply has been disrupted (Man can live for longer period without food than without water).

Rehabilitation Stage:

In coordination with the DMC and on orders of the Committee.

(a) Maintain the supply of drinking water under special arrangement.
(c) Make available sufficient quantity of bleaching powder for maintaining adequate hygienic condition in shelters, relief camps etc.
(d) Supervise repair/rehabilitation work of tub-well/water supply system and ensure availability of required manpower/spare parts for speedy completion of work.

Dhaka WASA

In addition to normal duties and appropriate implementation of agency work, Dhaka WASA will carry out following tasks.

Risk Reduction:

(a) Designate one responsible person in the WASA as the Disaster Management Focal Point.
(b) Ensure participation in all Disaster Management Committee's Meetings starting from National to Upazila level for planning, rescue, evacuation and rehabilitation works.

(c) Undertake a sectoral risk assessment initiative and develop procedures for alternative water supply system and sewerage and drainage system.
(d) Prepare WASA contingency plan for earthquake and natural disaster.
(e) Arrange training of WASA official for agency services during and after disaster.

Note – The roles of DWASA for other stages are not mentioned in the SOD. Other WASAs, City Corporations and Pourashavas also will take the risk reduction measures.

Chapter 3 Preparedness for WASH

CHAPTER OUTLINE

3.1 Introduction

Before the incidence of any disaster, depending on the nature and type of disaster, some kind of measures are required for getting ready to face immediate effect of the onset of the disaster. Therefore, all actors of WASH emergency shall have to be prepared themselves to response the emergency. Preparedness measures aim to identify approaching potential hazard events, to cope with the immediate effects of an event, and to recover as quickly and as good as possible from the damage done. Emergency preparedness measures are:

3.2 General Preparedness

3.2.1 Preparing Emergency Preparedness Plan

Emergency Preparedness Plan (EPP) describes in detail the strategy and organization of dealing with specific hazard events, resourcing and monitoring and evaluating processes. It also describes the strategy of how to deal with hazards and hazard events and how to recover from the negative effects of an event. The EPP will need to be updates regularly with the changing context and requirement. An example of the contents of an EPP for a WASH could be as shown in Box 3.1:

BOX 3.1 Contents of an Emergency Preparedness Plan

- *Description of the WASH system with special attention to vital elements in the system*
- *Scenarios for different hazard events describing hazard characteristics, location, intensity, probability, early warning signs, and duration*
- *Forecasts on how these events will affect the WASH system*
- *Forecasts of how possible damage to WASH system will affect the service levels of users*
- *Description of potential new risks, or changes in existing risks, that could develop following the scenarios*
- *Description of aims of the contingency strategies (e.g. maintain minimum service levels to users, early recovery)*
- *Description of contingency strategies and their triggers; included will also be alternative strategies on how to maintain minimum service levels, and triggers for when these strategies will be activated*
- *Description of measures that can be taken to reduce the probability and/ or impact of hazard events (i.e. mitigation and preparedness measures)*
- *Description of risk monitoring strategies (e.g. early warning system)*
- *Listing expected time-scales of development of different strategies*
- *Listing internal and external stakeholders that play a role in disaster risk reduction and emergency response with contacts with their roles, responsibilities and real capacities with regard to the WASH system*
- *Hierarchy, procedures and systems that will be activated in case of different scenarios, this also includes communication strategy (e.g. notification, reporting) and release of back-up resources*
- *Description of assumptions and risks with regards to contingency strategies*
- *Description of possible liability issues and how they will be dealt with*
- *Describe other emergency management systems present in the target area and assessment of the potential to create links to these*
- *Listing of dedicated resources for emergency response and their location*
- *Define resources needed for maintaining the contingency strategies*
- *Defining where resources for set-up and maintenance of contingency strategies will be obtained*
- *Description of monitoring and evaluation processes*
- *Description of process to keep the EPP up to date*

3.2.2 Organizational Structure Development

Developing an organizational structure is required so that the contingency strategy can be made operational. For small-scale, simple WASH systems this structure may be very basic. WASH Cluster of Bangladesh can work in this respect. For larger systems this organization may consist of task forces taking on emergency coordination, search and rescue, first aid, psychosocial support, and logistics. Depending on the type, size and organization of the WASH service and the context, the organizational structure may entirely consist of community members, staff working in WASH related agencies; it may also include people from the authorities, and from the private sector.

3.2.3 Building Capacity

People who would be part of the emergency activities will need to have adequate knowledge and skills. These tasks may ask for new skills: coordination or supervision skills, damage assessment, and use of communication equipment, first aid, use of related machines and equipment and dealing with chemical waste, search and rescue. Equipment must be familiar, and procedures and personal safety measures have to be known. Besides individual skills, people will need to become familiar with working in the team and with the new rules that may apply. Building capacity, and maintaining it will need regular training and simulation exercises.

3.3.4 Prepositioning of materials, equipment and infrastructure

Specific materials are needed for emergency response. What is needed depends on the service, context and type of disaster. Some examples of materials and infrastructure that may be needed are buildings used for shelter, emergency water tanks, containers for household water storage, water distribution materials, mobile water treatment plants, water disinfection chemicals, pumps, generators, means of transport, fuel, spare parts, communication equipment, security materials, construction materials, medical supplies, places to dispose of waste. The exact needs in infrastructure and materials should be identified in the contingency plan.

3.4.5 Regular Budget Allocation

A yearly budget has to be allocated regularly for preparedness and contingency planning. Especially if disasters are unusual, are not a political priority, or if resources are scarce, it will be difficult to obtain funds for preparedness. It needs a political and/or collective will to make this investment, and efforts will be needed to obtain and keep the interest. Lobbying activities may be needed to raise the attention for this.

3.5.5 Setting up an Early Warning System for WASH

The Early Warning System (EWS) will give advance warning of imminent threats and it should trigger measures that will reduce the potential impact of an event. The value of a good EWS for society as a whole is large, and where possible EWS that cover a society as a whole should be set up. On a more limited scale, small range EWS may be adequate for WASH systems (e.g. a basic system that warns an operator if there is an imminent threat of flooding of a water intake or people can be brought in shelters).

3.3. WASH Sector Preparedness

3.3.1 Mapping of Disaster Prone Areas and Response Activities

In Bangladesh some common disasters are happening on regular basis in and around some definite geographical regions. Cyclone, flood, riverbank erosion are such common disaster. Besides, others disaster like drought, salinity intrusion may happen also whose geographical locations are, to some extent, known to Department of Disaster Management (DDM). Based on the occurrences of such disasters, venerability maps can be prepared in general and locally by Union wise. Union Disaster Management Committee (UDMC) should prepare such maps and update after every events of the disaster.

WASH Cluster should lead the preparation of disaster prone area maps on union basis. Because of the existing manpower setup up to Upazila level, DPHE should prepare the maps in consultation with other stakeholder. For simplicity, various information need to be collected, example of a format shown in next page. A preparedness map should be as simple as possible. DPHE has an office at Uinon Parishad where the mechanics of DPHE look after the WASH activities. She/he can perform as coordinator of Union Parishad for the collection of information. Then the information can be transferred in the administrative map of the Union.

Table: 3.1 Information for preparation of disaster prone maps of WASH Emergency Preparedness

District: **Upazila:** **Union:**										
	Mouza/Village	Population	Type of disaster(s)	% of affected area	Type. of Shelter(s) ***	Number of water options in the shelters & types	Number of sanitary latrines in the shelters	Total number of Options in the village/ward	Number of Hand Pump Tubewells in the village/ward	Number of other options & types in the village/ward
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										

Note: In case of multiple disasters (e.g. cyclone, flood etc.) in a village use multiple rows for the village

*** Cyclone shelter or Govt .Institution like School or Embankment etc.

3.3.2 WASH Preparedness Activities

Before onset of disaster of any kind, WASH preparedness is necessary. Existing facilities, skill people and logistic support are needed to be kept ready to meet the emergency. The important ones are described below.

Organization

- Early warning system: set up an early warning system or connect to an existing early warning system to know the updated situation.
- Develop alternative strategies of service provision or limiting impact on society: e.g. prepare for provision of water through trucking; prepare for installation of emergency tubewells and latrines; preparation for adequate disposal of dangerous waste (e.g. medical waste, industrial waste if any, and containment of sludge). Identify and train people, store materials and equipment, prepare logistics and transport.
- Prepare changes in the organization for dealing with emergency and recovery: procedures, standards and systems will possibly need change. Prepare alternative protocols adapted to changes in inputs (e.g. water quality, water availability, fuel shortage, consumables with new specifications). These changes have tobe worked out beforehand and people affected have to be aware of the new systems
- The risk of outbreaks and service breakdown is large after a disaster occurrence; set up a system of quality monitoring and when issues are detected and arrange rapid repair.

Human resources

- Prepare for human resource issues following a hazard event: ensure more people in the community have the skills needed to adequately operate and maintain structures; prepare for changes in staffing levels and/ or reduced access (e.g. prepare systems of operation with reduced staff levels; find alternative means of (safe) transport for staff (e.g. agreement with owner of motorized boat to transport staff); ensure staff has the knowledge and skills needed for dealing with the effects of a hazard event.

Infrastructure

- Prepare infrastructure for potential hazard event or secondary effects: e.g. monitor condition, and repair and maintain infrastructure; install drainage channels; protect or repair existing water points and keep running. In case of piped water protect pipes that are exposed. Prepare for changes in needs (e.g. prepare landfill site so large quantities of debris can be disposed of rapidly.

Materials

- Prepare vehicle and mobile treatment plant for event: e.g. ensure vehicles and plants are in order and equipped; stock fuel and in strategically places.
- Prepare equipment for hazard events: obtain additional equipment where needed; install equipment in safer locations (e.g. raise level to avoid flooding, place equipment in building, brace equipment); store non-essential equipment in safe place; proposition equipment where a need may arise (e.g. generator with fuel supply for back-up energy supply, ensure staff is familiar with operation of new equipment).
- Prepare levels of spare parts and consumables for events: store adequate levels of spares, nipples and pipes & filter for hand pump tubewells and consumables (like water purifying tablets, chemicals, bleaching powder) so periods of inaccessibility and

poor supply can be bridged adequately; decentralize stocks to where materials are needed; store materials so they are protected.

Water Sources

- Develop a good understanding of existing sources, improve existing sources, and look for alternative sources of water: e.g. assess water quality and quantity of water that can be produced (current and projected) of existing sources; repair/ upgrade existing sources; map all sources of water in a target area, including private water sources and sources used for industry and irrigation, assess usability and negotiate access to source in case of disaster; install or prepare installation of alternative sources.

Community capacity building

- Education of communities: on the use and maintenance of WASH systems in their communities; on coping with reduced service level (e.g. hygiene promotion, household water treatment, excreta disposal).
- Identify and train persons in communities that can assist in maintaining service levels and recovery.

External service providers

- Link with emergency management bodies and emergency response services (e.g. health services, shelter),other authorities (e.g. public works) and relevant organizations (e.g. NGOs, private sector), be realistic on their capacity to assist though.

Others

- Identify other preparedness initiatives and try to connect initiatives; this is especially relevant for preparedness plans of community and critical services (e.g. public health services, education).
- Ensure WASH systems are adequate in shelters.
- Lobby for support in preparedness activities in society and for the WASH services (e.g. lobby relevant department for access roads, policy makers for more resources attributed to preparedness, support of authorities with transport etc.).
- Prepare for periods where revenue will drop: e.g. because users are not paying because of other priorities, inability to pay or poor access; politics may put pressure on WASH service providers, normally paying services shall have to be provided free of charge.

3.4 WASH Cluster preparedness

As stated earlier, before onset of the disaster WASH preparedness is necessary. Existing facilities, skill people and logistic support are needed to be kept ready to meet the emergency. All the activities are therefore need to be coordinated efficiently by a group of skilled people. The WASH Cluster in Bangladesh has been developed for this purpose. The purpose of having a dedicated WASH Cluster Coordination (WCC) is to facilitate improved coordination and effective partnership between all actors involved in responding to WASH sector needs. UNICEF is the WASH Cluster Lead agency at global level and by default, WASH Cluster Lead at country level. From the Bangladesh Government side, DPHE is acting as Co-Cluster Lead of the WASH Cluster in Bangladesh.

At preparedness stage three major activities are necessary.

- Active coordination
- Who will do what and where, and
- Organizing the required resource

3.4.1 Active Coordination

At national level, the WASH Cluster meetings shall have to be organized on regular basis and at least once in 3 months during preparedness phase and increase its frequency as the time of onset of disaster approaches. All regular stakeholders of WASH sector need to be contacted and the new stakeholders need to be enrolled in the cluster. The preparedness for disaster with the contingency plan of all stakeholders shall have to be reviewed on regular basis. The local level WASH clusters in the disaster prone areas need to be activated and their meetings shall have to be monitored at national level.

The Strategic Advisory Group (SAG) and the Technical Working Group (TWG) have been formed to be formed to provide necessary support to field levels to reduce the affect of the disaster and provide adequate and quality WASH services.

3.4.2 Stakeholders' activities mapping

It is important that when an emergency relief is provided in affected areas, it must reach to all population. As a national agency, DPHE can move any places, but other stakeholder may have limitations in respect of resources and facilities and the working areas. Therefore, at preparedness phase "Who will do What & Where" mapping is important. Table 3.2 shall have to be prepared.

Table 3.2 Mapping of Who will do What and Where

Sl.No.	Name of Stakeholder & address with contact point(s)	Working Areas			Type of activity of WASH done			
		Dist.	Upazila	Union	WS	San	Hyg	Adv
1								
2								
3								
4								
5								
6								
7								

Note:WS=Water Supply, San=Sanitation, Hyg=Hygiene, Adv=Advocacy on WASH

3.4.3 Organizing the required resource

Necessary financial arrangement is the precondition for implementing all activities of disaster risk reduction. Some stakeholders have some standby budgets which are used on onset of the disaster. Moreover, additional funding may be necessary. WASH Cluster should assess available internal financial resource as well appeal for international humanitarian assistance.

3.4.4 Contingency Planning of individual stakeholder

Each stakeholder should have a contingency planning as preparedness according to their role for the WASH, programme, working areas, manpower, logistics and probable budget. The extent of this planning should not be overestimated and may be for emergency response phase of about 7 days. Depending on the magnitude of the disaster and its effect on life and property, further planning shall have to be made. Table 3.3 should be filled up by every stakeholder and the WASH Cluster at national level should coordinate.

Table 3.3 Contingency planning as preparedness of stakeholders

Year:			**Disaster Type:**			
Name of Stakeholder:						
Type: Govt./INGO/NGO/Other				**Role in WASH: National/Local level**		
Working Areas			**Activity**		**Possible resources: Type & Nos.**	
District	**Upazila**	**Union**	**Water Supply**	**Manpower**		
				Logistics		
				Budget		
			Sanitation	**Manpower**		
				Logistics		
				Budget		
			Hygiene	**Manpower**		
				Logistics		
				Budget		
			Advocacy in WASH	**Manpower**		
				Logistics		
				Budget		

3.4.5 Checklist for minimum materials requirement

A minimum requirement of materials needs to be kept ready as preparedness particularly for emergency water supply. Other materials for sanitation and hygiene are also necessary. WASH Cluster lead agency DPHE, as national organization, should prepare the list and keep stock at central level as well pre-positioned in the disaster prone areas in a quantity so that emergency response can be made immediately after onset of disaster. Pre-positioning of the water treatment plants at strategic locations with skill manpower and fuel should also be made. A list as per Table 3.4 should be prepared.

Table 3.4 Minimum requirement of materials

DPHE Stock				Other Stakeholder Stock			
Water Supply		Sanitation & Hygiene		Water Supply		Sanitation & Hygiene	
Item	Qnty	Item	Qnty	Item	Qnty	Item	Qnty

Note:

1. Water supply should include spare parts for repairing hand tubewells and other options, raising of tubewells, materials for installation of temporary tubewells, water purifying tablets, water treatment chemicals, water carrying jar, water tanks to be carried by local transports (like boat, van) etc.
2. Sanitation should include ready cash to buy local material to construct latrines and hygiene should include minimum number of hygiene kits.
3. Leaflet for safe water supply, sanitation & hygiene practices.

It is important that necessary data and information with all mode of contact communication like web site, mobile network, and telecommunication should be checked time to time for their availability on time.

Chapter 4 WASH Emergency Response

CHAPTER OUTLINE

4.1 Introduction

The emergency response phase is the period during hazard event (for slow onset hazards) and immediate after it. If there is a forewarning of an approaching event, the emergency response may start before the event occurs. The priorities in this phase are avoiding loss of life and injury, limiting damage to assets and environment, and preparation to recovery. This phase will last until the situation is in some measure stabilized, mortality brought back to an acceptable level, imminent threats controlled and where recovery can start. Depending on the situation, the emergency response phase typically last from some days to some weeks.

4.2 WASH assessments for disaster response

As in any phase in the emergency management cycle a proper assessment is critical to the success of the action. Various agencies working in disaster management in Bangladesh use similar but somewhat different methods and tools for assessment of the disaster situation. The most relevant method and tools are those of the DDM. The Joint Needs Assessment (JNA) of the LCG prepared detailed methodology and tools which are in line with those of the DDM.

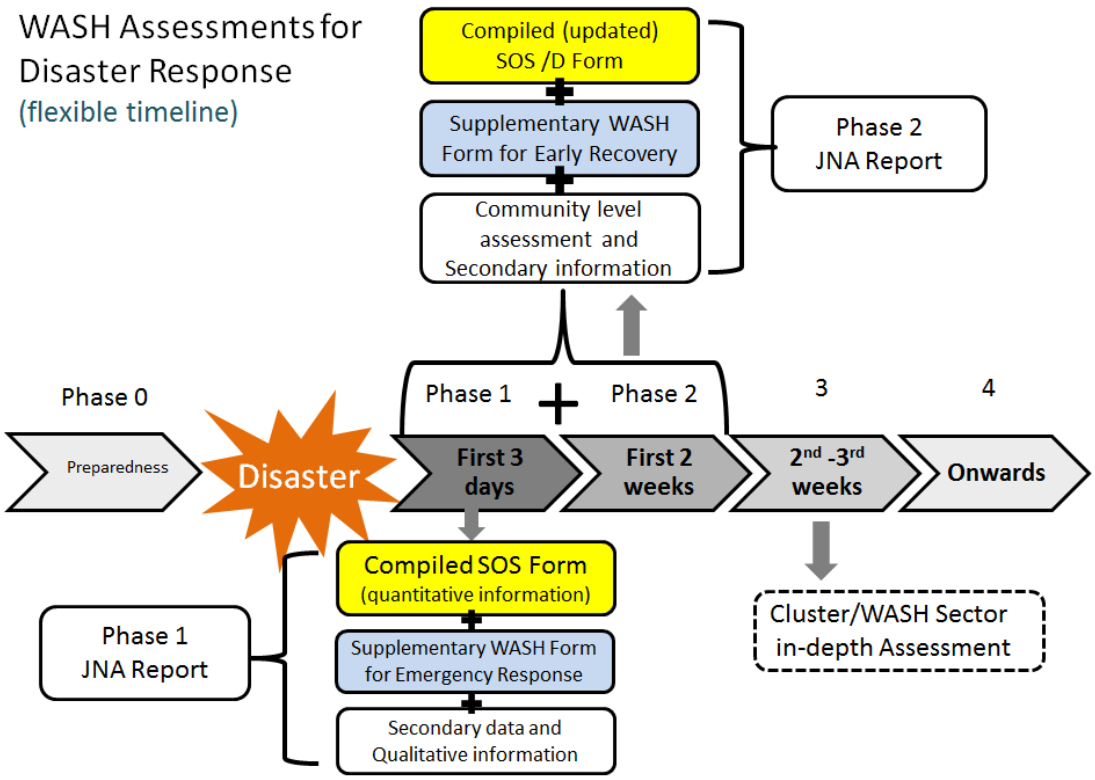


Figure 4.1 WASH Assessment for disaster response

For the purpose of assessment of the WASH situation this Guideline suggest similar method and had developed supplementary tools (forms) for WASH specific information. The supplementary forms, together with the assessment forms of DDM and JNA, will be useful for planning and implementation of WASH intervention.

The WASH assessment methodology and tools for disaster management, including those for Phase 1 (Emergency Response) and Phase 2 (Early Recovery) phases, are shown schematically in Figure 4.1. This chapter explains the assessment for emergency response phase and the next chapter explains for early recovery phase.

4.3 Assessment for Emergency Response

Generally immediately after the disaster the information on the extent of damage and the basic needs of the affected peoples are required to be known to the concern authorities. In Bangladesh, the Department of Disaster Management (DDM) introduced a form to collect information on emergency basis. This form is known as "SOS Form" for initial assessment of **approximate loss and damage and emergency requirement.** As per the SOD, the basic initial information as per SOS Form shall have to be submitted within 1 hour after the onset of the disaster to Emergency Operation Center of DDM through district administration. The form

includes 13 types of information including need of water supply. The initial report is designed to provide a brief overview of emergency situations to allow the Government and humanitarian organizations to prioritize response efforts. DPHE should support the local administration in respect of providing information of water supply. The SOS form is shown in Table 4.1.

In emergency response period time availability is very limited and a balance will have to be found between simplicity and rapidity on the one hand, and reliability and comprehensiveness on the other. In the initial period of the emergency response phase the focus will be on critical WASH services. What these services are, will depend on the situation. Assuring that people have access to their needs for survival in water and household water storage is an obvious first priority. The second priority would be to ensure that large threats to public health are addressed; this may be to limit fecal contamination of the environment, to increase water availability, bathing, access to soap and control of vectors.

The initial assessment will normally identify the specific priorities in a given context. The emergency context is usually complex. Response teams suffer from extreme workloads and stress levels are usually high. Simplicity of approach has added value in emergency relief. Adding new tools or procedures should be avoided wherever possible.

In order to obtain additional WASH information, Supplementary WASH Detailed Form, as shown in Table 4.2, should be used by WASH Cluster, the lead should be taken by DPHE which is the focal agency WASH. The assessors should first collect information at the upazila level and then visit a sample of affected unions within the upazila, filling out the form in Table 4.2 for each upazilas using the SOS form. An effort should be made to triangulate information from:

- Key information interview (KII) from UNO, SAE-DPHE and tubewell mechanics, Health Department, Union Chairman/Members etc.
- Direct observation (transect walks, assessment of infrastructure)
- Interview with affected people (including children, adolescents, women, men, people with disabilities and vulnerable groups)
- Focus group discussions.

Table: 4.1 Approximate loss and damage and emergency requirement (SOS) form

	Name of Upazila/Pourashava : ……..		
	Name of District : ……..		
	Type of Disaster : ……..		
1.	Name of disaster affected Unions/Wards number : ……		
2.	Name of heavily disaster affected Unions/Wards numbers : …… …… ……		
3.	Number of affected people (approximate) : ……		
4.	Total number of damaged house (approximate) : …… 4.1 Partly damaged : …… 4.2 Fully damaged: : ……		
5.	Number of dead people (approximate) : ……		
6.	Number of missing persons (approximate) : ……		
Please mark Tick (✔) in the relevant box			
7.	Necessity for investigation and rescue activities	Yes	No
8.	Necessity for medical services	Yes	No
9.	Necessity for Water Supply	Yes	No
10	Necessity for prepared food	Yes	No
11	A. Necessity for cloths	Yes	No
	B. Type of Cloths	Blanket, Shari	Lungi, Selwar Kamij
12	Emergency Shelter	Yes	No
13	Other emergency materials (Please write)	: ……	

Note: UNO/Pourashava Chairman will send the above information to DC within one hour after onset of the disaster. DC will accumulate all information from upazilas & pourashavas and send them to EOC of DDM. DDM will compile and send them to NDRCC of MoDisaster Management & Relief.

Table 4.2 Supplementary WASH Detailed Form for emergency response

Name of Upazila:		**Type of disaster:**			**Date:**	
Names of assessment person with designation:						
Name of Unions	Total Population	Affected Population in %	Number of Water Option			Number of Sanitary latrine damaged
			Total	Tubewell damaged	Other options damaged	
Shelter Location	Permanent	Temporary	Open place	Population in the shelter	Nos. of water option	Nos. of Latrines available

4.4 Roles and responsibilities of stakeholders

Various government departments, local government institutions, INGOs, NGOs and individual are working in WASH related activities in the Upazilas/Porashava levels. For emergency response, everybody should provide information from their activity points in the areas to fill the SOS form for sending it to EOC of DDM through DC. But to get the first hand authentic information, the primary source of data should be Union Parishad/wards. Therefore, all the information as per requirement of SOS needs to be given to Union Parishad/wards. The Upazila/Pourashava should collect those data and compile for the whole Upazila/Pourashava and send to DC of the district for onward transmission. The roles and responsibility in emergency response are shown in Table 4.3

Table 4.3 Roles and responsibility of stakeholders in WASH emergency response

Stakeholders	Responsibility	Activities
MoDM & Relief	Overall Coordination	Monitor the situation and give directions
DDM	Coordinate all activities of the response	- Run control room for 24 hours - Make emergency need assessment (SOS) - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Communicate with international agencies
District Administration	Coordinate, conduct and supervise the rescue and relief operations	- Run control room for 24 hours - Make emergency need assessment (SOS) and send it to DDM - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Report to DDM
Upazila Parishad/Pourashava	Coordinate, conduct and supervise the rescue and relief operations	- Run control room for 24 hours - Make emergency need assessment (SOS) and send it to DDM - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Report to DC
Union Parishad/Ward	Management of all activities of rescue operation and emergency relief	- Collect all information as per SOS format from different Govt. offices and stakeholder and UC members and send it to Upazila/Pourashava - Conduct relief activities and assess additional need and report. - Report to Upazila/Pourashava daily

Stakeholders	Responsibility	Activities
DPHE	Support to UP/Pourashava and restore water supply facilities	- Provide water related information to UP/Pourashava for SOS form - Act as focal agency for WASH - Coordinate and take lead role in filling Supplementary WASH Form for emergency response - Implement emergency response activities
WASH Cluster	Organize activities of WASH Cluster	- Activate WASH Clusters from Union to District & Central level - Support in providing information for SOS form - Support in providing information for Supplementary WASH form
INGOs & NGOs	Organize activities of WASH	-Support in providing information to WASH Cluster
Private Sector	Developing appropriate technologies and WASH need	-Support to WASH Cluster with the information of WASH facilities

4.5 WASH Information management

Information management is the key to the success of cluster coordination. National WASH Cluster is responsible for generating and sharing WASH information with cluster partners, government agencies and the UN Resident Coordinator.

- WASH information during an emergency response includes:
    - Information related to outbreaks of WASH related diseases
    - Identification of water-scarce locations
    - Location of communities with poor sanitary condition
    - Assessment of WASH infrastructure damage
    - Level and quality of on-going response to the affected people
    - Information on who is doing what where and when
    - Meeting notes
    - Situation reports
    - Identification of management/technical issues.

In the emergency response the following format should be used and report to control room of WASH on daily basis as per Table 4.4.

Table 4.4 Daily WASH report in emergency response

District:				**Upazial:**		**Reporting date:**	
Union name	**Nos. Tubewell**			**Latrines Units**		**Water Treatment/ Water Bottle**	
	Affected	Raised	Repaired	Affected	Reconstructed	WT	WB

4.6 Implementation of emergency WASH response

Minimum standards of water supply, sanitation and Non-Food Items (NFIs) should be maintained during emergency response. This actually begins at rapid assessment time and needs to be monitored. The Table 4.5 briefly summarizes the main steps to be followed when organizing implementing emergency WASH response.

Table 4.5 briefly summarizes the main steps to be followed when organizing implementing emergency WASH response

WASH response steps	Objectives	Indicators of success including minimum standards	Means of control/monitoring
Rapid Assessment, choice of working areas	▪ Assess damages, needs, scale of emergency response ▪ In coordination with the WASH Cluster, choose selected Unions following the criteria of prioritization	▪ WASH Cluster at national level has results of the rapid assessments, and knows which areas have been selected by whom ▪ No priority Unions are left without assistance	▪ Communication between agencies, authorities and the WASH Cluster ▪ Coordination between agencies to ensure that colleagues submit results to National WASH Cluster ▪ WASH Cluster prepares databases and maps of "*who does what where*" ▪ WASH Cluster establishes decentralised structure at the Division and District levels with coordination meetings and information management ▪ The first response could be carried out alongside the rapid assessment process, improving response to the assessment process
Coordination with local authorities and humanitarian agencies	▪ WASH Cluster ensures coverage of all worst affected locations with requisite assistance ▪ WASH Cluster partner agencies coordinate with institutions and individuals operating in the area	▪ All worst affected Unions receive assistance without overlapping ▪ Local authorities, humanitarian agencies, and WASH cluster have information regarding operational areas of agencies	

Onset / 1st NFIs distributions / 1st assistance to displaced & most vulnerable people	▪ Agencies start delivering WASH aid as soon as possible in coordination with: local authorities , opinion leaders, and other agencies	▪ All affected/displaced people receive:
		  ▪ Basic WASH NFIs
		  ▪ Access to hygiene campaigns
		  ▪ 2.5 L of drinking water/day/person
		  ▪ Temporary sanitation, meeting WASH Cluster guideline standards	

Rapid survey and prioritisation of affected people	▪ Together with local stakeholders, start identifying the affected	▪ All stakeholders use the WASH Cluster's selection criteria to identify their target population	▪ Number/location of beneficiaries, requisite interventions are communicated to WASH Cluster

WASH response steps	Objectives	Indicators of success including minimum standards	Means of control/monitoring
	people needing help as a priority		▪ WASH Cluster changes project if activities do not conform to technical guidelines ▪ National Cluster updates databases, maps
Rapid consultation, mobilisation of beneficiaries, activity design	▪ WASH Cluster partner agencies assess priority WASH needs and design temporary solutions	▪ All beneficiaries aware of project activities and satisfied with proposed interventions ▪ All interventions conform to the WASH Cluster guidelines	
Emergency projects implementation	▪ WASH Cluster partner agencies distribute NFIs to all affected people; carryout targeted communication for hygiene promotion	▪ No outbreak of WASH related diseases ▪ All affected families have at least: water containers, soap, and other basic NFIs ▪ ≥ 80% of affected people demonstrate practice of key hygiene behaviours	▪ Health centre and hospital visits in coordination with Health Cluster ▪ Visit shelters, interview beneficiaries about NFI use, hygiene practice; observe latrine and water points
	▪ WASH Cluster partner agencies provide emergency safe water or water treatment to all affected people	▪ All beneficiaries have access to 2.5 L safe drinking water/day ▪ ≥ 80% of affected people have access to safe drinking water within 500m or 15 minutes walking distance from their dwelling ▪ water quality tests conform to safe to drink	▪ Visits to water points and interviews of beneficiary households ▪ Water testing at source and/or beneficiary household levels
	▪ WASH Cluster partner agencies provide adequate temporary/ permanent sanitation to all affected people	▪ No evidence of open defecation is observed among affected population ▪ All beneficiaries have access to adequate sanitation ▪ 80% of these facilities are properly cleaned and maintained and have soap or ash inside	▪ Exploratory walks to look for signs of open defecation/children faeces ▪ Observation of maintenance and use of wash facilities and toilets provided ▪ Interviews of beneficiaries to assess use, maintenance and satisfaction

WASH response steps	Objectives	Indicators of success including minimum standards	Means of control/monitoring
	▪ Integration of Water Supply, Sanitation and Hygiene; and integration to other sectors	▪ All beneficiaries receive water, sanitation and hygiene responses (from 1 or 2 agencies) ▪ These WASH responses are coordinated with other sectors	▪ Local/regional WASH Cluster and inter-Cluster meetings ▪ WASH Cluster monitoring/assessment ▪ Joint Clusters visits of WASH and non-WASH projects
Interim assessments in the working areas, correction of emergency projects if necessary	▪ While implementing, carryout surveys to find uncovered needs and verify quality of interventions	▪ All priority beneficiaries are covered ▪ Gaps identified and humanitarian agencies are informed to respond to the needs ▪ ≥ 5% of beneficiaries interviewed, 80% express overall satisfaction of the assistance received, with remarks taken into account	▪ Complementary surveys, coordinated with local stakeholders ▪ Corrected designs/strategies shared with or recommended by the Cluster ▪ Interview 5% of beneficiaries (individual or groups)
Outstanding needs assessment (facilitated by WASH Cluster with the help of partners or by engaging an qualified agency)	▪ Assess effectiveness of emergency response by WASH cluster partners ▪ Provide support to humanitarian agencies to prepare their early recovery response plans ▪ Identify short-comings of interventions and capacity/skill gaps of partner agencies	▪ Local WASH Cluster: ▪ Has Assessment results ▪ Updates on who what and where ▪ Shares finding with other agencies ▪ Support for humanitarian agencies to develop early recovery intervention plans ▪ Identify capacity and financial gaps among partner agencies ▪ All affected people receive recovery support	▪ ToR developed by SAG of WASH Cluster ▪ Assessment carried out along side WASH Cluster partner agencies and local authorities as far as possible ▪ WASH Cluster updates database and maps explaining "*who does what where*"

4.7 Guidelines

Different kinds of guidelines are necessary to implement the disaster recovery WASH activities in emergency response and in early recovery phases. The following guidelines are provided in **PART-B** of this document.

1. Water Guidelines for Emergency Relief and Early Recovery
2. Excreta Disposal Guidelines for Emergency Relief Early Recovery
3. Inclusiveness Guideline for Emergency Relief and Early Recovery
4. Hygiene Promotion Guidelines for Emergency Relief Early Recovery
5. WASH Non Food Item (NFI) Guidelines for Emergency Relief Early Recovery
6. Solid Waste, Drainage & Vector Control Guidelines for Emergency Relief early Recovery

The detailed designs of water supply options with quantity of works are provided in **PART-C** of this document.

Chapter 5 Early Recovery

CHAPTER OUTLINE

5.1 Introduction

The early recovery phase starts in the emergency response phase when some stabilization has been reached. During this stage the service levels are restored and essential elements of normal life and livelihood are resumed. The fluidity that usually surrounds emergencies makes it difficult to define when recovery begins. It is also difficult to know when recovery exactly ends. The early recovery phase also prepares society for the next rehabilitation and development phase where the affected communities are brought back to normal life and the damaged infrastructure are reconstructed to previous or better condition.

5.2 Assessment and Tools

The assessment in the early recovery phase is more thorough than the one during emergency response phase. The SOD has suggested a standard form, known as D form which requires more information than the earlier SOS form. The UNOs/Pourashava Mayors shall collect information on the damages and losses from the Union Parishad and different concerned offices and filled up a form and will send to Emergency Operation Center (EOC) of DDM through the DC of the respective districts. In the D form there are 28 columns where columns 24, 25 & 26 are related water supply and sanitation. Initial information is the baseline data and the remaining is damages and losses data. The related part of “D” form is shown in Table 5.1.

Table 5.1 "D" form of Department of Disaster Management

Baseline Data	24												25				26											
	Total Tubewells (Nos.)												Sanitary Latrines (Nos.)				Total Water bodies (Nos.)											
	Deep				Shallow				Handpump								Ponds				Water bodies				Others (if any)			
	24.1.1				24.1.2				24.1.3				25.1				26.1.1				26.1.2				26.1.3			
Data of damages and losses	Damage tubewells (nos.)												Damage Sanitary Latrines (Nos.)				Affected Water bodies (Nos.)											
	Deep				Shallow				Handpump								Ponds				Water bodies				Others (if any)			
	Fully		Partly		Fully		Partly		Fully		Partly		Fully		Partly		Fully		Partly		Fully		Partly		Fully		Partly	
	24.2.1		24.2.2		24.2.3		24.2.4		24.2.5		24.2.6		25.2.1		25.2.2		26.2.1		26.2.2		26.2.3		26.2.4		26.2.5		26.2.6	
	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs	Average Cost	Total Costs
Sub Column																												

Note: Costs are the restoration costs to its original conditions

The basic baseline data should be collected at normal time and updated time to time. During emergency response time the damages and losses information should be collected for preparation plans for early recovery. The collected data in “D” & “SOS” form need to be verified. Following steps are therefore recommended:

- Interview conducted for a particular number of households (5-10%) in some villages (as per TWG) of a Union.
- Discussion with the affected people.
- Engaging a person of a Government office.
- Discussion with different Government offices, and
- Focal Group Discussion

Generally, soon after the aftermath of an event in any area, the information of basic needs and demand of the affected peoples are collected in “SOS Form” for assessment of approximate loss and damage and emergency requirement. Then during emergency response phase detailed estimation of damages and losses are collected in “D” form for planning the early recovery phases. There are various sectors where WASH activities are included. For preparing the detailed plan for WASH activities in the early recovery phases, more detailed information for water supply, sanitation, hygiene and communication are necessary. Therefore, Supplementary WASH forms for Early Recovery Phase are to be used to collect the detailed information. The forms are shown in Table 5.2.The assessors should follow the same process as required for “D” form but with further detailed information.

Table 5.1 Supplementary WASH form for Early Recovery Phase

1. GENERAL INFORMATION		**Locations ; Affected population ; Information sources**			
Date (dd/mm/yyyy)	/ /	*Type of Emergency*	☐ Floods	☐ Cyclone	☐ Other (specify)
Brief history of the emergency					
Name	*Designation*		*Organisation*		
District name			*Number of affected Unions*		
Upazila name					
Total Upazila population			*- entirely affected i.e. all over the union:*		
Est. affected population (%)	%				
Est. # of dead or missing people					
Est. # of affected people in shelters	*Permanent**				
	*Temporary***				
Est. # of affected people in other locations (please detail)					
*Est. # of people with special needs**** *(segregated details)*					
Key-informants checklist	☐ UNO/PIO	☐ DPHE	☐ Health Dept.	☐ Union Chair.	☐ Leaders:
Contact names, mobile numbers					
Unions / villages visited					
Other information sources in these places					
WASH agencies / NGOs working in this Upazila					

Note: #: number / est.: estimated / aff.: affected / *Permanent shelters: cyclone or flood shelters earmarked by Government / **Temporary shelters: other permanent buildings, highways, embankments, etc. / ***People with special needs: separated/ unaccompanied children, pregnant/lactating women, disabled/injured/ chronically-ill/elderly people, excluded groups, etc.

2. WATER	Sources / Uses ; Quality / Quantity ; Accessibility / Reliability											
2.1. Water sources												
Water sources	*Est. % of people using this source and % of sources damaged in the Upazila*			*Est. available quantity of water (Litres / capita / day)*			*Est. quality: is water potable or not, if not, explain: faecal or solid waste contamination, arsenic, weak O&M, etc)*		*Est. access: average return*** distance and/or time to collect drinking water*		*Sustainability: are water quantity/quality likely to decrease soon and if so, why (drought, end of monsoon, contamination, etc)?*	
	% of people	*Fully dam.**	*Partly dam. **	<5	5-15	>15	*Potable*	*Not potable, why?*	*< 1 km*	*< 30 min*	*Quantity*	*Quality*
Tube wells	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dug wells	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐
PSF	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐
RWHS	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐
Piped networks	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ponds / rivers / canals	%	% (ponds)	% (ponds)	☐	☐	☐			☐	☐	☐	☐
Others:	%	%	%	☐	☐	☐	☐	☐	☐	☐	☐	☐

2.2. Water uses					
Water sources	*Est. % of people using these sources for...*			*Do some people treat drinking/cooking water? If so, how (alum, chlorine, WPT, chulli, boiling, other household water treatment, etc)?*	*% of people using treatment*
	Drinking	*Cooking*	*Bathing, laundry*		
Tube wells	%	%	%	☐N ☐Y how:	%
Dug wells	%	%	%	☐N ☐Y how:	%
PSF	%	%	%	☐N ☐Y how:	%
RWHS	%	%	%	☐N ☐Y how:	%
Piped networks	%	%	%	☐N ☐Y how:	%
Ponds / rivers / canals	%	%	%	☐N ☐Y how:	%
Others:	%	%	%	☐N ☐Y how:	%

2.3. Special water needs					
Do these sites have access to safe water (≥15/L/capita/day)? If not, please explain.	Permanent shelters ☐Yes ☐No	Temporary shelters ☐Yes ☐No	Hospitals / clinics ☐Yes ☐No	Schools / Madrasas ☐Yes ☐No	Specify Others: ☐Yes ☐No

Notes: PSF: Pond Sand Filters / RWHS: Rainwater Harvesting Systems / Est.: estimated / *Fully damaged: must be replaced / ** Partly damaged: not fully operational but can be rehabilitated /O&M: operation and maintenance / ***return distance / time: to go, queue, collect water and come back / km: kilometre / min: minutes
Note: PSF: Pond Sand Filter / RWHS: Rainwater Harvesting Systems / WPT: Water Purifying Tablets / Y: yes / N: no

3. SANITATION	**Excreta disposal / Drainage / Solid Waste / Vector Control**

3.1. Excreta disposal (ED)

Where do people defecate?		*% of people presently using this facility*	*Estimated % of damaged facilities*		*For Communal facilities only, average number of people / facility*				*Average distance from dwelling to facility (m)*
			Fully ***	*Partly* ****	☑ if >20 and explain	*Are there male / female separated facilities?*	# Female / facility	# Male / facility	
Undefined open area		%							m
*Defined open area**		%			☐	☐Yes ☐No			m
Unhygienic / unsafe latrine	*HH*	%	%	%					m
	Com.	%	%	%	☐	☐Yes ☐No			m
*Hygienic / safe latrine***	*HH*	%	%	%					m
	Com.	%	%	%	☐	☐Yes ☐No			m
Septic tank / sewers		%	%	%					m
Other:		%	%	%	☐	☐Yes ☐No			m

3.2. Drainage (D)

Is stagnant rainwater creating problems?	☐ In /around shelters / settlements	☐ In / around water facilities	☐ In / around sanitation facilities	☐ Outside settlements	☐ On roads, paths, etc.
Is stagnant wastewater creating problems?	☐ In /around shelters / settlements	☐ In / around Water facilities	☐ In / around sanitation facilities	☐ Outside settlements	☐ On roads, paths, etc.

3.3. Solid Waste (SW)

Is solid waste (SW) creating problems?	☐ In / around water facilities	☐ In / around sanitation facilities	☐ In/around shelters/settlements	☐ Outside settlements	☐ On roads, transport ways	*Which sort of SW?*	
Do people collect / dispose their SW?	☐Yes ☐No	*How / where / who disposes of SW?*		*Do they need support for SW?*	☐Yes ☐No	*What support is required?*	

3.4. Vector Control (VC)

Are there risks of vector borne diseases, if so, which diseases?	☐Yes ☐No	*Do people report vectors to be a problem?*	☐Yes ☐No	*Do they need VC support, how?*	☐Yes ☐No
Which vectors are problematic?	☐ Mosquitoes	☐ Flies / cockroaches / other insects		☐ Rats / other rodents	

3.5. Special sanitation needs

Do the sites have access to adequate sanitation (ED, D, SW, VC)? If not, provide details:	Permanent shelters ☐Yes ☐No	Temporary shelters ☐Yes ☐No	Hospitals / clinics ☐Yes ☐No	Schools / Madrasas ☐Yes ☐No	Others: ☐Yes ☐No

Note: *Defined open area: delimited, managed defecation area / **Safe/hygienic latrine: sanitary latrine, safe for users (especially girls/women), preventing contamination of water sources (e.g. not hanging latrine, pits not contaminating groundwater) / HH: household / Com.: Communal / ***Fully damaged: must be replaced / ****Partly damaged: can be rehabilitated / m: metre

4. HYGIENE / COMMUNITY		**Hygiene practices ; WASH NFIs ; Community structures**	
4.1. Hygiene practices, NFIs			
Safe hygiene behaviours	*What proportion of affected households (0, less< or more> than half of the households)...*		
	...really practice these behaviours?	*...have the following hygiene related Non Food Items / facilities*	
Hand-washing with soap/ash	☐0 ☐<½ ☐>½	Handwashing / bathing soap, ash or others	☐0 ☐<½ ☐>½
Safe water collection, transport, storage and retrieval	☐0 ☐<½ ☐>½	2 appropriate containers with lid ≥ 10 L (kolsi, jerry-can)	☐0 ☐<½ ☐>½
		Household treatments: boiling, filtration, purifiers (if needed)	☐0 ☐<½ ☐>½
		Jug / mugs	☐0 ☐<½ ☐>½
Safe excreta disposal, latrine use and maintenance	☐0 ☐<½ ☐>½	Hygienic latrines (culture, age-abled and gender-friendly)	☐0 ☐<½ ☐>½
		Sandals to be used in latrines	☐0 ☐<½ ☐>½
		Water containers inside the latrines / hand-washing facility	☐0 ☐<½ ☐>½
		Tools and site to dispose of children faeces safely	☐0 ☐<½ ☐>½
		Tools and detergents to clean latrines	☐0 ☐<½ ☐>½
Diarrhoea treatment	☐0 ☐<½ ☐>½	Oral Rehydration Salt (ORS)	☐0 ☐<½ ☐>½
Safe menstrual hygiene	☐0 ☐<½ ☐>½	User-friendly sanitary cloths/napkins	☐0 ☐<½ ☐>½
Safe laundry	☐0 ☐<½ ☐>½	Laundry Soap	☐0 ☐<½ ☐>½
		Sanitary space/facility, acceptable to users, for washing clothes/drying (including non-disposable sanitary cloths)	☐0 ☐<½ ☐>½
Body hygiene	☐0 ☐<½ ☐>½	Sanitary space/facility, acceptable to users and safe to wash (privacy and security, especially for women)	☐0 ☐<½ ☐>½
		Towel/Gamsa	☐0 ☐<½ ☐>½
		Tooth brushes, toothpaste/powder, nail cutter, shampoo, comb/hairbrush	☐0 ☐<½ ☐>½
Safe food cooking, preservation	☐0 ☐<½ ☐>½	Cooking dishes, plates, covers for food/dakna, cutlery	☐0 ☐<½ ☐>½
		Dish washing soap	☐0 ☐<½ ☐>½
		Sanitary space/facility, acceptable to users, for dish washing/drying	☐0 ☐<½ ☐>½

Protection from vectors	☐0 ☐<½ ☐>½	Mosquito net (if needed)	☐0 ☐<½ ☐>½
Solid waste management	☐0 ☐<½ ☐>½	Remote dumping / burning / compost areas	☐0 ☐<½ ☐>½

4.2. Existing WASH related community structures

Which existing community structures could be used in the WASH response? (WASH committees; community / traditional / religious leaders; women groups, health centres; health committees; health / hygiene / WASH CBOs or NGOs, volunteers, schools, etc)

5.SUMMARY (To be filled after the assessment, when analysing the results)

District		**Upazila**		**# of affected Unions**	
Total population in the Upazila					
Est. %/# of affected people			%		#
Est. %/# of people without good access to enough safe water			%		#
Est. %/# without adequate sanitation			%		#
Est. %/# not practicing safe hygiene			%		#
Agencies / NGOs already working in the area					
Main water risks and needs					
Main sanitation risks and needs					
Main hygiene risks and needs					
Main WASH NFIs needs					

5.3 Roles and responsibilities of stakeholders in earlyrecovery phase

Various government departments, local government institutions, INGOs, NGOs and individual are working in Upazilas and Pourashava levels. For emergency response phase, everybody should provide information from their activity points in the areas to fill the SOS form for sending it to EOC of DDM through DC. But to get the first hand authentic information the primary source of data should be Union Parishad and Wards. Therefore, all the information as per requirement of SOS needs to be given to Union Parishad/wards. The Upazila/Pourashava should collect those data and compile for the whole Upazila/Pourashava and send to DC of the district for onward transmission. Once the emergency responses have started the assessment for early recovery phase is initiated by collecting detailed information in “D” form of the DDM.

Roles and responsibility of stakeholders in early recovery phase are shown in **Table 5.3**

Table 5.3 Roles and Responsibilities of stakeholders in WASH early recovery phase

Stakeholders	Responsibility	Activities
MoDM & Relief	Overall Coordination	Monitor the situation and give directions
DDM	Coordinate all activities of the response	- Run control room for 24 hours - Make early recovery need assessment (D form) - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Communicate with international agencies
District	Coordinate, conduct and supervise the rescue and relief operations and early recovery activities	- Run control room for 24 hours - Make early recovery need assessment (D form) and send it to DDM - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Report to DDM
Upazila/Pourashava	Coordinate, conduct and supervise the rescue and relief operations and early recovery activity	- Run control room for 24 hours - Make early recovery need assessment (D form) and send it to DDM - Send relief materials - Restore easy transportation - Coordinate activities of all stakeholders - Report to DC
Union Parishad/Ward	Management of all activities of early recovery activities	- Collect all information as per D form format from different Govt. offices and stakeholder and UC members and send it to Upazila/Pourashava - Conduct relief activities and assess additional need and report. - Report to Upazila/Pourashava daily

Stakeholders	Responsibility	Activities
DPHE	Support to UP/Pourashava and restore WASH facilities	- Provide information to UP/Pourashava for D form - Act as focal agency for WASH - Coordinate and take lead role in filling Supplementary WASH Form for early recovery - Implement early recovery activities
WASH Cluster	Organize activities of WASH Cluster Coordinate WASH activities	- Activate WASH Clusters from Union to District & Central level
INGs & NGOs	Restore WASH facilities	-Implement WASH facilities under WASH Cluster coordination
Private Sector	Produce WASH facilities	-Support WASH Cluster & INGs-NGOs

5.4 WASH Information management

Information management is the key to the success of cluster coordination. National WASH Cluster is responsible for generating and sharing WASH information with cluster partners, GoB, and the UN Resident Coordinator.

- WASH information during an emergency response includes:
    - Information related to outbreaks of WASH related diseases
    - Identification of water-scarce locations
    - Location of communities with poor sanitary condition
    - Assessment of WASH infrastructure damage
    - Level and quality of on-going response to the affected people
    - Information on who is doing what where and when
    - Meeting notes
    - Situation reports
    - Identification of management/technical issues.
- The success of information management depends on the timely flow of information from local to national levels. All WASH information should flow from/to the various administrative levels through the local, district, and national WASH Cluster Information Managers and Coordinators. These Managers and Coordinators are responsible to share the WASH information both *horizontally and vertically*.
- Vertically, all WASH Cluster Information Managers and Coordinators are responsible to share information with the WASH Cluster Coordinators directly above or below them (in their area of activity/responsibility) regularly.
- Horizontally, all WASH Cluster Coordinators are responsible to collect and share the information with all the WASH agencies in their geographical work areas and respective administrative levels. Donors and NGOs need to systematically share their response to the situation with the Cluster Information Managers and Coordinators.
- As Cluster co-leads, it is vital that DPHE and UNICEF are constantly updated about problems, needs, and interventions. This will enable them to share timely information with the partners to respond to the needs in the affected areas efficiently and effectively.

In the early recovery phase the necessary format as per Table 5.4 should be used and report to control room of WASH on daily basis and periodically until the phase is over.

5.5 Implementation of emergency response

This actually begins at rapid assessment time, emergency response and followed in early recovery. This also needs to be monitored. The Table 5.5 briefly summarizes the main steps to be followed when organizing implementing WASH early recovery response. Minimum standards of water supply, sanitation & NFIs that should be maintained during emergency response are also mentioned in column 3 along with other parameters for indicators of success.

Table 5.4 WASH report in early recovery phase

District:			**Upazila:**			**Date:**			
Union name	**Nos. Tubewell**				**Sanitary Latrine**		**Water Treatment/ Water Bottle**		**Others**
	Affected	Raised	WT	WB	Affected	Reconstructed(Re) /Newly constructed(Ne)	Water Treatment/ Tablet	Water bottle/ Jerri cane	Bleaching Powder

Note: Depending on the type of activities the table should be rearranged and all activities should be monitored and reported

Table 5.5 Main steps for implementing WASH early recovery

WASH response steps	Objectives	Indicators of success	Means of control/monitoring
Early Recovery project planning and implementation	▪ WASH Cluster facilitates and capacity building among local authorities and partner agencies	▪ Local authorities, national/international agencies and NGOs understand sustainable WASH interventions and coordination	▪ Quality management of training events ▪ Ongoing assessment: field visits and meetings
	▪ WASH Cluster partner agencies design project interventions for sustainable use, operation, and maintenance of WASH facilities and hygiene behaviour impact	▪ ≥ 80% of affected beneficiaries are aware of planned interventions and are satisfied with proposed strategies and outputs ▪ Project activities conform to WASH Cluster guidelines	▪ Wash cluster aware of number and location of beneficiaries, project outputs, and design ▪ WASH Cluster asks for requisite changes to conform to the technical guidelines ▪ WASH Cluster updates databases
	▪ WASH Cluster partner agencies provide appropriate targeted hygiene promotion activities and mass campaigns and distribute NFIs to all beneficiaries	▪ No outbreak of WASH diseases ▪ All affected people have necessary NFIs to practice safe hygiene behaviours ▪ ≥ 80% of affected people demonstrate key hygiene behaviours	▪ Coordination with Health Cluster ▪ Random visits to affected communities, schools, and health centres ▪ Interviews with observation/discussion
	▪ WASH Cluster partner agencies facilitate safe water supply systems for communities	▪ All affected people have access to ≥ 7.5 L safe drinking water/day ▪ ≥ 80% of beneficiaries have access to safe drinking water within 500m or 15 min from their dwelling	▪ Visits to water points and interviews of beneficiary households ▪ Water testing at source and/or beneficiary household levels

WASH response steps	Objectives	Indicators of success	Means of control/monitoring
		▪ All water quality tests conform to safe to drink (meet basic Bangladesh standard)	
	▪ WASH Cluster partner agencies promote adequate temporary/permanent sanitation to all beneficiaries	▪ No evidence of open defecation or children faeces can be observed in the beneficiary communities ▪ All affected people have access to adequate permanent sanitation ▪ 80% of these facilities are properly cleaned and maintained and have soap or ash inside	▪ Exploratory walks to look for signs of open defecation/children faeces ▪ Observation of maintenance and use of toilets/potties provided ▪ Interviews of beneficiaries to assess use, maintenance and satisfaction
	▪ WASH Cluster partner agencies ensure integration of Water Supply, Sanitation and Hygiene; and integration to other sectors	▪ All affected Unions receive water, sanitation and hygiene responses ▪ SW,D, & VC taken into account ▪ Responses are coordinated with other sectors	▪ Local/regional WASH Cluster coordination and inter-Cluster meetings ▪ WASH Cluster visits to WASH projects ▪ Joint Clusters visits to WASH and non-WASH projects
On-going assessments in the working areas, correction of early recovery projects if necessary	▪ WASH Cluster assesses project planning, implementation process, appropriateness of interventions ▪ WASH Cluster provides feedback to implementing agencies	▪ All poor/vulnerable affected people are covered under early recovery interventions ▪ Assessment feedback shared with partners ▪ ≥ 5% of beneficiaries interviewed, 80% express satisfaction with assistance	▪ Complementary surveys, in coordination with local stakeholders ▪ Corrected implementation strategies are shared with Cluster ▪ Interview 5% of beneficiaries (individual or group)

WASH response steps	Objectives	Indicators of success	Means of control/monitoring
		received, remarks taken into account	
Evaluation of early recovery activities (facilitated by WASH Cluster or UN Resident Coordinator's Office by engaging an qualified agency)	▪ Evaluation provides overview of effectiveness of WASH interventions and identifies gaps for further work ▪ Evaluation provides feedback on effectiveness of new approaches and technologies	▪ ≥ 10% of the projects outputs have been visited and interventions helped return to pre-disaster condition; conform to WASH Cluster guidelines ▪ ≥ 10% of beneficiaries have been interviewed, and 80% express satisfaction with assistance received ▪ Document lessons learned to prepare for future emergencies and continue developing interventions	▪ ToR developed by SAG of WASH Cluster ▪ Assessment carried out along side WASH Cluster partner agencies and local authorities as far as possible ▪ Results presented to local or national WASH Cluster

5.6 Guidelines

Different kinds of guidelines are necessary to implement the disaster recovery WASH activities in emergency response and in early recovery phases. The following guidelines are provided in **PART-B** of this document.

1. Water Guidelines for Emergency Relief and Early Recovery
2. Excreta Disposal Guidelines for Emergency Relief and Early Recovery
3. Inclusiveness Guideline for Emergency Relief and Early Recovery
4. Hygiene Promotion Guidelines for Emergency Relief and Early Recovery
5. WASH Non Food Item (NFI) Guidelines for Emergency Relief and Early Recovery
6. Solid Waste, Drainage & Vector Control Guidelines for Emergency Relief and Early Recovery

The detailed designs of water supply options with quantity of works are provided in **PART-C** of this document.

Chapter 6: Decommissioning of Water Supply, and Hygiene Facilities

CHAPTEROUTLINE

6.1 Introduction:

During disaster people are displaced from their normal living condition. If they are not evacuated and stay at home with many difficulties, all kinds of WASH NFIs are reached to their homestead. On the other hand when people are compelled to go out of the houses, they take shelter in a safe place like embankment, road, school and other shelters. People then live in a concentrated way and the WASH NFIs are provided to them. Combining the food & medical items along with other activities the environment become risk of hazard. When the early recovery phases are over, people started to return back to their normal life. All the intervention are left over and decommissioning of these facilities become necessary to restore the place in good environment conditions.

6.2 Items that need to retained if disaster resilient

For disaster risk reduction, in the disaster prone areas, disaster resilient options are built. Raised platform hand tubewells, raised sanitary latrine units etc. or additional tubewells & latrines are the example. During early recovery time if any new structures are built that will be disaster resilience. Therefore, all such items should be retained and will not be listed under decommissioning activities. Only items to be given temporarily should be decommissioned.

6.3 Decommissioning of different facilities

The following format described the steps to be taken for decommissioning water supply, sanitation and hygiene activities after early recovery phase.

Table 6.1 Decommissioning of WASH facilities

Activities	Items	Decommissioning steps	Consequences
1.Water Supply	a) Raising of tubewells	Remove the nipples and preposition for next event	Tubewell will be unstable and may break, inconvenience to take water
	b) Installation of temporary tubewells	Withdraw temporary tubewells and preposition the materials for next event	Water Quality may not be suitable for long use, tubewell may chocked-up, pump may be stolen
	c) Mobile water treatment plants	Filter to be cleansed as per standard procedure, maintenance work to be done and re-transported to safe places. Trial run to be continued to face the emergency	Filter will be clogged and un-useable, plant will not be ready for next event and trouble to operate during disaster may occur if nor trial run
	d) Water trucking and distribution	Discontinue the services and people are motivated to take the jerricanes to their home and use it as water container	People will depend on water supply if not discontinued
	e) Emergency Household water treatment	All packets (paper) should be kept together and burnt to ashes	Health hazard may occur particularly to the children for mishandling
	f) Pond Sand Filter, Rain Water Harvesting, Raised Platform tubewells	These options are installed in a place from where people can take water. Therefore, these options should be in operation condition after early recovery phase. Management committee be established	Otherwise people will not get water, option will be disorder making loss of investment
	g) Arsenic Removal Technologies (house hold)	If media is exhausted (by testing arsenic of treated water) it should be returned back to the proponent for dispose the waste media safely as per protocol. If it is workable, it should be carried to home for further use with monitoring of treated water for arsenic	Otherwise people will continue to drink arsenic contaminated water, investment will be lost if not used the good ART, and media exhaust will not be known if not monitored
	h) Water quality testing kits	Clean them and handed over to DPHE lab or the working NGOs	Proper use will not be ensured and investment will be lost

Activities	Items	Decommissioning steps	Consequences
2. Sanitation	a) Temporary latrines	All temporary latrines should be filled with ash and soil. After filling, the surrounding areas should be sprayed with bleaching powder. The place should be demarcated so that people do not dig within 6 months	Environment pollution will occur, health hazard risk for handling with un-decomposed excreta
	b) non-conventional latrines	All bucket, pot should be well cleaned and wash with water and solution of bleaching powder. If not accepted by people for further use, it should be buried in soil in unused land	Otherwise Risk of health hazard will exist
3.Hygiene materials, solid waste and place of living	a) hygiene materials	To be burnt or buried in pit	Otherwise Risk of health hazard will exist
	b) Solid waste	i) Burnt the non-hazardous items ii) Buried the hazardous items iii) Safe disposal in dumping places or recycled the solid, glass and plastic items	Otherwise Risk of health hazard will exist
	c) Place of living	After departure from the temporary shelter all debris should be cleaned and safely disposed up as mentioned above and the place should be Sprayed with bleaching powder to improve the environment	Otherwise Risk of health hazard will exist

OPERATIONAL GUIDELINES FOR WASH

(Water Sanitation and Hygiene)

IN EMERGENCIES - BANGLADESH

PART B and PART C

TABLE OF CONTENTS

PART B

PART C

Guideline 1: Water Guidelines for Emergency Relief and Early Recovery

GUIDELINE OUTLINE

1.1 INTRODUCTION

Ensuring people's have access to sufficient quantities of water of acceptable quality is of primary importance in the aftermath of a disaster. **Quantity must always be the first priority** (using easily accessible water sources), but adequate **quality should also be ensured as soon as possible** (using water treatment or other improved sources).

- **Emergency water responses** must focus on the quickest, the easiest and the cheapest short-term technical solutions
  - Water purifying tablets, water trucking, bottled water if needed, etc.
  - Raising of tubewell with nipple, collection of rainwater in bucket and sinking of shallow hand pump tubewells

- **Early recovery water responses** should implement medium to long-term solutions
  - Tubewells, Pond Sand Filters, Rainwater harvesting, spring catchments and piped networks, household water treatment, etc.

1.1.1 ORGANISING WATER RESPONSE

Water response **activities should be consistent** with Sphere guidelines, and national water regulations and technical guidelines outlined by the Government of Bangladesh's Department of Public Health Engineering. Water responses should be **integrated with various hygiene promotion activities** to promote the proper use of the hardware and safe hygiene practices. **Drainage, solid waste and vector control** must be taken into account when selecting a site and designing water infrastructure. Water responses should also be **integrated with NFI distribution and excreta disposal responses**, and **coordinated across clusters** (including health, education, shelter, etc.).

Water responses should always be **coordinated with local authorities and other NGOs,** including both those involved *inside* the project area (to avoid duplication) and *around* (to ensure relative homogeneity of water responses across Bangladesh).

Water response activities should target the poorest, most affected and most vulnerable households; special priority should be given to displaced people.

Targeted communities must always be involved in the design of the water response and activities, the selection of beneficiaries, and the project implementation strategy. An effort should be made to include:

- women
- adolescent girls
- children
- men
- the elderly
- the disabled
- the chronically ill

1.2 TECHNICAL REQUIREMENTS

The following table gives **minimum technical requirements** that should be taken into account.

All **water options** should be systematically designed taking into account:

- **Excreta disposal and solid waste**: sources of water should be located at safe distances from latrines and solid waste pits, so that they are not contaminated with faecal matter or other waste (see the excreta disposal guidelines and the solid waste guidelines).
- **Drainage and vector control**: water infrastructures should be designed in such a way that they are not flooded, and that the wastewater (from hand pumps, taps) falls on a concrete slab and is properly drained to a garden, pond, river or soak away pit through a drainage channel instead of forming puddles of stagnant water (see the drainage and vector control guidelines).

Types of technologies	Considerations	Minimum Technical requirements
Distribution of water: water trucking, or distribution of jerrycans filled with water or bottled water by rickshaw, boats, truck, etc)	▪ Should only be organised if no other option is available ▪ Logistically complicated, and very expensive ▪ Water distribution should be a short-term solution to water supply challenges	▪ SPHERE guidelines should be followed when possible (water quantity/quality, distance to distribution points, number of distribution points per 100 people, queuing time, etc)
Household Water Treatments(HWT): water purifying tablets/sachets (WPT/WPS), alum/fitkiri, chlorination, boiling, chullis, biosand filters, arsenic filters, etc	▪ HWT should be adapted to the quality of the available water sources (turbidity, faecal contamination, arsenic, iron, etc) ▪ HWT should be as user-friendly as possible and systematically coupled with demonstrations, explanations ▪ HWT can be promoted as a sustainable option only if products and spare parts are easily available, affordable and easy to manage.	▪ *Turbid, contaminated water*: use WPS, or alum/fitkiri + boiling/or bleach/or WPT, or chullis, or biosand filters ▪ *Non turbid, contaminated water*: alum/fitkiri + boiling/or bleach/or WPT, or chullis, or biosand filters ▪ *Arsenic:* Use only BCSIR approved filters ▪ *Iron (high levels)*: Use WPS, or alum/fitkiri + boiling/or bleach/or WPT, or biosand filters ▪ All HWT should always be distributed with demonstrations and appropriate, visual guidelines
Tubewells: Raising of tubewells with nipple, repair of disorder tubewells, installation shallow, shallow shrouded, very shallow shrouded, deep	▪ Tubewells are often preferred by rural communities ▪ They are the most sustainable, and should be installed whenever possible (suitable ground, no arsenic, no salinity) ▪ Long term technical and financial management is an issue that must be carefully thought and prepared	▪ Government designs should be systematically followed ▪ Communities must be consulted on the siting of the tubewell / well ▪ A well Management Committee must be set up and trained in operation, maintenance and financial management

Types of technologies	Considerations	Minimum Technical requirements
Ring wells (It is a post flood rehabilitation option)	▪ Ring wells are an option where tubewells are feasible but do not provide enough water ▪ When relevant and feasible, ring wells should be covered with a slab and fitted with a handpump	
Pond Cleaning and Pond Sand Filters(PSF) rehabilitation and construction of new PSF	▪ Ponds should be cleaned after all major floods and cyclones. ▪ PSFs should only be installed in regions where tubewells are not feasible ▪ Long term technical and financial management is a significant issue and must be carefully considered	▪ PSF design usually followed in the locality shall be used or any suitable design as per recommendation of TWG (Technical Working Group) of WASH Cluster ▪ Communities must be consulted on the choice of the pond ▪ A PSF Management Committee must be set up and trained in operation, maintenance and financial management
Rainwater harvesting systems(RWHS): for households or communities	▪ RWHS should only be implemented in water-scarce areas where no other option is possible (because of distance to other water sources) and where people are already used to this practice.	▪ Design usually followed in the locality shall be used or any suitable design as per recommendation of TWG (Technical Working Group) of WASH Cluster Communities or households must be consulted on the location of the tank ▪ Users (households) or a RWHS Management Committee (communities) must be trained in operation, maintenance and financial management
Piped water network	▪ Networks are mostly for urban areas (cities, small towns) but can also be implemented in hilly areas where gravity flow systems are practical. ▪ These should be built only in projects long enough to ensure proper community participation and trainings ▪ Long term technical and financial management is a significant issue and must be carefully considered.	▪ Standard design as per approval of management committee should be followed ▪ Communities must be consulted on the level of service they want and can afford (household yard connection, tap stands, etc)

1.3 EMERGENCY RESPONSE OPTIONS

The following table lists the various water options that can be used in different contexts, and at different emergency phases. For each context and phase, the various options are listed from the simplest and quickest to set up, to the most sophisticated and slowest to implement. Depending on the context and needs, different options can be implemented in parallel.

Context	**Preparedness options** (before emergencies)	**Emergency options** (max. 6 weeks after the disaster)	**Early recovery options** (until people have recovered)
Roadsides / embankments Shelters (schools, public buildings, etc.)	▪ Prepositioning of water purifying tablets/sachets, alum/fitkiri, bleach(see NFI guidelines) ▪ Prepositioning of jerrycans and other water containers (see NFI guidelines) ▪ Prepositioning of materials to raise/rehabilitate tubewells/install temporary tubewells	▪ Distribution of emergency HWT: WPS, or alum/fitkiri + boiling/ or bleach/ or WPT (see NFI guidelines) ▪ Pond Cleaning ▪ Temporary tubewells, or rehabilitating/raising existing tubewells ▪ Transport and distribution of jerry cans or bottles full of water	▪ These options are best for emergency response and generally should not continue into early recovery. ▪ In extreme circumstances, these options may be continued during early recovery
Water scarce areas (salinity, arsenic, etc.)			▪ HWT: chullis, biosand filters ▪ Rehabilitation/construction of PSFs ▪ Rehabilitation/construction of RWHS (household / community)
Safe groundwater areas	▪ Prepositioning of materials to raise/rehabilitate tubewells	▪ Distribution of emergency HWT: WPS, or alum/fitkiri + boiling/ or bleach/ or WPT (see NFI guidelines) ▪ Pond Cleaning (even if not used for drinking water) ▪ Temporary tubewells, or rehabilitating/raising existing tubewells	▪ Rehabilitation/construction of tubewells ▪ Rehabilitation/construction of ring wells

Context	**Preparedness options** (before emergencies)	**Emergency options** (max. 6 weeks after the disaster)	**Early recovery options** (until people have recovered)
		▪ Rehabilitation of existing ring wells ▪ Transport and distribution of jerry cans or bottles full of water	
Hill tracts areas	Prepositioning of materials for gravity fed systems, and for rehabilitation of tubewells/ringwells	▪ Distribution of emergency HWT: WPS, or alum/fitkiri + boiling/ or bleach/ or WPT (see NFI guidelines) ▪ Temporary tubewells, or rehabilitation of existing tubewells/ring wells ▪ Rehabilitation of RWHS, infiltration galleries, water networks ▪ Transport and distribution of jerry cans or bottles full of water	▪ HWT: chullis, biosand filters ▪ Rehabilitation/construction of tubewells, ring wells ▪ Rehabilitation/construction of RWHS ▪ Rehabilitation/construction of infiltration galleries ▪ Rehabilitation/construction of water networks
Refugee camps	None	▪ Distribution of emergency HWT: WPS, or alum/fitkiri + boiling/ or bleach/ or WPT (see NFI guidelines) ▪ Transport and distribution of jerry cans or bottles full of water	Depending on the local situation: ▪ Temporary tubewells and point of use treatment (household water treatments)may be appropriate

1.4 WATER QUALITY

When testing water quality, is important to assess:

- Water sources, before rehabilitating or building an infrastructure (tubewell, PSF, treatment plant, network, etc).
    - For example, it might not be necessary to rehabilitate a damaged tubewell contaminated with arsenic, or to rehabilitate a PSF if the pond has become saline.
    - Also, it is necessary to choose a good quality source when installing a treatment plant or designing a piped network.
- The outlet of a treatment or collection infrastructure (tubewell, RWHS, PSF, HWT, treatment plant, network, etc), to determine if any repair/improvement/cleaning is needed.
    - If the outlet water from a PSF or a RWHS is turbid or contains faecal coliforms, it is necessary to clean the sand and/or reservoir.
    - If water is contaminated at the outlet of a treatment plant, it is necessary to adjust the treatment parameters.
    - If the outlet water from a network is contaminated, there might be leaks in the pipes.
- The water stored at the household level (pitcher, bucket, etc).
    - If stored water is contaminated while the source where it has been collected is not, it is necessary to emphasize hygiene promotion (handwashing, safe collection, transport, storage and retrieval of water, see hygiene promotion guidelines).
    - Appropriate household water treatment should be provided and promoted.

The following table presents the main water quality parameters (physical, chemical and microbiological) that might be tested in emergency/early recovery contexts:

Quality parameters		Remarks	Norm/target
Physical	Turbidity	Turbidity refers to the amount of particulate matter in water, which affects how clear/transparent water is. Turbidity may prevent treatments (e.g. chlorination and filtration) from working effectively.	< 5 NTU
Physical	Colour, Odour	People do not like coloured or smelly water. They can indicate specific quality parameters (red water = iron; water smelling like rotten eggs = hydrogen sulphide gas).	Transparent, no smell (except slight chlorine smell)
Chemical	pH	pH measures how acidic or basic the water is. It should be relatively neutral for people to like the water, and for treatment to be effective (chlorination, etc.)	pH of 6.5 to 8.5

Quality parameters		Remarks	Norm/target
	Salinity	People do not like salty water.	No complaint from users, if possible TDS: <900 mg/L, conductivity: <1000µS/cm
	Iron	Most people do not like the taste of iron. Iron "red" water can also stain clothes during laundry.	No complaint from users,
	Arsenic	Arsenic is sometimes present in groundwater (only), and can be lethal in the long term, at high doses.	< 0.05 mg/L
	Chlorine	Chlorine can be used in treatment plants or at household level (sometimes also at handpumps or reservoirs) to disinfect water. Chlorine has to stay in water long enough to disinfect it effectively. Too little chlorine is ineffective, too much is dangerous.	contact time: at least 30 minutes; residual free chlorine:0.2 to 0.5 mg/L
Microbio	Thermo-tolerant coliforms	Thermo-tolerantcoliforms indicate faecal contamination, hence the risk of transmission of diarrhoea and other diseases. Water should NEVER be contaminated with such coliforms.	0 coliformper 100 mL

Note: This table does not list all the quality parameters that should be taken into account to ensure drinking water is safe, but only the main ones that should / can realistically be measured in emergency and early recovery contexts. In specific situations, other parameters could be measured, including manganese, fluoride (in areas known where these are known to be present in high concentrations in groundwater), nitrates, nitrites, sulphides, ammonia (in areas where agricultural activities using fertilizers can affect surface water), etc.

Water can be tested in central or regional laboratories (DPHE, ICDDR,B, etc), but this means samples have to be collected through a very specific protocol (refer to each laboratory for guidelines) and transported and analysed rapidly (less than 6 hours after collection). Otherwise, basic physical, chemical and microbiological water parameters can be tested in the field with testing kits, a few examples of which are presented below.

The Delagua (left) and Wagtech (centre) kits measure basic physical, chemical and microbiological water quality parameters. The Arsenator (right) can measure the level of arsenic. Other field kits also exist to measure less common parameters, like salinity, iron, manganese, fluoride, chloride, nitrate, nitrite, sulphide, ammonia, etc.

During the emergency/Early Recovery response, water should be tested at both community infrastructures and household levels as regularly as possible, but in any case at least once at each community infrastructure (tubewells, PSF, RWHS, etc), and once at more than 2% of the beneficiary households. Results (positive or negative) should be discussed with the concerned communities or households. When results are below standards, organisations should give special attention to the concerned infrastructures or households, providing additional support (rehabilitation, additional hygiene promotion, etc). If necessary, bad water quality results can also support decisions to change a project's activity (infrastructure design, hygiene messages, etc).

Exception: As far as possible the water quality shall be maintained as mentioned above. In extreme case where the testing will be difficult or not possible due to non-availability of testing kits; in the emergency case the water should be clear, odourless, acceptable by the consumers for drinking and should be used after chlorination with WPT. However, testing facilities shall have to be restored as soon as possible.

The following table can be used in the field to assess or monitor water quality in various sources.

WATER QUALITY REPORT SHEET

District		**Date**	
Upazila		**Organisation / NGO**	
Union		**Water Analyst**	
Village/Community		**Type of test kit(s) used**	
Comments:			

Sample			**Physical parameters**			**Chemical parameters**				**Chlorine (mg/L)**			**Thermo-tolerant Coliforms**			**Is the source drinkable or not?**
# or code	*Source*	*Time*	*Colour*	*Odour*	*Turbidity (NTU)*	*pH*	*Salinity (TDS, mg/L or conductivity, µS)*	*Iron (mg/L)*	*Arsenic (mg/L)*	*Free (DPD1)*	*Total (DPD3)*	*Combined (Total - free)*	*Volume filtered (ml)*	*Number of colonies*	*Total per 100 ml*	

1.5 WATER TECHNOLOGY DESIGNS

The following pages present some pictures and drawings to illustrate the designs of various emergency and early recovery water options. For some options, estimated bills of quantities and costs are also given.

All options should **respect as much as possible the SPHERE Guidelines and the minimum technical requirements.**

1.5.1 MOBILE WATER TREATMENT PLANTS

Mobile treatment plants are very costly to purchase, operate and maintain and should only be used if no other solution is available.

Mobile water treatment plants can be used to treat large quantities of water (generally from rivers or ponds). These are highly technical in terms of their operation and maintenance, & require skilled / trained staff, and specific chemicals (alum, chlorine, etc). Various designs / brand exist, each with their own technical specifications and requirements. The treated water can then be distributed by water trucking or other means (see below).

An example of UNICEF-DPHE mobile treatment plant, installed in a vehicle for easy transport and installation.

1.5.2 WATER TRUCKING AND DISTRIBUTION

Water trucking and distribution should only be considered as a **temporary, emergency option**. People might have to be provided with water containers. Finding other longer term water solutions should be a priority.

Water can be transported by trucks, rickshaw vans, boat, etc…


If necessary, water can also be distributed in jerry cans or bottles, although this requires good logistical organisation and is very costly.

1.5.3 POND CLEANING AND REHABILITATION

Major floods and cyclones can pollute ponds with organic matter such as branches, leaves and animal carcasses. In coastal areas, tidal surges can also bring saline or brackish water into ponds.

All ponds should be cleaned after flood and cyclone. Where alternative water supply is not possible and the sweet water pond become only source (indispensible) to get water for drinking; then pond should be cleaned and rehabilitate for use in relief and emergency situations

Cleaning sweet water ponds should be a priority after any major flood and after all cyclones. An average pond is approximately 500 square meters, and 1 to 2 metres deep, holding some 500+ cubic metres of water. Coastal people have traditional methods of cleaning ponds, which involve removing major debris manually, and then dosing with lime (approximately 10-20 kg per pond), but this method is not adequate for clarifying the pond water or reducing offensive smells/gas from rotting organic matter. Salinity is also unaffected by lime treatment.

Below is described **DPHE's conventional method for cleaning ponds**. This should clarify the water, but will not reduce salinity. The workers involved in pond cleaning operations should wear impermeable boots, gloves and overalls (See NFI Guidelines).

- Remove all floating objects from the pond (branches, leaves, animal carcasses, human remains, etc). Buckets can also be used se to dredge some debris from the bottom of the pond.
- Measure the dimensions of the pond (area and water depth).
- Determine the amount of lime required for the pond, according to the pond's dimensions. For a 5 feet deep pond, of 1 decimal area (= 1*shotak*= 480 sq. feet = 44.6 sq meters), 1 kg of lime (*chun*) is required.

- Mix half of the lime with water. If it is hard lime (*pathurerchun*), then boil the lime-water mixture well.
- Spread the lime-water solution equally throughout the pond. Stir so that the lime is mixed well with pond water. For the next 4-5 hours, do not allow the pond to be disturbed.
- After 4-5 hours, repeat step 5 with the remaining portion of lime. For the next 4-5 hours, do not allow the pond to be disturbed.
- If the pond water is not sufficiently cleaned, repeat the whole process once again.
- Do NOT apply chlorine (bleaching powder, sodium hypochlorite, bleach, etc) directly to the pond.

If the pond has been filled with salty or brackish water, or if this conventional pond cleaning method is not successful, the pond may be drained: using a diesel pump and irrigation hose, the pond water should be completely removed from the pond and pumped to a nearby drainage channel. Workers can remove more debris from the bottom of the pond, if there are any.

The pond must them be refilled, using one of the following methods:

- **Pond Draining and Groundwater Refilling**: deepen the pond by approximately 1-2 feet to remove the fine materials at the bottom of the pond and allow groundwater to slowly refill the pond. This may take several days, and the infiltrating groundwater may also be brackish. After the pond is refilled, lime application can be done as in Conventional Cleaning. This option will be best when there is a nearby river with higher water level than the pond base, so that water can flow naturally through the aquifer. If the nearby river is saline this option may not be suitable.
- **Pond Draining and Artificial Refilling**: using the diesel pump and irrigation hose, freshwater from a nearby river or stream can be pumped to refill the pond. In case the nearest stream is far, a long hose may be used from a dredging pump. If the nearby river is brackish, it will be best to do this at the low tide, when the salinity level in rivers is less. A simple roughing filter may be used to reduce turbidity from the river water before pumping. After the pond is refilled, lime application can be done as in Conventional Cleaning.

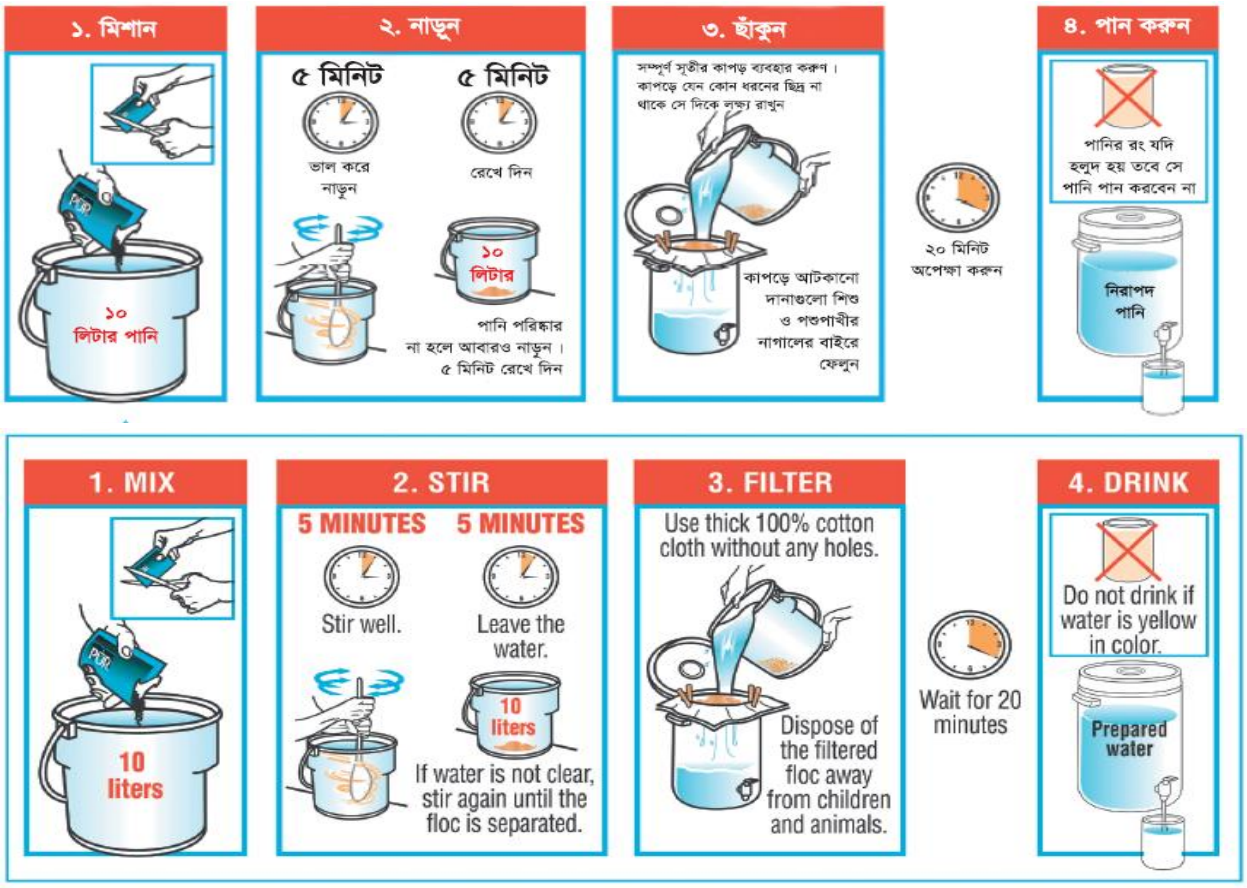
Local knowledge should be sought in determining the most effective approach. Local people will have a good idea about which ponds will fill naturally with groundwater, and what surface water sources could be available to pump freshwater from. Ownership and access rights are also important issues that should be clarified through local consultation before rehabilitation. After the pond is cleaned/rehabilitated, it can be used for various domestic purposes (bathing, washing, drinking, and cooking). If the pond water is used for drinking, cooking and washing utensils, ensure that people do not use the pond for aquaculture, washing clothes or bathing humans or animals, and that they have the means to treat their drinking and cooking water. If not, provide them with emergency or early recovery household water treatments (see

below). To ensure a better raw water quality, ponds can be fenced, banks raised and over-hanging branches cut, etc.

1.5.4 Emergency Household Water Treatment

Various household water treatments can be promoted during emergencies, and sometimes after (if they can be sustainable). These should always be **promoted with appropriate hygiene promotion, demonstrations** (see hygiene promotion guidelines) **and visual leaflets and/or stickers**.

The following leaflet / sticker (samples and soft copies available at UNICEF, in Bangla or English) explains how to use water purifying sachets to remove turbidity and disinfect drinking and cooking water:



On next page, another leaflet (samples and soft copies available at UNICEF) promotes household treatment of drinking and cooking water after emergencies (Bangla version only):

এছাড়াও নীচের দেয়া পদ্ধতিতে পানি পানের জন্য নিরাপদ করা যায়

১. পানি ফুটানো

পানি ফুটিয়ে নেয়া (বুদ্‌বুদ্‌ ওঠার পরে প্রায় ১ মিনিট ফুটাতে হবে)।

২। ফিটকিরির সাহায্যে

২০ লিটারের এক কলসী পানিতে ½ (আধা) চা চামচ ফিটকিরি মিশিয়ে ভালভাবে নাড়তে হবে। ফিটকিরি পানিতে পুরোপুরি মিশে গেলে ১ ঘন্টা অপেক্ষা করতে হবে। এর পর উপরের প্রায় ৯০ ভাগ পানি পানের জন্য আরেকটি পরিস্কার কলসি/পাত্রে ঢেলে তলানীসহ নীচের পানি ফেলে দিতে হবে।

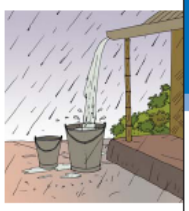
৩। ব্লিচিং পাউডারের সাহায্যে

২০ লিটার পানি ছেঁকে নিতে হবে।

ছাঁকা পানিতে ¼ (চার ভাগের এক ভাগ) চা চামচ ক্লোরিনের গন্ধযুক্ত, শুকনো, সাদা ব্লিচিং পাউডার মিশিয়ে ৩০ মিনিট (আধা ঘন্টা)

অপেক্ষা করতে হবে। এ সময় পানি অবশ্যই ঢাকনা দিয়ে রাখতে হবে। ৩০ মিনিট পরেও পানিতে ক্লোরিনের গন্ধ পাওয়া যাবে। যদি গন্ধ পাওয়া না যায় তবে ব্লিচিং পাউডারের ডোজ এমন পরিমাণে বাড়িয়ে দিতে হবে যেন পানিতে হালকা ক্লোরিনের গন্ধ পাওয়া যায়।

৪। বৃষ্টির পানি সংরক্ষণ



বৃষ্টি থেকে আমরা বিশুদ্ধ পানি সংগ্রহ করতে পারি। বৃষ্টির সময় বাড়ির ছাদ অথবা কৃত্রিম উপায়ে তৈরি চাল থেকে অথবা সরাসরি বৃষ্টির পানি সংগ্রহ করে পান করা যায়।

পানি বিশুদ্ধকরণ প্রক্রিয়া সম্পর্কে জানুন বিশুদ্ধ পানি পান করুন

DFID unicef

পানি বিশুদ্ধকরণ ট্যাবলেট কি?

যেকোন প্রাকৃতিক দুর্যোগ বা বন্যার পর নিরাপদ পানির সংকট দেখা দেয়। অনেক সময় বন্যার পানিতে নলকূপের পানিও দূষিত হয়ে পড়ে। তখন মানুষ নির্ভরশীল হয়ে পড়ে পুকুর বা নদীর পানির উপর যা কোনভাবেই পানের যোগ্য নয়।

তবে বিশুদ্ধকরণ প্রক্রিয়ার মাধ্যমে দূষিত পানির জীবানু ধ্বংস করে পানের জন্য নিরাপদ করা যায়। এর একটি সহজ পদ্ধতি হল

ক্লোরিন ট্যাবলেট দূষিত পানিতে মিশিয়ে পানি নিরাপদ করা

বাজারে বিভিন্ন ক্ষমতাসম্পন্ন ক্লোরিন ট্যাবলেট পাওয়া যায়। কাজেই ব্যবহারের আগেই প্যাকেটের গায়ে লেখা নির্দেশাবলী অনুসরণ করতে হবে বা স্বাস্থ্য কর্মীর পরামর্শ নিতে হবে।

বিঃ দ্রঃ

- *এই ট্যাবলেট কোনভাবেই খাওয়া যাবে না।*
- *ট্যাবলেট শিশুদের নাগালের বাইরে রাখতে হবে।*
- *ট্যাবলেটগুলো অবশ্যই শুষ্ক ও আলোবাতাসপূর্ণ স্থানে রাখতে হবে।*

জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কর্তৃক সরবরাহকৃত ক্লোরিন ট্যাবলেট

জনস্বাস্থ্য প্রকৌশল অধিদপ্তর/ইউনিসেফ কর্তৃক সরবরাহকৃত ক্লোরিন ট্যাবলেটের নাম হল একোয়াটেব। এর একটি প্যাকেটে ১০ টি ট্যাবলেট থাকে।

একটি ট্যাবলেটের মাধ্যমে ১০ লিটার দূষিত কিন্তু দেখতে পরিস্কার ধরনের পানি নিরাপদ করা সম্ভব।

- সাধারণ মাপের একটি কলসী ২০ লিটার পানি ধারন করতে পারে। সেই ক্ষেত্রে এক কলসী পানি নিরাপদ করতে ২টি ট্যাবলেট ব্যবহার করতে হবে।

বিঃদ্রঃ

পানি যদি অপরিস্কার এবং নোংরা, ঘোলা হয় তবে সেই ক্ষেত্রে ক্লোরিন ট্যাবলেট ব্যবহারের আগে ফিটকিরির মাধ্যমে বা কয়েক পরতা ভাঁজ করা পরিস্কার সুতির কাপড় দিয়ে ছেঁকে নিতে হবে এবং এধরনের ২০ লিটার পানিতে ৪টি ট্যাবলেট ব্যবহার করতে হবে।

আধা ঘন্টা

ট্যাবলেট পানিতে দেওয়ার পর আধাঘন্টা (৩০ মিনিট) অপেক্ষা করতে হবে। যদি ক্লোরিনের গন্ধ পাওয়া যায় তবে পানি পান করা যাবে। গন্ধ না পেলে আবারও ১টি ট্যাবলেট পানিতে দিয়ে আধাঘন্টা অপেক্ষা করতে হবে। তারপরও দেখতে হবে পানিতে ক্লোরিনের গন্ধ আছে কি না।

- বালতি অথবা জারিকেন এর ভিতর ট্যাবলেট দিয়েও পানি নিরাপদ করা যাবে। জনস্বাস্থ্য প্রকৌশল অধিদপ্তর ১০ লিটার পানি ধারন ক্ষমতা সম্পন্ন জারিকেন সরবরাহ করছে। সুতরাং এই এক জারিকেনের পানি নিরাপদ করার জন্য ১টি ট্যাবলেট প্রয়োজন।

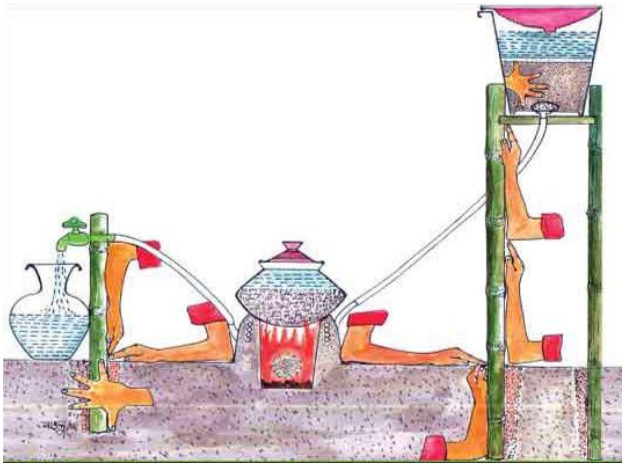
একই নিয়মে আবারও ট্যাবলেট পানিতে দেওয়ার পর আধাঘন্টা অপেক্ষা করতে হবে। যদি ক্লোরিনের গন্ধ পাওয়া যায় তবে পানি পান করা যাবে। গন্ধ না পেলে আবারও ১টি ট্যাবলেট পানিতে দিয়ে আধাঘন্টা অপেক্ষা করতে হবে। তারপরও দেখতে হবে পানিতে ক্লোরিনের গন্ধ আছে কিনা।

- **Alum/fitkiri can be used to remove turbidity**: to treat one pitcher/kolsi of water, ½ teaspoon of fitkiri should be added and the water stirred vigorously. The water should be left for one hour for the fitkiri to settle. Then the top 90% of the water can be used, while the bottom 10% should be discarded and drained properly (in a pond, river, etc).
- **Water can then be disinfected by boiling it for at least one minute** (sufficient fuel is required). Boiling changes the taste of water by removing all gases that may give a taste to water, such as hydrogen sulphide or carbon dioxide. After boiling and cooling, the taste can be improved by vigorously stirring the water, or by shaking the water in a sealed container.
- Another option to disinfect water is to use water purifying tablets (WPTs). **WPTs are not efficient to disinfect turbid water**, if water is turbid, it must first be cleared with alum/fitkiri. Beneficiaries should be educated on proper use so that they know that they **should never swallow the tablets,** and that they must **keep the tablets out of reach of children.** Store tablets in a safe and dry place. There are different types and sizes of WPTs in the market, so the instruction mentioned in bottle/packet must be read before promoting or using them. For instance, the chlorine tablets used by DPHE and UNICEF partners can disinfect 4 to 5 litres of water each. To treat one kolsi, 4 chlorine tablets should be mixed to water. After adding the tablets wait half an hour. If there is a smell of chlorine the water is safe to drink. If there is no smell add another tablet and wait another half an hour.
- Alternatively, **clear water can be disinfected with bleaching powder**. Bleaching powder should also be stored in a dry, closed container, and kept away from children. Divide a full teaspoon of bleaching powder into 4 portions; add 1 portion to 1kolsi of water and stir. Let the water sit for at least half an hour before drinking. If there is no smell of chlorine the amount added was too little; repeat adding bleaching powder until some chlorine can be smelled in the water.
- **Solar Disinfection (SODIS) can disinfect water** simply by storing water in clear plastic bottles in the sun, for instance on a rooftop. The combination of increased temperature and ultraviolet radiation destroys bacteria and other germs. SODIS works best with clear water. There is little experience with SODIS in Bangladesh, so it is usually not promoted in emergency response.
- **Rainwater can also be collected** from clean tin roofs or plastic sheets into pitchers, and used for drinking and cooking.

Note:
Sometimes hydrogen sulphide gas can give a rotten egg smell to water. These gases can be reduced by shaking the water in a partly-filled container for about 5 minutes, and then allowing the water to stand for 30 minutes. Boiling will also remove gas, and at the same time kill germs.

1.5.5 Early Recovery Household Water Treatment

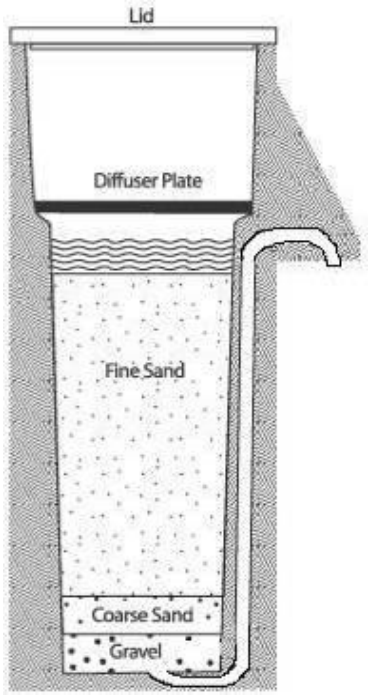
Chulli filters



As illustrated by the pictures and drawing above, the chulli filter is a household water treatment technology based on the clay oven rural Bangladeshi women traditionally use to cook. Water is poured in a bucket, where it is filtered by sand before flowing into a pipe, then a coil fixed into the clay oven. While flowing into the coil, water is heated by the fire from the oven (it is necessary to cook and use the filter at the same time), which helps to disinfect the water. Water then flows into a tap, open only slightly, and collected into a pitcher or any other container. Water is warm and can be used directly or first cooled in the container (with a lid).

This technology is produced and sold by Wagtech (developed in Bangladesh), while promotion and operation and maintenance materials and more information can be obtained from Oxfam. There is some contention regarding the effectiveness of this treatment method.

BiosandFilters



Biosand filters are small, household slow sand filters, basically operating the same principle than Pond Sand Filters but at a smaller scale.

They consist of a high concrete or plastic container fitted with a lid, a pierced diffuser plate protecting and diffusing water across a thick layer of fine sand, on top of thinner layers of coarse sand and gravel. The water is filtered and disinfected while flowing through the sand, thanks to "good" micro-organisms eating the pathogens. Water then flows into a pipe under which it can be collected. As bio sand filters do not always kill all pathogens, it might be necessary to boil or bleach the filtered water

The sand must always remain under water (for good micro-organisms to survive), and sand must be washed regularly (at least once a month).

In Bangladesh, Proshika and Wagtech produce biosand("Bishudda") filters.

1.5.6 Pond Sand Filters (PSF)

In areas where groundwater is not available or is of inappropriate quality (arsenic, salinity), but where surface freshwater is available (ponds, rivers), Pond Sand Filters can improve the quality of these sources to provide drinking and cooking water.

The key to creating a successful PSF is to:

- Select **a pond with sufficient water throughout the year to supply the intended users** (minimum 40 families, or 200-250 people).The pond should be protected and not used for bathing or washing dishes and clothes. Fish may be raised in the pond but no chemicals, fertilizer, or cow dung should be added. If the selected pond is private, the owner should give a written agreement granting sustainable, free access to the PSF, before its construction.
- **Pump water in the middle of the pond** (at least 5 meters away from the banks), to avoid leaves, sediment, etc. just below the surface (the pipe must be fitted with a floater, to avoid pumping sand or fine particles from the bottom of the pond). The PSF can be fitted with number 4 or 6 handpumps, depending on its size (e.g. number of users) and the spare parts available in the area.
- Have at least a **2 step filtration system**:

1. **A roughing filter** (with 10-12 mm brick chips, 'khoa' or gravel to filter the biggest particles). Upflow roughing filters are recommended as they can be cleaned by gravity drainage, without having to remove the filter materials. A **settlement chamber** can be added before the roughing filter to allow sand and fine particle to settle before water reaches the filters.

2. **Down flow slow sand filters** (SSF, with 0.2-0.3 mm fine sand to filter smaller particle and for micro-organisms to grow on the surface, which will "eat" the pathogens from the pumped water).

For 250 people, a SSF area of at least 20 square feet is needed. There must be a hydraulic control system for the SSF to always remain covered by at least 6 inches of water (for the bacteria to stay alive). A twin-bed SSF design is preferred so that one bed can be used while the other second is cleaned and allowed to 'ripen' (5 days minimum, for micro-organisms to grow at the surface).

- **A clean water chamber** (empty to collect and store the filtered water) should be connected to at least 2 taps, high enough for users can fill their usual containers (jerrycans, jugs, etc).
- There must be a **proper drainage system** below the taps where people collect water (see drainage guidelines).
- A **management committee**, if possible gender balanced, with at least 3 caretakers (at least one female) must receive a proper Operation and Maintenance (O&M) training to know how to operate the PSF, clean the filters and water chamber at least once every 3 months, repair the pump/taps/pipes, the reservoirs or the drainage system if needed, and raise money from users in case of break down. They should also receive the necessary tools to perform regular maintenance, as well as an appropriate O&M manual explaining the main tasks (technical and financial) to be performed, how and when.

As PSFs do not always guarantee a fully safe drinking water (some pathogens might remain in the outlet water in case of bad maintenance), it may be appropriate to provide/promote household water treatments in parallel.

If a PSF has been flooded / damaged by a natural disaster:

- Remove all the water and all the filtration materials (brick chips, sand) from the inside.
- Clean the internal PSF surface with clean water and chlorine.
- If needed, repair the concrete/brick structure, pipes and taps.
- Wash the filtration materials with clean water before putting them back in the filter.

Detailed drawing is shown in PART-C

1.5.7 Rainwater Harvesting Systems (RWHS)

In water-scarce areas, where groundwater is not available and surface water is saline, rain can provide fresh water for drinking and cooking. RWHS are especially adapted to areas where people are already used to practice rainwater harvesting during the monsoon (catching rain on their roof or a plastic sheet, and collecting it in a pitcher, a traditional clay pot or a concrete container). In early recovery phase, small RWHS can be built for individual households, but larger ones can also be built for a cluster of households or for institutions (schools, hospitals, etc.).

The key to successful RWHS is to:

- Build a reservoir big enough to store enough water for people to have sufficient drinking and cooking water throughout the year. The monsoon only lasts 4 to 5 months, but there are a few rains during the dry season. The reservoir must hold enough water for people to have at least 2.5 litres of water every day during 6 months:
  - for an average 5 member household: minimum volume is 3,200 litres
  - for a cluster of 6 households: minimum volume is 19,200 litres
  - for an institutional building: the minimum capacity depends on the number of users and the nature of institution (for instance, schools and hospitals have different water consumption, see SPHERE guidelines)
- Ensure that the rain collection area is as large as possible, ideally large enough for the reservoir to be full at the end of the rainy season.
- The reservoir (preferably in concrete, or bricks and concrete) must always be fitted with a manhole at the top, big enough for a person to get into the reservoir (for cleaning or repair).
- The pipe connexion between the gutters and the reservoir must be fitted with a “first flush” system, for the water from the first 10 minutes of rain to be drained away (this water will clean the roof from dust and leafs). After 10 minutes, the RWHS user/caretaker can manually switch the “first flush” system off, for rainwater to be led into the reservoir.
- There must be a proper drainage system below the first flush system and the tap(s)/pump where people collect water (see drainage guidelines).
- Users/caretakers must receive a proper Operation and Maintenance (O&M) training to know how to operate the first flush system, clean and disinfect the reservoir at least once a year (end of the dry season), repair the gutters, the pipes/taps/pump, the reservoir or the drainage system if needed.
- They should also receive the necessary tools to perform regular maintenance, as well as an appropriate operation and maintenance manual explaining the main tasks (technical and financial) to be performed, how and when. For community RWHS, a management committee, if possible gender balanced, with at least 3 caretakers (at least one female) must be created.

For a household RWHS:

- The reservoir must be elevated at least 1 foot above the ground level. The reservoir must also be fitted with a drain pipe (and a valve) at the bottom of the tank, and with a tap (preferably metal) 2 inches above the bottom of the tank (to allow for dust to settle).

For a community RWHS:

- The reservoir can either be elevated (same measurements as household RWHS) or underground (cheaper).
- Underground reservoirs must be fitted with a handpump (preferably number 4, to avoid wasting water), taking water at least 6 inches above the bottom of the reservoir (to allow for dust to settle).

As RWHS do not always guarantee a fully safe drinking water (the outlet water might contain some pathogens in case of bad maintenance), household water treatments can also be provided/promoted.

If a RWHS has been flooded / damaged by a natural disaster:

- Remove all the water from the inside.
- Clean the internal RWHS surface with clean water and chlorine.
- If needed, repair the concrete/brick structure, pipes and taps.

Detailed drawing is shown in PART-C

1.5.8 TUBEWELL REHABILITATION AND CONSTRUCTION

Tubewells are usually the water source people prefer. Tubewells are considered by many to be an easy to maintain and reliable source of safe water. However, tubewells are not feasible everywhere. Some areas do not have suitable ground conditions, or might have groundwater contaminated with saline water or arsenic. DPHE and local people know which areas are suitable for tubewells. UNICEF is also compiling a database with the suitability of all Bangladeshi unions for tubewells.

Tubewell rehabilitation

Tubewells that have been submerged (after floods or cyclones) need to be rehabilitated before they can be considered safe as floodwater may contain solids, sludge, and microbiological contaminants.

In some areas the floodwater is brackish due to tidal surges. This brackish water will not have a serious impact on deep tube wells, most of which draw water from layers more than 500 feet below ground. The deep aquifer underlies a saline shallow aquifer, and the two are separated by an impermeable clay layer. While some brackish water may enter the tubewell when it is submerged, widespread contamination of the aquifer will not occur. However, shallow tubewells and ring wells can face longer-term salinity problems.

In order to rehabilitate a tubewell/ring well, the following steps should be followed:

- Repair the handpump, if necessary
- Purge the tubewell to remove floodwaters
- Disinfect the tubewell through shock chlorination
- Repair the sanitary platform and drainage system, if necessary
- Analyse the water to check salinity, arsenic, iron, etc

Note that these steps can be followed in a different order, depending on how damaged the tubewell is. For instance, in an arsenic prone area, first analyse the water to check whether it is contaminated with arsenic, then decide whether it is worth rehabilitating the tubewell.

1) Repairing the handpump and platform

Handpumps may have to be repaired if they have been damaged by falling trees, or if some parts are missing. Most tubewells are equipped with number 6 handpumps, and spare parts are widely available. **Platforms should also be repaired as needed** though this can be done over coming weeks rather than as an immediate response.

2) Purging the tubewell to remove floodwater

The check valve within the handpump should prevent complete flooding of the tubewell so typically, the most highly contaminated water will be in the top part of the tube. Still it is best to manually **pump the water long enough to fully clear the water column within the tubewell**.

Tubewells that have been flooded are full of water (if the check valve still works). Most tubewells are equipped with 1.5 inch diameter pipe, which has a cross-sectional area of about 11 cm^2. This means that 3 feet of pipe (91 cm) can hold approximately 1 litre of water (11×91 = 1001 cm^3, rounded at 1 L). To purge a 900 feet deep well, at least 300 litres of water should be pumped.

Most tubewells can be purged by pumping about 200-300 litres, depending on the well depth. This can be done by filling a bucket repeatedly (e.g. fill a 20 litre bucket ten or fifteen times), or by estimating that a #6 pump draws about 50 litres per minute, so pumping about 5 minutes should be enough, ten minutes to be safe. For a Shallow TW that is 100 feet deep, pumping only about 35 litres is required (e.g. two full buckets).

3) Disinfection through shock chlorination

After purging the well, shock chlorination should be done to kill any remaining bacteria or other pathogens. In shock chlorination, the concentration of chlorine applied is very high – 200 mg/L, or 40 times the WHO Guideline Value for residual chlorine in drinking water. The chlorine solution should be added to the well, allowed to react with bacteria for some time, and then pumped out before the well can be used for drinking. To disinfect a well, two plastic buckets (20 litres), a funnel, a teaspoon, and a wrench are required, along with chlorine (either fresh bleaching powder or fresh HTH powder). **Chlorine is dangerous, especially when concentrated. Workers should wear impermeable gloves and overalls when disinfecting wells**.

- First, calculate the volume of the tubewell. As demonstrated above, the approximate volume (in litres) can be estimated as the tubewell depth (in feet) divided by 3. Transform this volume V into a number N of buckets: if you use 20 litres buckets, N = V/20.
- Next, calculate the amount A of chlorine to be added. For a tubewell with V = 300 litres, A = 200 mg/L × 300 L = 60 g of available active chlorine are needed. If bleaching powder is used, with approximately 20% active chlorine, 60g / 20% = 300gof powder would be needed. This can be measured with a weight, or approximated to 60 teaspoons. However, if HTH powder with 75% active chlorine is used, only about 80 g, or 15 teaspoons are needed. The exact dose of chlorine to add is not critical, so too much care should not be spent on exact measurement.
- Dilute all the required bleaching powder or HTH in the 1st20 litre plastic bucket full of water to make a highly concentrated chlorine solution. After adding the powder to the water, stir well and let the solution sit for some time to allow lime to settle out of solution.
- When the lime has settled and the chlorine stock is clear, the well disinfection can begin. Using the wrench, the pump head should be removed and set aside.
- Using the2nd20 litre bucket, fill the bucket with clean water (this will require another tubewell, or a storage tank) nearly to the top, adding a portion of the chlorine stock. Take care not to pour the lime along with the chlorine.
- Using a funnel, pour the diluted chlorine solution from the second bucket into the tubewell. It may be necessary to wait a few minutes for the water level in the tubewell to adjust, otherwise the tubewell may overflow.
- Repeat this procedure until N buckets (see 1st point) have been added to the well. Try to add approximately the same amount of chlorine stock to each bucket, but this is not critical.
- When all of the chlorine solution has been added, the chlorine should be left in the well for some time to react. A minimum of 2 hours is required, and overnight is recommended.
- After the reaction time, the pump head can be replaced and the well should be purged until the water has lost its chlorine odour. This should take approximately the same number of buckets as were used in the shock chlorination. The well is now safe to use for drinking and cooking water (provided it is not contaminated with arsenic!).
- Even when water is safe at the tubewell, poor hygiene can lead to contamination before drinking. Especially after a disaster people are vulnerable to infection and should take

special care to wash hands with soap, and to collect and store water safely (see hygiene guidelines).

Tubewell designs

In Bangladesh, various types of tubewells can be drilled:

- **Deep tubewell** (>150 meters deep) can provide very safe water as they tap deep aquifers, usually protected by an impermeable layer which prevents arsenic, faecal and chemical contamination. They can be fitted with #6 handpumps (when the water table level is within 7 meters from the surface) or Taradev handpump (when the water table is more than 7 m below ground level, including if only during the dry season).
- **Shallow tubewell** (<75 meters deep) are cheaper than deep tubewells but sometimes provide water of lower quality (arsenic, faecal contamination, etc).
- **Shallow shrouded tubewell** (>7 meters deep) or **very shallow shrouded tubewell** (<7 meters deep). In areas where deep groundwater is saline and where higher aquifers are made of fine sand, freshwater can sometimes be found, but the well screens must be fitted with centralizers and surrounded by coarse sand to prevent fine particles from entering into the tubewell.

The choice of the type of tubewell, depth, design and type of handpump vary a lot from place to place, depending on local geophysical conditions. **Please refer to the local or national DPHE staff for guidance.**

In villages where tubewells are drilled, a **management committee**, if possible gender balanced, with at least 3 caretakers (at least one female) must receive a proper Operation and Maintenance (O&M) training to know how to operate the tubewells, repair the pump/taps/pipes and the drainage system if needed, and raise money from users in case of break down. They should also receive the necessary tools to perform regular maintenance, as well as an appropriate O&M manual explaining the main tasks (technical and financial) to be performed, how and when.

1.5.9 Water Safety Plan during disaster

Water is scarce during disaster. It always required to arrange additional water supply to meet the demand. Therefore, it is very important to keep the available water safe to drink. Water Safety Plan is an approach to keep water supply safe from catchment to consumption. But during disaster the normal situation is disrupted and there is risk to contaminate the water easily. People therefore, need to give extra attention so that the available water supply during the disaster remain safe to drink. The following steps need to be followed ninimum for water safety plan during disaster.

1. **Source :**
   Hand Pump Tubewells: During disaster hand pump tubewells are the major source of drinking water supply. To keep the source safe

a) If the tubewell is submerged and raised by nipple it need to be washed with bleaching powder solution before use as stated in***Disinfection through shock chlorination.***

b) Tubewell platform must be in good condition, having disposal of waste water at least 10 m away and there shall be no latrine around 10-15 meter radius.

c) Tubewell shall never be prime with un safe water.

Pond and PSF: Pond and running flood water are often used as source and supplied after treatment with PSF or mobile treatment plant. To keep the source safe

a) Pond should be keep clean and protect from surface run off and bathing. People can use pond water for other purpose using separate handpump with protection not to discharge the used water into the pond.
b) Provide lime as per guidelines of Pond Cleaning.
c) Running flood water intake area need to be protected from contamination.
d) If priming of the handpump of PSF is required, it must be done with safe water. Defect should be repaired immediately.

2. **Collection & Storage:**
   The water can be collected from tubewell, PSF, treatment plant by Jerricans, Pitchers, Buckets, Plastic bottles etc. To Keep the water safe
   a) All the containers first clean/rinse with the source water before collection.
   b) Soon after collection the container need to be capped or covered properly.
   c) Transport carefully to the point of use.
   d) Keep safely and avoide risk of contamination.
   e) Use WPT as per instruction. In case of treatment plant water chlorination is provided with treatment, So no need to use WPT again

3. **Point of Use:**
   The ctitical step to maintain safety is the point of use. People should be more carefull at this stage. To use/drink water safely
   a) Drinking glass/pot need to be cleaned and rinse with safe water.
   b) It should be covered after every use.
   c) Water container need to be covered after taking water from it.

Guideline 2: Excreta Disposal Guideline for Emergency Relief and Early Recovery

GUIDELINE OUTLINE

2.1 INTRODUCTION

- Excreta contain pathogens that can cause serious diseases such as diarrhoea and skin diseases, so **proper excreta disposal solutions are critical in reducing morbidity and mortality, and managing or preventing epidemics**. Children, the elderly and immune-compromised individuals are especially vulnerable to water and sanitation related diseases.
- It is essential to find solutions for safe excreta disposal in emergency and early recovery situations. Floods and cyclones often damage **regular household latrines**, which later need to be rehabilitated or reconstructed. When people are displaced due to disasters or conflicts, **emergency communal latrines or emergency excreta disposal solutions** must be provided. When necessary, NFIs should be distributed to safely dispose of babies and infants excreta.

2.1.1 HOW TO ORGANISE AN EXCRETA DISPOSAL RESPONSE

- Emergency and early recovery excreta disposal responses should be consistent with Sphere guidelines and GoB DPHE sanitation regulations and technical guidelines.
- Excreta disposal responses should always be **coordinated with local authorities and other NGOs** involved *inside* (to avoid duplication) and *around* the project area (to maintain technical and strategic homogeneity).
- **Target communities must always be involved** in the choice and design of technologies, selection of beneficiaries, project implementation strategy, and construction and maintenance of facilities. Women, children, adolescents, men, elderly people, disabled people, and chronically ill people should all be consulted to ensure the response satisfies their needs. The response must be gender-sensitive, as well as culturally, socially, and technically appropriate for local geophysical conditions.

- Beneficiaries must be selected according to **agreed upon objective and verifiable criteria** in favour of the poorest, most affected and most vulnerable households (but all displaced people should be treated equally).
- Excreta disposal responses must systematically be **integrated with hygiene promotion activities**, NFI distributions, and water responses to promote proper use of latrines and safe hygiene practices.

2.2 TECHNICAL GUIDELINES

Note: Ecological sanitation has not been included in these guidelines, as there is little experience on this type of sanitation technology in Bangladesh. Moreover, training, monitoring and follow-up on ecological sanitation takes significant time (minimum 1 year), making it rarely relevant in emergency/early recovery contexts. Information can however be obtained from UNICEF or the NGOs Comilla BARD and SPACE.

Components	Elements to take into account	Minimum technical requirements
Location of the excreta disposal facility	▪ Excreta deposited in latrines should not contaminate surrounding ground/surface water ▪ Users must be able to use the latrine safely at all times (during floods, at night, etc.) ▪ Latrine should be close and convenient	▪ Ideally, minimum 30 m away AND downhill/downstream from any ground/surface water source; if not possible, at least 10 meters (30') distance, downhill, and downstream ▪ Avoid locating latrines in flood prone areas or raise them above the flood level; locate them in a safe, lit location if possible ▪ Latrines should be as close to users as possible(< 50 m away from users' home); consult with users to choose a convenient and safe location
Excreta disposal pit/ vault	▪ Excreta deposited in latrines should not contaminate surrounding ground water sources ▪ In unstable soils, pits must be lined not to collapse ▪ Vault must be big enough to ensure that latrine can be used for a long time before being full (collect information on how many people will use the facility)	▪ Ideally, the bottom of the pit is ≥ 1.5 m above groundwater; vaults can be underground or above groundwater level; if not , excreta should be contained in a sealed vault (PVC tank, Oxfam tank, metal culvert or drum, etc) ▪ Stabilise the soil around underground pits dug in unstable soils with concrete/plastic/clay rings, metal drums, brick masonry, clay pots, bamboo lining, etc. ▪ Each user will fill the pit at the rate of 40 L/user/year (assuming water is used for anal cleansing); dig an additional 0.5 m (height) for latrines not to fill up completely: 40 L/user/yr x # users + 0.5 m ▪ For household latrines with rings, 5 standard RCC concrete rings (12" high; 30" outside ∅; 1.5" wall thickness) should be used; communal latrines should have twin pits. ▪ Above ground rings must be sealed with cement and mortar
Slab	▪ Slab must not be flooded; In flood prone areas, slab level must be raised above normal flood level ▪ Slab must be user-friendly and easy to wash	▪ Standard RCC concrete slab should be 32" outside∅; 2" wall thickness; slabs can be made of plastic, bamboo, etc. ▪ The slab should always be raised above flood level (same level as surrounding houses) ▪ Hole should not be too big (child-friendly); slab should be made or covered with impermeable, smooth material that

Components	Elements to take into account	Minimum technical requirements
	▪ Slab must ensure excreta are isolated from the outside of the pit/vault.	can be washed easily (concrete, tile, or tarpaulin/oilcloth in emergencies; all slopes should lead liquids to the hole ▪ Hole should be fitted with a pan and water seal; if not appropriate (water scarce areas), a flap or a lid is fine
Pathway to go to latrines	▪ Pathway to latrines must never be flooded; in flood prone areas, the pathway must be raised above normal flood level ▪ Pathway must be user-friendly (accessible to all) and easy to maintain	▪ The pathway should be raised at the same level as the slab and surrounding houses, using clay, bricks, sand bags, etc. on the ground; if above ground, use bamboo or wood ▪ If possible, pathway should include a ramp/banister for users to hold
Super-structure	▪ Superstructure must ensure user privacy and protect latrine from rain ▪ It must be built with strong, appropriate materials that can last at least 2 years and be maintained by users ▪ Superstructure must be user-friendly and gender-sensitive	▪ Roof is covered with solid impermeable material (CI sheets, tarpaulin, thick plastic sheet), to protect from rain and for privacy ▪ Household: walls can be made of vegetal mats, opaque/dark thick cloth or plastic sheets, CI sheets (not in cyclone-prone areas), wood, bricks ▪ Communal: more robust superstructure; separate gender toilets (under different roofs or separated by walls); internal lock for privacy and a hook to hang clothes/bags ▪ Adequate light and space inside; removable chairs; women's and girls' menstrual needs considered (washing, drying, disposal of sanitary cloths)
Anal cleansing, handwashing	▪ Latrines should always include appropriate containers for stocking water, anal cleansing, flushing and hand washing, and soap/ash for handwashing	▪ See NFI guidelines for containers, badnas, and soaps ▪ Ideally, communal latrines have handwashing devices outside (but not mandatory) ▪ All beneficiaries should receive hygiene promotion, including messages on handwashing
Operation and Maintenance	▪ Beneficiaries must be trained to use and maintain excreta disposal facilities	▪ All beneficiaries of excreta disposal facilities should receive hygiene promotion to use them safely ▪ Households will be fully responsible for latrine maintenance and must be trained accordingly ▪ Management committees are set up, trained, and supported for communal latrine maintenance; also responsible for water infrastructure maintenance
Desludging of the pit/vault	▪ When full, latrines should be emptied ▪ Safety of workers, users, environment, and surrounding population must be protected	▪ If available, hire traditional sweepers, dhangors, or mathors; compensate with high wages as an incentive to do this work; provide workers with impermeable boots, gloves, overalls and health and safety trainings

Components	Elements to take into account	Minimum technical requirements
		▪ Latrine pits can be drained in a new pit, dug near the existing one (lower if possible) and linked to it by a pipe or a hole ▪ Emptying is usually done manually (buckets/shovels), but alternative technologies exist: desludging handpump (Wateraid/VERC), the Poo pumps (Oxfam), or the Vacutug (UN-Habitat) for urban contexts ▪ Sludge should **never** be drained in rivers or ponds It should be disposed of properly and isolated from water sources and the environment

2.3 EXCRETA DISPOSAL OPTIONS

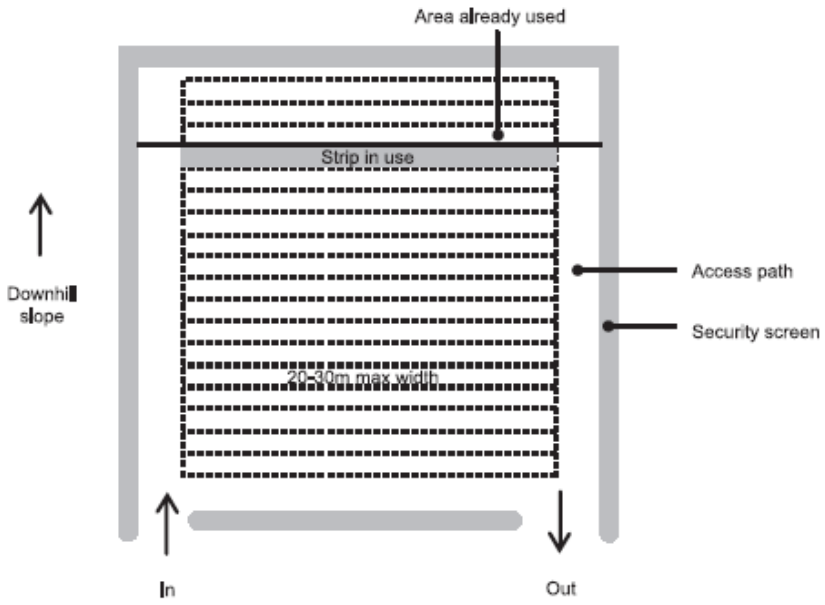
	Context	**Preparedness options** (before emergencies)	**Emergency options** (max. 6 weeks after the disaster)	**Early recovery options** (until people have recovered)
Floods & cyclone	*Embankments*	▪ Pre-positioning of materials for: - bucket latrines - trench latrines - temporary communal latrines	☒ **NO deep digging on embankments!** ▪ Shallow trench latrines on top of the embankment ▪ Temporary raised communal on-set latrine (shallow pit only)	▪ Unlikely to continue but if so, continue the emergency options
	Roadsides		▪ Trench latrines ▪ Temporary raised communal on-set latrines	
	Shelters (schools, public buildings)	▪ Disaster resistant permanent communal latrines should be built in all shelters ▪ Prepositioning for temporary latrine to meet additional demand	▪ Trench latrines, outside main premises ▪ Rehabilitation of existing latrines ▪ Temporary raised communal on-set latrines/above flood level off set pit latrines **For urban areas (only):** ▪ Temporary blocks of raised communal latrines, excreta contained in large tanks	▪ Permanent communal latrines (brick, concrete)
Floods only	*Chars (small sandy islands in a river)*	▪ Pre-positioning of materials for raised household latrines, plastic lining	▪ Bucket or drum latrines ▪ Raised household latrines, pit lined with bamboo (and plastic sheets if the soil is very unstable)	▪ Bucket latrines ▪ Raised household on-set or off-set latrines
	Raised households (houses on raised land)	▪ Pre-positioning of materials for bucket latrines, raised household latrines, plastic lining	▪ Bucket latrines (disabled, elderly people) ▪ Raised household latrines, pit lined with bamboo (and plastic sheets if the soil is very unstable) ▪ Raised on-set or off-set household latrines	▪ Bucket latrines (disabled, elderly people) ▪ Raised household on-set or off-set latrines

	Context	Preparedness options (before emergencies)	Emergency options (max. 6 weeks after the disaster)	Early recovery options (until people have recovered)
Floods only (continued)	*Waterlogged areas (low lands near rivers) and Haors (low clay lands, regularly flooded)*	▪ Pre-positioning of materials for raised communal latrines with large containment ▪ Build raised latrines or raise existing latrines as preparedness	▪ Bucket latrines, drum latrines ▪ Communal latrines on a raised land, with large excreta containment ▪ Latrines on boat with privacy/ mobile latrines	▪ Raised household latrine (to level of house plinth) ▪ Raised/elevated on-set or off-set household latrine, with steps or pathway
	Hill tracts areas	▪ Pre-positioning of materials for household latrines (on-set/off-set) ▪ Build raised latrines or raise existing latrines as preparedness	▪ On-set or off-set household latrines (raised in areas prone to flash floods)	▪ On-set or off-set household latrines (raised in areas prone to flash floods)
Refugees	*Refugee camps (water scarcity)*	▪ None	▪ Controlled defecation zones ▪ Trench latrines ▪ Communal on-set or off-set latrines, with twin pits if possible	▪ Communal off-set latrines with twin pits

2.4 EXCRETA DISPOSAL TECHNOLOGY DESIGNS

The following pages present designs of various excreta disposal options. For each option, a list of materials is also described. Each solution can be adapted (within the parameters of the minimum technical standards) to local context, materials available space, user needs, and user numbers.

2.4.1 CONTROLLED DEFECATION FIELDS (ONLY IN VERY EMERGENCY SITUATION)

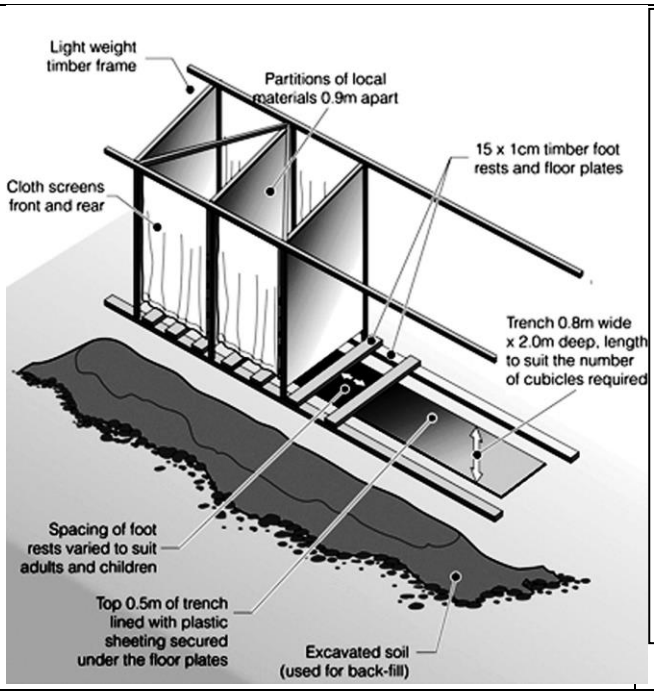


Controlled defecation field, with organised defecation space.

Materials:

- Poles (bamboo, wood or metal)
- Solid fences, as opaque as possible (dark plastic sheets or cloth, vegetal mats, etc) nailed or attached to the poles
- Ropes to delimit the used / unused areas.
- Provide small shovels, soil and hygiene promotion for people to cover their excreta.

2.4.2 TRENCH LATRINES



Trench latrines with privacy fences and individual chambers

(Convenient for users).

Materials:

- Poles (bamboo, wood or metal)
- Solid fences, as opaque as possible (dark plastic sheets or cloth, vegetal mats, etc) nailed or attached to the poles
- Bamboo to use as slabs
- If necessary and possible, roof (CI sheets, tarpaulin, plastic sheets or cloth or vegetal mats)
- If soil is unstable, trenches should be reinforced and lined with bamboo or wood

2.4.3 BUCKET LATRINES

Bucket latrines can be built quickly anywhere if they are acceptable tousers, but they need very regular emptying, with proper disposal of excreta in pits. They should be built near places where they can be emptied easily, regularly and safely.

Bucket latrines can also be adapted for disabled or elderly people.

Materials:

- Bucket (minimum 20 litres)
- Wood to build an elevated slab
- Poles (bamboo, wood or metal)
- Solid fences, as opaque as possible (dark plastic sheets or cloth, vegetal mats, CI sheets if long-term and not in a cyclone prone area) nailed or attached to the poles
- Roof (CI sheet, tarpaulin, plastic sheet or cloth or vegetal mat)

2.4.4 DRUM LATRINES

Drum latrines are sometimes used in hoar and char areas. They need regular emptying, with proper disposal of excreta in pits.

Latrine with a drum with open ends as a pit. A slab can be added if necessary and possible. Infrastructures are not shown in the drawings but should be added for privacy.

Materials:

- Drum, open at both ends
- Steps or pathway to the latrines (soil, sand bags, bamboo, wood or concrete)
- Wood / concrete to improve the slab if necessary
- Poles (bamboo, wood or metal)
- Solid fences, as opaque as possible (dark plastic sheets or cloth, vegetal mats, etc) nailed or attached to the poles
- If necessary and possible, roof (CI sheet, tarpaulin, plastic sheet or cloth or vegetal mat)

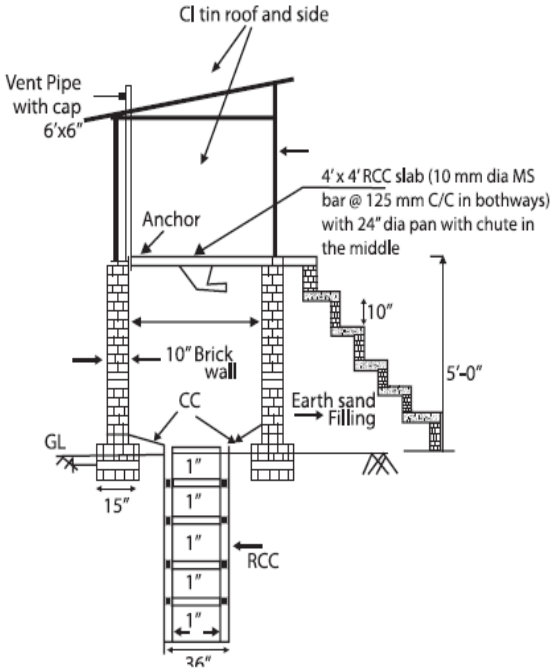
Building guidelines:

- In flood prone areas, the bottom of the drum must be below the ground level, but the top must be above the flood level.

2.4.5 Rehabilitation / Improvement of existing latrines

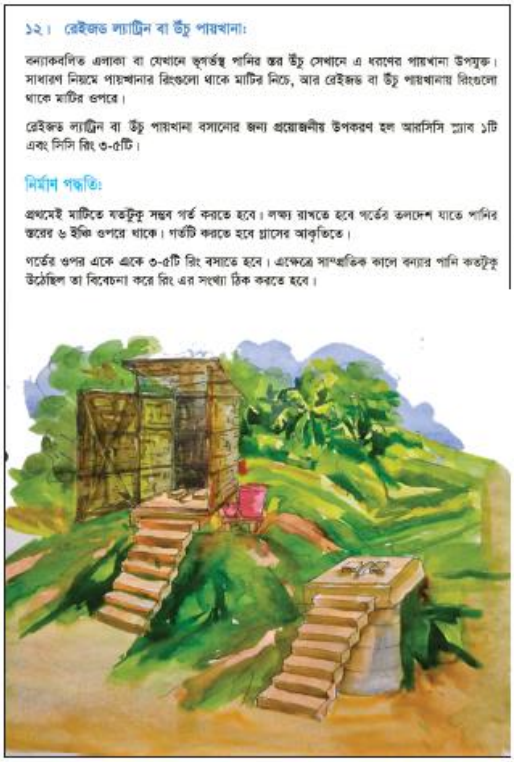
Existing latrines can be upgraded, or rehabilitated if they were partly damaged. The designs will then greatly depending on the original design of the latrines to be rehabilitated, the extent to which they were damaged, the number and needs of users, availability of local materials, etc. It is therefore impossible to give precise guidelines.

The drawing on the right gives an example of a latrine, which superstructure had been washed away by floods and that was later rehabilitated into a raised communal latrine.



2.4.6 Raised household latrines (on-set / off-set)

Household latrines are the most common and the best long-term solutions for excreta disposal. Ideally, one latrine should be available for each household, but sometimes latrines can be shared by 2 households. They need regular emptying, with proper disposal of excreta.



১২। রেইজড ল্যাট্রিন বা উঁচু পায়খানা:

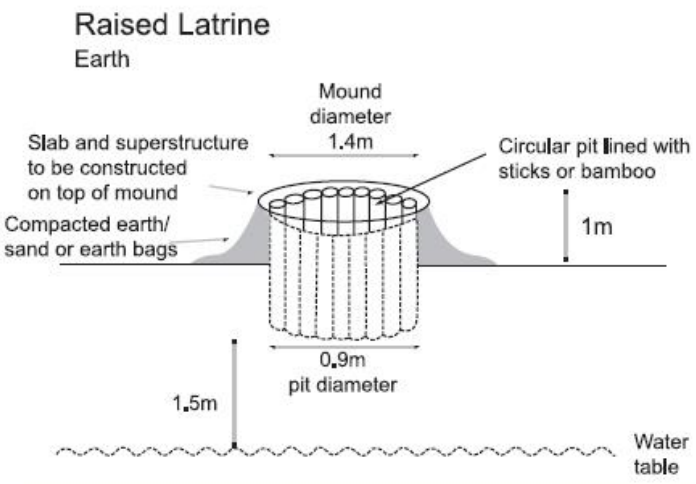
বন্যাকবলিত এলাকা বা যেখানে ভূগর্ভস্থ পানির স্তর উঁচু সেখানে এ ধরণের পায়খানা উপযুক্ত। সাধারণ নিয়মে পায়খানার রিংগুলো থাকে মাটির নিচে, আর রেইজড বা উঁচু পায়খানায় রিংগুলো থাকে মাটির ওপরে।

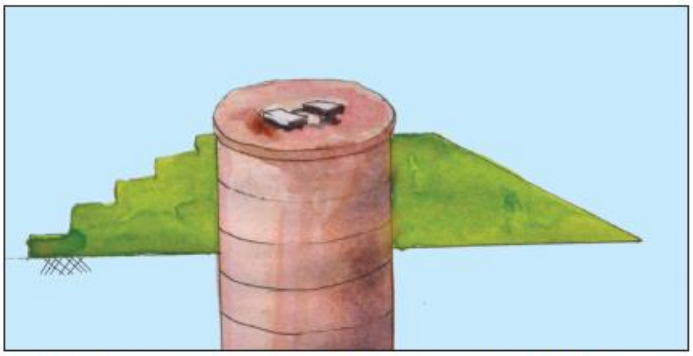
রেইজড ল্যাট্রিন বা উঁচু পায়খানা বসানোর জন্য প্রয়োজনীয় উপকরণ হল আরসিসি স্ল্যাব ১টি এবং সিসি রিং ৩-৫টি।

নির্মাণ পদ্ধতি:

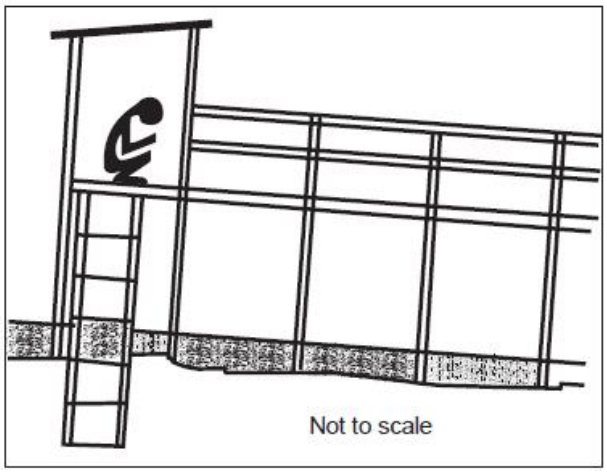
প্রথমেই মাটিতে যতটুকু সম্ভব গর্ত করতে হবে। লক্ষ্য রাখতে হবে গর্তের তলদেশ যাতে পানির স্তরের ৬ ইঞ্চি ওপরে থাকে। গর্তটি করতে হবে ফ্লাসের আকৃতিতে।

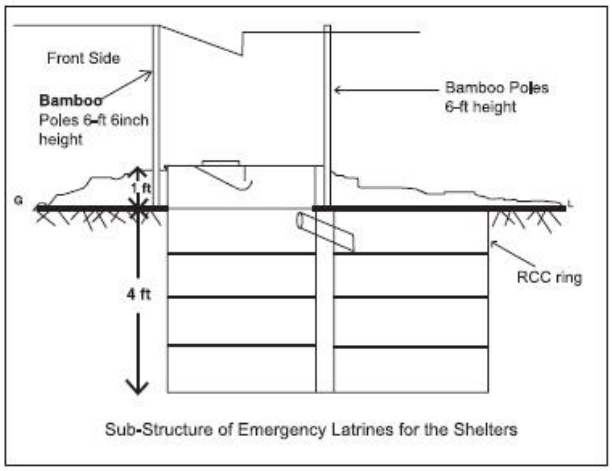
গর্তের ওপর একে একে ৩-৫টি রিং বসাতে হবে। এক্ষেত্রে সাম্প্রতিক কালে বন্যার পানি কতটুকু উঠেছিল তা বিবেচনা করে রিং এর সংখ্যা ঠিক করতে হবে।





View of a raised latrine with RCC slab and rings. Not to scale





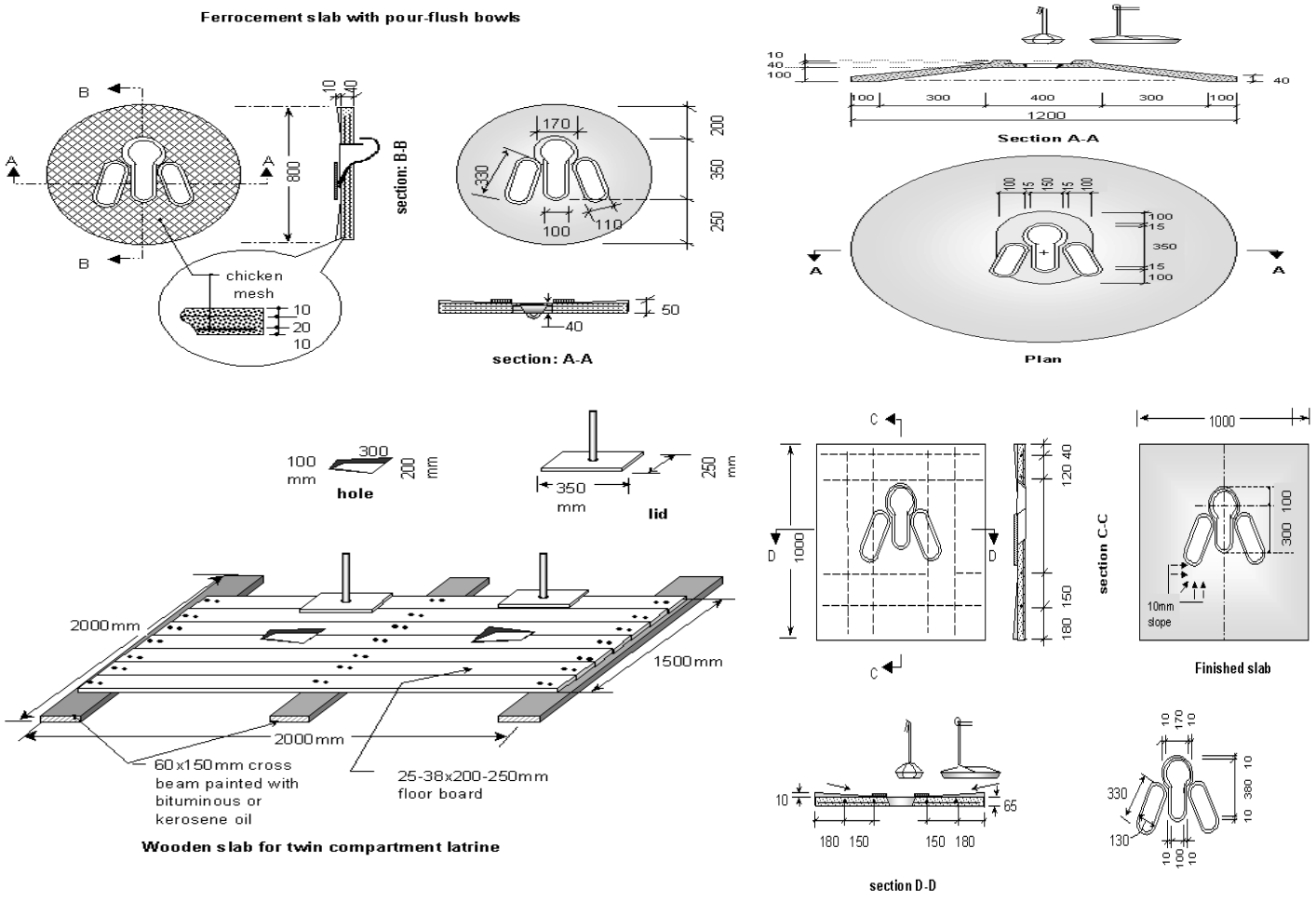
Sub-Structure of Emergency Latrines for the Shelters

Pit digging, raising and lining:

- In flood prone areas, the top of the pit and the superstructure should be raised above the flood level. If the latrine is built on a raised plinth, it should be as high as the plinth of the house. In hilly areas or raised households, latrines can also be elevated on bamboo or wood stilts.
- The pit can be on-set (directly below the superstructure) or off-set (apart from the superstructure, or a few meters below if the superstructure is on stilts). For permanent

latrines, the pit should be big enough for a family of 5 to use the latrine at least 1 year before it is full.

- The pit should be lined if the soil is unstable. In emergencies, plastic rings might be used. Ideally, use reinforced concrete rings (standard size: 12" high; 30" outside ∅; 1.5" thick), especially for on-set latrines. Alternatively, old drums, clay rings, wood planks, bamboo sticks or mats, can be used as lining material. If ground water is very shallow, pits can be doubled lined with plastic sheets, or sealed containers can be used as pits (metal culvert, closed drums, etc, needs regular and safe emptying.
- When using standard concrete rings, at least 5 pieces should be used (e.g. 2 years before a family of 5 fills it). If the water table is too high, at least 3 rings should be used. In latrines elevated on stilts with a suspended pathway, up to 7-8 ring might be necessary.
- The rings above ground level should be covered with soil (plinth) or sealed with mortar.



Slab:

- In emergencies, thick, solid plastic slabs can also be used. Ideally, use reinforced concrete slabs (circular or square, at least as large as the rings / pit), fitted with a pour-flush plastic pan including a water-seal.
- Alternatively, slabs can be made of wood or bamboo, if possible covered with an impermeable material (oil cloth, tarpaulin, thick plastic sheet). In water scarce areas, the water seal might be replaced by a lid or a flap system to cover the hole and ensure the inside of the pit is isolated from the outside.
- If the pit is off-set, the slab should be put on at least one ring to have a stable base.
- If the pit is off-set and/or water is scarce, the water seal can be replaced by a lid or a flap.

Superstructure and pathway:

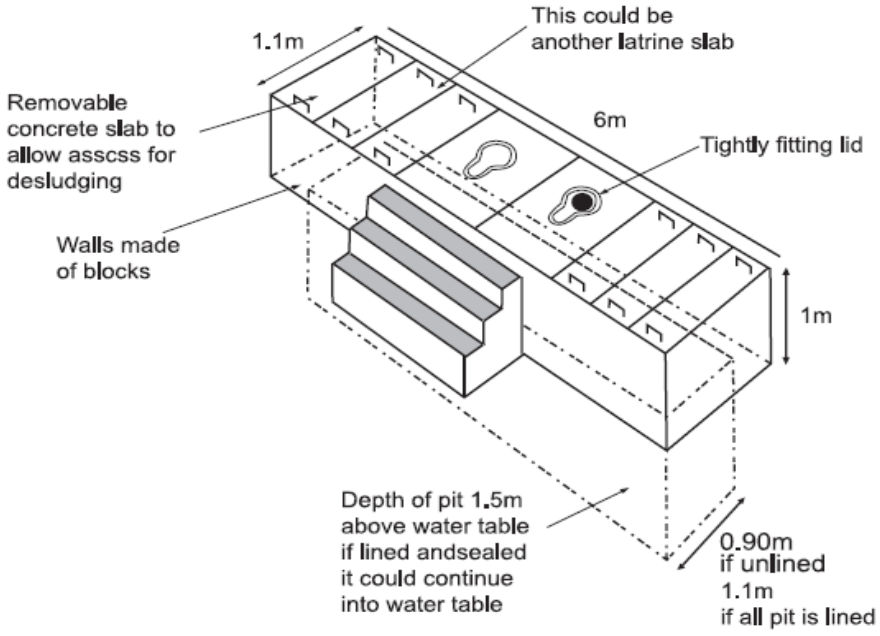
- Poles can be in bamboo, wood, concrete or metal
- The wall should be as solid and opaque as possible, using vegetal mats, dark plastic sheets or cloth, or CI sheets (not cyclone prone area) properly nailed or attached to the poles.
- Roof (if possible CI sheet, otherwise tarpaulin, plastic sheet or cloth or vegetal mat)
- Steps or pathways to go to latrines can be made using clay, bricks, sand bags on the ground; or bamboo, wood above the ground. The pathway must be at the same level than the latrine, above the flood level.

2.4.7 COMMUNAL LATRINES (ON-SET / OFF-SET)

Communal latrines should have the same basic characteristics than households ones except that:

- The pits should be big enough for the intended number of users and the estimated period of use of the latrines. To design the volume of the pit, count that each user will fill the pit at the rate of 40 Litres/year (for latrines where water is used for anal cleansing). Make the pit 0.5 metres higher that the dimensions previously calculated for the latrine not to be completely full. Pits can be doubled. In emergencies, if the water table is too high, large containers/tanks (PVC tank, Oxfam tank, etc) can be used to collect the excreta (but need regular and safe emptying.
- The slabs should be more solid and easy to wash as they will be used by many people. Concrete or plastic slabs are better than wood or bamboo ones.

- The superstructure also should be more solid and provide absolute privacy. Using CI sheets for the walls and the roof is better than plastic sheets. Vegetal mats should not be used for communal latrines as they have little holes. Men and women should always use different latrines. All doors should have an internal lock.
- Even more than household latrines, communal ones have to take into account special needs (children, pregnant women, elderly people, and disabled people).



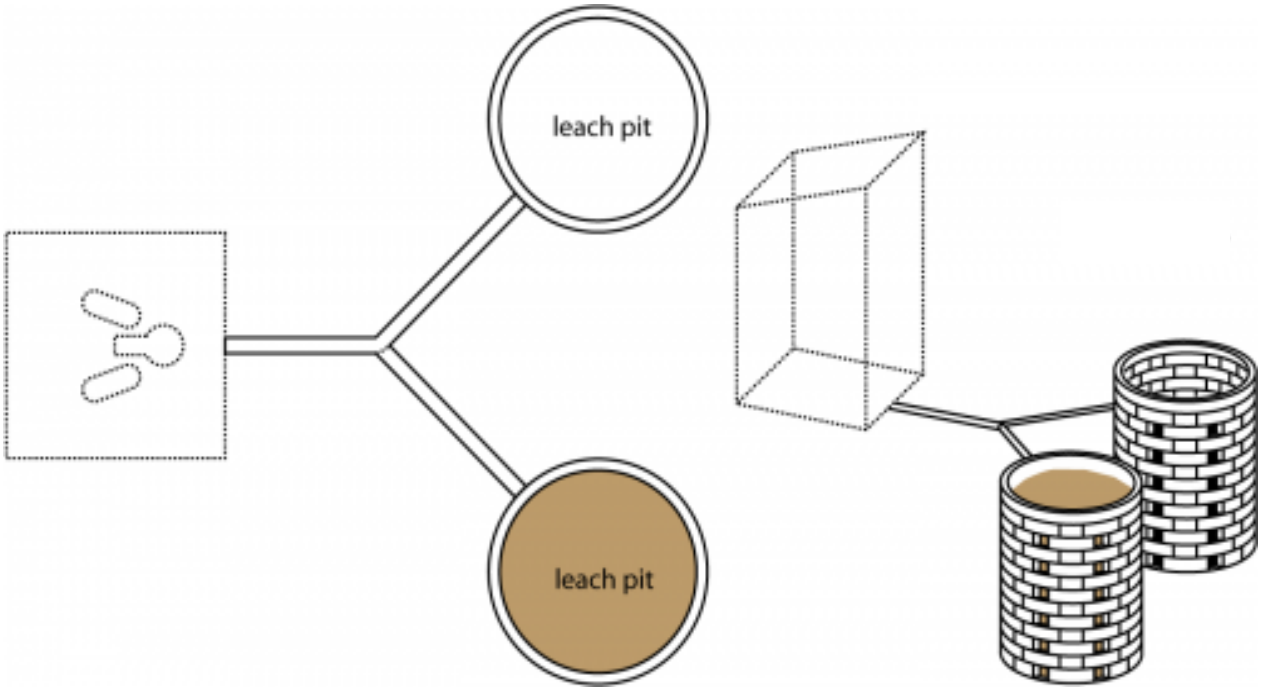

Examples of raised off-set communal latrines, with single or double pits

2.4.8 COMMUNAL LATRINES (TWIN OFF-SET)

During any kind of disaster many people live in a concentrated place. The defecation of people all on a sudden increases lot and in that case accumulation of faecal sludge becomes high. Emptying of the

dug pit become frequent and safe disposal of the sludge is difficult. On the other hand latrine unit can't be stop for emptying of the dug pit. Sometime, particularly in land scarce areas like embankment, required numbers of latrine construction become difficult. In this case, **twin offset pit latrine** is a good solution for managing the defecation of many people.

This technology consists of two alternating pits connected to a pour flash toilet. The black water (and in some cases gray water) is collected in the pits and allowed to slowly infiltrate into the surrounding soil. Over time, the solids are sufficiently dewatered and can be manually removed with a shovel and reused on-site, much like compost, to improve soil fertility and fertilize crops. Although most pathogens are filtered during soil infiltration or die-off with time and distance, there remains a risk of groundwater pollution, particularly in densely populated areas or in areas with a high groundwater table. However, during disaster time, there is less scope to decompose the sludge and after filling up of one pit, the alternate pit is started to be used and before filling of the second pit, the first pit is emptied and make ready for alternate use. The constructions of dug pits are similar to a single offset pit latrine. The diagram of Twin Off Set pit latrine are shown below.



2.4.9 LATRINES FOR PEOPLE WITH SPECIAL NEEDS (CHILDREN, DISABLED, ELDERLY)

On the right, handles for children / disabled to hold (it is preferable that people use the right hand to hold these, as people usually use the left one for anal cleansing).
For children, the hole should not be too big and the latrine not too dark. The internal lock on the door should be at a height they can reach.

Below, handles and bucket latrines for disabled and elderly people.

2.4.10 HANDWASHING DEVICES

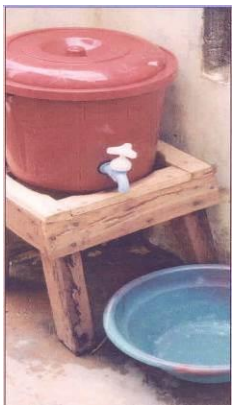
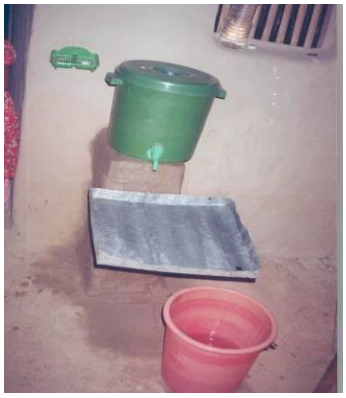
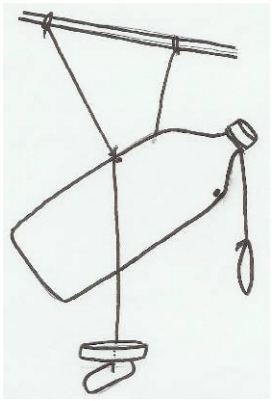
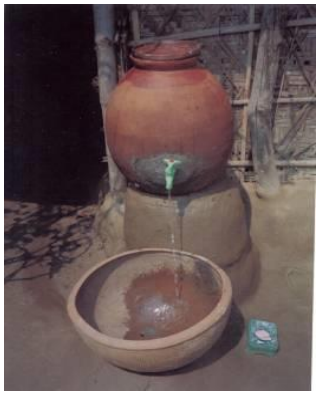
Handwashing after defecation being so important to prevent various diseases, including diarrhoea, that latrine users should be given the means to wash their hands properly. In household latrines, people can use the badna and soap or ash, but as handwashing is more

efficient when scrubbing both hands together, handwashing devices are preferable. In communal latrines, handwashing devices should be provided.

Handwashing devices basically consist of:

- A water container (jerrycan, metal or plastic tank/drum, clay pot, bottle, etc) fitted with a solid tap (preferably metal for communal devices, otherwise plastic) with washer
- A stand to hold the container (wood, bamboo, stone, bricks, etc)
- A container, or soakaway pit filled with gravel or brick chips to collect or drain the wastewater




2.4.11 DESLUDGING THE LATRINE PITS/VAULTS

Apart from latrines with twin pits (making compost in one pit when it is full) and latrines separating urine and excreta (re-use for irrigation and agriculture after composting, more

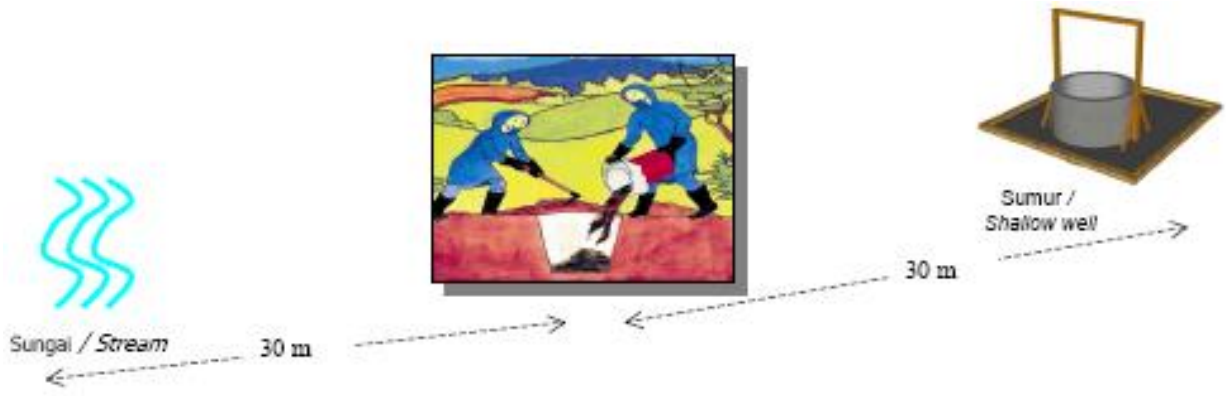
expensive and difficult to implement in emergencies), **fresh excreta has to be desludged safely from latrines/vaults and disposed of properly**.

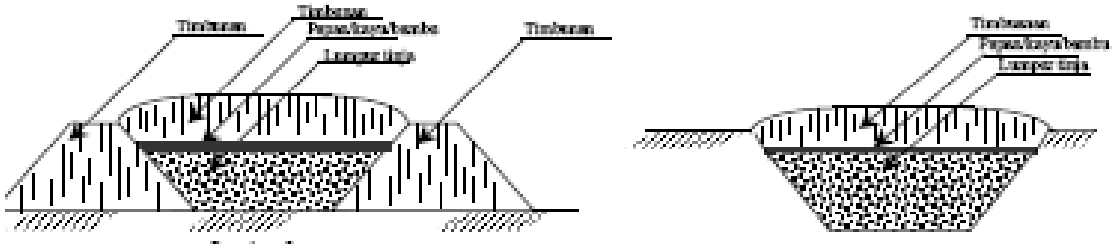
This is can be done:

- By digging a new pit – if possible lower – next to the latrine pit, connecting both pits together with a pipe or a hole and letting the sludge flow by **gravity** in the new pit, then covering the pit with soil.
- **Manually**, using buckets and shovels to extract the sludge from the latrine pits, then disposing of it in a new pit to be covered with soil.
- Using various types of **sludge pumps**, presented below, to extract the excreta from the latrine pit, then disposing of it in a new pit to be covered with soil.
- For large containers collecting excreta from one or several communal latrines, the sludge can often not buried. Specific solutions must be found depending on local conditions.

The desludging workers should have adequate **impermeable equipments (boots, gloves, overalls)**, to protect themselves from the sludge.

The following pictures present how to safely manipulate and dispose of latrines sludge.





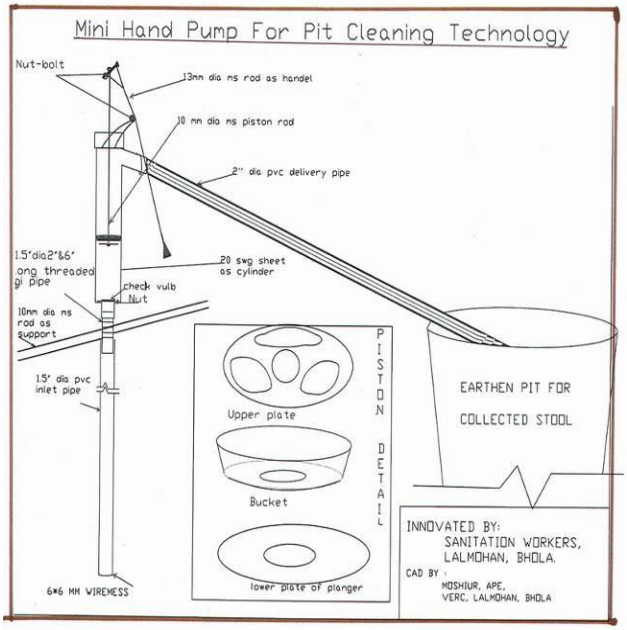
The sludge should NEVER be drained in ponds or rivers !

It must be disposed of properly and isolated from surface and ground water sources and the environment in underground / above ground pits. These pits should follow the same technical

requirements than latrines pits. They should be marked with poles so that people do not dig there before 6 months to 1 year.

On the right, a latrine desludging handpump developed by Wateraid/VERC for Bangladesh. It was developed recently and still needs field testing

Made of PVC, it only costs a few hundreds takas and helps protecting the health of the workers desludging latrines.



Below, Oxfam's poo pump for household latrines, similar to Wateraid/VERC's desludging handpump (Design and information: http://desludging.org/), was already tested and is ready for dissemination.

On the left, the vacutug is a UN-Habitat mechanised desludging technology for urban slums. It was already tested in Bangladesh by WaterAid / DSK.

Note: if a latrine needs to be abandoned/destroyed for some reasons, the pit should be backfilled with soil, and marked with poles so that people do not dig there before 6 months to 1 year.

Guideline 3: Inclusiveness Guidelines for Relief and Early Recovery

GUIDELIBE OUTLINE

3.1 Introduction

Importance of Gender/Inclusiveness considerations for WASH

During an emergency, well-designed WASH programmes and facilities can help to keep affected populations safe from violence. Conversely, WASH programming that is poorly planned and insensitive to gender dynamics can exacerbate risk of exposure to sexual and other forms of gender-based violence (GBV). This is particularly true for women, girls and other at-risk groups such as Persons with Disabilities (PwD), older persons and socially marginalised groups (indigenous people, casts, etc.), who may be disproportionately affected by WASH issues.

Women, girls and other at-risk groups face an increased risk of sexual assault and violence while travelling to WASH facilities (including water points, cooking facilities and sanitation facilities) that are limited in number, located far from homes or placed in isolated locations. In some emergencies, women and girls must travel through unsafe areas or after nightfall to relieve themselves.

In shelter lack of lighting, locks, privacy and/or sex-segregated sanitation facilities can increase the risk of harassment or assault against women and girls. Inadequate building materials (such as weak plastic sheeting) and poor design (such as open roofs in sites where there is an embankment located above) can also increase this risk. In situations of displacement, tensions with receptor/host communities over water resources can lead to violence against IDPs/refugees, especially women and girls who are most often responsible for collecting water. Women, girls and other at-risk groups may face exploitation at the hands of WASH staff in return for soap, sanitary materials, water or other WASH supplies.

For the above reasons, the WASH cluster has a great opportunity and responsibility to design and implement its activities in ways that do not increase, but reduce the risk for vulnerable groups to experience incidents of violence.

3.2 Assessments

Wherever possible, assessments should be inter-sectoral and interdisciplinary, working in partnership with other sectors as well as with GBV specialists. Females, including those from marginalised groups, need to be consulted about their specific needs and priorities to inform the design of WASH facilities and services. Single-sex focus group discussions with same-sex facilitators should be carried out. Assessment and response teams should have balanced representation of females and males.

Cultural and Community Norms and Practices

1) What are the gender- and age-related responsibilities related to WASH (e.g. water collection, storage and treatment; waste disposal; general cleaning; taking care of children's hygiene; laundry; maintenance and management of WASH facilities; etc.)?
   - What are the different uses for water, especially by women and girls (e.g. drinking, cooking and sanitation, etc.)?
   - What are the patterns of water allocation among family and community members (including sharing, quantity and quality)?
   - How are decisions made about the use of water? Who makes these decisions?
2) What are the preferences and cultural habits related to the type of toilets, bathing facilities, laundry, kitchens and water points to be constructed?
   - What are the relevant cultural, ethnic, and gender differences related to WASH practices in the affected community (e.g. different anal cleansing practices; washing facilities close to prayer rooms; etc.)?
   - Are there recommendations for how certain roles related to WASH practices should or could change in the emergency?
3) How does the crisis impact the access of women, girls and other at-risk groups to WASH facilities?
   - How does it affect their personal hygiene practices as compared to before the emergency?
   - What are the barriers that keep women, girls and other at-risk groups from using toilets, bathing or collecting water (e.g. lack of privacy; fear of harassment; unsafe times of day or night; ligthing)?
   - Has the crisis created new or additional WASH needs—particularly arising from physical injuries and trauma?

Infrastructure

4) How often do women, girls and other at-risk groups collect water or use other WASH facilities?
   - What time of day?
   - How many hours per day are spent travelling to and from WASH facilities?
   - Is the route to be travelled safe?
   - Is there a system of safety patrolling or a community surveillance system of potentially insecure areas?
   - Are children, especially girls, prevented from attending school as a result of WASH-related responsibilities e.g. collecting water)

3.3 Planning

Areas Related to WASH PROGRAMMING

1) What is the ratio of male to female WASH staff, including in positions of leadership?
   - Are systems in place for training and retaining female staff?
   - Are there any cultural or security issues related to their employment that may increase their risk of GBV?
2) Are women and other at-risk groups actively involved in community activities related to WASH (e.g. community water management and sanitation committees, etc.)? Are they in leadership roles when possible?
3) Are the lead actors in WASH response aware of international standards (including these Guidelines) for mainstreaming GBV prevention and mitigation strategies into their activities?
   - Is training provided to WASH staff on issues of gender, GBV, women's/human rights, social exclusion and sexuality?
4) Do WASH-related community outreach activities raise awareness within the community about general safety and GBV risk reduction?
   - Does this awareness-raising include information on survivor rights (including to confidentiality at the service delivery and community levels), where to report risk and how to access care for GBV?
   - Is this information provided in age-, gender-, and culturally appropriate ways?
   - Are males, particularly leaders in the community, engaged in these community mobilization activities as agents of change?
5) Are discussion forums on hygiene and sanitation age, gender, and culturally sensitive? Are they accessible to women, girls and other at-risk groups (e.g. confidential, with females as facilitators of women's and girls' discussion groups, etc.) so that participants feel safe to raise GBV issues?

3.4 Recommendations for Programming

1. Involve women and other at-risk groups as staff and leaders in the sitting, design, construction and maintenance of water and sanitation facilities and in hygiene promotion activities (with due caution in situations where this poses a potential security risk and/or increases the risk of GBV)

Strive for 50 per cent representation of females and employ persons from at-risk groups within WASH programme staff. Provide women with formal and on-the-job training, as well as targeted support to assume leadership and training positions.

Ensure women (and where appropriate, adolescent girls) are actively involved in community based WASH committees and management groups. Be aware of potential tensions that may be caused by attempting to change the role of women and girls in communities and engage in dialogue with males to ensure their support.

2. Implement strategies that increase the availability and accessibility of water for women, girls and other at-risk groups

Persons with disabilities and older persons face additional challenges when trying to safely access WASH facilities in humanitarian emergencies. Access to WASH facilities should be promoted through physical accessibility, as well as community outreach that encourage them to use these facilities. Information, education and communication (IEC) materials for sanitation or hygiene should be adapted so that they are accessible for older people and PwD. Regular meetings should be held with older persons and PwD within the community to monitor safety and access issues. Accessibility measures (in both design and utilization) should be considered for water points and distribution; water pump design; water containers; and latrine and bathing/shower unit design with ramps at entry; more space inside the cubicle; latrine seats and handrails; etc.).

Strive to place water points no more than 500 metres from households, in accordance with Sphere standards. When water cannot be made available in kitchens, design kitchens that are no more than 500 metres from water points. Ensure hand pumps and water containers are women- and girl-friendly, and are designed in ways that minimize the time spent collecting water. In situations where water is rationed times should be convenient and safe for women, girls and other at-risk groups, and users should be fully informed of when and where water is available.

There should be enough water points available to prevent fighting at the pumps and/or waiting for long periods in order to get water. Ensure measures in place to prevent sexual exploitation in exchange for access to water.

In IDP/refugee settings, work with receptor/host communities to reduce tension over shared water resources, as this can exacerbate the risk of attacks against those collecting water.

3. Implement strategies that maximize the safety, privacy and dignity of WASH facilities

Build upon indigenous knowledge and practices to construct age-, gender-, and culturally sensitive WASH facilities (including toilets, laundry, kitchen and bathing facilities). In consultation with affected communities, locate WASH facilities in safe locations and within safe distances from homes (e.g. toilets no more than 50 metres from homes with a maximum of 20 people using each toilet, in accordance with Sphere standards). Ensure they are accessible to persons with disabilities. Ensure adequate lighting both inside and outside WASH facilities. Identify strategies to ensure lighting even without electricity.

Construct culturally appropriate toilets and bathing facilities that are family-based or sex-segregated. Clearly label these facilities with pictures as well as text, and equip them with doors, sturdy internal locks, privacy fencing and other safety measures. Use sex-disaggregated data to plan the ratio of female to male cubicles (using the approximate ratio of 3:1, in accordance with Sphere standards).

In settings where affected populations must travel some distance to reach WASH facilities, develop strategies to enhance safety along the routes (e.g. safety patrols along paths; escort systems; community surveillance systems; etc.). Work with communities security personnel

and other relevant sectors (such as livelihoods, CCCM, and protection) to develop these strategies. In situations where women, girls and other at-risk groups feel too unsafe to use toilets and other WASH facilities after dark, consider making provisions at the household level (e.g. potties, bucket latrines, etc.).

4. Ensure dignified access to hygiene-related materials

Consult with women and girls to identify the most culturally appropriate materials.

Distribute underwear, menstrual hygiene supplies and other sanitary supplies at regular intervals throughout the emergency and to any new arrivals.

Include bins for disposable sanitary supplies in female toilets to prevent women and girls from having to dispose of their sanitary supplies in locations or at times that increase their risk of assault.

Support the sustained availability of these supplies post-emergency (for example, undertake a market assessment to identify potential opportunities for local production of sanitary supplies as a micro-enterprise).

Ensure that the timing and process of distributing these materials does not place women and girls at a higher risk of GBV.

Ensure dignified and confidential access to incontinence pads for male and female survivors of sexual assault who have suffered urethral, genital or rectal damage.

Include bins in male toilets for disposable incontinence pads to minimize stigmatization of male survivors of sexual assault.

Hygiene and Dignity Kits

Hygiene kits are often distributed by WASH programmes and others at the onset of emergencies. These kits include items such as soap, sanitary materials for women and girls, toothbrushes and toothpaste.

Dignity kits are often distributed by health or shelter, settlement and recovery actors. They focus on promoting the dignity, respect and safety of women and girls by providing age-, gender-, and culturally appropriate garments and other items (such as headscarves, shawls, whistles, torches, underwear and small containers for washing personal items) in addition to sanitary supplies. It is essential that hygiene actors work closely with logisticians, health actors and other actors to maximize the distribution potential of all of these items and avoid gaps or unnecessary duplication of efforts. Hygiene and dignity kits must also be designed in partnership with the affected community to identify the most

Guideline 4: Hygiene Promotion Guidelines for Emergency Relief and Early Recovery

GUIDELINE OUTLINE

4.1 INTRODUCTION

4.1.1 SIGNIFICANCE OF HYGIENE PROMOTION

- Disasters or conflicts can damage or destroy water and sanitation infrastructure, wash away homes and assets (including the WASH related ones), and displace people. In these sudden and extreme situations, people are more vulnerable to WASH related diseases (like diarrhoea, typhoid, jaundice, skin diseases, etc). They sometimes exhaust the means to conduct safe health and hygiene practices (no access to safe water, sanitation and WASH related NFIs) and **Finding a shelter, food or cash might be of higher priorities to them than these safe hygiene practices**.
- WASH Non Food Items (NFIs) distributions and water and sanitation responses to the emergency give people back access to the means to perform safe health and hygiene practices. But **promoting hygiene is also necessary to ensure the people do use the NFIs, water and sanitation facilities, and that they use them in a way that protects their health as well as other people's health**.
- Hygiene promotion is a group of methods and activities to raise people's awareness and encourage them to practise safe hygiene practices. Hygiene is the way people interact with water and sanitation facilities, food, solid waste, vectors, menstruations and related NFIs. Hygiene practices are considered safe when they protect health (theirs and other's), as well as their environment ("public health").
- **Hygiene promotion is *different* from community mobilisation/participation, and from community management**. Hygiene promotion is one of the 3 WASH pillars, while community mobilisation, participation and management are cross-cutting issues on which each of the 3 pillars needs to be based (see diagrams in the SOF) to ensure water, sanitation and hygiene responses do satisfy the real needs of the people, in a way that is culturally acceptable to them, that ensures their sense of ownership, their sustainable operation and maintenance of the water and sanitation facilities, and their sustainable practice of safe hygiene practices.

4.1.2 Organization of Hygiene Promotion

- Emergency and early recovery Hygiene Promotion responses should be as much consistent as possible with **SPHERE guidelines and National hygiene regulations and technical guidelines** (Department of Health, Department of Public Health Engineering).
- Hygiene Promotion responses should always be **coordinated with local authorities and other NGOs** involved *inside* the project area (to avoid duplication) and *around* (for responses to be relatively homogenous, from technical and implementation strategies points of view).
- **Beneficiary communities must always be involved** in the choice and design of the promotion programme of activities, the selection of beneficiaries, and the project implementation strategy. As various groups of people might have different hygiene needs / requirements, women, adolescent girls, children, men, elderly people, disabled people, chronically ill people should all be consulted to ensure the response satisfies their needs and is culturally and socially appropriate as well as gender-sensitive.
- Beneficiaries must be selected according to a **widely agreed upon set of objective and verifiable criteria** in favour of the poorest, most affected and most vulnerable households (but all displaced people should be treated equally). If possible, the list of beneficiaries should be agreed and signed by community leaders and local authorities.
- Whenever possible, Hygiene Promotion responses should be **integrated with NFI distributions, Water and Sanitation responses**. There is no point promoting the use of soap, sanitary latrines or safe drinking water if people do not have access to them. Hygiene promotion responses should also be **coordinated with other clusters (health, nutrition, shelter)**.

4.2 Target Populations

The following table disaggregates the population in various groups that can be targeted by hygiene promotion programmes. They can be targeted separately or, whenever possible in an integrated manner.

Target groups (ranked by decreasing priority)	**Why are they important for hygiene?**
Women (above 18 year old)	They usually are more receptive to hygiene promotion messages, as they are the ones going to fetch water, cooking, caring children, managing other house tasks, having menstruations and educating their daughters, etc. When putting hygiene promotion messages into practice, they are the ones who **can achieve the biggest impact on themselves and their family**.

Target groups (ranked by decreasing priority)	**Why are they important for hygiene?**
Adolescent girls (11-18 year old)	Like women, adolescent girls also participate to housework (water, food, caring children, etc) and **can have a big impact on their family**. Once married, they will have to manage their own family. Hygiene promotion activities with adolescent girls should include messages on safe menstrual management.
Children (Girls and boys, 6-10 year old) and teachers	Children should also be targeted by all hygiene promotion programmes. They **have a higher learning capacity and are more flexible to change their behaviours than adults**. Teachers should also participate or observe these activities, to later repeat or spread the messages delivered, and ensure school latrines and water points are used and maintained (cleaned, soap, etc). Schools (public/private schools, Madrasas) often are the ideal place to reach children and teachers, but unschooled children should also be targeted.
Men	Although less involved in hygiene related activities, men often **have a high authority on their family and manage financial matters** (important to buy soap, ORS, sanitary napkins, etc).
Community leaders	Community leaders (UNOs, Union Chairmen and Members, traditional leaders, watsan committees, etc) also have some authority on the people they represent. They also **often participate to decisions on WASH related infrastructures** (public investment, choice of beneficiaries, safe operation and management, etc).
Religious leaders	Religious leaders (Muslim Imams, Hindu Purohits, Christian Pastors, Buddhist Vantes) also have **some authority on their community**. They can deliver basic hygiene messages during religious ceremonies or during discussions with people. These messages can be supported by religious texts and precepts (Quran, Haddiths, Vedas, Bible, etc).
Specific professional groups/	Health professionals (traditional and conventional), water (water vendors in water scarce areas, caretakers of communal water infrastructures, etc) and sanitation professionals (traditional sweepers or mathors, sellers of water seals, rings and slabs, etc), can also be targeted by hygiene promotion programmes, as **their knowledge and awareness can vary considerably, while they play important roles related to health and hygiene**.

Target groups (ranked by decreasing priority)	**Why are they important for hygiene?**
Teachers	Teachers of the school can play a very vital role in health and hygiene educations. Not only in school, teachers are respected by all groups of people of rural areas. In many topics people go and take their suggestion to solve the problem.

4.3 HYGIENE MESSAGES

The following table lists broad hygiene messages that can be delivered in emergency or early recovery contexts. These have also prioritised, as it is always more efficient to **focus on a few key-messages** to address key unhygienic practices, rather than confusing beneficiaries with too many different messages that they will forget or not put into practice.

Hygiene promotion is important throughout the duration of WASH responses, but it is also **vital when distributing certain types of WASH NFIs, to explain/demonstrate how to use them safely** (especially chemicals like bleach and water purifying tablets).

Generally it takes time and frequent repetition before people change their hygiene habits. **Key messages should be repeated as regularly as possible** to the target population. It is usually more efficient not to focus only on the health dangers of not changing hygiene habits (some diseases can be lethal), but to also **highlight the advantages of practicing safe behaviour** (hands smell nice after soap, latrines with water seal or lid avoid flies and bad smell, drinking safe water avoids stomach aches, diarrhoea, and other diseases).

Safe hygiene behaviours	**Related types of hygiene messages that can be promoted**	**Priority messages** (1=high priority 2=medium priority 3=low priority)	**Necessary when distributing NFIs** (but not only !)	**Remarks**
Handwashing	Washing both hands with soap or ash: after using latrines, cleaning/handling children faeces, before handling or eating food or water.	1	▪ Bathing Soap	**Handwashing should always be promoted as a priority**, as it is the hygiene behaviour that can achieve the greatest health impact.
Safe water collection, transport, storage and retrieval	Using appropriate and clean containers with lids to collect, transport, and consume drinking and cooking water.	1	▪ Jerrycans ▪ Pitchers / Kolsis ▪ Jugs / mugs	Important, as water is often contaminated after collection by bad hygiene practices.
	Safe use and maintenance of: ▪ *household* water treatments technologies and products. ▪ *communal* water infrastructures (but specific management committees must	1	▪ Water purifying sachets / tablets ▪ Alum, bleach (liquid or powder)	Water treatment technologies and chemical should always be distributed with appropriate guidelines and demonstrations. For communal infrastructures, specific management committees must also be set up and trained, see water guidelines.

Safe hygiene behaviours	Related types of hygiene messages that can be promoted	Priority messages (1=high priority 2=medium priority 3=low priority)	Necessary when distributing NFIs (but not only !)	Remarks
	also be set up and trained, see water guidelines).			
Safe excreta disposal	Advantages and importance of using latrines compared to open defecation (security, privacy, flies, smell, health, etc)	1	-	Especially important to beneficiaries receiving sanitary latrines, but can also achieve impact on people having basic latrines, to upgrade them on changing their hygiene behaviours. For communal latrines, specific management committees must also be set up and trained, see excreta disposal guidelines.
	Safe use and maintenance of latrines (*household / communal*), using sandals, water and soap/ash inside or nearby the latrines, importance of water-seal/lid, cleaning/disinfecting regularly.	1	▪ Soap ▪ Badna, bucket for latrines ▪ Sandals ▪ Brush, detergent for latrines	
	Disposing of children faeces safely	1	▪ Small shovels ▪ Potties, nappies	Focus on mothers and older children, taking care of younger ones.
WASH diseases and diarrhoea treatment	WASH related diseases (different type, transmission, faecal-oral route, prevention)	2	-	Useful to understand transmission routes, but maybe better to focus on simpler behaviour messages.
	Using / making Oral Rehydration Salts (ORS)	2	▪ ORS	In emergency context, focus on using distributed ORS. In early recovery, focus on how to make them (salt, sugar, water). This aspect need to be communicated with the health cluster/ medical team working in the areas.
Safe menstrual hygiene, Safe laundry	Why does menstruation happens and how to manage it safely (using clean napkins or cotton cloths, safe washing, drying and storing)	2	▪ Sarees / non-disposable sanitary cloth ▪ Laundry soap	Focus on women and girls. These messages should be delivered in an appropriate, discreet and socially acceptable manner.

Safe hygiene behaviours	Related types of hygiene messages that can be promoted	Priority messages (1=high priority 2=medium priority 3=low priority)	Necessary when distributing NFIs (but not only !)	Remarks
Body hygiene	Importance and advantages of body hygiene (body, nails, teeth, hair)	3	▪ Bathing soap ▪ Nail cutters ▪ Toothbrushes/paste ▪ Shampoo/combs	Important for dignity, personal comfort, but will generally not achieve significant health improvements.
Safe food handling and preservation	washing food, dishes and cooking with safe water, eating fresh food, covering dishes and left-overs to avoid flies	2	▪ Bathing soap ▪ Dishes with lids, plates with covers, cutlery	Important as flies and food can be significant health/diarrhoea vectors.
Solid waste	Safe disposal of solid household , community, medical waste (composting, burning, safe dumping)	2	▪ Big shovels and picks ▪ Impermeable boots, gloves and overalls	Can be promoted at both household and community levels (waste and drainage groups or committees, possibly cash for work in emergencies).
Drainage	Easing drainage of stagnant water, control of vectors breeding sites	2		
Vectors control	Prevention, protection from mosquitoes, flies, rodents, fleas, etc*(if needed)*	2	▪ Mosquito nets	Mainly for acute diarrhoea, malaria or dengue prone regions.

4.4 HYGIENE PROMOTION ACTIVITIES AND MATERIALS

The following table lists various types of activities that can be used to promote safe hygiene practices. Generally speaking, it is more efficient to use more than one of these. Hygiene promotion activities are usually more effective when they **focus on a limited number of interested participants** (for instance women), and when they are **fun and participative** (discussions with jokes, games, demonstrations, appropriate, communication materials, etc).
Activities can be conducted through various communication channels:
- either directly by trained **Hygiene Promoters** from the implementing agencies (female or male, depending on the target population and the types of messages to be delivered),
- indirectly by **Community Hygiene Volunteers**, previously trained by the implementing agencies
- indirectly by **other beneficiaries** (for instance, child to child, or child to parents approaches)
- by **combinations** of the above.

As behaviour change takes time, **key-messages should be repeated regularly**, on a period as long as possible, if possible using different promotion activities, materials and communication channels.

Types of activities	Remarks	Examples	Type of materials needed
Group hygiene sessions	▪ Easy to organise and can quickly cover a large population ▪ Sessions should be repeated several times (a single session would be little effective) ▪ Participative exercises and discussions are more effective than formal lectures	▪ Monthly sessions with 20 women or adolescent girls, discussing only a few different messages each time and including demonstrations (see below) ▪ Monthly hygiene sessions with children, using games, theatre plays, songs, etc (see below)	▪ 5F diagram, flash cards, 3 piles sorting cards, leaflets, etc. Should be illustrated with realistic drawing or pictures, big enough to be seen by a group
House visits	▪ More demanding than group sessions (staff, time), but more effective as they focus on a little number of beneficiaries	▪ Regular visits to individual households, or to groups of less than 5 households or women, discussing only a few different messages each time and including demonstrations (see below)	
Demonstrations	▪ To show beneficiaries how to use various NFIs, ▪ To illustrate the difference between good and bad hygiene practices ▪ Should be very visual, participative and easy to understand.	▪ Demonstration on how to use water purifying tablets or sanitary cloths ▪ Demonstration showing the difference of colour of water after washing hands 2-3 times without soap, then with soap	▪ Depends on messages (water purifying sachet, soap, sanitary cloths, etc)

Types of activities	Remarks	Examples	Type of materials needed
Theatre plays, puppet shows	▪ Can deliver basic messages in a very fun and participative way ▪ People remember more and talk more about what is fun than what is not ▪ Can be used during group sessions, especially with children	▪ Theatre play comparing 2 characters, one with safe hygiene behaviours and the other doing wrong things. ▪ Puppet show with various "hero-puppets" (Soap, Alum/fitkiri, ORS, etc) fighting against and winning over "bad-puppets" (bacteria/diarrhoea, bad smell, etc)	▪ Hygiene NFIs ▪ puppets representing funny characters (people, soap, bacteria, etc)
Songs	▪ Fun and participative, easy to remember ▪ Can be broadcasted on radio, or on rickshaws with speakers	▪ Song on handwashing, with easy-to-remember lyrics and music (for instance based on a famous song) ▪ Sung by children at school, in fair, markets, etc	▪ Traditional music instruments
Hygiene competitions	▪ Competition can motivate some people to do their best (but can de-motivate others if too competitive) ▪ Can be coupled with other activities	▪ Hygiene drawing competition in a school, or health competition between various villages, with small but motivating prizes for winners	▪ Depends on target groups (pencils, posters, etc)
Community hygiene fairs	▪ Fun and participative ▪ Can target a whole village at once	▪ Village fair with a mix of activities like theatre plays, songs, competitions / games with prizes, etc	▪ Depends on the activities
T-shirts, caps or bags distributions	▪ Easy to make, but can be expensive ▪ People value gifts and will continue wearing and using them after the project	▪ Distribution (to beneficiaries, hygiene promoters or volunteers, winners of competitions, etc) of T-shirts, caps or bags with hygiene drawings / messages.	
Billboards, wall painting in public places	▪ Easy and quick to make, but limited impact ▪ Beneficiaries should be involved in the choice of drawings / messages	▪ Painting of simple drawings and messages on water infrastructures (PSF, Rainwater tank, etc), public walls (schools, UP, hospital, etc) or on billboards in busy streets / markets	▪ Water and UV resistant paint
Leaflets, stickers distributions	▪ Easy to print and quick to distribute, but limited impact ▪ Messages should be simple and illustrated with drawings	▪ Stickers given to beneficiaries to stick in their latrine, kitchen, on their water container, household water treatment technology, etc.	▪ Printed leaflets or water-resistant stickers

A few examples of hygiene activities are presented next pages.

Women group hygiene session

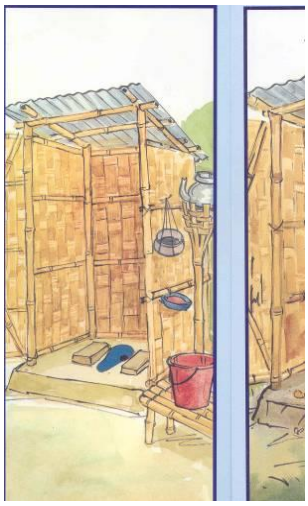
Hand washing demonstration

Community and religious leaders hygiene training

Hygiene promotion billboard

Children hygiene puppet show

Some of the hygiene promotion messages are difficult to provide during disaster time. Therefore, in the disaster prone areas these messages need to be delivered/ demonstrated regularly to create awareness among the people.



Visual sanitation and hygiene promotion material

Note: Sample hard copies or soft copies of hygiene promotion materials (3 piles sorting, flash cards, leaflets, stickers, etc) can be asked for free to all the major WASH stakeholders (UNICEF, NGO Forum, WaterAid, CARE, Oxfam, etc). Any Organisations like NGO can also sometimes print and sell large quantities of materials, upon request

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Visual sticker to promote water purifying sachets

Guideline 5: WASH Non-Food Item (NFI)Guidelines for Emergency Relief and Early Recovery

GUIDELINE OUTLINE

5.1 INTRODUCTION

NFIs are items that cannot be eaten, and that can be **distributed in emergency or early recovery situations** to the people affected and possibly displaced by natural disasters.

WASH NFIs are items that enable people to **have safe hygiene practices, use water and sanitation facilities safely, and have a safe environment**. They must be suitable for local conditions, culturally and socially appropriate, and gender sensitive.

The aim of WASH NFI distribution is to enable people affected by emergency situations to have safe water, sanitation and hygiene related practices, and therefore to protect themselves from WASH related diseases. The WASH NFIs are usually distributed in "**NFI kits**".

5.2 DISTRIBUTION OF NFIS

5.2.1 NFI DISTRIBUTION PROTOCOL

- Distributions of NFIs should always be **coordinated with local authorities and other NGOs** *inside* the distribution area (to avoid duplication) and *around* the distribution area (to maintain homogeneity and to avoid tensions between communities).

- **Target communities must always be involved** in the choice of the NFIs, the selection of beneficiaries, and the design and schedule of distributions. As various groups of people have different requirements, women, children, adolescents, men, elderly people, disabled

people, and chronically ill people should all be consulted to ensure the NFIs satisfy their needs and are culturally and socially appropriate as well as gender-sensitive.

- **Beneficiaries** must be selected according to agreed upon **objective and verifiable criteria** in favour of the poorest, the most affected and the most vulnerable households (but all displaced people should be treated equally).

- NFIs should systematically be distributed together with **appropriate and visual guidelines, trainings and demonstrations**, so that people use them properly and safely.

- High demand for NFIs in the communities can sometimes create tensions before, during and after distributions. Distributions must ensure the **security** of the beneficiaries and the distributing staff.

5.2.2 NFI Distribution Priorities

The following table lists safe hygiene practices and related types of WASH NFIs to be distributed.

- **Distribution priority** indicates the most important types of NFIs to distribute in terms of time, financial, and logistical constraints.

- The minimum technical and quality standards of each NFI are given in following tables.

Safe hygiene behaviours	Related types of NFIs that can be distributed	Distribution priorities (1 = high, 3 = low)	Emergency NFIs (≤ 6 weeks after emergency)	Early recovery NFIs (≥ 6 weeks after emergency)
Hand/body washing	Soap for hand/body washing	**1**	▪ Bathing soap bars	
Safe water collection, transport, storage and retrieval	2 appropriate water containers with lid	**1**	▪ Plastic jerricans ▪ OR plastic buckets with lid ▪ OR metal pitchers	▪ Metal pitchers only
	Household water treatments (HWT)	**1**	▪ Water purifying tablets ▪ OR Alum AND bleach, water purifying tablets	▪ Permanent community or household water technologies (*not NFIs*)
	Jug / mugs	2	▪ Plastic jug AND mugs	
Safe excreta disposal	Sandals to be used in latrines	2	▪ Sandals	
	Water containers inside the latrines	2	▪ plastic badna / flushing pot ▪ AND plastic bucket with lid (as water reservoir in the latrines)	
	Tools to dispose of children faeces safely	**1**	▪ small shovel OR/AND plastic potty ▪ OR/AND non-disposable nappies	
	Tools and detergents to clean latrines	2	▪ small toilet brush ▪ AND toilet detergent, bleaching powder or equivalent	
Safe menstrual hygiene	Sanitary napkins/cloths	**1**	▪ user-friendly, non-disposable sanitary napkins/cloths	
Safe laundry	Soap for laundry	2	▪ Laundry soap bars	
Body Hygiene	Gamsa/towel	3	▪ Gamsa/towels	
	Tooth hygiene NFIs	3	▪ toothpaste/powder ▪ OR/AND toothbrushes (only if appropriate, see below)	
	Nail hygiene NFIs	2	▪ nail cutter(without knife)	
	Hair hygiene NFIs	3	▪ soap ▪ AND Comb / hairbrush	
Safe food handling and preservation	Dishes with lids	3	▪ Metal cooking pans with lids ▪ OR/AND plastic containers with lids	

Safe hygiene behaviours	**Related types of NFIs that can be distributed**	**Distribution priorities** (1 = high, 3 = low)	**Emergency NFIs** (≤ 6 weeks after emergency)	**Early recovery NFIs** (≥ 6 weeks after emergency)
	Plates and covers	3	▪ set of plastic plates with covers	
	Cutlery	3	▪ set of metal spoons	
Safe dish washing	Soap for dish washing	3	▪ dishwashing soap	
Vectors control	Vector control NFIs (*if needed*)	2	▪ mosquito nets	
Solid waste, drainage	Solid waste and drainage NFIs (*if needed*,***for communities only, not households***)	2	▪ Big shovels and picks ▪ Impermeable boots, gloves and overalls	

5.3 TECHNICAL STANDARDS FOR WATER NFIS

Items	Minimum technical standards / requirements	Remarks
Plastic jerrycans (≤6 weeks after the emergency)	*Capacity*: 10 -12 litres *Material*: PVC, or equivalent plastic material; UV resistant; withstand temperatures of 0°C to +50°C; suitable for storing drinking water (*foodgrade*). If possible collapsible ▪ *Colour*: Colourless, transparent, or white ▪ *Fittedwith*: Carrying handle, sealer and a screw cap. ▪ *Droptest*: When filled with water at 20°C, container must withstand a 1.8 meter drop on a hard surface (successful if no leakage occurs) Height of the drop is from ground level to bottom of container	▪ Convenient to collect, transport and store water; prevent external contamination but need detergent to clean inside ▪ Ideal for pre-positioning as it is easier to store than pitchers; if not collapsible, jerrycans take more space than bucket, as buckets can be nested one in another ▪ Volume must not be too big(women and children must be able to carry full of water)
Metal pitchers with lid	▪ *Capacity*: 10 litres minimum, 16 litres maximum ▪ *Material*: non-corrosive metal; possible aluminium, stainless steel ▪ *Fittedwith*: narrow neck, lid (attached to neck if possible)	▪ Local and traditionally acceptable item to collect, transport, and store water ▪ Volume must not be too big (women and children must be able to carry full of water)
Plastic Bucket with lid	▪ *Capacity*: 10 litres minimum, 16 litres maximum ▪ *Material*: PVC, or equivalent plastic material; UV resistant; withstand temperatures of 0°C to +50°C; suitable for storing drinking water (*food grade*) ▪ *Colour*: transparent, white, or light colour ▪ *Fittedwith*: electroplated handle, plastic tight lid, plastic tap (ideally)	▪ Convenient to store sufficient quantity of water at household level/in the latrines ▪ Easy pre-positioning. ▪ Volume must not be too big, as women and children must be able to carry full of water.
Water Purifying sachets or tablets (WPS/T)	▪ *Quality*: Sachet or tablets to treat non-drinking water into safe water ▪ *Quantity:* at least 2 weeks supply (2.5 litres/person/day) ▪ Easy to use (instruction to be followed as per manufacturer) ▪ For turbid water, distribute tablets with alum (alum removes turbidity, tablets disinfect water). Sachets would be easier to use. ▪ Must ALWAYS be distributed with appropriate, visual user guidelines and demonstration	▪ WPS/T enable people to disinfect water. Sachets also remove turbidity, while tablets do not. ▪ WPS are ideal for pre-positioning. WPT must be prepositioned with alum. ▪ Easy to distribute in the initial phase of the emergency, before longer term water response can be delivered ▪ The treatment method should be as simple as possible
Alum/fitkiri	▪ *Quality*: crystal alum (household use, more familiar); aluminium sulphate (industrial use) ▪ *Quantity*: 200 gram pouches ▪ Must ALWAYS be distributed with appropriate, visual user guidelines and training/demonstration ▪ Alum only removes turbidity; after using alum, water must be disinfected with water purifying tablets, bleach (to be distributed with alum) or by boiling; sachets are easier to use	▪ Alum treats turbidity but does not disinfect water ▪ In some areas, people regularly use alum to clarify pond or river water ▪ Can be pre-positioned (together with WPTs or bleach) ▪ Treatment method should be as simple as possible
Liquid bleach	▪ *Quantity*: 250-500 millilitre bottle ▪ *Quality*: 3 to 6% solution (depends on brand) ▪ Must ALWAYS be distributed with appropriate, visual user guidelines, training/demonstration, and explanations of potential risks	▪ Bleach can disinfect water, but is not effective in turbid water ▪ Can be pre-positioned (together with alum) ▪ Treatment method should be as simple as possible
Oral Rehydration Salt sachets	▪ *Quality*: WHO formula, sachets to be diluted in 1 or 0.5 litre of water	▪ ORS help the rehydration of people affected by diarrhoea. ▪ Ideally to be used with safe water

	▪ *Quantity*: enough to make 5 litres of ORS solution per person ▪ Must ALWAYS be distributed with appropriate, visual user guidelines and training/demonstration. Emergency coordination with health cluster / medical team must be done	▪ Can also be home made with salt and sugar
Plastic jugs with lid / mugs	▪ *Material*: PVC or equivalent (*food grade*) ▪ *Capacity*: 1 litre for jugs/0.25 or 0.5 litre mugs ▪ *Quantity*: 1 jug, ideally 1 mug per person or at least 3 per household ▪ *Fittedwith*: lid for the jugs, handles for all	▪ Can be used both for water treatment, preparation of ORS and normal scooping/ tumbling use.

5.4 SANITATION NFI STANDARDS

Items	Minimum technical standards / requirements	Remarks
Plastic badna/ flushing pot	▪ *Material*: PVC or equivalent plastic material ▪ *Capacity*: 1 to 2 litres ▪ *Colour*: if possible white or light colour ▪ *Fittedwith*: plastic lid	▪ Local and traditionally acceptable item for anal cleansing ▪ Must not be too heavy when full (so children, old, disabled or ill people can use)
Brush for latrine cleaning	▪ *Traditional brush*: made of strong vegetal fibres OR ▪ *Plastic brush*: long PVC handle, plastic hair, plastic container to hold brush	▪ Keeping latrines clean (without traces of excreta, bad smell) avoids flies and is an important factor for continuous use ▪ Traditional brushes should be preferred if people are already familiar with them ▪ The detergent should be as easy to use as possible and leave a nice smell
Bleaching Powder / latrine cleansing detergents	▪ *Bleaching powder*: minimum 25% strength at the time of delivery, distributed in 250 to 500 g air tight sealed packs OR ▪ *Toilet detergent*: containing bleach, chlorine or other disinfectant; liquid (distribute 0.25 to 0.5 litre bottles) or solid (distribute 250 to 500 grams) ▪ Must ALWAYS be distributed with appropriate, visual user guidelines and training/demonstration, and explanation of potential risks	
Small shovel	▪ *Material*: PVC or metal that can be washed easily (steel, aluminium, painted metal) ▪ *Fittedwith*: short handle (10 to 15 cm) ▪ Must be distributed with appropriate hygiene promotion to mothers	▪ Children's faeces contain even more pathogens and should not be left on open ground ▪ Faeces should be covered with soil or transported into latrines
Plastic potty for children	▪ *Material*: PVC or any other plastic that can be washed easily ▪ *Colour*: if possible white or light colour ▪ Must be distributed with appropriate hygiene promotion to mothers	
Non-disposable nappies	▪ *Material*: dark cotton cloth/katha ▪ *Quantity and size*: at least 4 pieces of 0.25 m^2 each.	
Sandals to enter latrines	▪ *Material*: soft plastic sandals ▪ *Quantity and size*: 2 pairs per household(1 for adults, 1 for children); OR provide cash so that people can buy their size	▪ Wearing sandals is especially important when going to latrines to prevent sanitation related infections (helianthus and worms, but not diarrhoea)

5.5 HEALTH & HYGIENE NFI STANDARDS

Items	Minimum technical standards/requirements	Remarks
Soap For hand/body washing, laundry and dishwashing	▪ Bathing AND laundry soap should be distributed ▪ Dishwashing soap can also be distributed if available ▪ *Quality* (bathing soap): contain antiseptic agent ▪ *Quantity:* in disasters, at least 100 g bathing soap and 50 g laundry soap/person/month (at least during 2 first months); in conflict, refugees/IDPs should receive at least 250 g bathing soap and 200 g laundry soap/person/month (first few months)	▪ Body hygiene (especially the hands) is critical to prevent water-washed diseases. ▪ Wearing clean clothes can also prevent some water related diseases. ▪ Both also are related to personal comfort and dignity.
Non-disposable sanitary cloths	▪ Each woman and adolescent girl should receive appropriate means to absorb and dispose menstrual blood, through distribution of: - 1 new cotton sari (so that old one is used as non disposable sanitary cloth) - OR at least 3 pieces (1 m^2 each) of highly absorbent, dark cotton fabric (to be used as non disposable sanitary cloth) - OR panties and disposable pads for at least 2 menstruations (urban context only, if appropriate) ▪ Saris and cotton cloths must ALWAYS be distributed with appropriate hygiene promotion on safe washing and drying	▪ Materials related to menstrual hygiene must be appropriate to local conditions and the choice of beneficiaries ▪ Distributions should be discreet, ideally in women / adolescent girls groups
Mosquito net (in malaria/ dengue prone areas)	▪ *Material and quality*: cloth or plastic mosquito nets, pre-impregnated with insecticide and distributed with a spare insecticide re-impregnation kit (must ALWAYS be distributed with appropriate, visual user guidelines, training/demonstration, and explanation of potential risks) ▪ *Quantity and size*: ideally (if appropriate) 2 double mosquito bed nets should be distributed (1 for parents, 1 for children) ▪ *Fittedwith*: hooks or any other hanging/attaching devices	▪ Insecticide treated mosquito nets prevent diseases transmitted by mosquitoes, such as malaria, dengue.
Gamsa/ Towel	▪ *Materialand size*: highly water absorbent cloth of at least 0.5 m^2 ▪ *Colour:* light colour if possible ▪ *Quantity:* at least 2 pieces/household(1 piece/family member ideal)	▪ Low priority NFI ▪ Towels are useful items but do not have any direct health impact
Toothpaste/ powder + Tooth brush (if appropriate)	▪ *Material*: standard toothpaste/powder and tooth brushes ▪ *Quantity:* ideally one toothbrush/family member, in case of non availability people should be advised to use clean finger or “Datan”(thin branches of NIM tree) and 50 g toothpaste/person/month	▪ Low priority NFI ▪ To be distributed only where people used before (low health impact) ▪ Some people use sticks instead of toothbrushes
Bathing soap + Hairbrush/ comb	▪ *Material*: standard bathing soap and hairbrush/comb ▪ *Quantity:* one hairbrush/comb per household, and 50 mL bathing soap/person/month	▪ Low priority NFI (low health impact) ▪ Lice combs are of a higher importance in crowded displaced centres and refugee camps (but not in villages)
Nail cutter	▪ *Material*: standard nail cutter ▪ *Quantity:* 1 piece/household	▪ Low priority NFI (low health impact), except where children and women deal with cow dung or dirty work with bare hands (to prevent diarrhoea)
Metal cooking pans with lid	▪ *Material*: solid/thick aluminium or other non-corrosive metal; withstand cooking temperature (>100°C) ▪ *Capacity*: 3 to 5 L (enough to cook for one household) ▪ *Quantity:* ideally 2/household (1 big, 1 medium size)	▪ Not directly WASH NFIs ▪ Can have a positive health impact as food is a vector of WASH related

Items	Minimum technical standards/requirements	Remarks
	▪ *Fittedwith*: handles, metal lids	diseases (diarrhoea, worms, etc.) if not prepared, eaten, or stored properly
Plastic containers with covers	▪ *Material*: solid/thick PVC or other plastic (*food grade*); withstand relatively high temperatures (100°C) ▪ *Capacity*: 1 to 2 L (enough to store leftovers and fresh food) ▪ *Quantity:* ideally 2/household (one big, one medium size) ▪ *Fittedwith*: tight plastic lids (for safe food storage)	
Plastic plates with covers/ dakna	▪ *Material*: solid/thick PVC or other plastic (*food grade*); withstand relatively high temperatures (100°C) ▪ *Quantity:* ideally 1/family member or 5/household ▪ *Fittedwith*: plastic covers (for safe food storage)	
Metal cooking spoons	▪ *Material*: standard cooking spoons and knives; stainless steel or non-corrosive metal; withstand cooking temperature (>100°C) ▪ *Quantity:* ideally 2 cooking spoons /household	

5.6 Technical Standards for Community Clean-Up NFIs

Items	Minimum technical standards/requirements	Remarks
Big metal shovels, picks **Boots, gloves and overalls**	▪ *Quality (tools)*: Solid metal shovels and picks that can be used to clean solid waste and ease drainage of stagnant water ▪ *Quality (protection gears)*: solid, easy to wash, impermeable boots, gloves and overalls to protect workers from waste and water ▪ *Quantity:* depending on the needs (amount of solid waste, number of people, quantity of stagnant water, area of the community).	▪ To be lent/distributed to community representatives or to groups/committees specifically set up for solid waste and drainage (possible link to cash for work).

Note: Other NFIs (blankets, clothes, candles, tarpaulins/plastic sheets, CI sheets, bamboo poles, rope, seeds, farming/ fishing tools, notebooks, pens) were **not included in the above list as they are not related to water, sanitation and hygiene**. WASH NFIs distributions should always be **coordinated** with distributions from other clusters.

5.7 Standards for Household NFI Kits

5.7.1 Emergency Relief Sample Kit Contents

Limited Resources Example: Emergency Relief WASH NFI Kit (distributed to affected/displaced households, < 6 weeks after the emergency)		
Water	**Sanitation**	**Hygiene**
▪ 2 × 10-12 L jerry cans ▪ Water purifying sachets OR alum+ water purifying tablets (2-3 weeks supply to treat ≥ 2.5 L/person/day)	▪ 1 small shovel for safe excreta disposal	▪ Bathing soap (≥ 100 g/person) ▪ Non-disposable sanitary cloths (1 new sari or at least 3 sanitary cloths per woman or adolescent girl)

Comprehensive Example: Emergency Relief WASH NFI Kit (distributed to affected/displaced households, < 6 weeks after the emergency)		
Water	**Sanitation**	**Hygiene**
▪ 2 × 10-12L jerry cans ▪ Water purifying sachets OR alum + water purifying tablets (2-3 weeks supply to treat ≥ 2.5 L/person/day) ▪ 1 jug and 3 mugs	▪ 1 small shovel for safe excreta disposal ▪ Non-disposable nappies (≥ 4 per baby) ▪ 1 plastic badna (2 L) ▪ 1 plastic bucket with lid ▪ 2 pairs of sandals for latrines (1 for adults, 1 for children) OR cash	▪ Bathing soap (≥ 100 g/person) ▪ Laundry soap (≥ 50 g/person) ▪ Non-disposable sanitary cloths (1 new sari or at least 3 sanitary cloths per woman or adolescent girl)

5.7.2 Early Recovery Sample Kit Contents

Limited Resources Example: Early Recovery WASH NFI Kit (distributed to affected/displaced households,>6 weeks after the emergency)		
Water	**Sanitation**	**Hygiene**
▪ 2 × 10-12L aluminium pitchers with lid ▪ 1 jug, and 1 mug per person	▪ 1 plastic potty for safe children excreta disposal ▪ 1 plastic badna (2 L) ▪ 1 plastic bucket with lid ▪ 1 brush and ≥ 250 g/mL bleaching powder/detergent to clean latrines	▪ Bathing soap (≥ 100 g/person) ▪ Non-disposable sanitary cloths (1 new sari or at least 3 sanitary cloths per woman or adolescent girl)

Comprehensive Example: Early Recovery WASH NFI Kit (distributed to affected/displaced households, > 6 weeks after the emergency)		
Water	**Sanitation**	**Hygiene**
▪ 2 × 10-12 L aluminium pitchers with lid ▪ 1 jug, and 1 mug per person	▪ 1 plastic potty for safe children excreta disposal ▪ Non-disposable nappies ▪ (≥ 4 per baby) ▪ 1 plastic badna (2 L) ▪ 1 plastic bucket with lid ▪ 1 brush and ≥ 250 g/mL bleaching powder/detergent to clean latrines ▪ 2 pairs of sandals for latrines (1 for adults, 1 for children) OR equivalent cash value	▪ Bathing soap (≥ 100 g/person) ▪ Laundry soap (≥ 50 g/person) ▪ Non-disposable sanitary cloths (1 new sari or at least 3 sanitary cloths per woman or adolescent girl) ▪ Gamsa/towel (≥2 per household) ▪ 1 nail cutter ▪ Other NFIs depending on needs and budget

Guideline 6: Waste, Drainage and Vector Control Guidelines for Emergency Relief and Early Recovery

GUIDELINE OUTLINE

6.1 INTRODUCTION

- **Floods and cyclones inundate vast areas,** damaging infrastructure, creating **large quantities of liquid and solid waste, and causing significant drainage problems**. Without proper disposal and drainage, liquid and solid waste can contaminate water sources, block drainage channels, **contaminate water sources, and create disease vector breeding sites**. Because of the links with NFIs and WASH, solid waste, drainage and vector control (SWDVC) should always be considered a part of **integrated public health projects**.

6.1.1 ORGANIZING SW, D & VC RESPONSES

- SWDVC responses should be consistent with Sphere guidelines and GoB DPHE regulations and technical guidelines.
- SWDVC responses should always be **coordinated with local authorities and other NGOs** involved *inside* the project area (to avoid duplication) and *around* the project area (to maintain technical and strategic homogeneity).
- **Target communities must always be involved** in the choice and design of the technologies, selection of beneficiaries, project implementation strategy, and construction and maintenance of the facilities. Women, children, adolescents, men, elderly people, disabled and chronically ill people should all be consulted to ensure the response satisfies their needs and is culturally and socially appropriate as well as gender-sensitive.
- Beneficiaries must be selected according to agreed upon objective and verifiable criteria in favour of the poorest, most affected and most vulnerable households and communities (but all displaced people should be treated equally).
- SWDVC responses must systematically be integrated with hygiene promotion activities and water and excreta disposal responses.

6.2 SOLID WASTE

Whenever possible, solid waste should first be minimised (for instance, by distributing NFIs without packaging) or recycled (for instance, using the CI sheets from damaged houses to build latrines). When minimisation or recycling is not possible, solid waste should be disposed of safely, to prevent the contamination of ground and surface water sources, as well as the development of vectors such as flies and rats. Disposing medical waste safely also avoids the transmission of infectious diseases.

The distances and location rules for solid waste disposal sites are the same as those for excreta disposal sites. **Disposal facilities should always be covered** (with soil, slabs, lids, etc.) to prevent contact between the waste and vectors.

Emergency and early recovery responses should be **combined with adequate hygiene promotion** to encourage safe disposal of waste. People might also need specific **tools to clear waste and dig pits**. The staff and community members involved in waste disposal activities should be provided with **adequate training and impermeable, protective gear** (boots, gloves, overalls, etc.). In some cases, transport of waste to disposal sites must be organised.

Types of solid waste	**Remarks**	**Disposal options (for both emergency & early recovery contexts)**
Corpses (humans)	▪ Bury human bodies in a culturally appropriate way, consulting families whenever possible ▪ All corpses should be safely disposed of as early as possible (within 3 days), for sanitary (decomposition and environmental contamination) and psychological reasons (high visual impact)	▪ Burial of human bodies in individual graves, whenever possible ▪ Incineration is possible depending on cultural and religious acceptance ▪ In emergencies only, corpses can be buried in collective graves (try to identify and list bodies before)
Corpses (animals)		▪ Burial of animal corpses in large pits ▪ If necessary, animal corpses can be also burnt (using fuel) ▪ Avoid above ground disposal of corpses
Building waste (CI sheets, bamboo, wood, rubbles, etc)	▪ Building waste creates conditions favourable for vectors to hide and breed	▪ Recycle when possible: rebuild shelters, latrines, repair roads, make concrete for drainage ▪ When it is not possible to reuse, large volumes of waste can be transported and dumped in landfills
Medical waste (infectious, non-infectious / sharps, non-sharps)	▪ Safe disposal of medical waste is critical as it can harm people (sharps) and transmit diseases (infectious waste) ▪ Medical staff should be trained to sort waste by disposal category, at source	▪ Place sharps (needles, syringes, scalpels and surgery tools, glass) in a safety box directly after use, for later burial or incineration ▪ Bury or incinerate other infectious and organic waste (blood stained cloths, plasters, used plastic gloves and placenta, human operation waste, etc.) directly after use/production

Types of solid waste	Remarks	Disposal options (for both emergency & early recovery contexts)
		▪ Treat other non-infectious waste as domestic waste
Domestic waste (organic, non-organic)	▪ Rural households are responsible for managing their own waste but should be given the means to do so ▪ In urban areas, a communal collection system must be put in place, in addition to hygiene promotion and hardware	▪ Organic waste (food, paper, used tea powder, etc.) should be dumped in underground, covered (soil, or bamboo, wood, CI sheet cover) compost pits ▪ Other domestic waste can be dumped in separate pits and buried or burnt ▪ In urban areas or camps, domestic waste should be disposed in communal bins (with drainage holes) emptied regularly, and transported by trained staff to fenced communal dumping/burning pits or landfills ▪ Train a committee to oversee solid waste management
Market/bazaar waste (organic, non-organic)	▪ Treat most market waste (old vegetables and fruits, plastic wrapping, etc.) as household waste by the people managing the market ▪ Communal bins (with drainage holes) should be made available at strategic places, with trained staff emptying them regularly and transporting them to nearby fenced dumping/burning pits or communal landfills ▪ Train market managers to oversee solid waste management ▪ Slaughterhouse waste needs specific disposalin a large pit with a cover; blood can run from slaughterhouse to pit through a covered channel (reducing flies); water should be available for cleaning; once the pit is full, cover it with soil and dig another one	
Other institutional waste (organic, non-organic)	▪ Waste from offices, schools, colleges, Madrasas, religious institutions, shops, restaurants, etc. can be treated as household waste ▪ Communal bins (with drainage holes) should be made available at strategic places, with trained staff emptying them regularly and transporting them to nearby fenced dumping/burning pits or communal landfills ▪ Train committees to oversee solid waste management ▪ Areas surrounding public water and sanitation infrastructures should be kept free of solid waste ▪ Drainage channels should always remain clear of solid waste for wastewater to drain properly	

6.3 DRAINAGE

Drainage should be taken into account when selecting sites and designing facilities. Communities and households should be made aware of the importance of drainage, receiving tools to dig and clean drainage channels around houses, water and sanitation facilities, etc.

Waters to be drained	Remarks	Prevention / protection (for both emergency and early recovery contexts)
Flood and storm water	▪ Build so that flood and storm water do not erode or flood roads, shelters, water points, etc.	▪ All infrastructure and facilities should be in sites that are less vulnerable to floods ▪ In flood prone areas, raise or elevate roads, houses, shelters and latrines above the flood level, using clay plinths or bamboo stilts ▪ Water points should also be raised above flood levels (install tubewell pumps 0.5 metres above ground level, build PSFs and RWHS on bricks/concrete stands) ▪ Surround streets, houses, shelters, latrines and water points by small drainage channels so that storm water does not erode them ▪ Channels can be dug directly in the ground and lined with bricks/concrete
Water from water points	▪ No stagnant water around water points	▪ All water points should include a small concrete slab around/below the pump or taps, with a drainage channel and/or slope leading the water falling on the slab to a garden, surface water body, or soakaway pit ▪ Soakaway pits are dug in the ground and filled with stones, pebbles, or brick chips; the walls of the pit should be lined (concrete rings, bricks/concrete) if the soil is unstable; the bottom of the pit should be above the groundwater table ▪ Soakaway pits are an effective drainage option, including in densely populated areas
Household wastewater (kitchen, washing, etc)	▪ No stagnant water around households	▪ Train households to dispose of their wastewater safely; dig small channels to lead household wastewater to ponds/rivers, or in soakaway pits if large volumes are produced ▪ Household areas should be kept free of solid waste that could hold stagnant water and vectors (flies, mosquitoes)
Wastewater from latrines	▪ Latrine wastewater should be drained/contained in sewerage or pits	▪ NEVER allow wastewater from latrines to mix with ground or surface water sources (including from kitchen, showers, etc.)

6.4 VECTOR CONTROL

Selecting appropriate sites for settlement of displaced people, adequate water and sanitation infrastructures, drainage and solid waste management, and hygiene promotion can control vectors. Extermination campaigns should only be implemented after prevention and protection measures have been attempted.

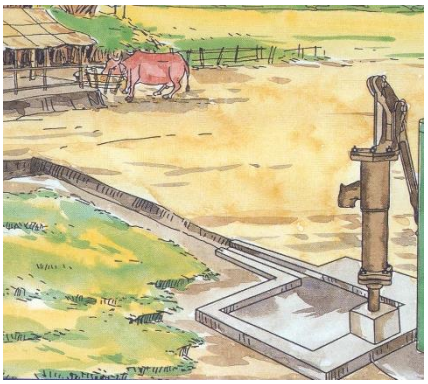
The following table lists various vectors present in Bangladesh, and solutions to **prevent** their development, **protect** from them and – if necessary – **exterminate** them.

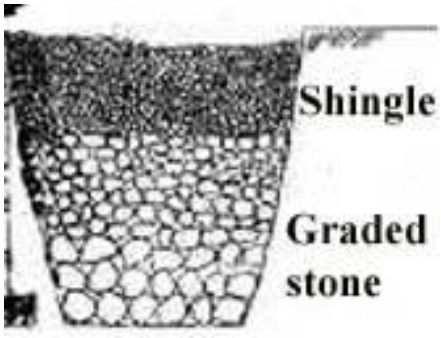
Vectors	Diseases transmitted in Bangladesh	Prevention/Protection (for both emergency and early recovery contexts)	Extermination
Flies, cockroaches, and other insects	Diarrhoeal diseases	▪ Prevent: safe excreta disposal and safe organic waste disposal Protect: safe food storage (flies) and mosquito nets (biting flies)	▪ Fly traps ▪ Chemical insecticides, sprayed in streets or in households ▪ Unnecessary with adequate prevention/protection, might be necessary in case of severe epidemics (diarrhoea, malaria)
Mosquitoes and biting flies	Malaria, dengue, filariasis	▪ Prevent: appropriate site selection of settlements whenever possible, drainage of stagnant water ▪ Protect: long sleeved clothes, mosquito nets ▪ Spray on the stagnant water body	
Rats, mice, and other rodents	Transmit leptospirosis, salmonellosis, and host fleas	▪ Prevent: safe organic waste disposal and safe food storage.	▪ If rodents are problematic in large settlements or large food storage warehouses, mouse/rat traps can be used ▪ Chemical poisons also exist but should be used extremely carefully and as last measure
Body and head lice	Typhus, relapsing fever	▪ Prevent: washing, drying, and aeration of clothes and bed sheets, hair washing ▪ Protect: combing hair with lice combs.	▪ Lice can be exterminated with washing products and medical shampoo, if necessary
Fleas and other bed bugs	Typhus and plague	▪ Prevent/protect: regular washing, drying and aeration of clothes and bed sheets	▪ Fleas can be exterminated through adequate insecticides
Ticks	Relapsing fever	▪ Prevent: avoid contact with animals	▪ Doctors should be consulted in case of tick bite, or to remove ticks from humans
Snakes	No disease; bites, sometimes venomous	▪ During floods, snakes try to enter houses, shelters, and other dry places	▪ Not necessary to exterminate at a large scale, as snake bites are relatively rare

Vectors	Diseases transmitted in Bangladesh	Prevention/Protection (for both emergency and early recovery contexts)	Extermination
		▪ Carbolic acid is said to keep them away, but they can be controlled mostly by keeping doors/windows closed, avoid having hot holes where they can rest, etc.	
Water borne diseases	Leptospirosis	▪ Prevent: no bathing in/washing with surface water known as potentially risky for such diseases ▪ Protect: provide treated water for all uses (especially in refugee camps)	▪ Treatment of surface water (not realistic in household or community ponds)

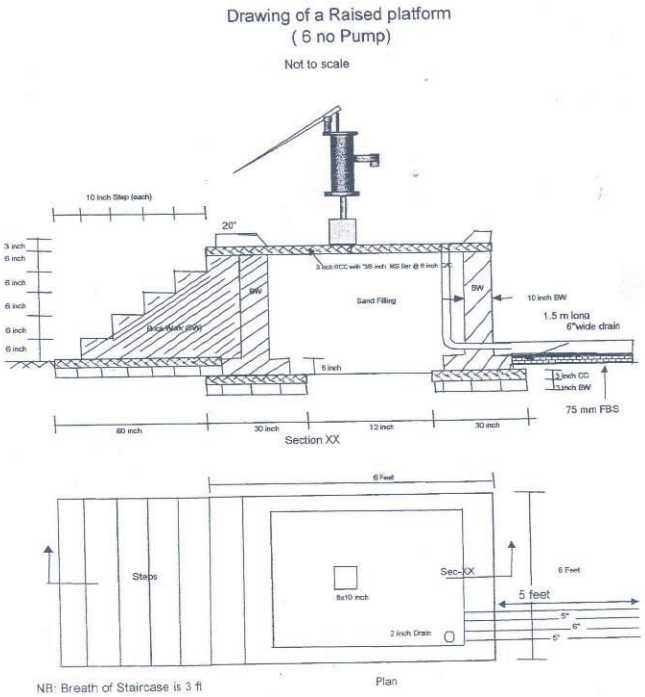
6.5 Solid Waste, Drainage and Vector Control Technology Designs

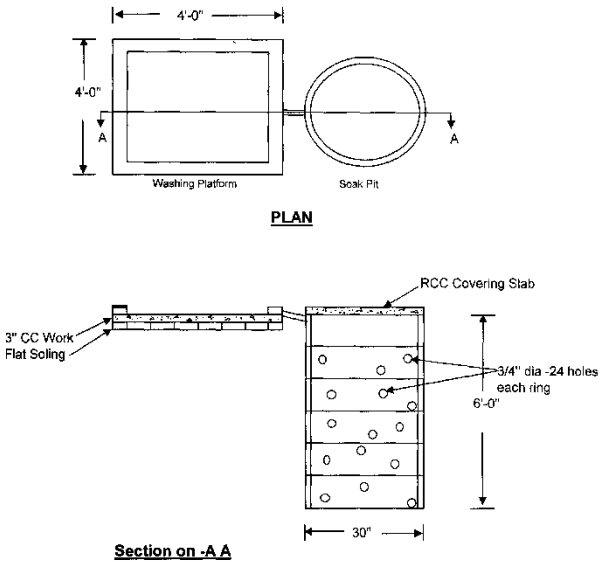
Below are shown a few examples of simple technologies that can be used for drainage and solid waste management.





Above, water points need to have clean drainage slabs around, leading water to a drain, pond, river, or soakway pit. On the left (above and below), soakway pits can be built near washing areas, water points, etc, for water to be drained into the ground. On the right (below), a raised handpump that can be used even during floods.





Below, examples of a household composting pit for organic waste, a burning pit (household or community), and community bins (for schools, public buildings, urban areas, refugee camps, etc).

PART-C

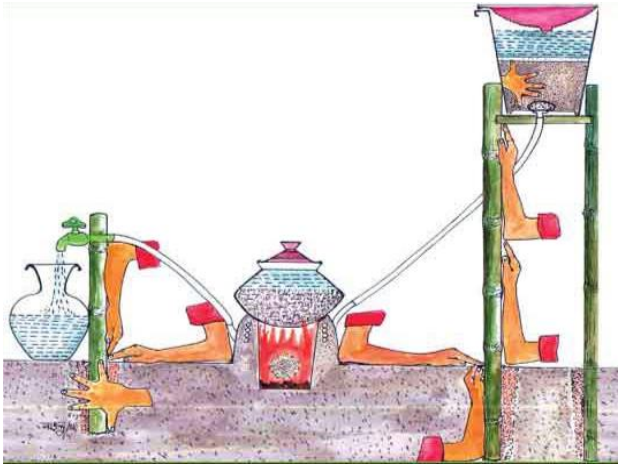
Detailed Design and Costing of Water Supply Options related to Disaster Management

A. Water Supply Options during disaster are installed on emergency basis. The design that are suitable for the area should be followed. The costing shall have to be prepared based on the prevailing market price.

B. In this chapter design and costing of different water supply options are shown to guide the installation. The implementing agencies shall follow this design and costing and consult the concern department to select the suitable type of design, depth in case of hand tubewells, location in consultation with disaster management committee, alternative design in consultation with TWG of WASH Cluster and make realistic estimate as per market rate.

1. Early Recovery Household Water Treatment

Chulli filters



As illustrated by the pictures and drawing above, the chulli filter is a household water treatment technology based on the clay oven rural Bangladeshi women traditionally use to

cook. Water is poured in a bucket, where it is filtered by sand before flowing into a pipe, then a coil fixed into the clay oven. While flowing into the coil, water is heated by the fire from the oven (it is necessary to cook and use the filter at the same time), which helps to disinfect the water. Water then flows into a tap, open only slightly, and collected into a pitcher or any other container. Water is warm and can be used directly or first cooled in the container (with a lid).

This technology is produced and sold by Wagtech, while promotion and operation and maintenance materials and more information can be obtained from Oxfam. There is some contention regarding the effectiveness of this filtration method.

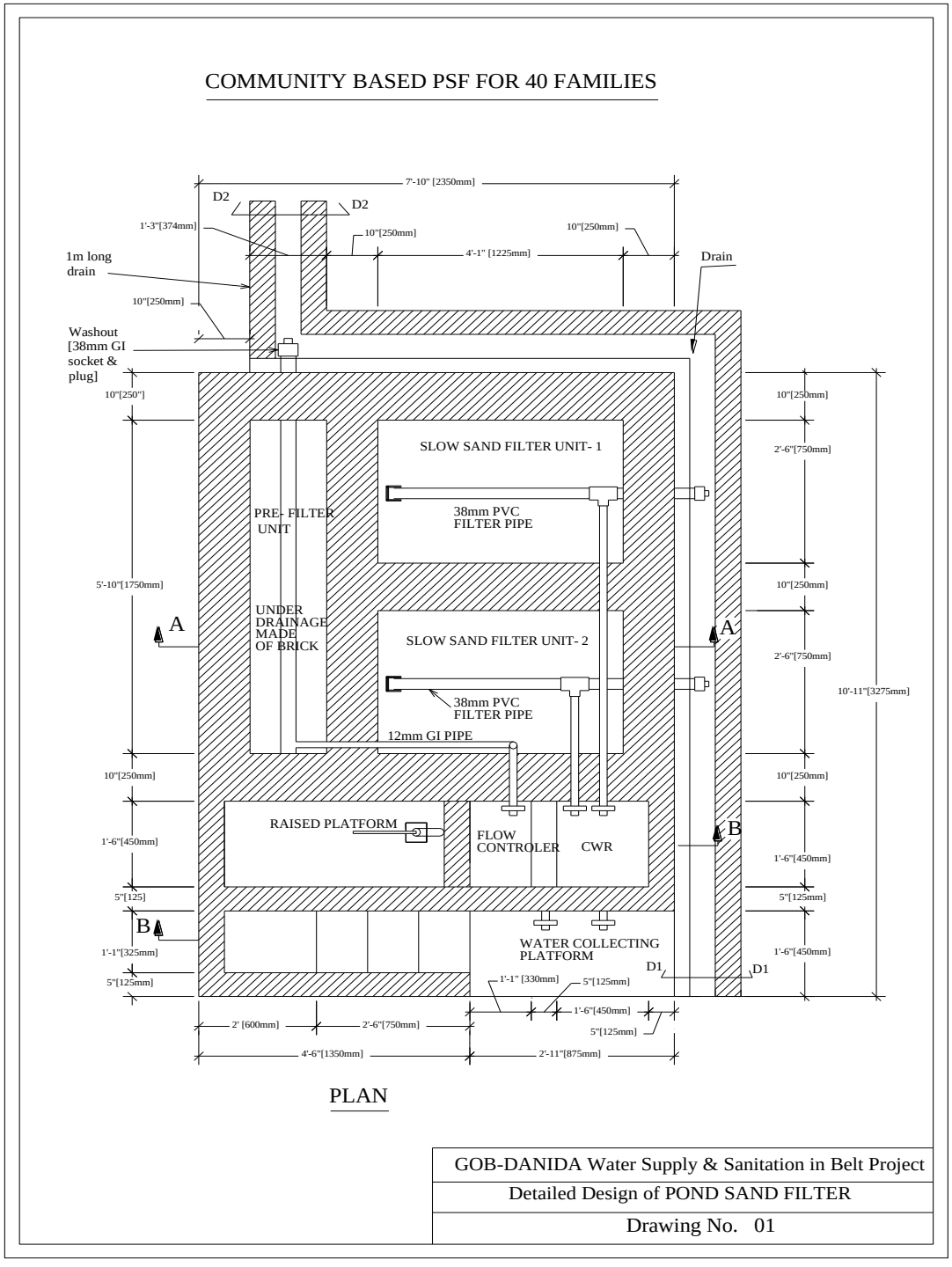
Oxfam's Bill of Quantity (BoQ)

Construction of Chulli Water Filter (CWF)

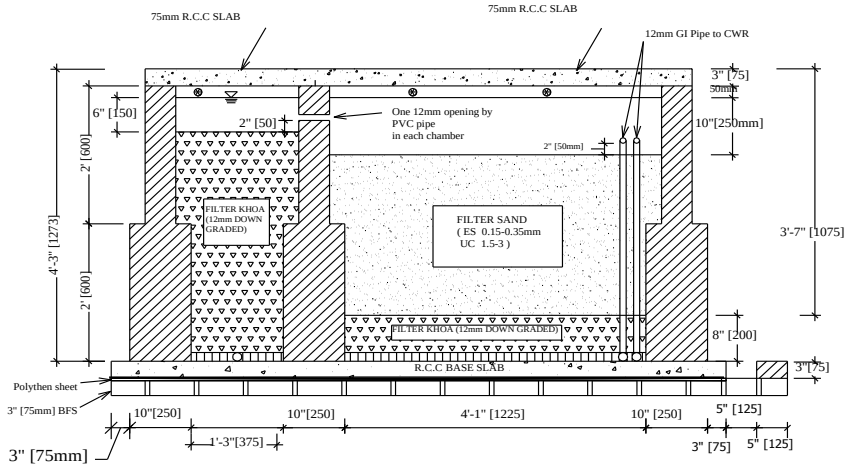
Item no	Description of Items	Unit	Quantity	Rate (Tk.)	Amount (Tk.)
1	Supply of complete set of Chulli Water Filter, drawing and design including carrying, handing, storage etc all complete	set	1		
1.1	Plastic bucket (balti), 25 liters, RFL, with filtering units and nipple [all fittings together]	set	1		
1.2	Plastic perforated lid for bucket	no	1		
1.3	Foam (same size of perforated lid)	no	1		
1.4	Hosepipe [ID 12.5mm]	m	2		
1.5	Coil made out of aluminum, pipe dia 12.5mm, coil dia 8.5 inch, # of coils 5	set	1		
1.6	Complete set of outlets [e.g. plastic tap, elbow, etc] all fittings together	set	1		
1.7	Adjustable clamp [galvanized metal], size 1 inch	no	4		
2	Supply medium coarse sand [FM 1.0-1.3] packed in a bag, should be clay & dirt free				
2.1	Supply medium coarse sand [FM 1.0-1.3], (dry weight 15 kg and wet weight 17 kg)	cft	0.6		
2.2	Plastic bag [width 18" and Hight 18", used cement bag]	no	1		
2.2	Labour cost for packing sand in a bag [per bag]	LS	1		
3	Screw driver - 5 inch	no	1		
	Total Filter Cost				
Carrying cost from store to distribution site		LS	1		
	GRAND TOTAL				

The cost will depend on the availability of the material locally. Rate will be local rate.

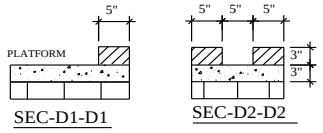
2. DPHE-Danida R&D model PSF design



COMMUNITY BASED PSF FOR 40 FAMILIES

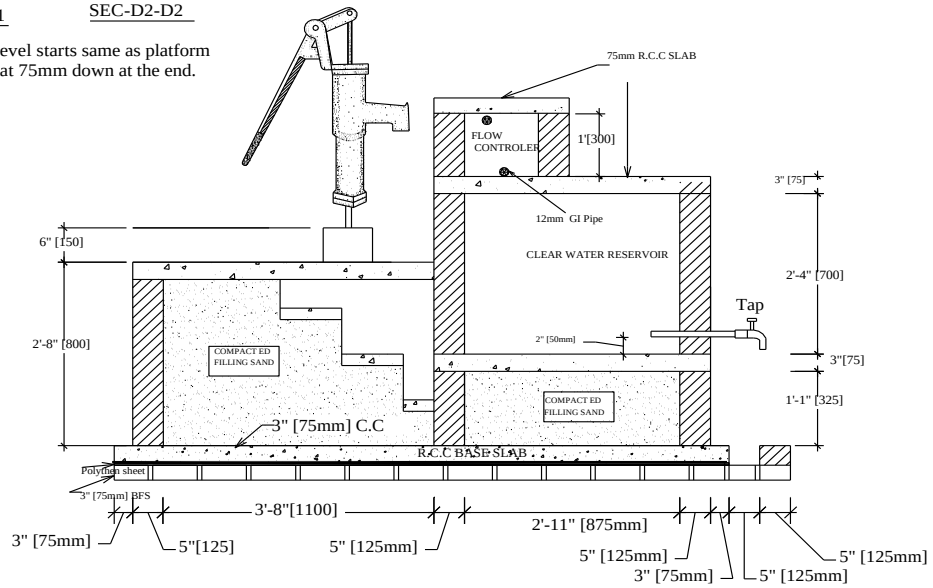


VERTICAL SECTION A-A



SEC-D1-D1 SEC-D2-D2

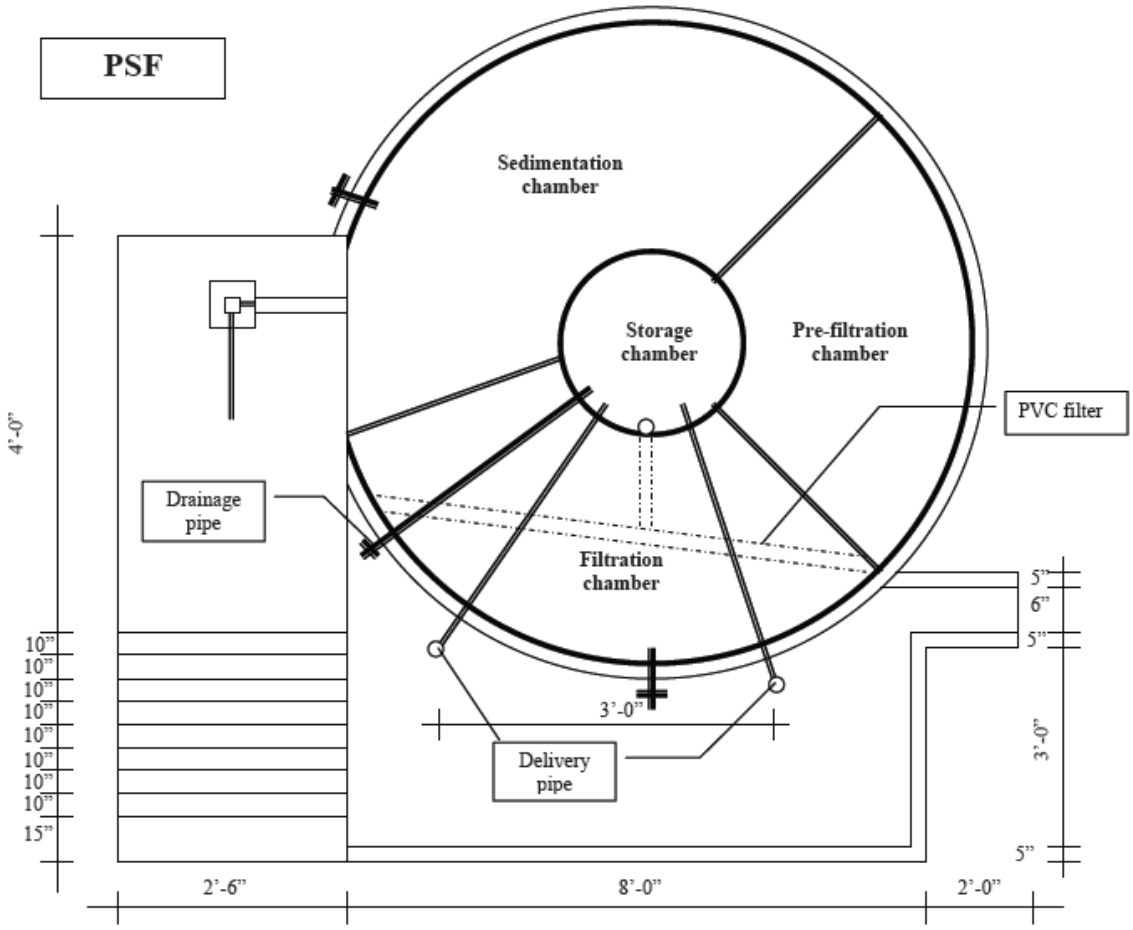
Note: Drain level starts same as platform level & ends at 75mm down at the end.

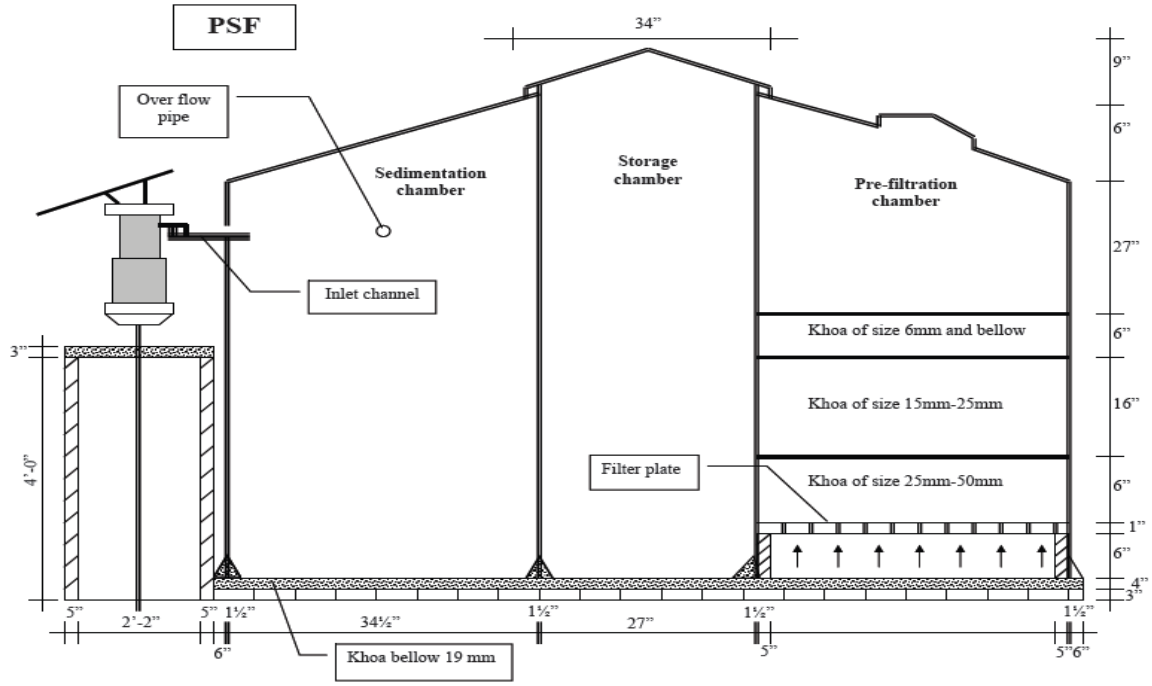


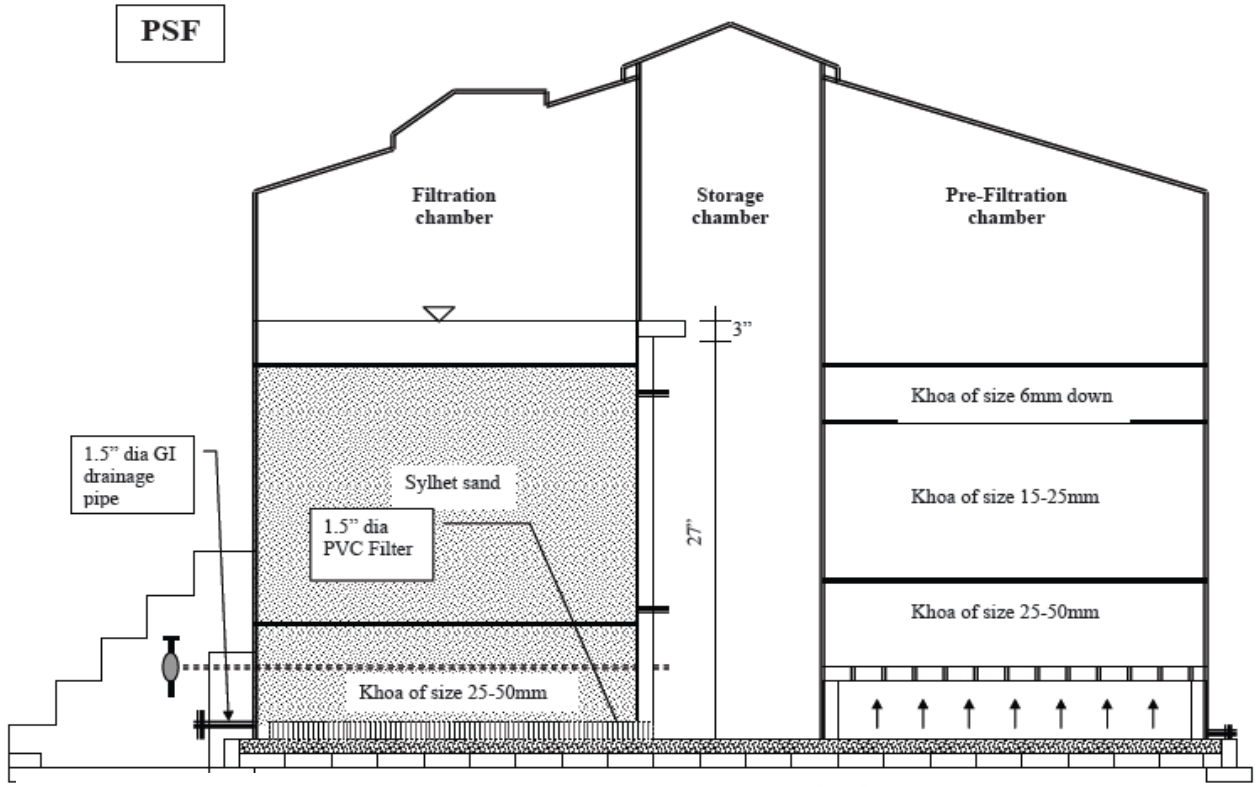
VERTICAL SECTION B-B

GOB-DANIDA Water Supply & Sanitation in Belt Project
Detailed Design of POND SAND FILTER
Drawing No. 02

3. NGO Forum PSF design and cost estimation







Detailed cost estimate of PSF

Sl. No.	Item	Specification	Unit	Quantity

A. Construction materials

1	No.6 Hand Pump	Heavy type, weight 30-30.5kg per pump.	No.	1
2	GI Pipe	GI pipe of National Tubes Ltd. 1.5" nominal bore pipe, both surface of the pipe would be smooth and uniform thickness (2.5-3.0 mm), both end of the pipe will be threaded of 11 TPI and length of thread will be 32mm, 10mm dia MS rod will be welded at 0.5 m from any end, welded rod will be extended minimum 6" from the pipe surface. Total	No.	1
3	Adapter	1.5" dia, wall thickness 5mm, length 6".	No.	1
4	PVC pipe	1.5" dia uPVC, water grade class-D(BS-3505), wall thickness 2.5-3.0 mm, bell socketed at one end, pipe must be straight and uniform thickness, free from any defects such as cracks, rupture, leak, etc.	Rft.	75
5	Elbow (PVC)	1.5" dia, wall thickness 2mm	No.	8
6	PVC strainer	1.5" dia uPVC pipe of 6'-0" length, with 8 Nos. rib, wall thickness of 3.0mm, slot width is 0.18 to 0.2mm and slot pitch is 1.5mm. Slot cutting will be like a helical spring, depth of cut will penetrate into pipe wall fully but penetration in to rib not to exceed 0.2mm, and maximum internal dia of rib will be 39mm.	No.	1
7	Cement	Normal Portland cements, 50kg/bag, initial setting time 40-45 minutes, final setting time 8-12 hours. free from any	Bag	29
8	Brick	1st class brick, cracking strength 5000-8000 psi, free from any defects.	No.	850
9	Khoa	Made from Ist class picked brick, size 19mm to6mm	Cft.	25

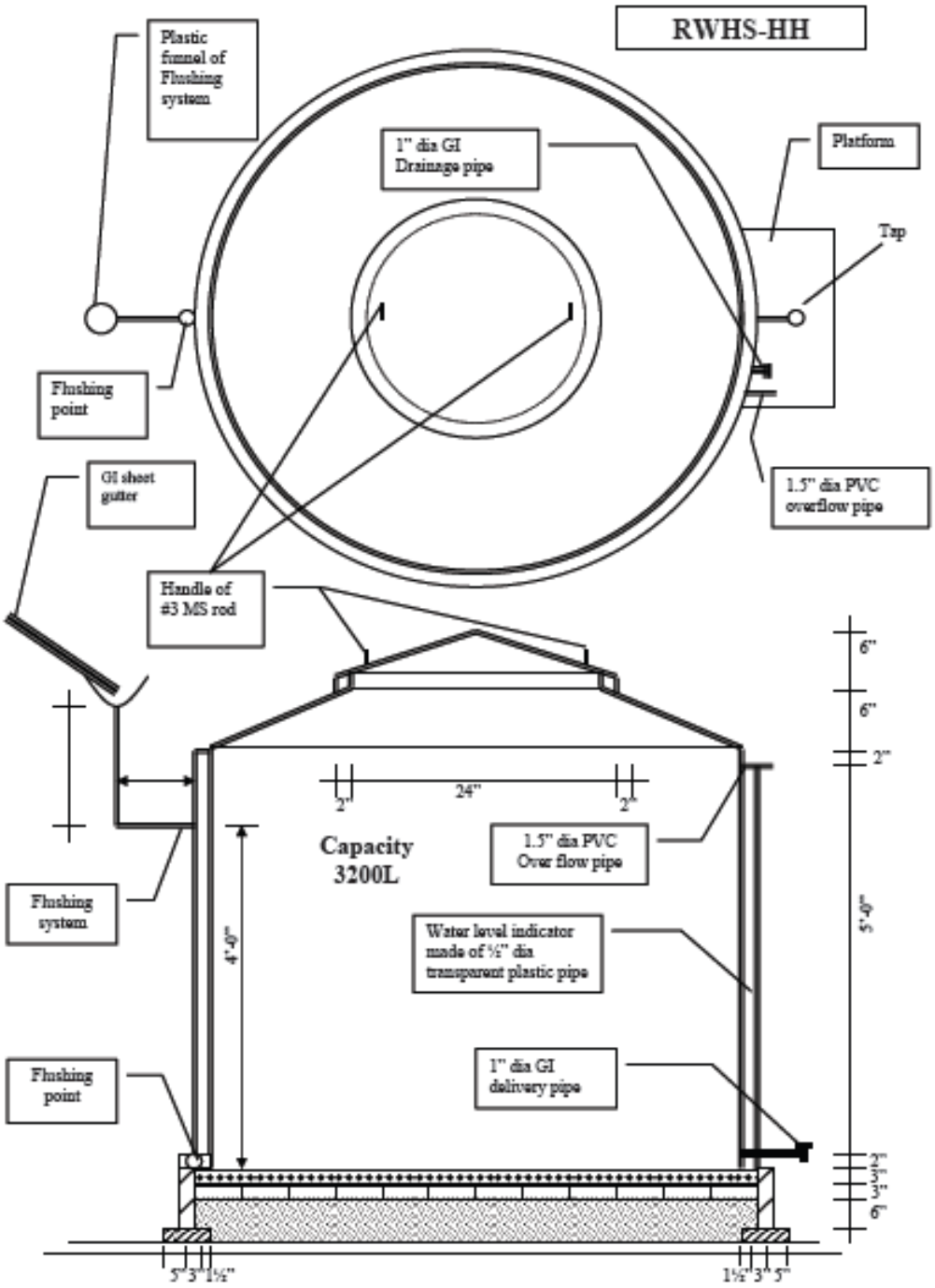
Sl. No.	Item	Specification	Unit	Quantity
10	Sand	Sand for construction work. FM= 1.0, free from any impurities.	Cft.	100
11	Sand	Local filling sand.	Cft.	50
12	MS Wire mesh	Made from 18-gauge wire, 12mm spacing both directions. Width of the mesh is 0.91m and 15.25 m/roll.	Rft.	100
13	MS Rod	MS Rod 9mm dia	Kg	28
14	MS wire	3mm dia MS wire.	Kg	12
15	GI wire	No.24 GI wire of good quality.	Kg	1
16	GI wire	No.18 GI wire of good quality.	Kg	5
17	Filter material	**Sand:** Coarse sand (Sylhet Sand), good quality free from any impurities.	Cft.	50
		Khoa: Made from Ist class picked brick, size 25mm to19mm.	Cft.	25
		Khoa: Made from Ist class picked brick, size 19mm to 6mm.	Cft.	18
		Khoa: Made from Ist class picked brick, size 6mm down.	Cft.	12
18	Delivery pipe (GI)	1.5" nominal bore, wall thickness 2.5-3.0mm, one end threaded. Length of pipe 4'-6" each. Clamp (6mm dia MS rod) Should be welded at 18" from the threaded end along with an urban type ball valve.	No.	2
19	SC and PFC wash out pipe (GI)	38mm nominal bore, wall thickness 2.5-3.0mm, one end threaded. Length of pipe 0.35m each. Clamp(6mm dia MS rod) Should be welded at 450mm from one end.	No.	2
20	Storage Chamber wash out pipe (GI)	38mm nominal bore, wall thickness 2.5-3.0mm, one end threaded. Length of pipe 1.29m. Clamp(6mm dia MS rod) Should be welded at 450mm from one end	No.	1

Sl. No.	Item	Specification	Unit	Quantity
21	Drainage pipe	1.5" dia good quality GI pipe with 1.5" dia GI socket and 1.5" dia GI end cap. Length of GI pipe is 10" and 2.5 mm wall thickness. One end of the pipe will be threaded and 6" long clamp (9 mm dia MS rod) must be welded at 5" distance from the threaded end of the pipe.	No.	3
22	GI reducer	38mm X 12mm GI reducer of good	No.	1
23	Tap	Size 12mm(Urban type), good quality.	No.	2
24	PVC end cap	38mm dia PVC end cap, good quality.	No.	1
25	Hose pipe	32mm dia, good quality, made of rubber.	m	3
26	Jubilee	65mm dia clip good quality.	No.	6
27	Small size water pot.	Made of plastic that can hold air.	No.	1
28	RCC ring	Inner dia 0.79m and outer dia 0.86m, thickness 38mm and height 0.3m. Reinforced with No.10 MS wire 3nos. Mixture ratio 1:2:4.	No.	6
29	Solvent Cement.	Cony-bone, made in Japan	No.	1
30	Bamboo	Mature and good quality.	No.	1
31	Local carrying	Local carrying of the materials from the upzilla head quarter to the construction place by Rickshow van.	LS	1
B.	**Labor for construction**			
1	Mason	Skilled mason having adequate knowledge of construction.	Day	20
2	Labor	Ordinary labor having knowledge on construction work.	Day	28

Rates of different item will depends on availability of materials & materials locally

4. RAINWATER HARVESTING SYSTEMS (RWHS)

a) NGO Forum household RWHS design and cost estimation



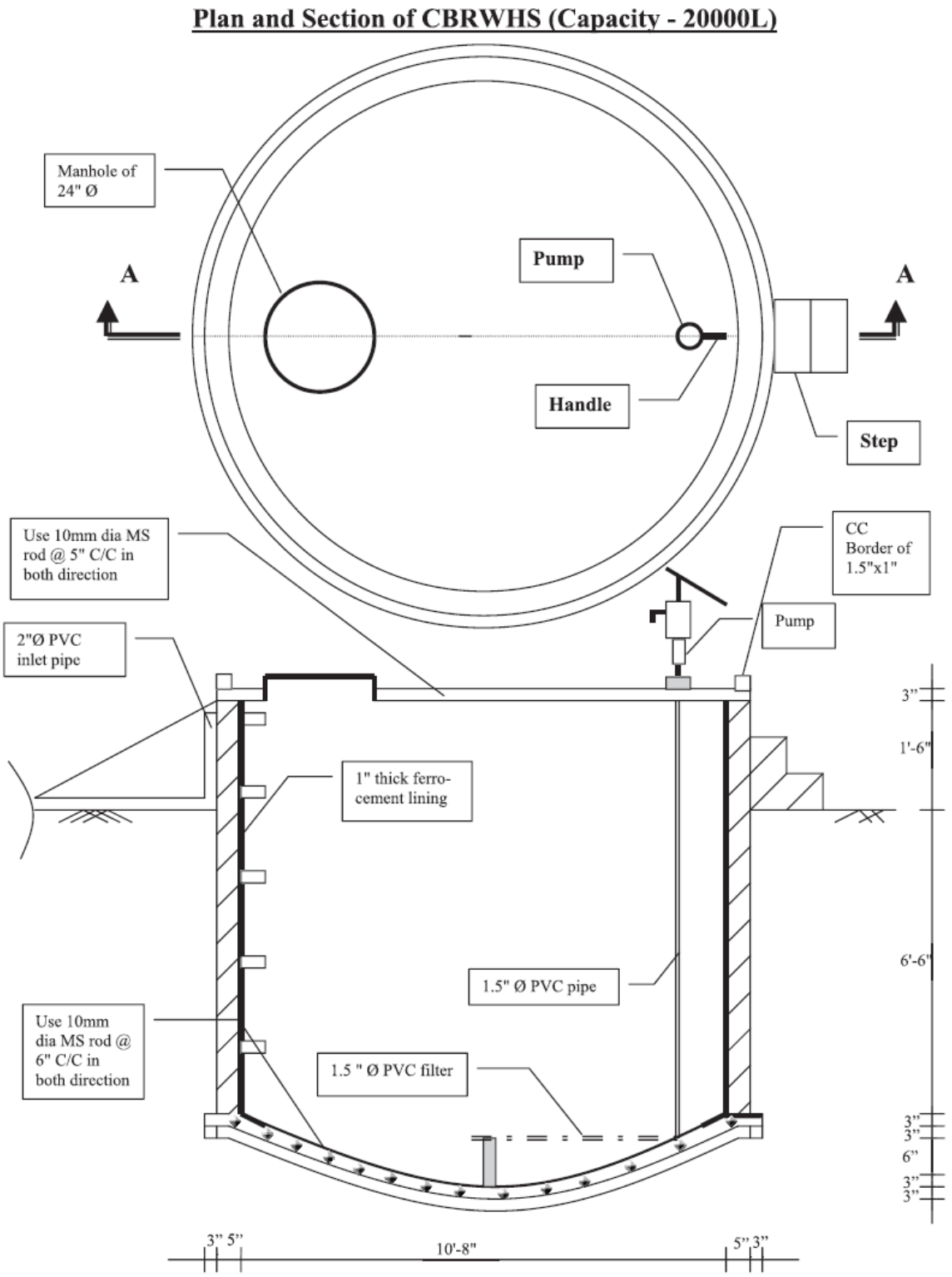
Rainwater Harvesting System (RWHS) Capacity -3200 L

Sl. No.	Item	Specifications	Quantity
Material			
01.	Cement	Normal portland cement, 50 kg per bag, initial setting time 40-45 minutes and final setting time 8-12 hours.	9 bags
02.	Sand	Good quality local coarse sand. Free from salt, clay, silt, organic matter and shells.	50 cft
03.	Local Sand	Local Sand for filling and making segments.	30 cft
04.	Brick	First class Brick, free from any defects. Cracking strength 5000 – 8000 psi.	130 nos.
04.	Khoa	Broken Brick of 1st class or picked, size from 3/4" to 1/4" of angular shape.	10 cft
05.	MS Wire	No.10 (3mm) dia MS wire, good quality.	5 kg
06.	Wire Mesh (Net)	Made of 18 gauge MS wire of high temper, ½" spacing in both direction, 0.91m height.	1 roll (15.25 running meters)
07.	Gutter	Made of GI sheet of ½mm thick, 6m long, good quality along with inlet gutter.	1 no.
08.	GI wire	18 gauge GI wire	2½ kg
09.	GI Pipe with Ball Valve (Tap)	12mm dia good quality GI pipe of 0.46m long with GI socket and Ball valve made of brass. One end of the pipe will be threaded and 150mm long clamp (9mm dia MS rod) must be welded at 125mm distance from the un-threaded end the pipe.	1 no.

Sl. No.	Item	Specifications	Quantity
10.	PVC Pipe	75mm dia PVC pipe, wall thickness 2.5mm, 300mm long.	1 no.
11.	Elbow	75mm dia PVC Elbow, minimum thickness of wall is 2.5mm.	1 no.
12.	Drainage Pipe	37.5mm dia good quality GI pipe with GI socket and end cap, length of GI pipe is 250mm, uniform thickness. One end of the pipe will be threaded and 150mm long clamp (9mm dia MS rod) must be welded at 125mm distance from the un-threaded end the pipe.	1 no.
13.	Hanger for Gutter	4.5mm thick MS flat bar, Average length of each piece 1m.	6 nos.
14.	Mosquito Net	Made of nylon, good quality.	As required
15.	GI mesh for inlet gutter	Fine GI mesh of best quality.	1 sft
16.	Others (26 Gauge GI Wire, News paper etc.)	Good quality	-
17.	Local conveyance		-
Sub-total			
abour			
01.	Mason and Helper	Skill mason and helper (Trained)	6 days
Sub-total			
Grand-total			
To			
01.	Slide Wrench	Slide wrench of 250mm length, diamond brand, made in China.	1 no.
02.	Pipe Wrench	Pipe wrench of 300mm length, good quality	1 no.

Rates of different item will depends on availability of materials & materials locally

b) NGO Forum community RWHS PSF design and cost estimation



Detailed Material Requirement of CRWHS – 20000L

Sl. No.	Item	Specification	Unit	Quantity
A.	**Construction materials**			
1	Cement	Normal Portland cement, 50 kg per bag, initial setting time 40-50 minutes and final setting time 8-12 hours.	Bag	42
2	Sand	Good quality local coarse sand. Free from salt, clay, silt, organic matter and shells.	Cft	120
3	Local sand	Local Sand for filling.	Cft	30
4	Brick	First class Brick free from any defects, such as cracking, de-shaped etc. Crushing strength 5,000-8,000 psi.	No.	1850
5	Khoa	Broken Brick of 1st class or picked, size from ¾" to ¼" of angular shape	Cft	65
6	MS rod	No.3 (10mmØ) MS rod of 40 grade.	kg.	180
7	MS Wire mesh	Made of 18 gauge MS wire of high temper, ½" spacing in both direction, 0.91m height.	Rft.	90
8	Over flow pipe	2" dia PVC pipe of 1' long with plastic with fly guard net including all fiiting and fixing.	Rft.	1
9	Delivery pump	No.6 Hand made pump.	No.	1
10	Gutter	Made from 28 gauge plain sheet as per specification.	Rft.	70
11	PVC pipe for flushing system	50mm dia PVC, water grade class-D (BS-3505), wall thickness 2.5-3.0 mm, bell socketed at one end, pipe must be straight and uniform thickness, free from any defects such as cracks, rupture, leak, etc.	Rft.	25
12	PVC elbow	2" dia PVC elbow of best quality.	No.	4
13	PVC 'T'	2" dia PVC 'T' of best quality.	No.	1
14	GI pipe	2" dia GI pipe of best quality. Length 1'-0" and one end threaded.	No.	1
15	GI elbow with end cap	2" dia GI elbow of best quality with end cap.	No.	1
16	Manhole cover	CI manhole cover of 24" diameter.(Lucky or equivalent)	No.	1
17	Hanger for gutter	Use No.3 plain MS rod in preparing hanger as per supplied design.	No.	25
18	Shuttering	As per requirement	sft	120
19	Local carrying	Local carrying of the materials from the upzilla head quarter to the construction place by Rickshow van.	LS	1
20	Message	Writing message as per instruction of NGO Forum and painting of tank.	LS	1
21	Others	To adjust the price hike of construction materials	LS	1
		Sub total		
B.	**Labor for construction**			
1	Mason	Skilled mason having adequate knowledge of construction.	Day	27
2	Labor	Ordinary labor having knowledge on construction work.	Day	40

Rates of different item will depends on availability of materials & materials locally

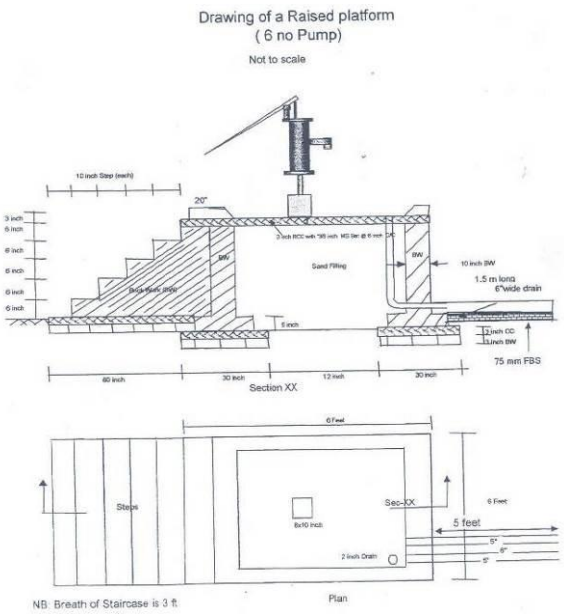
5. TUBEWELL CONSTRUCTION

Tubewell designs

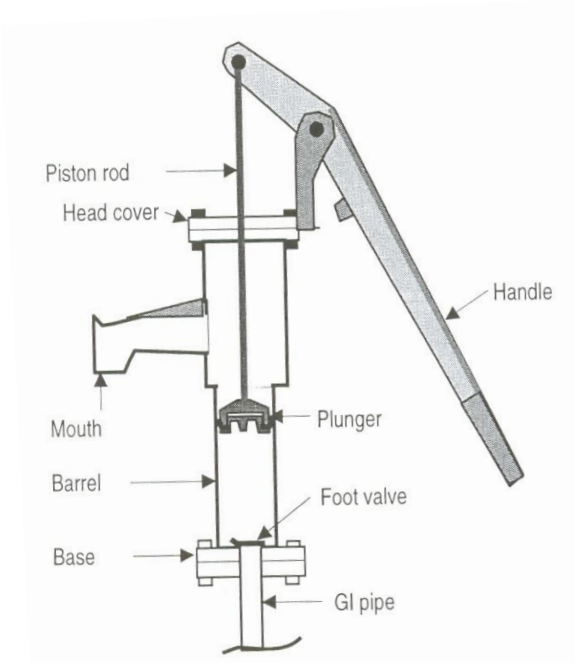
In Bangladesh, various types of tubewells can be drilled:

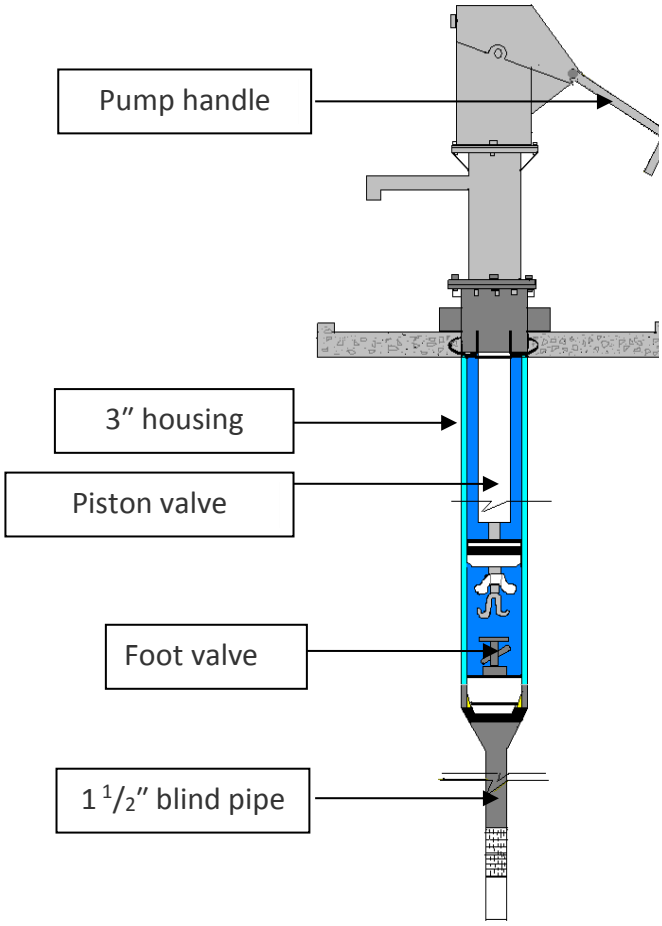
- **Deep tubewell** (>150 meters deep) can provide very safe water as they tap deep aquifers, usually protected by an impermeable layer which prevents arsenic, faecal and chemical contamination. They can be fitted with #6 handpumps (when the water table level is within 7 meters from the surface) or Taradev handpump (when the water table is more than 7 m below ground level, including if only during the dry season).
    - All costs included (labour, tubewell, handpump and platform materials, transport costs, and VAT), a 275 meters deep tubewell costs about 100,000 Tk (with a #6 handpump) or about 125,000 Tk (with a Taradev handpump).
- **Shallow tubewell** (<75 meters deep) are cheaper than deep tubewells but sometimes provide water of lower quality (arsenic, faecal contamination, etc).
    - All costs included, a 60 meters shallow tubewell costs about 30,000 Tk (with a #6 handpump) or about 50,000 Tk (with a Taradev handpump).
- **Shallow shrouded tubewell** (>7 meters deep) or **very shallow shrouded tubewell** (<7 meters deep). In areas where deep groundwater is saline and where higher aquifers are made of fine sand, freshwater can sometimes be found, but the well screens must be fitted with centralizers and surrounded by coarse sand to prevent fine particles from entering into the tubewell.
    - All costs included, a 10 meters shallow shrouded tubewell costs about 25,000 Tk (with a #6 handpump).

Raised Platform Tubewell

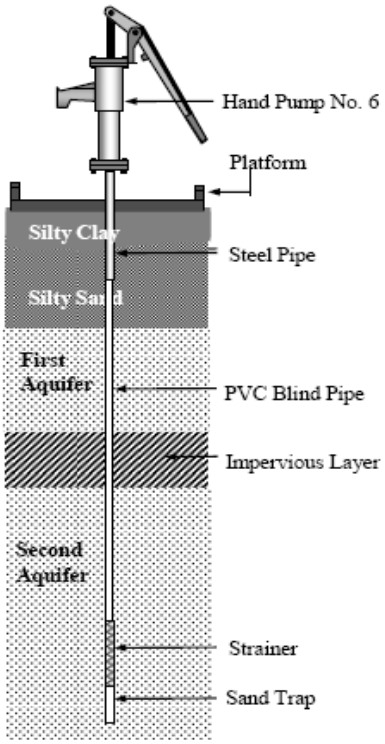


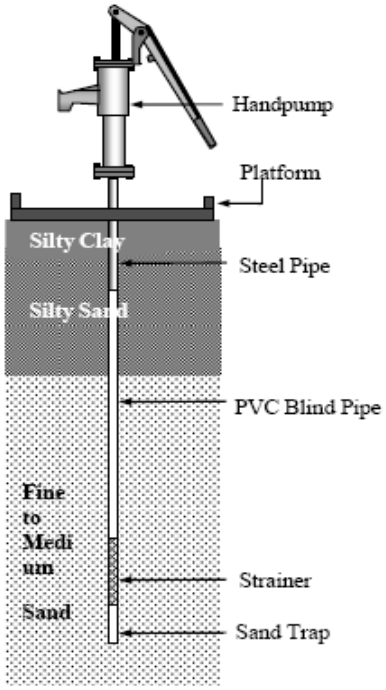
On the left, the platform to be built around a tubewell (please also see the drainage guidelines for soakaway pits). On the right, a design of raised handpumps for flood prone areas.



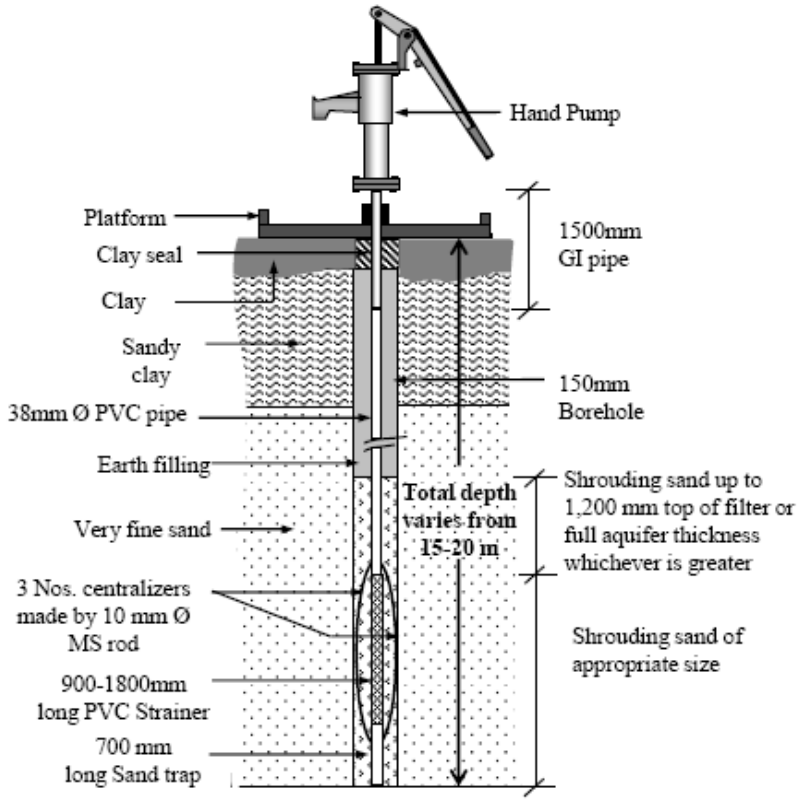


On the left, a #6 handpump (the most common). On the right, a Taradev handpump.





On the left a deep tubewell, on the right a shallow one. Both have a #6 handpump.



Above, a shallow shrouded tubewell fitted with a #6 handpump.

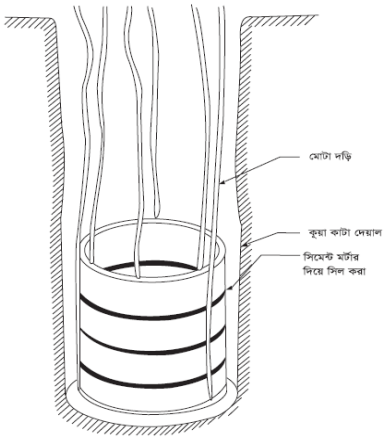
6. RING WELLS (POST DISASTER REHABILITATION OPTION)

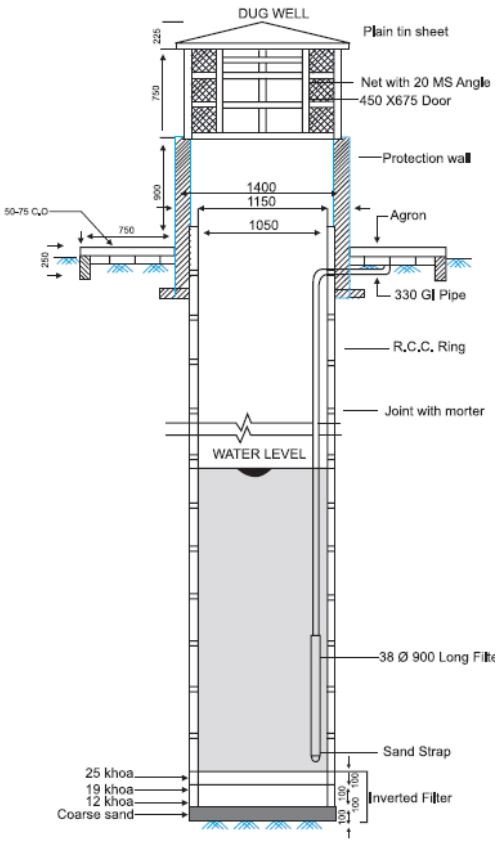
In some rural areas, people are used to drawing water from large **ring wells, for drinking but also sometimes irrigation and water for cattle**. Ring wells usually are relatively shallow (<20 meters) and collect rainwater that filtered through the ground, rather than groundwater from the aquifers. When they are lined, protected and covered, they can provide large quantities of safe drinking water. They usually are arsenic and iron free. They can be fitted with handpumps (#6 or Taradev, depending on the level of the water table during the dry season) and/or motorised pumps (surface or submersible, depending on the level of the water table during the dry season).
All expenses included (labour, materials, pump, tax, VAT, profit from the contractor), a 13m deep ring well costs about 110,000 Tk (with a #6 handpump or with a Taradev pump).
The design, depth and type of handpump of a dug well vary a lot from place to place, depending on local geophysical conditions and user needs. **Please refer to the local or national DPHE staff for guidance.**

The procedure for cleaning tubewells that have been flooded can also be adapted to ringwells (but the volume of the well is $V = \pi R^2 H$, with R the radius of the well and H its height, and it is easier to use a motorised pump than a manual one if the volume is very large).
Like for tubewells and other community water infrastructure, a management committee must be created and trained.

On the right, an example of ring well design, with concrete rings lining, platform, protection wall, handpump and protection roof (sometimes replaced by a concrete slab with a manhole).

Below, concrete ring wells can be used to line the well to prevent collapsing and improve water quality.





7. INFILTRATION GALLERIES (POST DISASTER REHABILITATION OPTION)

In some areas where groundwater is not available, surface water can be filtered and extracted (from permanent rivers or ponds with sandy banks) through a filtration gallery.

This consists in a drain dug near the water body and filled with filtration material (coarse sand, gravel/brick chips/khoa)to collect clear water. This drain is connected to a nearby tubewell or a ring well, from which water can be pumped manually (Number 6 handpump).
Infiltration galleries are comparatively cheap but do not necessarily gather safe drinking water.

Like for tubewells and other community water infrastructure, a management committee must be created and trained.

It is well practiced in hilly areas.