



Emergency Water, Sanitation and Hygiene and Environmental Health Guideline

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Addis Ababa, Ethiopia

Forward

In the face of growing threats of global climate change, countries like Ethiopia need to take timely and extra-caution to avoid any catastrophic destiny. In addition to natural disasters like drought, flood and landslide which Ethiopia has been facing historically with narrow intervals, the threat of disease outbreaks has been a point of concern for the Government of Ethiopia in recent years.

Fighting high-magnitude disasters should always be integrally addressed as a part of the country's emergency preparedness. Though the Ministry of Health of the Government of Ethiopia is in charge of coordinating the public health emergency preparedness and response, other actors like NDRMC, NMA, MOWIE, EFCCC, MoA, MoUDC, MoP and partner organizations are in charge of providing the emergency response services in a post disaster situation.

Prompt and adequate response to the need of water supply, sanitation and hygiene in pre, during and post disaster situations is of crucial importance where the local government steps in for providing those services with active help and support from the development partners, humanitarian assistance and other stakeholders.

Traditionally, different concerned stakeholders provide WaSH and environmental health response during emergencies based on their own methodologies to minimize the sufferings of the people in the affected area. However, it is important to have a national guideline to be used for emergency WaSH and environmental health response so that interventions and services will be uniform and standardized.

I believe, the “Emergency WASH and Environmental Health Guideline” which has been prepared jointly with government sectors, humanitarian assistance and development partners will be a quality-source of guidance to plan, implement and monitor water supply, sanitation, hygiene and waste management response during emergency and early recovery phases of disaster. It will also help the local administrations and the policy makers to co-ordinate and supervise the activities to be performed by the actors.

Furthermore, the well-coordinated approach of WASH cluster is likely to reduce the duplication of efforts significantly while also ensuring the best utilization of resources. Given the right mix

of strategies and continued commitment of the Government, Development Partners, NGO and Civil Society actors, I am confident that the proper implementation of “Emergency WASH and environmental health Guideline” will result into better and efficient management of emergency situation in the years to come.

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This Emergency WASH and Environmental Health guideline is developed by the Ministry of Health (MOH) in collaboration with Ethiopian Public Health Institute (EPHI), Ministry of Water, Irrigation and Energy (MOWIE), National Disaster Risk Management Commission (NDRMC), World Health Organization (WHO) and United Nations Children Fund (UNICEF).

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List of acronyms/abbreviations

CLTSH	Community Led Total Sanitation and Hygiene
CTC	Cholera Treatment Center
EFCCC	Environment, Forestry, Climate Change Commission
EPHI	Ethiopian Public Health Institute
MOH	Ministry of Health
HHWTSS	Household Water Treatment and Safe Storage
IDPS	Internal Displaced Peoples
IPPS	Infection Prevention and Patient Safety
MoA	Ministry of Agriculture
MoP	Ministry of Peace
MoUDC	Ministry of Urban Development and Construction
MOWIE	Ministry of Water, Irrigation and Energy
NDRMC	National Disaster Risk Management Commission
NFI	Nonfood Items
NGO	Non-Government Organizations
NMA	National Metrology Agency
PPE	Personal Protective Equipment
NFI	Nonfood Items
SBCC	Social Behavioral Change Communication
UNOCHA	United Nations Office for The Coordination of Humanitarian Affairs
WASH	Water Supply, Sanitation and Hygiene
WHO	World Health Organization

Definition of terms

Communal latrines: is a type of latrine including pit latrine, VIP latrine established during long-lasting emergency situations.

Disease outbreaks: is the occurrence of cases of disease in excess of what would be normally be expected in a defined community, geographical area or season. This guideline considers outbreak of cholera, bloody diarrhea, scabies, measles, meningitis, yellow fever, malaria and trachoma.

Emergency WASH and environmental health: Emergency situation where affected communities do not have the minimum level of WASH and environmental health services which results in vulnerability to WASH and environmental health related diseases.

Emergency food safety measures: actions undertaken in emergency situation to keep the safety of food from production to consumption, cleanliness of food utensils, and the food hygiene practices of the community who are at emergency situation.

Water associated Diseases: Diseases that arise due to water unavailability, scarcity, poor quality, inadequacy, or poor management of reused water and contact with water bodies etc.

Hygiene Promotion: The planned, systematic attempt to enable people to take action to prevent or mitigate water, sanitation, and hygiene related diseases and provides a practical way to facilitate community participation and accountability in emergencies.

Minimum standards: are statements which describe the sets of actions needed so that crisis-affected people can ensure the basic conditions for life with dignity.

Internal displaced people (IDP): are "persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict.

Emergency Operation Center (EOC): is a central command and control facility responsible for carrying out the principles of emergency preparedness and emergency management, or disaster management functions at a strategic level during an emergency, and ensuring the continuity of operation of a company, political subdivision or other organization.

Emergency WASH and environmental health communication: is the process to enable people in emergencies to take actions to prevent or mitigate water, sanitation and hygiene related diseases and to facilitate community participation to improve their situation.

Emergency WASH and Environmental Health Assessment: is the process to effectively justify the interventions proposed in the emergency areas. It is used to help assess water supply, excreta management, solid waste management, hygiene, vector control and other environmental health conditions in the emergency settings.

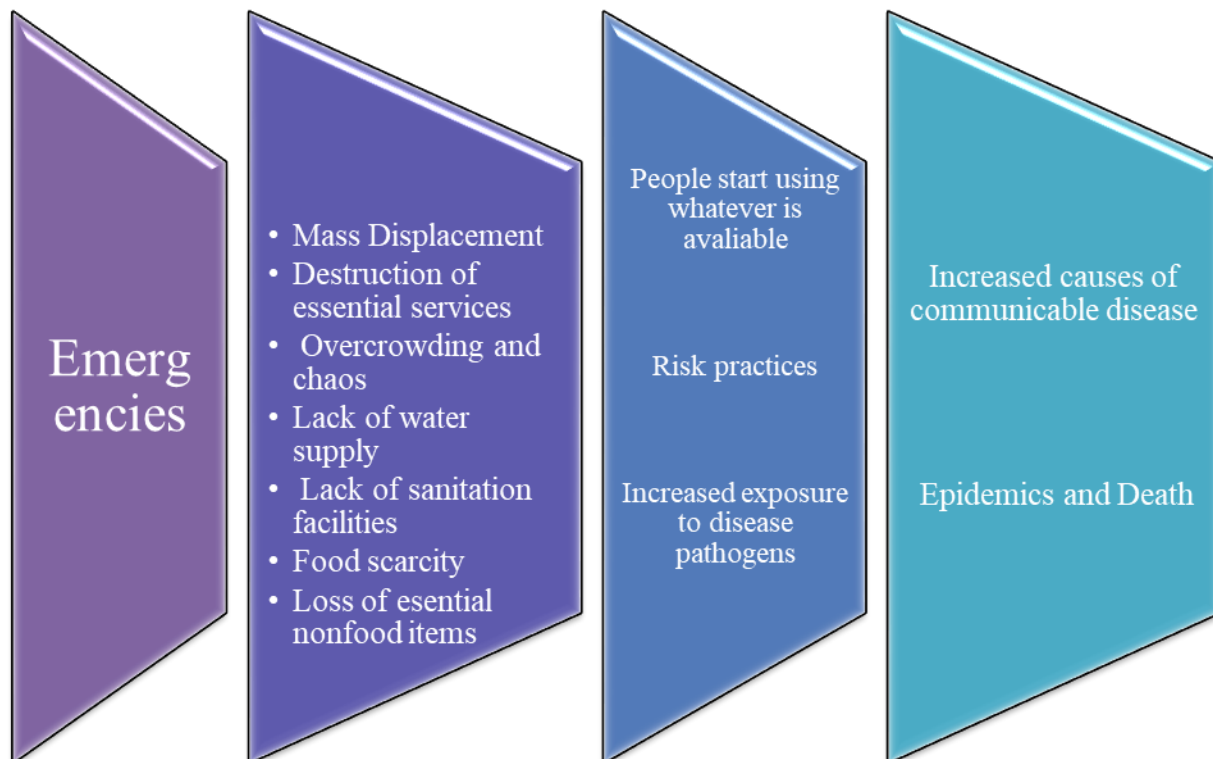
Rapid assessment: An initial rapid assessment that should be carried out within the first three days of any emergency / start of an emergency, to identify needs and resources. It should estimate the number of people affected, quantify immediate needs, the availability of local resources, and the need for external resources.

CHAPTER ONE

INTRODUCTION

1.1. Emergency Situation overview in Ethiopia

In Ethiopia low water supply and sanitation coverage coupled with poor hygiene behavior and poor practice of other environmental health programs leads to emergency disease outbreaks including cholera, scabies, measles, meningitis, yellow fever, malaria and trachoma. In addition, Ethiopia is prone to natural/ climate related hazards like drought, flood, landslide and human made human made hazards like conflict which are resulting displacement and increase vulnerability of communities towards above-mentioned diseases.



1.1.1. Disease outbreak

In Ethiopia, diseases like cholera, scabies, measles, meningitis, yellow fever, malaria, dengue fever, chikungunya trachoma and others are continued to be a major public health concern. Around 80,000 cholera cases were reported in the last five years (2015-2019). Large number of peoples from Afar region, Somali region and Dire Dawa city administration were affected by chikungunya and dengue fever in 2019. A pandemic called corona viral disease (COVID-19) affected almost all countries including Ethiopia.

1.1.2. Conflict

In 2018/19, Ethiopia had the highest number of people forced to flee their homes because of human made and natural disasters. There has been an unprecedented increase in the number of Internally Displaced Persons (IDPs) in the country following a spike in inter- communal conflicts leading to increase the number of IDPs.

WASH Service delivery for IDPs is challenging due to many factors including lack of WASH guidance for responses, security restrictions, complex operational conditions, scarce resources, understaffing, and difficulty of undertaking thorough measurements during emergency situations.

Overcrowded living conditions at IDP sites, shortage of safe drinking water and sanitation facilities coupled with widespread acute malnutrition, the risk of disease outbreaks d are very high. Considering the congested living condition in the IDP, there is high chance of disease transmission.

1.1.3. Drought

Drought is the most devastating emergency event which has been historically common in the northern part of Ethiopia and recently affecting the other parts of the country. Even if drought have been occurring in different annual intervals, the occurrence of drought after 1974 has become more frequent, severe in magnitude, and has been causing loss of human lives and property damage. The populations in drought areas are vulnerable because of their dependence

on seasonal rain-fall for their livelihood and hence affecting them in many ways-ranging from severe malnutrition to deaths and loss of livestock and agricultural related properties.

1.1.4. Flooding

Flood is one of the major natural hazards in Ethiopia which causes significant damages to lives and livelihoods in parts of the country. It is mainly linked with heavy rainfall and the topography of the highland mountains and lowland plains with natural drainage systems formed by the principal river basins.

Flood often causes major damage to infrastructures such as roads, water supplies, sewage disposal systems and health facilities and contaminates fresh water supplies. Areas affected by recurring floods have been advocating for enhanced and strong WASH mitigation, preparedness and response mechanisms.

1.2 Emergency WaSH & EH Response in Ethiopia

The public health emergency response strategy of Ethiopia has six major response components. These are public health surveillance, case management, Water, Sanitation and Hygiene and Environmental Health (WaSH&EH), community engagement and social mobilization, nutrition and logistics.

In Ethiopia Lack of WASH & EH services in communities, holy water sites, temporary settlements (or migration) of seasonal labor, congested internal displacement sites and low level of hygienic practices are among the risk factors of disease outbreak. Provision of adequate and safe water supply, sanitation services and proper utilization of those services play a key role in reducing and controlling the disease outbreaks.

There are different actors in Ethiopia which are responsible for the provision of WaSH & EH services during emergencies and the Ministry of Health is responsible for coordinating the overall public health response.

Hence, MoH has prepared this emergency WASH & EH guideline in collaboration with concerned actors to strengthen harmonization and integration and to ensure provision of standard WaSH & EH services.

1.3. Rationale

There is no nationally adopted standardized tool to guide emergency WASH & EH responses during emergencies. As a result, stakeholders have been providing services in a fragmented way.

As a result, standardized WASH & EH services haven't been provided and accountability is not in place.

Hence, this guideline is developed considering country's context and international requirement to provide guidance to all responsible actors of emergency WaSH &EH responses. This will in turn ensure provision of standardized and harmonized services.

1.4. Scope

The guideline includes prevention, preparedness, response, early recovery, rehabilitation and resilience of emergency WaSH & EH response. It incorporates site selection, construction, maintenance and utilization of WASH & EH infrastructure, supply and services.

The guideline will be used in any public health emergencies such as flood, land slide, conflict, drought, disease emergencies. It excludes refugee camps hence it is managed by United Nations High Commissioner for Refugees (UNHCR) and Agency for Refugee and Returnee Affairs (ARRA) with different standards.

All Governmental and Non-Governmental Organizations (NGOs) providing emergency WASH and environmental health response will use this guideline.

1.5. Objectives

General objective

The main objective of the guideline is to provide guidance for the provision and regulation of WASH & EH responses in pre, during and post emergency situations across the country.

Specific objectives

- To set minimum standard for WASH & EH services for emergencies
- To harmonize emergency WASH & EH responses across the country
- To define roles and responsibilities of concerned actors
- To enhance risk communication and social mobilization related to emergency WASH and EH response
- To strength coordination of emergency WASH & EH interventions

Figure 1: Emergency and its consequences

CHAPTER TWO

EMERGENCY WaSH AND ENVIRONMENTAL HEALTH RESPONSE

2.1. Emergency WASH & EH Assessment

Following a disaster, rapid and effective response is vital to save lives, to prevent wastage of resources, protect health and stabilize the situation, and to reduce the impact of emergency. Assessment required at various stages of the responses:

- Rapid initial assessments to understand the nature and scale of the emergency and the likely need for external assistances.
- Detailed sector assessments to plan, implement and coordinate responses.
- Continual assessment (i.e., monitoring or surveillance) to monitor and identify gaps during emergency response.
- Conduct Inter Action Review (IAR).
- Post emergency assessment (damage and loss assessments) for post-emergency rehabilitation.

WaSH & EH assessment is conducted based on the nature/type of emergency. In acute emergencies, initial assessments should be rapid and produce the information required to start an appropriate response. It should be done to ensure that any action undertaken (types and scale of response, timely response) is effective. In less acute emergencies, a more detailed assessment is needed to design longer-term measures to link emergency responses with developmental programs.

2.1.1. Assessment Process and techniques

It is important to use standardized processes and standard report formats for assessments, to ensure objectivity and to enable the response to be made in proportion to the identified needs.

The assessment processes are:

- Development of assessment tools.
- Training/orientation on assessment techniques and tools.
- Avail and ensure the necessary logistics required for the assessment.

- Conduct assessment.
 - ✓ Field based assessment.
 - ✓ Brief review of information about the area and the population affected; the type of disaster and WaSH infrastructure that may have been damaged.
 - ✓ Involvement of community, local partners and government agencies.
 - ✓ Discussion with local communities and administrators and other relevant persons
- Debriefing field-based assessment.
- Data management and analysis.
- Report writing and disseminate to concerning bodies.

There are different field assessment techniques to gather the information during Emergency conditions. These are

- ✓ Key informant interview (KI) and Focused Group Discussions (FGD) for community's discussion
- ✓ On-site visual assessment using both structured and non-structured observation checklist (e.g., a health observation walks); spot check
- ✓ Expert measurement and testing (e.g., water quality testing, or diagnosis of mechanical failure of a pump);
- ✓ Surveys- to provide statistically valid information from a sample of the population;
- ✓ Document and record review: If second hand information is needed, it needs to review documents, records and registrations that relate with the emergency situation.

2.1.2. Interpreting and presenting assessment findings

Adequate effort should be exerted to collect data from various sources as much as possible to recommend appropriate intervention. Collected data from various sources should be verified. It is important to make decision on whether the situation demands external assistance or not. If yes, assistance should be clearly identified. The decision should consider local capacities, real gaps, actual or proposed activities of each sector.

An assessment report should include the following points.

- Assessment team members, organization, location and date of assessment.
- Executive summary with main problems, needs, the likelihood of further spread of outbreak, local response capacity and additional requirements.

- Introduction/background.
- Objective.
- Methodology used to collect data.
- Key findings related to the emergency WASH; any water, sanitation and hygiene problems to address with other agencies' activities and plans.
- Conclusion.
- Priority gaps with possible recommendations including resource implications (human, financial, logistic etc).

2.2 WASH & EH Response in Disease Outbreaks

WASH & EH responses in emergency settings can prevent outbreaks and an escalation of the total burden of disease and death associated with natural or man-made disasters. For example, outbreaks of diarrheal diseases, including dysentery and cholera, are common in emergencies. Feco-oral diseases may account for more than 40 percent of deaths in the acute phase of an emergency, with greater WASH & EH measures are intended to protect health by reducing exposure to pathogens.

WASH & EH services and facilities in outbreak situations are not necessarily intended to provide long-term sustainable access, but instead provide rapid relief to minimize the impact or spread of disease.

The main components of WASH and environmental health responses are:

Water: Water supply interventions in outbreak response aim to increase water quantity and quality. Increasing water quantity is a necessary step in providing potable water, and also enables hygiene and sanitation practices. Use of water quality interventions at the source or in the household can reduce microbial contamination of drinking water. Interventions include:

- Water trucking
- Provision of water tankers
- Rehabilitation of the existing non-functional water schemes
- Expansion of existing water supply to the IDP camps or affected communities.
- Construction of new water supply schemes.
- Conduct water quality monitoring and surveillance
- Provision of Household Water Treatment and Safe Storage (HHWTSS). Treatment of the existing water source.

Sanitation: Sanitation interventions in outbreak response aim to isolate feces from the environment. Minimizing open defecation and ensuring proper management of feces in a latrine or latrine alternative reduces exposure to infectious waste and can reduce disease transmission. Interventions include:

- o Provision of temporary/permanent latrine with hand washing facilities.
- o Maintenance and upgrading existing sanitation facilities.

- Promotion of proper utilization of sanitation facilities

Hygiene: Hygiene messages promote awareness among affected or at-risk populations on the disease transmission routes and how to prevent and control diseases while distribution of hygiene kits equips peoples to act on hygiene messages. Interventions include hygiene promotion, including hand washing:

- Multi-level social and behavioral change interventions.
- Distribution of soap and/or hygiene materials/dignity kits Distribution of other items like bucket, jag, jericans, detergents

Vector control: Following emergency conditions, stagnant water may create favorable environment for vector breeding. Due to this, the probability of occurrence of vector borne diseases is high. Environmental management activities with engagement of the community and stakeholders should be done at all levels.

- Filling, drainage and environmental management activities at breeding sites.
- Distribution of long-lasting insect treated nets (LLITNs).

Food safety: Contamination of food occurs at varies level from production to consumption. Provision of safe foods to the affected community is necessary. Ensure all food that is stored, prepared, and consumed should be safe. It is advisable to check raw and cooked foods are kept separate at appropriate storage temperatures, food handling is carried out with utmost cleanliness, food is thoroughly cooked, and safe water is used in food preparation. Interventions are:

- Monitoring of food safety and hygiene practices
- Orientation for food handlers
- Promotion on proper food handling for affected communities

Liquid and solid waste management: Waste management is one of the challenges of affected community during emergency conditions, because waste management system might be collapsed by the emergency or it may be difficult to access waste management supplies and facilities. Needed interventions:

- Availing of color coded waste bins for waste collection and segregation

- Construction of solid and liquid waste disposal facilities for final disposal including incinerators and pits based on the context.
- Conduct sanitary inspection.
- Organize IDP site Sanitation campaign.

Infection prevention: Infection prevention and control mechanisms should be in place through:

- Capacity building to the health practitioners on IPC practices to prevent from further spread both in the CTC and communities.
- Ensuring availability and proper use of PPE

2.2. Advocacy and Social Behavioral Change Communication (SBCC)

2.2.1. Advocacy

Advocacy is essential for effective partnerships, adequate fund raising, and implementing appropriate interventions and giving rapid response for the emergency conditions.

Advocacy could be carried out for mobilizing resources, mainstreaming emergency WASH & EH response in different actors' plan targeting decision makers, parliamentarians, key public figures and practitioners at all levels.

It also allows better coordination among different stakeholders and linkages with the private sector. Advocating on global celebration days such as global hand washing days on October 15, world toilet day on November 19, world water day on March 22 and menstrual hygiene day on May 28 has paramount advantages to mobilize resources and lobbying stakeholders to act on emergency WASH interventions.

2.2.2. Social and behavioral change communication/SBCC/

Social and Behavioral change communication is a useful strategy to enhance general understanding along with breaking down barriers and creating supportive environment for attaining positive attitude and behaviors towards emergency WaSH & EH response. SBCC involves face-to-face dialogue with individuals or groups to inform, motivate, problem-solve or plan with the objective of promoting and sustaining behavior change.

At the community level, existing structures such as the health extension workers, women's support groups, youth associations, parent-teacher associations, and religious and community leaders are important for promoting emergency WASH & EH services.

At school level, it is important to engage students in emergency WaSH & EH response and increase their awareness through School clubs and mini media

Awareness creation on WASH emergency service could be linked to existing Information Education and Communication (IEC) and BCC programs implemented by various actors. Media engagement is also crucial to bring the agenda into the spot light so that key influencers can provide needed emphasis.

CHAPTER THREE

WASH AND ENVIRONMENTAL HEALTH MINIMUM STANDARDS

The main objective of ensuring minimum WASH and environmental health standards at emergency setting is to ensure provision of adequate and basic WASH and environmental health services. The WaSH & EH minimum standards that are designed based on country context and international regulations and lessons are:-

3.1. Site selection layout and shelter

When disaster occurs and as a result if evacuation is decided, emergency settlements for displaced people need to be established rapidly. During such situation, the first priority shall be to use existing buildings in the nearby safe vicinity areas. Otherwise, use tents or makeshift shelters made of plastic sheets, tarpaulins, or local materials, such as bamboos and thatch, in a secure location where water, sanitation and food can be provided. Such services might be required for months or even years but it is usually impossible to know at the outset of an emergency how long the emergency settlement will exist.

On the other hand, overcrowding and poor shelter are the risk factors for transmission of epidemic diseases and other communicable diseases. Therefore, site selection and shelter should be done by considering minimum standards like space per person, security issue, environmental risk factors, etc.

In general, the following measures for design of healthy living conditions for emergency and disaster-affected people should be considered:

- The topography of the land should permit easy drainage and the site should be located above flood level. Land covered with grass will prevent dust, but bushes and excessive vegetation can harbor insects, rodents, reptiles, etc., and therefore should be avoided or cleared. Wherever possible rocky, impermeable soil, steep slopes, narrow valleys, and ravines should be avoided. Ideally, the site should have a slope of 2–4% for good drainage, and not more than 10% to avoid erosion and the need for expensive earth-moving for roads and building construction.

- The site should be free of major water-related diseases such as malaria, onchocerciasis (river blindness), schistosomiasis (bilharzia) and trypanosomiasis (sleeping sickness). If not, possible care should be taken to avoid or control vector habitats.
- The site chosen should be within reasonable distance of an ample source of good water and, ideally, near some high ground from which water can be distributed by gravity.
- Discussion should be done with the host community before starting construction of shelter in order to avoid conflicts.
- The shelters should be situated near the nutritional rehabilitation center and health facilities. In conflict- and famine-related disasters, many people may be suffering from malnutrition and debilitation when they arrive, so specialized services such as intensive or therapeutic feeding may be needed.
- Whenever possible, the area should be naturally protected from adverse weather conditions such as windy, extreme heat and cold, etc.
- Areas adjacent to commercial and industrial zones, exposed to noise, odors, air pollution and other nuisances should be avoided.
- Shelters may be tents or prefabricated units, or may be built out of plastic sheeting together with timber, stone and thatch. Where plastic sheeting is used, it is common to provide one piece, 4 meters by 6–7 meters, per household.
- There should be ample space for the people to be sheltered and for all the necessary public facilities such as roads, firebreaks (areas without buildings and with little or no flammable vegetation) and other service areas (30m² per person, or 45m² per person allowing for small gardens, but not for full-scale agricultural activities).
- Areas for public spaces, food distribution, markets, etc. should be defined from the beginning.
- To facilitate the management and control of communicable diseases, settlement sites should hold no more than 10,000–12,000 people, and should be subdivided into independent units of no more than 1000 people.
- Shelters should be arranged in rows or in clusters of 10–12 on both sides of a road at least 10 meters wide to permit easy traffic flow and access by ambulances or firefighting vehicles. In tented areas, there should be at least 2 meters between the edge of the road and the tent pegs.

- Built-up areas should be divided by 30 meters wide firebreaks approximately every 300 meters. Firebreaks can be used for locating roads and recreation areas.
- Shelters should be spaced 8 meters apart so that people can pass freely between them without being obstructed by pegs and ropes. This spacing also helps to prevent the spread of fire. If this is not possible owing to a lack of space, the distance between shelters should preferably be at least twice the overall height of each shelter, and should never be less than 2 meters. A separation greater than 8 meters may lead to open defecation and should be avoided.
- There should be a minimum of 3.5m² per person inside the shelter in warm climates where cooking is done outside, and 4.5–5.5m² per person in cold climates where cooking is done inside the shelter.
- Small shelters with few occupants are preferable to large shelters with many occupants.
- In the absence of electric lighting, wind-proof kerosene or oil lamps, or battery operated lanterns, solar should be provided for lighting shelters, toilets and roads.
- Natural ventilation should normally be adequate for temporary shelters such as tents.
- Bathing, laundry and disinfection facilities should be provided. One double sided ablution bench (3 meters long) should be provided for every 50 people.
- Separate accommodation is necessary for unaccompanied children, with provision of welfare staff and/or community volunteers to stay with them; there should be at least one adult per shelter or room.
- Sites for epidemic disease management should be selected considering the nature of the disease and it must be clearly separated and isolated from other departments, to avoid contamination of other patients, the management center should not be far from affected areas to make ease of access, the space should be adequate for future expansion if required’.

3.2. Water supply

3.2.1. Water Sources

An inventory of the existing water sources should be made as part of the site-selection process. Permanent water-supply arrangements will depend on the length of time that the settlement is to be in use and the size of the population to be served. When existing water sources have been destroyed, it should be rehabilitated otherwise adequate new sources should be selected.

If new sources are required, surface water (streams, rivers, and lakes), groundwater (underground or emerging as springs) and rain water harvesting are major water sources. Rain water, groundwater (springs and wells) or water from municipal and private systems is usually of better quality than surface water (rivers, lakes or dams). If surface water is the only options, it should be considered to be contaminated and must be treated prior to use and need to physical protection from pollution.

Considerations in choosing between alternative sources of water in an emergency situation include:

- Speed with which source can be made operational.
- Yielding capacity of the source against the number of populations served.
- Reliability of supply (taking into account seasonal variations and, if necessary, operational costs and logistics).
- Water quality, risk of contamination and ease of treatment if necessary.
- Rights and welfare of local population (host community).
- Simplicity of technology and ease of maintenance.

The types of water supply schemes determine the number of persons/schemes. The following are recommended in emergency conditions (Table.2)

Table 1: Types of water supply schemes and number of users during emergency condition

Water supply schemes	Maximum number of peoples	Remark
Hand dug well (with pump)	500	500 people per hand pump (based on a flow rate of 17 liters/minute)
Hand dug well (without pump)	400	400 people per open hand well (based on a flow rate of 12.5 liters/minute)
Water tap	250	250 people per tap (based on a flow rate of 7.5 liters/minute)
Protected Spring	250	It should be more than 7.5lt/min
Water trucking	≥ 7.5 L/C/day	If the above options is not feasible

3.2.2. Water supply access and quantity

In extreme situations, there may not be sufficient water available to meet basic needs of the affected population, furthermore, disasters can contaminate or destroy previous safe drinking

water supplies. However, the availability of a safe drinking water supply during an emergency is the most priority issue.

People in emergency situations are generally much more susceptible to illness and death from diseases, often caused by a lack of adequate water supplies. Diarrhea and other infectious diseases transmitted from faces to mouth are the most significant diseases resulting from poor water and sanitation services. To be the water sources accessible in disaster and emergency conditions:

- The distance of the water sources should be less than 500 meters from the dwellings/households
- Queuing time should be less than 30 minutes
- It should not take more than 3 minutes to fill a 20-liter container (this can be adjusted during the design of reservoir)
- Availability of storage tank with a capacity of 1500 Liters for every 400 persons which can be filled twice per day.

The minimum amount of water needed in different purpose and in different emergency center is provided in table shown below.

Table 2: Basic survival water needs for emergency crisis situation.

S/N	Description	Amount of water needed
1	Survival needs: water intake (Drinking and food)	2.5-3 litres/person/day
2	Basic hygiene practice (hands and face washing)	2-6 litres/person/day
3	Basic cooking needs	3-6 litres/person/day
4	Total basic water needs	7.5-15 litres/person/day

Table 3: Minimum Water Quantity for different centers: Survival figures and quantifying water needs

	Type of centers	Minimum water quantity (Liters)
1	Health centers and hospitals	5 liters per outpatient/day
		40-60 liters per in patient per day
		100 liters per surgical intervention and delivery
2	Cholera treatment centers (CTC)	60 liters per patient per day
3	Viral hemorrhagic fever centers	300-400 liters per patient per day
4	Therapeutic feeding center	30 liters per in patient per day
		15 liters per care giver per day
5	Mobile clinic with infrequent visit	1 liter per patient per day
6	Mobile clinic with frequent visit	5 liters per patient per day
7	Oral Rehydration points	10 liters per patient per day
8	Reception/Transit Centers	15 L/c/d (if stay more than 5 days)
		3 L/c/d if stay is limited to day time
9	Schools	3 liters per pupils per day for drinking hand washing
10	Public toilets	1-2 L/user/d for hand washing
11	All flushing toilets	20-40 L/user/d for conventional flush latrine connect to a sewer
		3-5 L/user/d for pour flush latrine
12	Anal washing	1-2 L/c/d
13	Livestock	20-30 l/animal/day for large animals
		5 l/animal /day for small animals

3.2.3. Water collection, transportation, storage and distribution

During emergency conditions if water sources could not be available around the emergency centre, water can be transported by vehicles (purpose-built water-tank trucks, water-tank trailers, or ordinary trucks carrying tanks), although this is an expensive option. Water delivered by water truck should be drawn from the safest possible sources and should be disinfected before delivery to the public and usage. Adequate storage capacity and back-up systems for all components of a water system must be assured.

Water should be conveyed (possibly through pumping) to a storage tank of a suitable size, depending on the population to be served, the reliability of the water source, and the treatment system.

The appropriate storage volume will depend on a number of specific factors such as

- The reliability of the water source and pumping facilities (where relevant).
- Cost and peak hours in demand.

Water can be transported and distributed using gravity flow and/or pumps. The gravity flow is preferable due to cost effectiveness. If natural slopes are not available, selection of raised mounds and establishment of storage tanks is necessary. Installation of water storage/tankers facilities should include distribution points with inclusive design that should address the needs of disabilities, elders, females and children.

3.2.4. Water quality and Treatment

Water should be safe in quality to be drunk and used for cooking and also suitable to use for hygienic purposes. Water supplies need to be treated during and after an emergency to make them safe and acceptable to the user. Water, Sanitation and Hygiene service providers should provide safe water as per the national quality standard. Water treatment can be conducted at the source or at household level. Treatment at the point of use is generally quicker and less expensive to implement than a centralized system, but it can be more difficult to manage.

The recommended water quality limit in emergency conditions:

- The water should be in the range of 0.2-0.5 mg free residual chlorine/L at point of delivery.
- It should be nil for fecal coli forms/100 ml at point of delivery.
- The maximum turbidity of water should be less than 5 NTU.
- The Ethiopian minimum standards of water quality should be met (see annex III).
- Water quality monitoring should be conducted in regular basis depending on the type of the water source and risk assessment result by using portable test kits.

3.2.5. Household water treatment, handling and safe storage

If chlorination is not possible at the source, point of use of water treatment options is important. Treatment and safe handling of water at household level or at the point of use is important to safeguard the consumer from uncertainty. In emergency conditions, it is so difficult to predict the point and possible sources of water contaminations. So that drinking water supplies need to be treated at the point of use. If household treatment kit is available, it is recommended to distribute the treatment kit to each household.

It is necessary to show the family members how to use the treatment kit, how long they use, how to handle the filtered water and others issues before the beginning of utilization.

Table 4: Common chlorine chemical used in Ethiopia for emergency condition

S/N	Concentration of chlorine in the product	Amount of chlorine needed	Amount of water to be treated
1	Wuha agar bottle of 150 ml	1 cup of the bottle	20 liters
2	Aqua tab (1g/tablet)	1 tablet	20 liters
3	PUR (1 sachet=4g)	1 sachet	10 liters (need further filtration process)
4	Bishangari (I sachet = 2.5 g)	1 sachet	20 liters

N.B. If possible, boiling methods can be taken as treatment options at household level.

Families will need containers, preferably with a narrow neck, to keep transported and stored water supplies. So that, providing jerry cans (or suitable alternatives such as plastic buckets or barrels) to affected families who need a way to collect and store water for washing, cooking and bathing is required. Each household should have at least two clean water collection containers of 10–20 liters, plus enough clean water storage containers to ensure there is always water in the household. The amount of storage capacity required depends on the size of the household and the consistency of water availability.

3.2.6. Water for hygiene facilities

Communal facilities for maintaining personal cleanliness should be provided in shelters and camps. These may include showers, washrooms, laundries and disinfection rooms. Ensuring proper maintenance and supervision of all these facilities is the responsibility of health personnel and the users. Regular meetings are required to ensure this shared task is carried out correctly.

a. Shower facility

- 30-35 L/person/week required Water for bathing
- A washing bench of 4-5 meters should be provided for 100 peoples
- The shower room should be separated for men and women.
- One shower head is need for every 100 people in temperate climate.
- Floors should be disinfected every day.

b. Cloth washing trough (Laundry)

- In temporary shelters, people may be expected to wash their clothes in tubs/barrels provided.
- In longer-term camps, however, communal laundry slabs or basins should be provided.
- When disinfection rooms are needed, clothes should be washed in them.
- Whenever possible, hot water should be provided.
- One washing stand should be provided for every 100 people, and a schedule for use established by the camp health committee.
- Soaps should be used, rather than detergents.
- Proper drainage should be provided for waste water, with traps for grease, soap and sand (see liquid waste management for detail).
- Washing clothes and bathing should not be allowed at taps used for drinking-water, but separate bathing and laundry areas should be provided. If these areas are not close to the water points, then they should have a piped water supply, otherwise people will tend to wash at the water points.

c. Hand washing facilities

- regular hand-washing with soap is very important especially in disaster conditions
- Soap is an essential aid to reducing disease in emergencies:
- People should have access to at least 250 g of soap per person per month, for personal and domestic hygiene

3.3. Food safety measures

In emergency situations, difficult conditions can happen even worse in the event of food borne disease outbreak. Provision of food is often carried out under basic conditions and the people who provide services available may not have the necessary experiences to manage food safety effectively. Therefore, especial attention should be given to reduce food borne diseases.

Preventive food safety measures: Food may become contaminated by different sources of contaminants during harvesting, storage, transportation, preparation, and consumption.

Therefore, preventive food safety measures are depicted as follow;

- Water for food preparation should be treated as contaminated unless specifically confirmed as safe.
- Agricultural products from suspected to contaminated with raw sewage and hazardous chemicals should be prohibited for consumption
- All food stocks should be inspected for their safety.
- In areas that have been flooded, whatever intact foods remain should be moved to a dry place, preferably away from the walls and off the floor.
- Any food stocks found to be unfit for human consumption must be disposed of properly
- Consumers should be clearly informed of measures they need to take to maintain food safety.
- Check all food for physical hazards, such as glass, wood splinters and stones that may have been introduced.
- Moldy food should not be consumed as it may contain toxic substances.

Generally, as a reference, it is better to follow WHO's **Ten Golden rules** for safe food preparation;

1. Choose foods processed for safety
2. Cook food thoroughly
3. Eat cooked foods immediately
4. Store cooked foods carefully
5. Reheat cooked foods thoroughly
6. Avoid contact between raw foods and cooked foods
7. Wash hands repeatedly
8. Keep all kitchen surfaces meticulously clean
9. Protect foods from insects, rodents, and other animals
10. Use safe water

3.4. Excreta management

Free environment from human excreta is essential for people's dignity, safety, health and well-being. During emergency conditions safe excreta management is one of the priority components. Thus, providing safe excreta management has an equal importance as providing a safe water supply. All people should have access to appropriate latrines. When considering technical options of emergency latrine facilities, it is important to bear in mind its acceptability to the user, cultural practices, people's daily customs and habits, perceptions and can be used and maintained hygienically.

Open defecation practice constitutes a high risk to health. Human excreta may contain a range of disease-causing organisms including virus, bacteria and parasites. These microorganisms in human excreta may enter in human body through contaminated finger, food, water, eating and cooking utensils and by contacting with contaminated objects. Oral-fecal transmission of enteric microorganisms may specially be a major cause of illness in disasters and emergency. Therefore, the containment of human excreta away from people creates an initial barrier to excreta-related disease by reducing direct and indirect routes of disease transmission. Excreta containment should be integrated with its collection, transport, treatment and disposal to minimize public health risks and environmental impact. Providing safe excreta management is will help to reduce direct human exposure to disease causing microorganisms and contamination of food and water sources.

Generally, the activities for excreta management conditions for emergency and disaster-affected people in both short term and long-term settlements should include: -

- Consult representative stakeholders about the sitting, design, site and implementation of any type of latrines.
- Consider assessing the local topography, ground conditions and groundwater and surface water (including seasonal variations) to avoid contaminating water sources and inform technical choices.
- Quantify the affected population's latrines preference based on public health risks, cultural habits, water collection and storage.

- Design and construct latrines to minimize safety and security threats to users, especially women and girls, children, older people and persons with disabilities.
- Separate all types of latrines by sex.
- Provide appropriate facilities inside latrines for washing and drying or disposal of menstrual hygiene and incontinence materials.
- Provide adequate supply of water for hand washing with soap, for anal cleansing, and for flushing.
- Establish sanitation facilities in newly constructed communal settlements or those with substantially damaged infrastructure to immediately contain excreta.
- Decontaminate any feces-contaminated living, learning and working spaces or surface water sources immediately.
- Contain and dispose of children’s and babies’ feces safely.
- Establish collection, transport, treatment and disposal systems that align with local systems, by working with local authorities responsible for excreta management.
- Desludge containment facility should be safe during collection, transportation and final disposal process.

3.4.1. Key Minimum Standards

All human excreta are disposed of in a manner which is safe to public health and the environment.

Table 5: Minimum number of seats of toilets for community, public places and institutions

S/N	Location	Short term (1-6 months)	Medium and long term
1	Community	1 squatting hole for 100 persons (communal)	1 toilet for 20 persons (shared family) 1 toilet for 5 persons or 1 family
2	Market areas	1squatting hole for 50 stalls	1 toilet for 20 stalls
3	Hospitals/medical centers	1 squatting hole for 20 beds or 50 outpatients	1 toilet for 10 beds or 20 outpatients
4	Feeding centers	1 squatting hole for 50 adults 1 squatting hole for 20 children	1 toilet for 20 adults 1 toilet for 10 children
5	Reception/transit centers	1squatting hole for 100 individuals 3:1 female for male	
6	Schools	1 squatting hole for 60 girls 1 squatting hole for 75 boys	1 toilet for 30 girls 1 toilet for 60 boys
7	Offices		1 toilet for 20 staffs

N.B. Ratio of shared toilets: Minimum 1 per 20 people.

3.4.2. Types of latrines during emergency

There are a number of latrine options during an emergency. Once cultural and physical factors have been taken into account, the key factors to consider are low cost, simplicity of construction and ease of maintenance. Emergency latrines should physically be separated for male and female users possibly in opposite direction except communal latrines and should fulfill protection principles. The type of latrine options includes: -

a. Shallow trench latrines

Shallow trench latrines allow feces to be buried and far better contained than open defecation. Approximately 3–5 meters' length of shallow trench is needed for every 100 people, and it is preferable to have a number of shorter, shallow trenches. Consultation with the camp health committee will reveal whether it is better to arrange for each family in a tent or shelter to dig and use its own shallow trench. A stock of shovels should be kept for use by residents.

After each visit, the user should shovel into the trench sufficient soil to cover the excreta. Boards can be placed along the edges of the trench to provide stable footing and prevent the sides from caving in. Trenches should never be used for more than a week before they are completely filled, compacted and replaced by new trenches. Shallow trench latrines should be sited in the same way as defecation fields. When the trench is filled to within 30 centimeters of the top, or after a week's use (whichever comes first), it should be completely filled, compacted and marked for future identification, and a new trench should be dug and used.

b. Deep trench latrines

A further improvement is the deep trench latrine, which is deeper, longer and wider than the shallow trench latrine. It can last 1–3 months. It can be constructed from a variety of materials, including wooden planks and plastic squatting plates for the floor and plastic sheeting, and wooden planks or metal sheets for the superstructure. Each deep trench can accommodate up to six cubicles, screened for privacy. Each cubicle measures 90 centimeters wide by 80 centimeters high. At peak usage, it is reasonable to use an estimate of 100 people per day per cubicle, or 240 each day for each deep trench. Soil is piled up and used to cover excrement, as in a shallow

trench system. The simple arrangement of using boards across the trench as foot rests can easily be improved on as time and materials allow.

Eventually, however, a wooden cover with either squatting plates or seats can be constructed. There may be carpenters among the residents, and volunteers should be mobilized to help; such improvements, and the use of ashes and soil to cover excreta, can help to control flies. A number of agencies now use plastic latrine slabs that can be placed in line over a deep trench to form a row of toilets that are rapid to construct and easy to keep clean.

c. Communal/Pit Latrines

Communal latrines may be an option in lower density, longer-term emergency settlements that need more hygienic, less maintenance, and have appropriate sub- and super structure. It is important for the control of flies, mosquitoes and odors that tight-fitting lids for the squatting holes are provided and are always closed by users after each visit to the latrine.

The latrine slab can be made of sawn timber, logs (with or without an earth covering), concrete, plastic, or a combination of two or more of these. The latrine superstructure may be made of a wooden framework covered with plastic sheeting, grass, or other local materials. Temporary superstructures may be replaced by the users with more permanent materials after the emergency phase. The choice of materials for slabs and superstructures will depend on considerations such as cost, local availability, environmental impact, and ease of use for families constructing their own latrines.

Normally the pit should be designed to last at least a year, and its volume should be calculated on the basis of about 0.07m³ per user per year. In unstable soils, the top 50 centimeters of the pit, or the whole depth of the pit, may need to be lined to prevent collapse. Pit linings may be made of many different materials, including brick, concrete, old oil drums or bamboo. Pit linings should normally not be watertight below 50 centimeters deep.

If the area is entirely water logged and shallow water table, the latrine type should be raised to protect the ground water from contamination.

3.4.3. Site selection and considerations for latrines construction

- Latrines should be sited at least 30 meters far from any water source. If the abstraction point is upstream of the latrine, the distance can be reduced provided that the groundwater is not abstracted at such a rate that its flow direction is turned towards the abstraction point. In heavily-fissured rock this distance may have to be increased substantially. Because pollution (faecal and chemical) tends to disperse down slope from its source, latrines should be sited downhill from any groundwater source, particularly if the bottom of the latrine is less than 2 meters above the water table.
- Latrines should be sited no more than 50 meters from users' shelters, to encourage their use, but sufficiently far away (at least 6 meters) to reduce problems from odors and pests.
- Onset acute emergency (up to 6 months) emergency trench latrine 1 stance per 100 persons as a minimum standard
- Protracted emergency beyond 6 months 1 stance per 50 persons with appropriate types of latrines. E.g., Semi-permanent latrines for communal shared latrine (1 instance/5 households.
- Depending on the needs of the affected population, latrine blocks should be separated by sex as long as it is physically feasible.
- Allocated one dedicated cubicle for elderly people/people with disability per block (7 stances per block – 3 each for male and female and 1 for barrier free).
- Equipped with ramps and level entries (Access paths should be clear and leveled) to allow access even with wheelchairs as per needs
- Install and maintain internal locks.
- Provide lighting to access latrines.

3.5. Waste management

3.5.1. Solid waste management systems

The quantity of solid waste generated from settlement sites and institution (including health facilities, market places and food and drinking establishment) are often not considered as substantial. Inadequate solid waste management poses a public health risk as it can create favorable habitats for insects, rodents and other disease vectors, causes injury and sickness to children and waste collectors, block drainage systems which creates favorable environment for insects, causes direct health impacts because of its hazardous and infectious nature. Therefore, the solid waste generated from settlement areas should be given priority and should be managed as per the standard of management.

In solid waste management system consider the following activities: -

- Design the solid waste collection storage and disposal program based on public health risks, assessment of waste generated by households and institutions, and existing practice.
- Work with local or municipal authorities and service providers to make sure existing systems and infrastructure have included the settlement areas.
- Representative persons from the affected population should be involved in the design and implementation of the solid waste program.
- Give particular attention for communal areas because it often lack designated ownership and responsibility for solid waste management.
- Give particular attention for solid waste generated from abattoirs, food and drinking establishment and health care areas
- Organize a system to regularly remove household and other waste from designated public collection points.
- Organize periodic or targeted solid waste clean-up campaigns with the necessary infrastructure in place to support the campaign.
- Provide separate containers for infectious and noninfectious wastes
- Provide personal protective equipment (PPE) for people who collect and dispose of solid waste and those involved in reuse or re-purposing.

- Ensure that solid waste collection and disposal sites are appropriately, adequately and safely managed.
- Minimize packing material and reduce the solid waste burden by working with organizations responsible for food and household item distribution if possible.

Solid waste storage, collection, transportation and disposal

- Provide for households/ tents and in peoples gathering area with convenient, adequately sized and covered storage for household waste for small clusters of households.
 - Consider household preference for the number and size of containers for reuse and recycling.
 - In markets and commercial areas, large containers or collection material may be needed.
- Wastes should be put in containers daily for regular collection, burnt or buried in a specified pit.
- Provide clearly designated and fenced public neighborhood collection points where households can deposit waste on a daily basis.
- Provide clearly marked and fenced storage for waste generated in communal areas, especially formal or informal marketplaces and peoples gathering area.
- All shelters have access to a refuse container and/or are no more than 100 meters from a communal refuse pit.
- At least one 100-litre refuse container is available per 10 families, where domestic refuse is not buried on-site.
- Ensure that institutions such as schools and others, have clearly marked, appropriate and adequate covered on-site storage for waste generated at that location.
- Daily refuse collection is best, especially putrescible wastes, but collection not more than once a week is essential to minimize insect breeding (flies produce a new generation approximately every eight days in warm conditions).
- The waste should be covered before planning to transport to disposal site.
- In low-density settlements where relatively small quantities of refuse are produced, small refuse pits may be dug by each family.

- Alternatively, a communal trench 1.5 meters wide and 2 meters deep can be excavated for the refuse. Each day, refuse should be covered with 20–30 centimeters of earth.
- When the level in the trench is 40 centimeters below ground level, the trench should be filled with earth and compacted, and a new trench should be dug.
- Disposal sites should be fenced off to prevent accidents and access by children and animals; care should be taken to prevent any leachate contaminating the ground water
- It may be appropriate to encourage and facilitate recycling of refuse after collection and transport.
- Refuse can be sorted as an income-generating activity, producing paper, glass, metals and plastics for recycling, where these materials are present in significant quantities in the refuse
- Recycling of solid waste should be encouraged, provided it presents no significant health risk.
- In most cases, the use of sanitary landfills will be the best option for final disposal. When no existing landfills, the construction of new landfills will be necessary.
- Earth moving equipment may be needed to modify the site and to manage the landfill operation

3.5.2. Liquid waste management

Liquid waste may be generated from household, health facilities, food and drinking establishments, toilets, hand washing basins, water points, laundry and bathing areas and drainage. The main health risks associated with liquid waste are contamination of water supplies and the living environment, damage to toilets and dwellings and place for vector breeding and thus increased exposure to diarrheal and other diseases.

Management of liquid waste focuses on finding a way to dispose of the waste in a way that is safe for humans and the environment. A proper drainage plan, addressing storm water drainage through site planning and wastewater disposal using small-scale, on-site drainage, should be implemented to reduce potential health risks to the population.

The following are key activities that should be implemented during emergency responses:

- Establish a drainage channel that runs under roadways to prevent flooding and soil erosion.
- Provide appropriate drainage facilities so that all dwelling areas and services are kept free of standing water and storm water drains properly
- Ensure appropriate water point drainage at household and communal washing, bathing and cooking areas and hand washing facilities.
- Areas around dwellings and water points are kept free of standing wastewater.
- Water point drainage is well planned, built and maintained.
- Unless the settlement is sited where there is an existing sewerage system, domestic wastewater should not be allowed to mix with human waste.
- Where possible, and if favorable soil conditions exist, drainage from water points and washing areas should be on-site rather than via open channels like to use the waste water for small gardens
- Channels should be designed both to provide flow velocity for dry-weather wastes and to carry storm water.
- The drainage canals need to be used properly and kept clear of debris
- Simple and cheap techniques such as soak away pits can be used for on-site disposal of waste water. The advisable size is 1M depth by 1M length by 1M width.
- The pit should be filled 40cm with broken stones, 30cm gravel and the remaining 30cm with sand mixed with gravel or sand and the grey water can be allowed to percolate into the ground.
- Protect toilets from flooding by constructing ditches around it to avoid structural damage and leakage.
- If liquid waste from toilet and other area dispose to septic tanks or directly in to pit, the sludge has to be removed periodically and the effluent has to be disposed of via a soak pit.
- If liquid waste disposed in to pit from abattoirs and health care areas, should be in a slab-covered channel to reduce insect access and prevent contamination.
- Appropriate tools, spare parts and fittings are provided for small drainage works and maintenance where necessary

3.6. Vector control

Vector borne diseases are a major cause of sickness and death in many humanitarian settings. Most vectors are insects such as mosquitoes, flies and lice, but rodents can also be vectors. Some vectors can also cause painful bites. Vector control measure must be targeted and based on the life cycles and ecologies of the vectors. Control programs should aim to reduce vector population density, vector breeding sites, and contact between humans and vectors. People live in an environment where vector breeding and feeding sites are targeted to reduce the risks of vector related problems.

Key measures for vector control;

- Assess vector borne disease risk for a defined area.
- Align humanitarian vector control actions with local vector control plans or systems, and with national guidelines, programs or policies.
- Determine whether chemical or nonchemical control of vectors is relevant based on an understanding of vector life cycles.
- Assess current vector avoidance or deterrence practices at the household level as part of an overall hygiene promotion program.
- Use participatory awareness campaigns to inform people of problem vectors, high risk transmission times and locations, and preventive measures.
- Conduct a local market assessment of relevant and effective preventive measures.
- Train communities to monitor report and provide feedback on vectors problem and the vector control program.
- Conduct regular environmental management and vector surveillance

3.7. WASH NFI Distribution

Provision of minimum WASH NFI package to affected communities is advisable to maximize the impact of emergency response activities and to improve the lives of the communities. Provision of WASH NFIs might be decided based on real needs in the sites through consultation and assessment with the target groups, women and girls in particular. A record of the types and number of WASH NFI distributed, number of households received, place of distribution, etc. should be kept.

All acting partners are responsible to compile Post-Distribution Monitoring (PDM) reports to verify how effectively and efficiently WASH NFIs were distributed to the target population as well as record responses of the beneficiaries to measure the level of satisfaction with the items received. The detail WASH NFI items are listed in Table 7 and 8.

Table 6: List of NFIs and recommended quantity and duration for affected communities

No	Item	Quantity and duration	Remark
1	Household water treatment chemical	3 months	Need feasible strategy after 3 months
2	Jerry can	2/household for 6 months	
3	Cooking utensils		
4	Bucket	1/household for 6 months	
5	Body soap	1/person/month for 3 months	
6	Laundry soap	1/person/month for 3 months	
7	Washing basin	1/household for 6 months	
8	Flashlight	1/household for 6 months	
9	Dignity kit	1/female	

The following list of items are additional WASH related NFI which partners with adequate capacity are encouraged to distribute based on actual needs of the affected population.

Table 7: Additional NFI for affected communities

Other family hygiene and dignity items			Duration
At household	Items	Quantity	
	Plastic child potty	1 child potty/family	
	Plastic scoop/shovel for baby faeces	1 scoop/family	
	Reusable baby diapers	6 pieces	
	Petroleum jelly	1 per household	
	Nail clipper	1 piece per household	
	Multipurpose cloth (2m x2.5m)	2 per household – cotton white colour	
	Towels 70x 130 cm	2 per household	
	Disposable diapers (if reusable is not available)	2 pieces per day per baby 60 pieces per month	
	Plastic jug (one liter made of plastic)	Two per household, one for anal cleansing and one for cooking.	
	Toilet paper	8 rollers per household for 4 months	

3.8. Infection prevention

Infection prevention (IP) is a key activity in disease prevention in any situation as well as for outbreak response. It is critical for patient, health care support staffs, caretakers, and the community. Application of infection prevention interventions both in healthcare settings and community, will reduce transmission of infectious diseases and help control outbreaks.

3.8.1. Emergency infection prevention responses in health care settings

All healthcare settings at emergency settlement sites should maintain minimum infection prevention standards, including in disease outbreaks.

The followings are key actions needed in health care facilities;

a. Provide a reliable water supply of sufficient quantity and quality, appropriate to the healthcare setting.

- Store at least 48 hours' worth of safe water (0.5mg/l free residual chlorine) to ensure a constant supply.
- During outbreaks: Increase water quantities and add chlorine solutions according to disease type risk and needs.
- Drinking water quality at point of delivery: Minimum: 0.5–1mg/l FRC

b. Provide sufficient excreta disposal facilities.

- Ensure access to segregated latrine facilities to client, staff including for disabled people
- Provide commode chairs (for disabled peoples) and bucket toilets for those facing mobility barriers.
- Clean sanitation facilities (toilets, showers, washing area) with water and detergent/disinfectants.
- Minimum: four in outpatient facilities (separated for men, women, children and healthcare workers).
- Minimum: 1 per 20 inpatients (separated for men, women, children and healthcare workers).

c. Provide enough cleaning materials and equipment for healthcare workers, patients and visitors to maintain hygiene.

- Provide hand washing stations at key locations with safe water, soap or alcohol rub. Air dry or use “once only” towels.
- Set up additional hygiene practices, such as chlorine foot baths or spraying (depending on the disease) and hand washing before putting on or removing personal protective equipment (PPE).
- Provide patients with specific hygiene items and training before discharge.
- Increase disinfectant strengths for cleaning floors and contaminated surfaces.
- Consider special mechanisms for disinfecting linen.

d. Maintain a clean and hygienic working environment

- Clean floors and horizontal work surfaces daily with water and detergent.
- Clean and disinfect potentially contaminated surfaces with an appropriate concentration of chlorine solution.
- Clean, disinfect or sterilize reusable medical devices depending on risk before each use.
- Disinfect all linen with 0.1 per cent chlorine solution after soaking if visibly soiled; sterilize all linens for operating theatres.

Table 8: Recommended cleaning frequencies for health care facilities

Activity	Location
Daily sweeping	<ul style="list-style-type: none"> • Offices and non-patient areas
Daily wet mopping	<ul style="list-style-type: none"> • Waiting areas, Consulting rooms, Noninfectious disease wards and Pharmacy
Daily cleaning with a detergent or 0.2% disinfectant solution, with separate cleaning equipment for each room or whenever soiled and after each intervention (in the case of operating suites and delivery rooms)	<ul style="list-style-type: none"> • Infectious disease or isolation wards • Operating suites and delivery rooms • Intensive care units and premature baby rooms • Casualty departments • Laboratory • Laundry and sterilization services • Kitchen, toilets, morgue

Table 9: Chlorine solutions required for different uses in healthcare

S.N	Chlorine solution	Health care facility activities
1	0.05%	Hand washing Laundry (After cleaning)
2	0.2 % (Cholera) 0.5% (Ebola, COVID-19)	Wiping horizontal work surfaces after cleaning (for cholera only) Cleaning materials, aprons, boots, cooking utensils and dishes Rinsing bedpans, buckets Cleaning surfaces contaminated with body fluids Preparing dead bodies (Ebola)
3	2%	Preparing dead bodies (Cholera) Added to excreta and vomit buckets (cholera)
4	1%	Mother solutions for chlorinating water

N.B. The detail preparation procedures for chlorine solution are annexed (see annex V)

e. Handle, treat and dispose of waste correctly

- Segregate healthcare waste at point of generation using labeling or by color coding.
- Train all healthcare workers in waste segregation and management.
- Ensure that designated teams should wear PPE to collect, treat and dispose of waste (minimum: gloves and boots).
- Collect segregated waste from the medical area at least daily, and immediately if highly infectious.
- Use trolleys to transport waste using a fixed route to designated areas with restricted public access.
- Waste containers, trolleys/ wheelbarrows and storage areas must be disinfected regularly.
- Vaccinate all healthcare waste handlers for environment contamination sensitive hazards including hepatitis B virus and clostridium tetani.
- Treat and dispose of waste depending on the available facilities.

Table 10: Waste category and containers color

S.N	Category	Example	Container color/label
1	General waste not hazardous	Paper	Black
2	Used sharps, hazardous, infectious	Needles, scalpels, infusion sets, broken glass, empty vials	Yellow, labelled 'sharps', leak-proof and puncture proof
3	Not sharps hazardous, infectious	Materials contaminated with body fluids, such as swabs, dressings, sutures, laboratory culture	Yellow, labelled, leak-proof

f. Manage overcrowding:

- Ensure that wards are not overcrowded and there is at least 1-2m between beds to reduce droplet and contact-based transmission risks.
- In emergencies this may require working with the health-care facility management to identify and establish new locations for temporary wards such as car parks, courtyards, or spare wards.

g. Vector control:

- Ensure patients, staff and care-givers are protected from vectors which can transmit diseases
- Ensuring kitchen and health-care wastes are properly disposed, installing window and door barriers, installing rodent traps, installing window and door screens, removing vector breeding sites, and installing insecticide treated mosquito nets in inpatient wards.

h. Hygiene promotion:

- Ensure patients and care-givers are informed of essential hygiene behaviors repeatedly, starting within 30 minutes of arrival.
- Provision of one hand washing station for every ten inpatients is necessary.

i. Ensure that Food safety measures on place:

- Ensure all food that is stored, prepared, and consumed by patients, staff and care givers is safe.
- Ensuring that raw and cooked foods are kept separate at appropriate storage temperatures, food handling is carried out with utmost cleanliness, food is thoroughly cooked, and safe water is used in food preparation.

3.8.2. Management of WASH & EH services in isolation areas

Isolation areas may need to be established for the management of patients during outbreaks of highly infectious diseases such as cholera or viral hemorrhagic fever. These isolation areas should ideally be located away from the rest of the health-care facility.

Some key interventions are as follows;

Dedicated services: Ensure isolation areas are fenced and have their own dedicated, functional and safe latrine, showers, laundry, changing area and waste disposal facilities.

Entrances and exits: Ensure that entrances and exits of isolation areas have functional foot baths and sprayers with 0.2% chlorine solution, hand washing stations and permanent guards. This may involve providing basic equipment (hand washing stations, soap, backpack sprayers, chlorine, buckets, mixing spoons and bowls). Orient guards to limit the number of people enter to isolation area and guide everyone entering and leaving to disinfect hands and feet.

Disinfection of wastes: Ensure all infectious wastes, excreta and body fluids created in the isolation area are disinfected with appropriate concentration of chlorine solution and disposed safely within the isolation area. Ensure there are no potentially infectious wastewater flows out of the isolation area and no potential pathogenic reservoir including wastes, food, food containers or soiled clothing is carried out of the isolation area.

3.8.3. WASH & EH preparedness and risk reduction in health facilities

Health-care facilities play a vital role in the community and it is essential that preparedness actions are undertaken to ensure they have sufficient resilience to withstand future disasters. The following tasks should be considered;

- a) **Backup arrangements:** Ensure back-up arrangements for water and power (e.g., backup pumps, generators, and treatment units).
- b) **Protective arrangements:** Ensure that critical WASH equipment and supplies are adequately protected from natural hazards or conflict damage.
- c) **WASH and environmental health stockpiles:** Estimate the expected weekly consumption of critical WASH supplies (fuel, soap, chlorine, detergent, disposable gloves, disposable aprons, water treatment chemicals, water pump and water treatment unit spare parts, health-care waste bags, body bags etc.) under various emergency response scenarios (earthquakes, floods, landslides, conflict, mass population displacement, disease outbreaks, etc.) and ensure sufficient stockpiles.
- d) **Preventative maintenance:** Ensure that critical WASH equipment (e.g., pumps, generators, water treatment units) are kept well maintained.
- e) **Training:** Ensure that all WASH and environmental health staff members have been adequately trained on emergency WASH and environmental health response actions. Develop job action sheets that briefly list essential duties and resources required for WASH and environmental health personnel during emergency response activities.
- f) **Surge/Overflow capacity:** Maintain a reserve roster of trained WASH and environmental health personnel that can be drawn on in times of disaster.
- g) Calculate maximal case patient admission capacity, determined not only by available space but also based on resources and staffing availability. Identify physical spaces (car parks, courtyards, spare wards), staffing and supplies required for temporary expansion of inpatient capacity. If necessary, identify additional sites that may be converted to patient care areas (e.g., hotels, schools, community centers).

- h) **Infection control readiness:** Ensure that infection control and health-care waste management protocols are strictly followed during normal operation so good practice is already instilled for periods of emergency response.
- i) **Vaccinations:** Ensure staffs have the appropriate vaccinations.
- j) **Coordination:** Ensure there is a designated health-care facility emergency focal point or committee to ensure appropriate coordination and management of each aspect of WASH and environmental health service provision.

3.9. Handling of dead bodies/mortem

In the immediate aftermath of emergencies, natural or human made disaster there may be many dead bodies that require appropriate disposal. Disposal of dead bodies is one of the most difficult aspects of a disaster response and takes various forms like burials, cremation, etc.

To minimize the risks of transmission of known and also unsuspected infectious diseases, dead bodies should be handled in such a way that workers and people's exposure to blood, body fluids and tissues is reduced. There should be training on handling and disposal of dead bodies to health workers and burial team which can consider the social, economic, and religious or ritual and environment factors.

A person who has died from cholera, HIV infection, Ebola, Hepatitis B, Tuberculosis, Meningitis, Gastrointestinal infection, typhus, COVID-19, plague and others may pose considerable health hazards to those in direct contact with the corpse.

3.9.1. Body Recovery

Bodies should be recovered as quickly as possible, but without interrupting other activities aimed the helping survivors. Rapid recovery aids identification and reduces the psychological effects on survivors. Bodies should be placed in body bags or any other container used as emblem like plastic sheets, or other locally available materials. Separate body parts such as arms or legs should be treated as individual bodies.

3.9.2. Temporary storage of dead bodies/morgue

In warm climates, a body will begin to decompose within 12 to 48 hrs.. If it is possible a refrigerated room can be used to store dead bodies. Where this is not possible, temporary burial is the next-best option. Dig a trench 1.5m deep, at least 200m from any water source and at least 3m above the water table. Lay the bodies in a single layer leaving 0.4m between each body.

3.9.3. Precautions during handling of dead bodies

- Put-on appropriate personal protective equipment before handling the dead body.
- The preparation of a body (washing dressing and packing) has to be managed by medical staff or by caretaker according the local requirements with standard precaution.
- The dead body should be embalmed or wrap-up with water or fluid proof material in order contains the fluid materials in case come out from corpus. Hazard specific procedures might be considered.
- Mortuaries must be kept cool and well ventilated,
- The embalming should be done according the local traditions,
- The grave location should not be much far from the camp,
- Transportation of the dead body much preferable by vehicle rather than by men,
- The grave yard or location should be away from flood prone areas, water bodies and ground water are very low,
- Do not smoke, drink or eat touch your eyes, mouth or nose before appropriate action taken after dead body management
- Observe strict personal hygiene.
- Avoid sharps injury, both in the course of examination of dead body and afterwards in dealing with waste disposal and decontamination,
- All used equipment is thoroughly disinfected after use,
- It is prohibited to bury a dead body or human remains in the places other than that are allowed for such burial.

- Remove personal protective equipment after handling of the dead body. Then, wash hands with soap and water immediately
- In case of percutaneous injury or mucocutaneous exposure to blood or body fluids of the dead body, the injured or exposed areas should be washed with abundant amount of water.

3.9.4. Disposal of Animals/Cattle's carcass

Animals usually affected by emergencies like drought, flooding and animal disease outbreaks. Especial during drought people migrate with their cattle and the cattle may die in number nearby the settlement sites which will create nuisance and other Zoonotic diseases to displaced communities. Dead bodies should have managed properly especially disease outbreaks like anthrax, rabies etc.

The following precautions should be considered during dead body management

- Cattle carcass should be collected to one place or in bunch in many places.
- Bury it in ground with in a depth not to contaminate ground water,
- Burn it in shallow ground using combustible materials and cover it with soil after,
- The persons designated for burring or burning of the carcass, should wear or dress appropriate personal protective clothing, (gloves, overalls, mask, boots).

3.10. Hygiene promotion

Hygiene promotion is a planned approach to prevent diarrheal and other water, sanitation and hygiene related diseases through the wide range of safe hygiene practices. Hygiene promotion is critical component of emergency response in WASH related disease outbreaks and displaced population to reduce the risk of diseases occurrence.

Appropriate message delivery methods need to be designed for emergency situations. A standardized approach that relies mostly on teaching messages and distributing hygiene items is unlikely to be very effective. Risks and the perception of risks vary across contexts. People have different life experiences, coping strategies, and cultural and behavioral norms. Therefore, it is important to adapt approaches based on analysis of these factors as well as context.

Effective hygiene promotion relies on:

- Working with the community to mobilize action and contribute to decision making;
- Two-way communication and feedback on risks, priorities and services; and
- Access to and use of WASH facilities, services and materials.

Hygiene promotion should build on people's own knowledge of risk and disease prevention to promote positive health seeking behavior.

3.10.1. Principles of hygiene promotion

- a) **Target a small number of risk-reduction practices.** Target the behaviors most likely to directly reduce the spread of disease first.
- b) **Target specific audiences:** - Identify the community groups that have the largest influence on the changes you wish to promote.
- c) **Identify the motives for changed behavior:** - People often change hygiene practices for reasons not directly related to health, such as a wish to gain respect from neighbors, or personal pride.
- d) **Use positive hygiene messages;** - People learn best and can listen for longer if they are entertained and can laugh.
- e) **Identify the best way to communicate:** -Traditional and existing channels of communication are easier to use and are usually more effective than setting up new ones.
- f) **Use a cost-effective mix of communication channels:** - Using several methods of communicating with your audience reinforces the message and improves acceptance.
- g) **Carefully plan, execute, monitor and evaluate:** Effective hygiene promotion is community-specific. Hence, programs must be designed to meet the needs of a particular community.

Essential skills and knowledge required by facilitators/hygiene promoters:

- Knowledge of health problems related to WASH in emergency situations and appropriate prevention strategies.
- Understanding of traditional beliefs and practices.
- Knowledge of hygiene promotion methods targeted at adults and children.
- Understanding of basic health messages and their limitations.

- Knowledge of the appropriate use of songs, drama, puppet shows.
- Understanding of gender issues.
- Knowledge of how to target various groups and especially vulnerable groups within the affected area.
- Communication, monitoring and evaluation skills.

3.10.2. Hygiene Promotion components

A. Hygiene Messages

People are aware of key public health risks related to WASH and can adopt individual, household and community measures to reduce the risks.

The key actions are:

- Identify the main public health risks and the current hygiene practices that contribute to these risks.
- Develop a community profile to determine which individuals and groups are vulnerable to which WASH related risks and why.
- Identify factors that can motivate positive behaviors and preventive action.
- Work with the affected population to design and manage hygiene promotion and the wider WASH response.
- Develop a communications strategy using both mass media and community dialogue to share practical information.
- Identify and train influential individuals, community groups and outreach workers.
- Use community feedback and health surveillance data to adapt and improve hygiene promotion.
- Monitor access to and use of WASH facilities, and how hygiene promotion activities affect behavior and practice.
- Adapt activities and identify unmet needs.

B. Menstrual Hygiene Management

Women and girls of menstruating age have access to hygiene products and WASH facilities that support their dignity and well-being.

The important actions during menstrual hygiene management are:

- Understand the practices, social norms and myths concerning menstrual hygiene management and incontinence management, and adapt hygiene supplies and facilities.
- Consult women, girls and people with incontinence on the design, siting and management of facilities (toilets, bathing, laundry, disposal and water supply).
- Provide access to appropriate menstrual hygiene management and incontinence materials, soap (for bathing, laundry and hand washing) and other hygiene items.

C. Identification, Access to and Use of Hygiene Items

Appropriate items to support hygiene, health, dignity and wellbeing are available and used by the affected people and the following actions should be considered.

- a. Identify the essential WASH-NFI that individuals, households and communities need.
 - Consider different needs of men and women, older people, children and persons with disabilities.
 - Identify and provide additional communal items for maintaining environmental hygiene, such as solid waste receptacles and cleaning equipment.
- b. Provide timely access to essential items.
 - Assess availability of items through local, regional, national or international markets.
- c. Work with affected populations, local authorities and other actors to plan how people will collect or buy the items.
 - Provide information about timing, location, content and intended recipients of cash-based assistance and/or WASH items.
 - Coordinate with other sectors to provide cash-based assistance and/or WASH items and decide on distribution mechanisms.
- d. Seek feedback from affected people on the appropriateness of the WASH items.

3.11. Early Recovery and Rehabilitation

There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. Progress in some areas will probably be quicker than in others. Physical rehabilitation and reconstruction can sometimes take place more quickly than social or psychological rehabilitation. Essentially, the process includes the restoration of physical environment, the participation of the people in the recovery and development activities, and provision of the appropriate environmental health infrastructure (shelter, water supply, sanitation, etc.)

Rehabilitation for WASH emergency service especially for resettlement area is crucial after return of residents to their home communities.

The rehabilitation should be considering the following issues:

- Assess extent of the damaged area
- Identify the damaged area for WASH emergency service
- Recover the area that has been damaged due to WASH emergency service (such as demolish and disinfect trench latrines, flatten ponds and others).

Major emergency WASH recovery interventions are:

- Routine operation and maintenance work of the existing water supply.
- Water sources chlorine residue monitoring.
- Environmental management (demolish and disinfect trench latrines, drain ponds and site clearing etc.).
- Link behavioral change interventions with existing health package.
- Prioritize affected locations to development programs.

Chapter 4

Institutional Arrangement, Coordination and Partnership

4.1. Institutional arrangement

Emergency WASH & EH response needs coordinated efforts of concerned actors at all levels. The institutional arrangement is shown in figure 7 below.

At national level, the overall responsibility of coordination the emergency WASH and environmental health guideline implementation will be by the ministry of health. At regional, zonal and woreda level, the overall responsibility of coordination the emergency WASH and environmental health guideline implementation will be by the regional health bureau, zonal health department and woreda health offices respectively. At kebele level, the PHCU directors will coordinate the WASH and environmental health response during in emergency preparedness and response.

At all levels, the involvement of community representative, relevant sectors, private sectors, Non-Governmental Organizations (NGOs) and other Civic Society Organizations (CSOs) are the significant program component. They will be engaged during stakeholder consultations, assessments, preparedness and response activities, lobby and advocacy meetings, monitoring and evaluation visits.

Figure 2: Institutional and organizational arrangement for emergency WASH and environmental health response

Figure 3: Coordination structure

4.2. Coordination and partnership

Water, Sanitation and Hygiene (WASH) service is a multi-sector response with different stakeholders from government, partners, donors, communities, private sectors and others. Coordination among stakeholders is very important for WASH emergency service at all level of governmental structure from national to community level.

Table 11 : Role and responsibility of stakeholders

Stakeholders	Roles and responsibility
Ministry of Health	<ul style="list-style-type: none"> ▪ Develop and update national Emergency WASH & EH service policies, strategies, standards, guidelines and regulate compliance in collaboration with MOWIE ▪ Coordinate national emergency WASH & EH preparedness and responses ▪ Advocate and draw political attention towards emergency WaSH & EH preparedness and response ▪ Mobilize required human resources and WaSH supplies ▪ Provide WASH NFIs and water treatment chemicals ▪ Implement risk communication interventions ▪ Support RHBs on strengthening emergency WaSH & EH preparedness and response ▪ Build the capacity of RHBs towards establishing strong emergency WaSH & EH preparedness and response system ▪ Establish sustainable and reliable information system for emergency WASH and EH. ▪ Monitor implementation of emergency WaSH and EH preparedness and response against standards and targets ▪ Conduct assessment/researches for evidence based emergency WaSH and EH program planning and implementation ▪ Evaluate emergency WaSH and EH programs ▪ Ensure that the humanitarian intervention principles are adhered

Regional Health Bureaus	<ul style="list-style-type: none"> ▪ Adopt Emergency WASH & EH service policies, strategies, standards, guidelines and regulate compliance in collaboration with RWBs ▪ Coordinate regional emergency WASH & EH preparedness and responses ▪ Conduct regional advocacy and draw political attention towards emergency WaSH & EH preparedness and response ▪ Regional mobilization of required human resources and WaSH supplies ▪ Provide WASH NFIs and water treatment chemicals ▪ Implement risk communication interventions ▪ Support ZHBs/WHOs on strengthening emergency WaSH & EH preparedness and response ▪ Build the capacity of ZHBs/WHOs towards establishing strong emergency WaSH & EH preparedness and response system ▪ Ensure proper utilization of uniform information system for emergency WASH and EH at regional level. ▪ Monitor regional implementation of emergency WaSH and EH preparedness and response against standards and targets ▪ Conduct regional assessment/researches for evidence based emergency WaSH and EH program planning and implementation ▪ Evaluate emergency WaSH and EH programs at regional level. ▪ Ensure that the humanitarian intervention principles are adhered
ZHO	<ul style="list-style-type: none"> ▪ Coordinate Zonal emergency WASH & EH preparedness and responses ▪ Conduct zonal advocacy and draw political attention towards emergency WaSH & EH preparedness and response ▪ Zonal mobilization of required human resources and WaSH supplies ▪ Provide WASH NFIs and water treatment chemicals ▪ Support WHOs on strengthening emergency WaSH & EH preparedness and response ▪ Build the capacity of ZHBs/WHOs towards establishing strong emergency WaSH & EH preparedness and response system ▪ Implement proper utilization of uniform information system for emergency WASH and EH at zonal level. ▪ Monitor zonal implementation of emergency WaSH and EH preparedness and response against standards and targets ▪ Conduct zonal assessment/researches for evidence based emergency WaSH and EH program planning and implementation ▪ Evaluate emergency WaSH and EH programs at zonal level. ▪ Ensure that the humanitarian intervention principles are adhered
	<ul style="list-style-type: none"> ▪ Coordinate woreda level emergency WASH & EH preparedness and responses ▪ Conduct advocacy and draw political attention towards emergency WaSH & EH preparedness and response at woreda level ▪ Avail the required human resources and WaSH supplies ▪ Provide WASH NFIs and water treatment chemicals ▪ Facilitate provision on hygiene promotion and awareness on utilization of WaSH service at emergency affected areas. ▪ Support PHCUs on strengthening emergency WaSH & EH preparedness and response ▪ Build the capacity of PHCUs towards establishing strong emergency WaSH & EH preparedness and response system

WHO	<ul style="list-style-type: none"> ▪ Ensure proper utilization of uniform information system for emergency WASH and EH at woreda level. ▪ Monitor woreda level implementation of emergency WaSH and EH preparedness and response against standards and targets ▪ Conduct woreda level assessment/researches for evidence based emergency WaSH and EH program planning and implementation ▪ Evaluate emergency WaSH and EH programs at woreda level. ▪ Ensure that the humanitarian intervention principles are adhered
PHCUs	<ul style="list-style-type: none"> ▪ Promote community ownership of emergency WaSH & EH preparedness and response in catchment area ▪ Facilitate two-way communication from community to woreda and vice versa ▪ Ensure all standards, protocols and standard operating procedures related to emergency preparedness and response ▪ WaSH & EH are available, up-to-date and accessible to all staff at all times. ▪ Provide hygiene promotion and awareness creation on utilization of WaSH service at emergency affected areas. ▪ Ensure that the humanitarian intervention principles are adhered
Ethiopian Public Health Institute (EPHI)	<ul style="list-style-type: none"> ▪ Activates Public Health Emergency Operating Center (PHEOC) depending on the PHEOC activation criteria ▪ Forecast emergency prone WASH related public health emergencies occurrence ▪ Communicate occurrence of WASH prone - disease outbreaks during emergencies ▪ Conduct investigation to identify emergency WASH & EH gaps ▪ Provide technical, financial and logistic support
Water Sector	<ul style="list-style-type: none"> ▪ Lead and facilitate Construction/rehabilitation of WASH infrastructure in IDPs and other temporary settlements ▪ Monitor water quality at emergency affected areas and temporary settlements ▪ Monitor provision of adequate and safe water at emergency affected areas and temporary settlements ▪ Ensure that the humanitarian intervention principles are adhered
National and international humanitarian partners	<ul style="list-style-type: none"> ▪ Provide technical support to the overall WASH and Environmental health response ▪ Mobilize resources to support WASH emergency and environmental health intervention ▪ Provide ongoing technical support, training and professional development to WASH emergency and environmental health ▪ Support efforts for strengthening cross-sectorial collaboration between development partners and government institutions for addressing the WASH emergency intervention ▪ Ensure that the humanitarian intervention principles are adhered
	<ul style="list-style-type: none"> ▪ Coordinate the overall national emergency response by all sectors ▪ Activate EOC ▪ In times of disaster to save lives, protect livelihoods, ▪ Ensure all disaster affected population provided with recovery and rehabilitation assistances.

National Disaster Risk Management Commission	<ul style="list-style-type: none"> ▪ To reduce dependency on and expectations for relief aid by bringing attitudinal change and building resilience of vulnerable people. ▪ Mobilize resources including Food and NFI items and back up store for the WASH emergency services. ▪ Provide emergency WASH NFIs ▪ Ensure that the humanitarian intervention principles are adhered

Chapter 5

Monitoring and Evaluation

Monitoring and evaluation (M&E) is a process that helps improve performance and achieve results through improving current and future outputs, outcomes and impact. It is mainly used to assess the performance of programs and plans. It ensures that programs and plans are focused; enable improving practices; sharing both positive and negative experiences with others.

Improving and managing WASH services requires strong and consistent monitoring mechanisms to measure progress and direct efforts where needs are greatest. Monitoring and evaluation is required at national, sub-national, district and health facility level.

Monitoring and evaluation in emergency WASH and environmental health service aims to track the following points:

- The progress of implementing WASH and environmental health service intervention, including facilities.
- It also helps to identify challenges and possible solutions.
- Lessons learned and best practices that would inform improvements.

Emergency WASH and environmental health monitoring should provide answers to the following key questions:

- Are required resources in place and is that adequate for the implementation of Emergency WASH and environmental health response?
- Which of the planned activities have actually been implemented?
- What are the key challenges for implementation Emergency WASH and environmental health response?
- How many of the planned output targets have been achieved?

Monitoring of emergency WASH and environmental health response should be conducted regular integrated assessment and follow up in all levels of concerned body to track the implementation of emergency WASH and environmental health response and outputs result of emergency WASH and environmental health response systematically.

And also, to identify the basic challenges on emergency WASH and environmental health response implementation and give appropriate recommendation to get the intended emergency WASH and environmental health response outputs result.

Evaluation is an assessment, conducted as systematically and impartially as possible, of an activity, project, programme, strategy, policy, topic, theme, sector, operational area or institutional performance. It analyses the level of achievement of both expected and unexpected results, by examining the results chain, processes, contextual factors and causality, using appropriate criteria such as relevance, coherence, effectiveness, efficiency, impact and sustainability.

Emergency WASH and environmental health evaluation should provide answers to the following key questions:

- Are we doing the right thing?
- Are we doing the right thing on a scale that will make a difference in the lives of persons of concern?
- How well have our interventions been?
- What results have been achieved?
- Are there better ways to achieve those results?
- To what extent can a given result be attributed to a specific intervention?

Emergency WASH and environmental health evaluation is expected to generate credible evidence that is sufficient to answer questions about implementation and process, and also questions about the relevance and coherence of interventions, their adaptation to context, cause-and-effect concerns, and their contribution to results.

Among different types of evaluation method, process and summative evaluation methods are appropriate to evaluate emergency WASH and Environmental Health Responses.

Process Evaluation determines whether emergency WASH guideline have been implemented as intended and resulted in certain outputs. Process evaluation should be conducted periodically throughout the life of emergency WASH and environmental health responses and start by reviewing the activities and output components of the logic model.

Summative Evaluation measures emergency WASH and environmental health response effects in the target population by assessing the progress in the outcomes that emergency WASH and environmental health responses is to address. This will be done after an emergency WASH and environmental health outbreak/disaster ends, to analyze the negative impact of emergency WASH and environmental health outbreak/disaster on the affected population and the system that serves them. And also, to evaluate over all emergency WASH and environmental health response, to identify the gaps, success and achieved goals and to design the appropriate response strategy for the future specific emergency context.

Logical model for emergency WASH guidelines

WASH and environmental health Indicators

Indicators are signs of progress, they are used to determine whether the WASH and environmental health intervention is on its way to achieving its objectives and goal that means prevent the escalation of the outbreak, decrease the burden of the disease, minimize the number of people affected, etc. It is best to use indicators that are easily and frequently measured to identify problems and correct them in a timely manner. Monitoring records should be developed at the national or sub-national level, so that monitoring reports and data can be compared across health facilities and tracked over time.

Int this emergency WASH guidelines there are 46 indicators are identified to monitor and evaluate. The period for data collection and analysis varies for each indicator, ranging from a monthly basis up to years. Some indicators are analyzed on a monthly basis, others on a quarterly, annual, and above years.

Indicator matrix

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
WASH-NFI indicators					
1	Proportion of household with at least two water containers	Numerator: - affected household that have at least two water containers Denominator: - total affected households	Monthly/quarterly	Observation, assessment report, interview	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
2	Proportion of utilized 250 grams of soap for bathing per person per month	Numerator: - utilization of 250 grams of soap for bathing per person per month Denominator: - total affected population	Monthly/quarterly	Assessment report, interview	
3	Proportion of utilized 200 grams of soap for laundry per person per month	Numerator: - utilization of 200 grams of soap for laundry per person per month Denominator: - total affected population	Monthly/quarterly	Assessment report, interview	
4	Proportion of fully functional hand washing facilities	Numerator: - number of fully functional hand washing facility Denominator: - total hand washing facility	Monthly/quarterly	Assessment report, interview	

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
5	proportion of children received Potty, scoop or nappies to dispose of children's faeces	Numerator: -number of children received Potty, scoop or nappies Denominator: - total number of eligible children for the service	Monthly/quarterly	Assessment report, interview, observation	
6	Percentage of affected people who report/are observed using WASH-NFIs regularly after distribution	Numerator: - number of affected people utilizing WASH-NFI regularly after distributed Denominator: - total affected people who received WASH NFIs	Monthly/quarterly	Assessment report, interview, observation	
8	Percentage of household who have lighting	Numerator: - household that have lighting Denominator: - total affected household	Monthly/quarterly	Assessment report, interview, observation	
Water supply indicators					
9	Percentage of households with chlorinated water (0.2-0.5 mg FRC/L)	Numerator: - household with chlorinated water (0.2-0.5 mg FRC/L) Denominator: - total affected	Monthly/quarterly	Assessment report, water quality testing	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
		household			<ul style="list-style-type: none"> • Available supply and logistics • Support of partners
10	Percentage of chlorinated water points with safe water (no fecal coli forms per 100 mL of water at the point of delivery and 0.2-0.5 mg FRC/L at the point of delivery)	Numerator: - number of chlorinated water points with safe water (no fecal coli forms per 100 mL of water at the point of delivery and 0.2-0.5 mg FRC/L at the point of delivery) Denominator: - total water point	Monthly/quarterly	lab report	
11	Proportion of individual benefitting from emergency safe water supply (7.5-15l/person/day)	Numerator: - number of individual benefitting from emergency safe water supply Denominator: - total number of individuals affected	Monthly/quarterly	Assessment report, interview	
13	Number of water schemes constructed by type of scheme	Not applicable	quarterly	Assessment report	

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
14	proportion of water schemes maintenance and rehabilitated	Numerator: - number of water schemes maintained and rehabilitated Denominator: - total number of water schemes in need of maintenance and rehabilitation	Monthly/quarterly	Assessment report, interview,	
15					
16	Average waiting time at water points in minutes	Not applicable	Monthly/quarterly	Assessment report, interview,	
17	Percentage of affected population who collect water from improved water sources	Numerator: - number of affected people who collect water from improved water source Denominator: - total number of affected people	Monthly/quarterly	Assessment report, interview	
18	Percentage of households that store drinking water in clean and covered \containers	Numerator: - number of households that store drinking water in clean and covered \containers Denominator: - total number of households	quarterly	Assessment report	
19	Water trucking	Volume of water delivered in liter			

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
Food safety measures indicators					
20	Number of people participated in health education session (FB, breast feeding, food safety, personal and environmental hygiene)	NA	monthly	Regular report	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
21	proportion of food handlers who have medical certificate	Numerator: number of food handlers who have medical certificate Denominator: total number of food handlers	monthly/Quarterly	Regular report	
22	Number of cases of food borne diseases		Daily/weekly	Regular report	
Excreta Management indicators					
24	Percentage of functional toilets	Numerator: - number of functional toilets Denominator: - total number of toilets	Monthly	Assessment report	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
26	Percentage of latrine with appropriate cleanliness	Numerator: - number of latrines with appropriate cleanliness Denominator: - total number of latrines	Monthly	Report/observation/assessment	logistics • Support of partners
27	Percentage of caretakers/ mothers who dispose their children's feces safely in the toilet.	Numerator: - number of caretakers/ mothers who dispose their children's feces safely in the toilet. Denominator: - total number of caretakers/ mothers			
28	Percentage of Individuals access to improved sanitation	Numerator: - number of Individuals access to improved sanitation Denominator: - total number of affected populations	Monthly	Report	
28	Percentage of individuals who disposed excreta from adult incontinence safely	Numerator: - number of individuals who disposed excreta from adult incontinence safely Denominator: number of individuals received dignity kit	Monthly	Report/observation	
28	Percentage of	number of individuals who	Monthly	Report/observation	

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
	individuals who dispose excreta from adult incontinence safely using incontinence products (pads, urinal bottles, bed pans, commode chairs)	dispose excreta from adult incontinence safely using incontinence products (pads, urinal bottles, bed pans, commode chairs) Denominator: - total number of individuals with incontinence disorders who received incontinence products			
Vector control Measure's indicators					
					<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
31	Percentage of households with LLITNS	Numerator: - number of households with LLITNS Denominator: - total number of households	Monthly/quarterly	Report/survey/observation	
32	Number of identified breeding sites where the vector's life cycle is disrupted (drainage, filling, etc.)		monthly	Regular report	
Hygiene Promotion indicators					

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
					<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
34	Percentage of affected population who practice proper hand washing at critical times.	Numerator: - number of affected populations who practice proper hand washing at critical times. Denominator: - total number of affected populations	Monthly/quarterly	Report	
37					
Hand washing at health care facility indicators					
38	Proportion of health facilities with functional hand washing facilities	Numerator: - number of health facilities with functional hand washing facilities Denominator: - total number of health facilities	Monthly	assessment	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
39	Proportion of patients and caretakers wash their hands before handling or eating food and after going to the toilet	Numerator: - number of patients and caretakers wash their hands before handling or eating food and after going to the toilet Denominator: - total number	weekly	assessment	

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
		of patients and caretakers			
Menstrual Hygiene indicators					
41	Percentage of women and girls of menstruating age provided with access to appropriate materials for menstrual hygiene kit (sanitary pad)	Numerator: - number of women and girls of menstruating age provided with access to appropriate materials for menstrual hygiene kit (sanitary pad) Denominator: - total number of women and girls of menstruating age	Monthly	report	<ul style="list-style-type: none"> • Appropriate infrastructure • Committed management • Available budget • Available supply and logistics • Support of partners
43	Percentage of people with incontinence that use appropriate incontinence materials and facilities	Numerator: - number of people with incontinence that use appropriate incontinence materials and facilities Denominator: - total number of peoples			
Solid waste management indicators					
44	Percentage of affected households who dispose	Numerator: - number of affected households who			<ul style="list-style-type: none"> • Appropriate infrastructure

S. N	Indicator	Formula	Frequency	Means of verification	Risk and assumptions
	of solid waste disposed appropriately	dispose of solid waste appropriately Denominator: - total number of affected households			<ul style="list-style-type: none"> Committed management Available budget Available supply and logistics Support of partners
45	Proportion of health facility practices solid waste segregation with recommended color.	Numerator: - number of health facility practices solid waste segregation with recommended color. Denominator: - total number of health facility			<ul style="list-style-type: none"> Support of partners
Liquid waste management					
46	Proportion of households who dispose waste water using soak away pit.	Numerator: - number of households who dispose waste water using soak away pit. Denominator: - total number of households			<ul style="list-style-type: none"> Appropriate infrastructure Committed management Available budget Available supply and logistics Support of partners

*Fully functional hand washing facility means a washing facility with soap and water availability at any time

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Annexes

Annex I: Water, sanitation and hygiene (WASH) risks - seasonal assessment format

General

Name of Region _____ Zone _____ Woreda _____

Total population of the woreda _____ Male _____ Female _____ Water supply coverage (%) _____

HH latrine coverage (%) _____ Is there active Woreda WASH Taskforce? Yes _____ NO _____

Is the woreda supported for WASH projects by any of the agencies like World Bank, UNICEF, ADB, specify if any _____

Table 1a: Kebeles in the Woreda currently facing/at risk of WASH related emergency/Hazard

Name of kebeles	Types of Emergencies				Kebele Population						Source of water supply										
					Total		Affected		At risk		No of Borehole		No of Shallow Well		No of Hand Dug Well		No of Protected spring		Type of un protected sources (River, Pond, Birka, Dam)	Water sources commonly for other purposes	
	Drought	Flooding	AWD	Displace	Male	Female	Male	Female	Male	Female	Function	Non-functiona	Function	Non-functiona	Function	Non-functiona	Function	Non-functiona		Cloth Washing	Bathing

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Table 1b: Kebeles in the Woreda currently facing/at risk of WASH related emergency/Hazard

Name of Kebele	Average time required to collect water (round trip queuing time)	Alternative water sources during emergency		Coverage (%)		Is there active kebeles WASH committee?	
		Type of water sources (water trucking, unprotected sources, sharing with neighboring kebele water sources)	Average time required to collect water (round trip including queuing time)	Water supply	Household latrine	Y/N	No. of women representatives

Additional note _____

Table 2: Schools in the Woreda facing/at risk of WASH related emergency/Hazard

Name of School	Location (Kebele)	No of Kebeles served by the school	Status			Total no of students		Water supply			Availability and management of latrines				
			Closed	Affected	At risk	Boys	Girls	Type of water source	If the school has its own water source		Is it Separate for boys & girls?	No. of seats for boys	No. of seats for girls	Conditions of the latrines (observe)	Is there hand-washing facility (Y/N)
									Functional	Non-functional					

Additional

note

Is there any school drop out? Why? _____

Table 3: Health Institutions in the woreda facing /at risk of WASH related emergency/Hazard

Name and type of Health Institution (Health Post, Health center, Hospital etc...l)	Location (Kebele)	No of Kebeles served by the Health Institution	Status			Source of water supply	If the Health Institution has its own water source			Availability and Management of latrine		
			Non-functional		Functional		Type of water sources	Functional	Non-functional	Separate for men & women	Conditions of the latrines (observe)	Is there Hand-washing facility (Y/N)
			Closed due to emergency	Due to lack of staff or infrastructure								

Additional note _____

What are the major problems related to maintenance and operation of WASH schemes in the Woreda (Community, schools, camps, health institutions)? Is there any contingency funding/resources available at the woreda level to respond to localized emergencies’?

What are the major gaps/problems encountered in responding to the above-mentioned emergencies? (In terms of coordination, human, logistic and financial resource etc.) _____

Solid Waste Disposal

- ❖ Is there any waste disposal facility for people affected/at risk of WASH related emergency in the woreda? yes No
- ❖ What types of garbage disposal Facilities are in place?
 - Communal refuse pit (for burning or burial takes place) Household level disposal (burning or burial) No system is in place other: Specify _____

Hygiene Promotion

- ❖ Is there any community level hygiene awareness raising activities? yes No
- ❖ Who is doing? (Health extension workers, community volunteers, NGOs) _____
- ❖ Is there special community mobilization during emergency? yes No
If yes, what was the methodology used?(IEC materials, community dialogue etc.)

- ❖ Are school boys and girls participated in hygiene promotion activities? yes No
- ❖ Are there any active WASH awareness sessions in School? (WASH club, sanitation club, Environment club)

List of major NGO's assisting Water, Sanitation and Hygiene Promotion activities in the area

Name of the Organization	Activities planned in the area					Duration of operation	Remark	
	Water Supply		Sanitation	Hygiene promotion	Capacity Building (trainings, logistic support)			Other sectors
	Scheme	No						

Recommendations on urgent actions needed

Annex II: Hygiene and environmental health management that protect health in emergencies and disasters shelters

General profile

- How many people are affected and where are they? Disaggregate the data by sex, age, disability and so on.
- What are people's likely movements? What are the security factors for the affected people and for potential emergency responses?
- What are the current, prevalent or possible WASH-related diseases?
- Who are the key people to consult or contact?
- Who are the vulnerable people in the population and why?
- Is there equal access for all to existing facilities, including at public places, health centers and schools?
- What special security risks exist for women, girls, boys and men? At-risk groups?
- What water, sanitation and hygiene practices were the populations accustomed to before the crisis?
- What are the formal and informal power structures (for example, community leaders, elders, women's groups)?
- Is there access to local markets? What key WASH goods and services were accessible in the market before the crisis and are accessible during the crisis?
- Are there seasonal variations to be aware of that may restrict access or increase demands on labour during harvesting time, for example?
- Who are the key authorities to liaise and collaborate with?
- Who are the local partners in the geographical area, such as civil society groups that have similar capacity in WASH and community engagement?

Hygiene and environmental health assessment checklist during emergency

1. Water supply

At the source:

- Water for drinking is collected from the cleanest possible source.
- If necessary, a distinction is made between water for drinking and water for other uses, such as bathing, laundry, watering animals.
- Water sources are protected from fecal contamination by fencing (to keep animals away), and by siting latrines or defecation fields at least 10–30 meters away, depending on ground conditions.

Collection and storage:

- Water is collected and stored in clean, covered containers and use of water at home is taken from the storage container with a clean, long-handled household level dipper or through a tap placed slightly above the bottom container.
- Efforts are made not to waste water.

Use of water at home:

- If there is a risk that water is not safe, it is filtered and/or chlorinated or boiled.
- Water for making food or drinks for young children is boiled.

2. Excreta management

Use of designated areas:

- Defecation is avoided near water sources and water-treatment plants, places for defecation uphill of camps and water sources, in fields destined for crops, along public roads, near communal buildings such as clinics, near food-storage facilities.
- Defecation is done in latrines, trenches, defecation fields, etc.
- People avoid going barefoot to defecate.
- Children do not visit a defecation area alone.
- New arrivals at emergency settlements are aware of the arrangements for defecation and the importance of complying with them.
- Uncontrolled defecation by children is stopped (the faeces of young children are more harmful than those of adults).

- The stools of young children or babies are wrapped in leaves or paper and buried or put in a latrine.
- Young children are helped to defecate into an easily-cleaned container that can be emptied into a toilet and washed out.
- Children are cleaned promptly after defecation and have their hands washed.
- People who clean children wash their own hands thoroughly afterwards.

3. Waste disposal

Solid waste:

- Refuse is not scattered about (this encourages insect breeding and attracts rats which can be a nuisance and transmit disease).
- In the immediate post-disaster period, if organized refuse collection has not been set up, household solid waste is buried by families.
- Once collection arrangements have been made, refuse is placed in the bins provided.
- Filled bins are not left in food-preparation areas.
- Bins are kept securely covered to prevent scavenging by children or animals.
- Manure from livestock is collected and disposed of as safely.

Liquid waste:

- Standing pools of wastewater (kitchen, laundry, shower, etc) are not allowed to form. This encourages mosquito breeding, which is a health hazard.
- Children are prevented from playing in or near pools of water/wastewater.
- Arrangements for disposing of liquid waste, such as using soakage pits, are understood and followed.

4. Vector control

Personal protection:

- Household refuse is removed regularly to avoid build-up of houseflies and against other disease transmitting vectors.
- Clothes are laundered frequently and insecticidal shampoos are used to prevent lice.

Rat infestations and other Vectors:

- Foodstuffs are kept in rodent-proof stores or containers.

- Cooked foods, which may have been contaminated by houseflies, are properly reheated thoroughly
- In areas where mosquitoes are a problem, bed nets or bedroom screens are used.

5. Personal hygiene

Water for washing:

- If possible, plenty of water is used for washing. Clothing is laundered regularly.
- The most readily-available water is used for personal and domestic hygiene.

Hand-washing:

- All family members wash their hands regularly at critical times: after defecating; after cleaning a child who has defecated and disposing of the stool; before preparing food; before eating; before feeding a child.
- Adults or older children wash the hands of young children.

6. Shelter

At the disaster site:

- Where people are trying to house themselves in the ruins of their previous homes, they take steps to avoid risks from the lack of structural integrity of their buildings.
- If their homes are definitely unsafe, decision is made to rapidly move the affected people to shelters.

In longer-term shelters:

- People take part in residents' committees to voice their views about the emergency setting up and running of a camp settlement.
- Residents participate in cleaning the settlement.
- Children do not enter dangerous areas of the settlement and, if necessary, volunteers guard unsafe areas.

7. Food safety

Dealing with:

- Food that has been contaminated as a result of a disaster is disposed of as contaminated food or, if there is a food shortage, cleaned thoroughly (possibly by submerging in an antiseptic solution) and cooked for an extended period.
- Contaminated fruit is always peeled.

- Perishable food that has spoiled is salvaged by cutting out bad bits, prolonged washing and prolonged cooking (but milk, eggs, meat and fish that have not been stored properly are discarded).
- Food handling and surroundings are kept clean; waste is disposed of properly; and food is preparation stored in closed containers to avoid contamination by insects and vermin.
- Food is prepared in a clean place, using clean pots and utensils. Uncooked food is washed in clean water before it is eaten.
- Cooked food is eaten while still hot, and previously prepared food and leftover food is thoroughly reheated.
- Kept foods are covered. Feeding babies and children up to 6 months of age are breastfed.
- Foods for children are clean and nutritious.
- Drinks are given with a cup and spoon rather than a bottle.
- People wash their hands before preparing weaning food and feeding a baby.

Annex III: Recommended maximum permissible level of parameters of water supply in Ethiopia

s.no	Parameters	Maximum permissible level
1	Odour	Unobjectionable
2	Taste	Unobjectionable
3	Turbidity, NTU	5
4	Color, CTU	15
5	Total Hardness (as CaCO ₃)	300
6	TDS mg/l	1000
7	Total Iron, mg/l	0.3
8	Managanese (as Mn) mg/l	0.5
9	Ammonia, mg/l	1.5
10	Residula, free chlorine, mg/l	0.5
11	Magnesium (as Mg), mg/l	50
12	Calcium (as ca), mg/l	75
13	Copper (as Cu), mg/l	2
14	Zinc (as Zn). Mg/l	5
15	Sulfate (as SO ₄), mg/l	250
16	Chloride (as cl), mg/l	250
17	Total Alkalinity (as CaCO ₃), mg/l	200
18	Sodium (as Na), mg/l	200
19	Potassium (as K), mg/l)	1.5
20	pH	6.5-8.5
21	Aluminum (as Al), mg/l	0.1
22	Barium (as Ba), Mg/L	0.7
23	Total Mercury (as Hg), mg/l	0.001
24	Cadmium (as Ca) mg/l	0.003
25	Arsenic (as AS) mg/l	0.01
26	Cyanide (As CN) mg/l	0.07
27	Nitrite 9 as NO ₂ mg/l	3
28	Nitrate (as NO ₃) mg/l	50
29	Lead (as Pb) mg/l	0.01
30	Chromium (as Cr) mg/l	0.05
31	Fluoride (as F) mg/l	1.5

Annex IV: Water supply, sanitation and hygiene promotion assessment checklist at IDP site

I. General

1. Region ----- Zone ----- Woreda ----- Place -----
2. How many people are affected and displaced?
M----- F----- T----- Disabled persons----- children -----
3. What are the current, prevalent or possible WASH-related diseases? -----

4. Who are the key people to consult or contact? -----

5. Who are the vulnerable people in the population? -----
6. Is there equal access for all to existing facilities, including at public places, health centres and schools? -----
7. What special security risks exist for women, girls, boys and men? -----

8. What WASH practices were the population accustomed to before the crisis? -----

9. What are the formal and informal power structures (for example, community leaders, elders, women’s groups)? -----
10. How are decisions made in households and in the community? -----
11. Are WASH goods and services being accessible in the market before the crisis and are accessible during the crisis? -----
12. Do people have access to cash and/or credit? -----
13. Who are the local partners in the geographical area, such as civil society groups that have similar capacity in WASH and community engagement? -----

II. Hygiene promotion

1. What existing WASH practices are harmful to health, who practises these and why? -----

2. Who still practices positive hygiene behavior and what enables and motivates them to do this? -----
3. What are the existing formal and informal channels of communication? -----
4. What are the learning needs of hygiene promotion staff and community outreach workers? -----
5. What WASH materials are available and what are the most urgently needed based on preferences and needs? -----
6. Where do people access markets to buy their essential hygiene items? Has this access (cost, diversity, quality) changed since the crisis? -----
7. How effective are hygiene practices in healthcare settings (particularly important in epidemic situations)? -----
8. What are the needs and preferences of women and girls for menstrual hygiene practices? -----
9. What are the needs and preferences of people living with incontinence? -----

III. Water supply

1. What is the current water supply source and who are the present users? -----
2. How much water is available per person per day? -----
3. Is the water available at the source sufficient for short-term and longer-term needs for all groups? -----
4. Are water collections points close enough to where people live? Are they safe?
Distance(m) ----- E. coli (no/100ml) -----
5. Is the current water supply reliable? How long will it last? -----
6. Do people have enough water containers of the appropriate size and type (collection and storage)? At least three 20-30 L -----
7. Is the water source contaminated or at risk of contamination (microbiological, chemical or radiological)? Observation -----
8. Is there a water treatment system in place? Is treatment necessary? Is treatment possible?
What treatment is necessary? -----

9. Is disinfection necessary? Does the community have problems with water palatability and acceptance associated with chlorine taste and smell? -----
10. Are there alternative sources of water nearby? -----
11. What traditional beliefs and practices relate to the collection, storage and use of water? -----
12. Are there any obstacles to using the available water supply sources? -----
13. What are the alternatives if water sources are inadequate? -----
14. Are there any traditional beliefs and practices related to hygiene? Are any of these beliefs or practices either useful or harmful? -----
15. What are the key hygiene issues related to water supply? -----
16. Do people have the means to use water hygienically? -----
17. Are water points and laundry and bathing areas well drained? -----
18. In the event of rural displacement, what is the usual source of water for livestock?
19. Will there be any environmental effects due to possible water supply intervention, abstraction and use of water sources? -----
20. What opportunities are there to collaborate with the private and/or public sector in water provision? What bottlenecks and opportunities exist that could inform the response analysis and recommendations? -----
21. What operation and maintenance duties are necessary? What capacity is there to fulfil them in the short and long term? Who shall be accountable for them? -----
22. Is there an existing or potential finance mechanism or system that can recover the operation and maintenance costs? -----
23. How does the host population access water and ensure that its water is safe at the point of use? -----

IV. Excreta disposal

1. Is the environment free of faeces? -----
2. If there is open defecation, is there a designated area? -----

3. Are there any existing facilities? If so, are they used? Are they sufficient? -----

4. Are the facilities safe and dignified: lighted, equipped with locks, privacy screens? Can people access the toilet facilities during the day and night? If not at night, what are the alternatives? -----
5. What excreta management practices does the host population practice? -----

6. Is the current defecation practice a threat to water supplies and env't -----?
7. Are there any social – cultural norms to consider in the design of the toilet? -----

8. Are people familiar with the design, construction and use of toilets? -----
9. What local materials are available for constructing toilets? -----
10. What happens to the faeces of infants and young children? -----
11. What is the slope of the terrain? ----- Ground water table
12. Are soil conditions suitable for on-site excreta disposal? -----
13. Do current excreta disposal arrangements encourage vectors? -----
14. What anal cleansing materials the people usually used? Is it available? How disposed? --

15. Do people wash their hands at critical time? Are soaps or other cleansing materials with water available next to the toilet or within the household? -----
16. How do women and girls manage menstruation? Are there appropriate materials or facilities available for this? -----
17. Sanitation facilities for disabilities, people living with HIV, people living with incontinence or people immobile in medical facilities? -----
18. Is the collected faecal waste disposed of appropriately and safely? How? -----

19. What is the appropriate strategy for management of excreta – inclusive of containment, emptying, treatment and disposal? -----

V. Vector-borne diseases

1. What are the vector-borne disease risks? -----

2. Are there traditional beliefs and practices that relate to vectors and vector-borne disease?

3. Is it possible to make changes to the local environment (especially by, for example, drainage, scrub clearance, excreta disposal, solid waste disposal) to inhibit vector breeding? -----
4. What are the appropriate means of control of vectors? -----
5. What information and safety precautions need to be provided to households? -----

VI. Solid waste management

1. How do people dispose of their waste? What type and quantity of solid waste is produced? -----
2. Is accumulated solid waste a problem? -----
3. Can solid waste be disposed of on-site or does it need to be collected and disposed of off-site? -----
4. What is the normal solid waste disposal practice for affected people (for example, compost and/or refuse pits, collection system, bins)? -----
5. Are there medical facilities and activities producing waste? How is it disposed of? Who is responsible? -----
6. What is the effect of the current solid waste disposal on the environment? -----

VII. Waste water management

1. How do people dispose of their liquid waste? -----
2. Is accumulated waste water a problem? -----
3. Is there any means of disposal system? -----
4. What are the practices that the affected people mostly habited? -----
5. How health facilities waste disposed (infectious wastes) -----
6. Can the disposal system affect the environment? If yes how it will be solved? -----

VIII. Food Hygiene and Handling

1. How do people get their food? -----
2. IS the food come from reliable sources? -----
3. How foods stored at store house and at tent? -----

4. What are the practices that the affected people mostly habited? -----
5. Are there shelves or food storage materials inside the tent? -----
6. What type of food the people mostly eat -----?
7. How the people cooked their foods? -----
8. What are the possible sources of food contamination? -----

IX. Housing Health

1. Are there shelters which protect people from sunlight, and rains? -----
2. Are the shelters enough for the displaced people? (at least 3.5m² /person) -----
3. Is accessible vacant land suitable for temporary settlements, considering topography and other environmental constraints? -----
4. How many affected households lack adequate shelter? -----
5. Illumination, ventilation and other condition of the shelter? -----

Annex V: Standard operating procedure for preparation of chlorine solution for decontamination

1. Decide the need of preparation and the kinds of stock chlorine solution you want to prepare.
2. Check the availability of chlorine and see its strength/concentration (usually in %).
3. Avail clean water.
4. Ensure the availability of volumetric measurement utensil and other water containers.
5. Calculate the proportion of chlorine needed as per to water as follows.

$$\frac{\text{Concentration of available chlorine}(\%)}{\text{concentration of stock chlorine solution want to prepare}} = a$$

6. Add ‘a’ volume of water in one unit of chlorine. If the available chlorine solution is in solid form, it needs to change into ml or Liter i.e., 1g=1ml and 1L= 1Kg
7. Determine the amount of chlorine stock solution you want to prepare
8. If the only available solution is aqua tab (the available chlorine concentration/strength is not labelled), you can prepare stock solution using the following consideration

To prepare 0.2% chlorine solutions add 20 tablets in 10 liters of water.

$$\begin{array}{l} 0.2\% = 20 \text{ tablet} \\ 0.05\% = x \end{array} \qquad \begin{array}{l} X = \frac{0.05 \times 20}{0.2} \\ X = 5 \text{ tablet} \end{array}$$

9. Label the concentration of all prepared chlorine solution

10. Discard the solution if it stayed beyond allowed time.