Checklists for strengthening water, sanitation and hygiene emergency preparedness and response

Focus on Ukraine

World Health Organization
European Region

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Abstract

This publication presents checklists designed to strengthen emergency preparedness and response ("readiness") of water, sanitation and hygiene (WASH) services in conflict settings. The checklists support situation assessments to enhance the resilience of WASH systems during conflict, and to facilitate maintenance – or rapid restoration – of services. The guidance outlines key considerations for setting priorities and progressively improving WASH emergency readiness at the local level.

Focusing on protecting public health, the checklists address essential WASH services to prevent infectious diseases and ensure safe water access for hydration, hygiene and food preparation, thereby helping to uphold human rights and dignity. Developed in the context of the war in Ukraine, the guidance draws on broader emergency principles, including references to international technical resources. The checklists can be adapted to other conflict settings with consideration of local systems, cultures, socioeconomic factors and risks.

Primarily intended for local-level stakeholders – such as authorities responsible for water, sanitation, health and emergency response, the checklists encourage inclusive consultation to assess and enhance emergency preparedness and response planning, to strengthen WASH service resilience.

Keywords

DRINKING-WATER
SANITATION
HYGIENE
EMERGENCIES
ARMED CONFLICT
UKRAINE

Contents

Acknowledgements

Glossary

Centralized system   A configuration where the management, treatment and distribution of water and the collection, treatment and disposal or end use of wastewater are handled by a central facility or location, rather than being decentralized to individual households or small local systems

Contingency planning   The process of developing alternative plans that include predefined actions and procedures to manage and mitigate the impacts of potential emergencies on WASH services effectively, helping to ensure continuity of safe and adequate WASH services during emergencies

Decentralized system   A configuration where the management, treatment and distribution of water and the collection, treatment and disposal of wastewater are handled at smaller, localized facilities or individual units rather than at a central location

Drinking-water   Water that is safe for human consumption (including for hydration and food/beverage preparation) without causing health risks

Emergency   A serious situation or occurrence for which there is no standard operating procedure in place – usually happening unexpectedly and requiring immediate and extensive action

Health-care facility   A place that provides health-care services – including preventive, diagnostic, therapeutic, rehabilitative and palliative care – to individuals or communities

Hygiene   Conditions and practices that help to maintain health and prevent the spread of disease, involving behaviours such as regular handwashing, proper waste disposal, cleaning of surroundings and personal cleanliness

Preparedness   Planning measures and actions taken to ensure the safety, functionality and adequacy of WASH services during and after an emergency

Readiness   The state of being prepared and equipped to respond effectively and rapidly to an emergency that could potentially disrupt WASH services

Resilience   The capacity of systems to cope with and manage health risks in such a way that the essential functions, identity and structure of the systems are maintained, while also maintaining the capacity for adaptation, learning and transformation

Response   The immediate actions and measures taken to address the needs for safe drinking-water, sanitation and hygiene during and after an emergency; can also be applied to longer-term actions and measures in specific contexts

Sanitary drainage system   A network of conduits (natural or artificial), pipes, pumps and infrastructure designed to collect and transport wastewater (sewage) from premises (residential, commercial and industrial) to treatment facilities

Sanitation   Access to, and use of, facilities and services for the safe disposal of human urine and faeces

Sanitation system   All components and processes comprising a sanitation chain, from toilet capture and containment through emptying, transport, treatment (in situ or off-site) and final disposal or end use

Sewage   The wastewater that flows through the sewerage system

Sewer   An underground conduit or pipe designed to carry sewage away from premises (e.g. homes and buildings) to treatment facilities or disposal areas

Sewerage	The system (including infrastructure) used for collection, transportation, treatment and disposal of sewage from the point of wastewater generation (e.g. homes, businesses and industrial premises)
Source water	The water source for a drinking-water supply system (e.g. river, reservoir or borehole)
Stakeholder	Any individual, group or organization that has responsibility for, has an interest in, or is affected by the policies, decisions, operations and outcomes related to WASH services
WASH	The collective acronym for water, sanitation and hygiene
Wastewater	The waste stream that contains one or more of blackwater, brown water, greywater or effluent
Water-washed sanitation	Use of water for the hydraulic movement of wastewater through a sewerage system

Executive summary

Purpose and scope

This publication provides reference checklists to help strengthen emergency preparedness and response ("readiness") of water, sanitation and hygiene (WASH) services in conflict contexts. The checklists outline key considerations for situation assessment to strengthen the resilience of WASH services during conflict, and to help maintain or more rapidly restore WASH services during and after a military attack. Basic considerations are also provided on setting priorities for action to progressively improve WASH emergency readiness. Completion of the checklists should encourage development of emergency preparedness and response plans at the local level, or their strengthening where such plans are already in place.

The checklists cover essential WASH systems and services to help protect public health by preventing infectious diseases associated with inadequate WASH. They also help to ensure adequate access to safe water for hydration, personal hygiene and food preparation, thereby supporting human rights, protecting health and preserving dignity.

The publication was prepared in the context of the war in Ukraine, but it draws upon principles and resources developed in other emergency settings and contexts. External references are provided to more detailed technical materials from select international actors working within the emergency sphere. The checklists may also be useful in the context of conflicts in other countries, although the material would need to be adapted to account for differences in WASH systems, cultures, socioeconomic factors and risks in other settings.

Target audience

The checklists are primarily for use by local-level stakeholders and decision-makers who are responsible for WASH and/or engaged in supporting provision of WASH services to their communities. These include local authorities with responsibility for water, sanitation, health, emergency preparedness and response, and community representatives.

Using the checklists

The checklists are intended to support an inclusive stakeholder consultation and discussion process (for example, in the form of workshops), from which a systematic planning and implementation process can be conducted at the local level. They aim to assess the adequacy of existing emergency preparedness and response plans and associated procedures at the local level, and to help develop or strengthen these as required.

It is recommended that a team is formed to apply the checklists during a series of meetings/ workshops, presenting the checklists as a series of questions and considerations for discussion. This exercise is intended to help coordinate:

- preparatory activities to minimize risks from potential future impacts of attacks on WASH services; and/or

- response activities after an attack has occurred and normal service is disrupted.

The aim is to ensure that the most important components of WASH service provision are systematically considered and assessed, and that local actions can be assigned to address any shortfalls in current emergency preparedness and response capacities. Priorities for action should be identified and addressed by progressive improvement planning, considering available resources, and by implementing priority planning actions to fill critical gaps to improve the resilience of WASH services during conflict.

Examples of application of the checklists may include assessing a system's ability to withstand attacks and/or to restore services following an attack; assessing and managing health risks from attacks; and developing or strengthening WASH emergency preparedness and response plans.

1. Background and introduction

This publication has been prepared to guide systematic discussions among concerned local stakeholders to assess the status of water, sanitation and hygiene (WASH) emergency preparedness and response ("readiness") at the local level in the context of military attacks.

The work was undertaken in the context of the situation in Ukraine, with the aim of addressing:

◆ the lack of existing global WASH guidance for conflict situations in industrialized countries; and

◆ the need for tailored guidance reflecting the current realities of the war in Ukraine, which requires context-appropriate checklists with particular attention to conflict-related emergency preparedness and response concerns.

For a summary of the methodology used to develop the checklists, see Annex 1.

1.1 Purpose and scope of the checklists

This publication provides reference checklists to help strengthen the resilience of WASH services in the context of the war in Ukraine. The checklists provide a framework to conduct a situational assessment to identify current conditions (including current responses to recent attacks, where relevant) and identify gaps and priorities for action. Local stakeholders at the municipality and regional levels can use the information gathered through the checklists to identify and implement measures to protect the health of the community. Through this process, a rapid WASH readiness assessment can be completed to help strengthen preparedness for a possible military attack. The process can also support the response to an attack – including the ability to continue WASH services during an attack and, where lost, to restore normal WASH services in the aftermath of such an attack, or ensure provision of safe and adequate alternatives.

The checklists consider WASH systems and related services that are essential to uphold and protect public health. Such services are vital to prevent illness or death arising from infectious disease transmission associated with unsafe and inadequate WASH services, and to mitigate risk of exposure to chemical contaminants that could be of public health concern. They therefore support basic human rights and protection of personal dignity. The checklists can also help to ensure adequate water quantity for hydration, personal hygiene and food preparation, which is essential for overall health and well-being. Broader aspects of liquid and solid waste management that are unrelated to human health are not within the scope of this publication.

Conducting the WASH readiness assessment can support strengthening of existing emergency preparedness and response plans or, where such plans are not in place, can encourage their development. The outputs from completion of the checklists may also facilitate and catalyse support by external agencies and inform broader recovery planning processes.

The checklists are not a detailed technical resource or implementation tool. Reference is made to more detailed external technical resources in Annex 2. It is envisaged that future practical experiences by users applying the checklists may contribute to further development and revision of this publication.

The publication was developed in the context of Ukraine, but the checklists can be adapted to suit to other contexts (with links provided to editable versions of the checklists for ease of adaptation).

1.2 Intended users of the checklists

The checklists should be used primarily by local stakeholders and decision-makers who are responsible for WASH and/or engaged in supporting the provision of WASH services to their communities. These stakeholders may include vodokanal [water supply utility] water and sanitation service providers, local government departments, local water and health agencies, and local agencies responsible for emergency preparedness and response (including first responders). The process can be supported by other administrative units, local nongovernmental organizations, community group representatives and other concerned local stakeholders.

The involvement of higher-level stakeholders (such as from the national or oblast [regional] level) may add value to the exercise in some instances, and should be considered in the local context where appropriate (see also section 2.2).

1.3 Utilization of the checklists

The checklists are intended for use at the local level to help guide decision-making by concerned stakeholders to improve the resilience of WASH services in conflict contexts. They may be of particular use, for example, to help with:

◆ developing or strengthening existing WASH emergency preparedness and response plans at the local level;

◆ assessing the impact of an attack on WASH services, and identifying and planning prioritized local actions to restore those services;

◆ assessing risks to public health in the local context, applying risk mitigation measures and preventive public health services – including risk communication and community engagement and education;

◆ assessing supply chain robustness for WASH services, and arranging procurement, storage and delivery logistics for essential items to help main the supply chain in the face of conflict; and

◆ working to advocate and/or directly support procurement, restoration and/or upgrading of WASH systems as part of preparedness and response and restoration efforts, including informing the identification of support and financing needs by WASH partners and donors in the country.

Outputs from the WASH readiness assessment should include both a rapid needs assessment and a list of priorities for action (identified through a "rapid prioritization process"; see section 2.6). The outcomes of the local-level exercise can also be communicated to higher-level authorities to support WASH emergency readiness. Higher-level stakeholders, such as those responsible for WASH, health, and emergency preparedness and response at the oblast and/or national levels, should be kept informed of the process and its outcomes (for example, where the outcomes of the local readiness assessment can be used to inform higher-level priority-setting).

Where checklists are used across various regions, the outcomes of the readiness assessment exercise could be compiled at the national level to assess the resilience of WASH services more broadly, and to prioritize resource allocation and action where significant vulnerabilities are identified.

1.4 Impacts of the war on WASH services in Ukraine

Access to adequate WASH services is recognized as a basic human right. These services are a prerequisite to prevent illness and to provide dignity. The war has undermined WASH services in Ukraine in multiple ways. The ongoing war has reduced access to clean water and safely managed sanitation by damaging infrastructure, disrupting power supplies, impeding maintenance and operations, displacing populations and staff of WASH service providers, disrupting supply chains, and diverting resources to address security challenges (see Table 1). This deterioration in WASH services exacerbates public health challenges caused by the war, leading to increased exposure to preventable water-related diseases.

Ukraine is a geographically large and diverse country; the war and associated WASH situation is dynamic and differs markedly across oblasts. Martial law declarations[1] distinguish four broad situational groups: less frequently attacked areas, more targeted areas, active combat areas and areas not under the control of the Government of Ukraine. These are defined as follows.

◆ **Less frequently attacked areas** are those that are geographically distant from current or imminent potential military attack. Although these are the least vulnerable zones, the nationwide situation is dynamic: the whole country is being subjected to actual, or the potential threat of, air strikes and sabotage. These safest zones face a challenge, as they may contain large populations who have been displaced from more dangerous areas of the country – this greatly stretches both infrastructure and human resources, often beyond their capacity. These zones may also play a role in supporting WASH service continuity in active combat zones (for example, via transfer of critical spare parts, essential treatment chemicals and similar).

◆ **More targeted areas** are zones outside active combat areas where there remains a reasonable likelihood of experiencing significant military activity (such as regions bordering areas not under the control of the Government of Ukraine or areas that are being actively targeted). Extensive activity is required to protect WASH infrastructure, implement backup systems and support general preparedness. These zones may also play a role in supporting WASH service continuity in active combat zones (for example, via transfer of critical spare parts, essential treatment chemicals and similar).

◆ **Active combat areas** are the most vulnerable zones, which sustain daily military strikes. The situation in these zones is most acute, owing to both significant damage to infrastructure and a lack of personnel, as many people have moved to safer areas. Daily repair and restoration activities are required, along with interim alternative solutions, provided by these very limited personnel.

◆ It is difficult to assess the true situation in the **areas not under the control of the Government of Ukraine** (both from 2014 and from the beginning of 2022), as Ukrainian officials and foreign actors are granted only limited access. The situation is expected to be varied (for example, infrastructure may have been damaged to varying extents, and may be at various stages of repair/restoration).

The WASH status within these groups represents a spectrum (in terms of vulnerability, infrastructure damage, resource constraints, population displacement and so on). The nature and severity of the impacts described in Table 1 will be different across and within different geographical areas, and this is likely to change over time depending on the direction of the war.

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1   Деякі питання формування переліку територій, на яких ведуться (велися) бойові дії або тимчасово окупованих Російською Федерацією [Decree of the Cabinet of Ministers of Ukraine dated 6 December 2022, no. 1364, on some issues of forming a list of territories on which hostilities are (were) conducted or temporarily occupied by the Russian Federation]. Official Bulletin of the Verkhovna Rada of Ukraine. 2022;1364 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/1364-2022-%D0%BF#Text, accessed 14 November 2024).

Table 1. Examples of impacts from the war on WASH services in Ukraine

WASH service impacts from the war	Relative intensity of the impacts by situational group			
	Less frequently attacked areas	More targeted areas	Active combat areas	Areas not under Government control
Drinking-water quality deterioration • Damage/destruction from attacks causing leakage/runoff of chemicals from polluting activities (e.g. industrial/manufacturing sites, military objects, fuel stations or oil/chemical storage facilities), contaminating water sources • Damage/destruction of wastewater/stormwater infrastructure, contaminating water sources • Damage/destruction of treatment and distribution infrastructure, resulting in unsafe water supply (e.g. untreated or partially treated drinking-water, ingress of contamination into damaged distribution networks)	+	++	+++	Unknown
Infrastructure damage • Combat operations directly damaging water and sewerage infrastructure (e.g. treatment facilities, pipes, reservoirs, dams or pump stations), leading to temporary reductions in safe and adequate drinking-water and a lack of sanitation services for safe faecal waste disposal • Corrosion of network assets due to emergency supply of non-potable (more saline) water • Challenges with repair/replacement of damaged infrastructure, and a lack of alternative arrangements, resulting in services remaining vulnerable to outages/breakdown	+	+++	+++	Unknown
Disruption of essential power supplies • Damage/destruction of essential infrastructure leading to disrupted power supplies (e.g. load shedding or blackouts) • Reduced treatment and pumping capacities during this time, severely affecting the delivery of safe and adequate WASH services (e.g. intermittent services or increased contamination due to depressurization of water networks) • Ongoing vulnerability due to challenges with implementing alternative power arrangements due to high costs	++	+++	+++	Unknown

WASH service impacts from the war	Relative intensity of the impacts by situational group			
	Less frequently attacked areas	More targeted areas	Active combat areas	Areas not under Government control
Disrupted logistics for materials • Supply chain disruption for WASH materials (including critical spare parts, treatment chemicals, disinfectants, testing equipment and reagents, hygiene products and delivery personnel) • Insufficient stockpiling and contingency planning due to staff attrition, and supply chain and financial constraints (see next row) • Delays in major ports and road crossings into Ukraine (due to blockades, attacks or mining), further complicating logistics and resource availability	++	+++	+++	Unknown
Reduced financing for services • Decreasing WASH service revenues due to a reduced population in affected areas and business closures, compounded by a moratorium on tariff increases, and rising costs to fund preparedness and response actions • Rising costs for repairing and restoring infrastructure in areas affected by military attacks, along with providing safe alternative and interim services • Rising costs for strengthening the resilience of WASH services against future attacks and procuring necessary materials (due to logistical challenges and the need to source materials from outside the country)	+	+++	+++	Unknown
Displaced populations and workforce availability • Significant population displacement altering demand for WASH services and affecting workforce availability, resulting in an impact on capacity to operate and maintain systems • Some areas (e.g. western Ukraine) facing demands on WASH systems that exceed their design capacity, while eastern regions and war zones experience reduced demand and personnel shortages	+++	+++	+++	Unknown
Negative societal impacts • Authorities forced to implement emergency-level WASH service targets, reducing service standards (e.g. having access at home to safe and adequate drinking-water when needed, functioning flushable toilets and solid waste collection), leading to populations being more vulnerable to serious health effects	+	+++	+++	Unknown

Key: **+++** severely affected; **++** moderately affected; **+** less affected.
Sources: the information was gleaned from a variety of sources, including case studies, vodokanal reports, published literature and media reports. For more information, see Annex 1.

2. Application of the WASH readiness checklists

2.1 Legislative context for the provision of WASH services in the context of the checklists

Application of the checklists must be conducted in the context of the relevant national legislation. This includes requirements for aspects relevant to completion of the checklists, such as those relating to regulation, monitoring and financing. In Ukraine, the relevant legislation includes, but is not limited to, the following.[2]

◆ Водний кодекс України [Water Code of Ukraine (updated 19 March 2024)]. Official Bulletin of the Verkhovna Rada of Ukraine. 1995;24:189 (in Ukrainian; this version is not currently available in English) (https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text).

◆ Кодекс цивільного захисту України [Code for Civil Protection of Ukraine (updated 21 September 2024)]. Official Bulletin of the Verkhovna Rada of Ukraine. 2013;34–5:458 (in Ukrainian; this version is not currently available in English) (https://zakon.rada.gov.ua/laws/show/5403-17#Text).

◆ Law on Drinking-water and Drinking-water Supply [updated 1 October 2023]. Official Bulletin of the Verkhovna Rada of Ukraine. 2002;16:112 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/2918-14#Text).

◆ Law on Sewage and Wastewater Treatment [updated 12 January 2023]. Official Bulletin of the Verkhovna Rada of Ukraine. 2023;58:181 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/2887-20#Text).

◆ Law on the Public Health System [updated 11 February 2024]. Official Bulletin of the Verkhovna Rada of Ukraine. 2023;26:93 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/2573-20#Text).

◆ Decree of the Cabinet of Ministers of Ukraine dated 19 September 2018, no. 758, on approval of the procedure for state monitoring of water resources [updated 26 September 2024]. Official Bulletin of the Verkhovna Rada of Ukraine. 2018;758 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/758-2018-%D0%BF#Text).

◆ Order of the Ministry of Health Protection of Ukraine dated 12 May 2010, no. 400, on approval of state sanitary norms and standards: hygienic requirements for drinking-water intended for human consumption (SanPiN 2.2.4-171-10) [updated 22 March 2023]. Official Bulletin of the Verkhovna Rada of Ukraine. 2010;400 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/z0452-10#Text).

◆ Order of the Ministry of Health Protection of Ukraine dated 22 April 2022, no. 683, on the approval of state sanitary norms and standards: safety indicators and certain indicators of drinking-water quality in martial law and other emergency situations [updated 22 March 2022]. Official Bulletin of the Verkhovna Rada of Ukraine. 2022;683 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/z0564-22?lang=en#Text).

◆ Order of the Ministry of Health Protection of Ukraine dated 17 March 2011, no. 145, on the approval of state sanitary norms and standards: maintenance of the territories of populated areas. Official Bulletin of the Verkhovna Rada of Ukraine. 2011;145 (in Ukrainian) (https://zakon.rada.gov.ua/laws/show/z0457-11#Text).

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2   All references accessed on 15 November 2024.

2.2 Coordination and leadership

To help ensure effective application of the checklists and good outcomes, an important first task is to understand and agree on roles and responsibilities – including those relating to health, water quality, wastewater management, water supply security and energy security. During this exercise, it may be useful to divide the entities into two main groups:

◆ "core" entities involved in WASH service provision, regulation and monitoring, and those responsible for emergency preparedness/response and coordination; and

◆ "supporting" entities involved in providing additional external support.

Coordination between sectors and disciplines is required. The lead users of the checklists should bear in mind that:

◆ a cross-sectoral response is required – for example, across power and water, since the two are interdependent in many cases – so the WASH sector needs to liaise with other critical sectors; and

◆ a multidisciplinary response is needed – for example, including civil engineering, water and wastewater treatment, network operation and WASH specialists.

Annex 3 gives some examples of local and subnational stakeholders who should be considered for involvement in the process. Information is provided on relevant authorities and institutions in Ukraine and on their areas of responsibility as they relate to WASH emergency preparedness and response. Annex 3 also presents examples of higher-level stakeholders who should be kept abreast of the process and its outcomes, and who can be involved further as appropriate.

2.3 Structure of the checklists

The checklists are structured into categories and subcategories (Fig. 1).

Fig. 1. Broad structure of the checklists

A WASH sector leadership and coordination	B Drinking-water supply services	C Sewerage and sanitation services	D Hygiene	E Other considerations
Stakeholders	Supplies	Supplies	Supplies	
Priorities	Infrastructure	Infrastructure	Infrastructure	
Funding sources	Events	Events	Communication	
Human resources	Supporting systems	Supporting systems	Health-care facilities	
Planninfg	Alternative water supplies	Alternative water supplies		
Rural areas	Communication	Communication		

Each checklist item A–E is organized into six columns as illustrated in Fig. 2. Each begins with a broad opening question, followed by a brief explanation of the relevance to health. More detailed considerations for each opening question are phrased as a series of further questions. Generic illustrative examples of the types of gaps, actions and stakeholders involved are provided for each question (in italics) to help guide use of the checklists.[3] The aim is that

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3   Editable versions of the checklists and improvement action plan can be downloaded from: Checklists for strengthening water, sanitation and hygiene emergency preparedness and response: focus on Ukraine. Editable versions. Copenhagen: WHO Regional Office for Europe; 2025 (https://www.who.int/europe/publications/m/item/checklists-for-strengthening-water-sanitation-and-hygiene-emergency-preparedness-and-response), accessed 14 May 2025.

users will complete their own gap analysis, and implement their own improvement actions with support from a number of actors. It is intended that the WASH readiness improvement actions identified will be consolidated into an "improvement action plan", an example of which is provided in section 3.F.

Fig. 2. Organization of checklist items
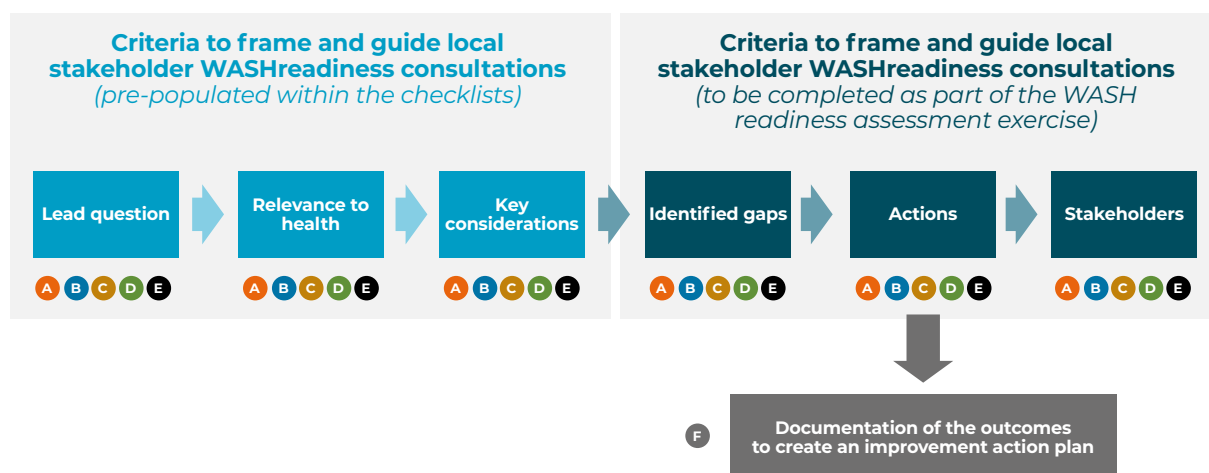
The checklist items have been broadly ordered in line with their probable priority, although this will vary according to the local context (see sections 2.5 and 2.6).

There is some overlap between some of the actions – for example, those relating to power supplies or personnel. However, since some categories may be used in isolation (for instance, by either drinking-water or sewerage service providers, but not both) this repetition has been retained.

Where the readiness assessment identifies the need for communication with the public, careful coordination is required to ensure that messages across the WASH domains are consolidated and harmonized, such that clear information is delivered that avoids any potential for contradictory messaging.

2.4 Completing the checklists

To complete the checklists, one or more multistakeholder workshops should be organized, to facilitate inclusive discussion, sharing and interaction by all stakeholders with responsibility at the local level for WASH service provision and emergency readiness. In preparation for the exercise, it is important to assemble all documentation, experiences and focal points dealing with WASH emergency preparedness and response. Conducting the readiness assessment may entail the following steps (although other approaches can be considered):

◆ identification of the purpose of conducting the readiness assessment and its scope, including the site and situation, and which WASH services are under consideration and their boundaries;

◆ mapping, contacting and formally inviting the stakeholders who are to be engaged, and formation of the team (including a team leader) that will apply the checklist;

◆ arranging the logistics of the workshop(s), such as travel and venue;

◆ supply of background information, such as presentation materials to brief stakeholders, along with the checklists, to enable preliminary review and preparation by workshop participants;

◆ onsite inspections of key WASH assets and infrastructure (possibly conducted by key stakeholders on the team) and discussions between parties prior to the workshop (such as meetings between workshop participants and local community representatives to

hear their WASH concerns) to observe and understand the situation on the ground;

◆ completion of the workshop(s) through a participatory process that involves working through the checklists as a group (sections 3.A to 3.F) to identify gaps and priority needs for those present, which will provide an immediate benefit to the participants;

◆ documenting the workshop outcomes, including developing a prioritized improvement action plan (see sections 2.6 and 3.F) to progressively strengthen preparedness and response for WASH services; and

◆ implementing the improvement action plan, including providing technical backstop support for implementation (on site and remotely), identifying and helping to secure financial and human resources, monitoring and reporting on progress against those action.

As part of this overall process, a dialogue between stakeholders should take place early in the proceedings to confirm responsibilities for all entities, including understanding of who is leading and coordinating on behalf of the community in each region and at each level. These responsibilities should be reconfirmed over time as needed.

2.5 Consideration of the local context

The readiness assessment should be conducted in line with local priority concerns and prevailing capacity and resource constraints. An informed selection needs to be made by local stakeholders of the checklist questions of most significance in the given context. At an early stage, it may be beneficial for stakeholders to review the template checklists provided in this publication to determine whether adaptations are needed to better suit the local context (for example, removing questions that are not relevant or adding questions of local significance).

Additionally, a staged and incremental approach to conducting the checklist exercise may be more appropriate in certain settings. For example, where capacity and resources are significantly constrained, the exercise could be completed by focusing initially on WASH domains of priority concern (for example, focusing only on the drinking-water checklist at first), and involving only critical stakeholders. Thereafter, the remaining checklists could be competed as part of an iterative cycle, with broader stakeholder engagement as capacity and resources permit.

2.6 Setting priorities for action

Given limited resources (financial, personnel, infrastructure and facilities), priorities need to be set for delivering WASH services during a conflict situation. In Ukraine, there is no one single list of priorities for all sites and situations, and priority-setting will very much differ across the country depending on the geographical area and situational groups discussed in section 1.4. As such, priority-setting needs to be based on situation-specific decision-making, determined by local stakeholders who best understand the needs, practicalities and resource realities on the ground.

The principal concern in most WASH emergencies, including in Ukraine, relates to infectious disease transmitted via faeces that contaminate water supplies, food and hands. As such, aspects relating to microbial safety should be prioritized in all cases. Chemical contaminants should be considered when such chemicals are known to be of concern to public health, and where these occur at concentrations of concern.

Another important general priority in the Ukrainian context is the need to focus on protection of existing functional WASH services. In addition, when restoring WASH services that

have been damaged or destroyed, efforts must consider safer and more reliable alternatives – either centrally managed services where practical or point-of-use services that are safely managed and adequate.

As part of the WASH readiness assessment exercise, a basic and rapid prioritization assessment should be conducted to help determine the relative priority of the identified actions. In its most basic form, priority can be assigned to the identified improvement actions based on the expert judgement and experience of the stakeholders supporting the exercise. A simple traffic light colour-coding system can be applied to the relevant cells of the "actions" column of the checklists. An example is presented in Table 2.

Table 2. Example of a simple approach using priority descriptors and corresponding colour-coding for a rapid prioritization process based on the judgement of concerned stakeholders

Priority level	Priority descriptor	Example guiding definition for descriptor[a]
High	Clear priority: requires immediate action	Failure to implement the improvement action may result in an immediate and major threat to public health (e.g. illness in the community as a result of faeces contaminating water supplies, food or hands, or from acute or longer-term exposure to a priority chemical) and prolonged loss of safe and adequate WASH services (e.g. damage to service reservoir, loss of sewage treatment capacity, longer-term outage of a critical treatment chemical or ruptured main supply pipeline) for the majority of the local population.
Medium	Medium- or long-term priority: requires some attention	Failure to implement the improvement action may result in a moderate impact on adequate WASH service delivery (e.g. shorter-term power outage, medium-term outage of a non-critical consumable item or non-health-related aesthetic issues in the water supply) for some of the local population.
Low	Not a priority in the short term	Failure to implement the improvement action may result in a minor or negligible impact on adequate WASH service delivery (e.g. a non-health-related water quality issue or some manageable disruptions to operations or supply chains) for a small section of the local community.
Unsure	Additional information required to inform a priority level	Further data collection, information gathering and/or broader stakeholder consultation is required to ascertain the priority level. Some no- or low-cost actions can be taken in the interim, targeting improvements that are considered no-regret/low-regret options based on the current understanding of the situation.

[a] The descriptor definitions should be tailored to suit the local context, considering the local priorities in line with section 1.4.

More advanced forms of prioritization could include a semiquantitative assessment. One example would be to consider the following questions for each of the improvements identified.

◆ How significant an impact will the improvement have on public health protection and service delivery?

◆ What is the time frame to implement it?

◆ How practical and feasible is it to deliver (for example, based on available local capacity and resources)?

◆ How much will it cost?

◆ Is external support available to help with it (such as local, national or international partners)?

From this, a rating scale could be applied to each criterion, as illustrated in Table 3, and the highest-scoring improvements could be prioritized for action.

Table 3. Example of a more sophisticated approach using weighted ranking as part of a rapid prioritization assessment for identified improvement actions

Possible improvement actions identified to address a gap	Impact of improvement	Time frame to implementation	Practicality	Cost	Availability of partner support	Score	Priority
Three-category rating scale	*1 Low 2 Intermediate 3 High*	*1 Long 2 Intermediate 3 Short*	*1 Low 2 Intermediate 3 High*	*1 High 2 Intermediate 3 Low*	*1 Low 2 Intermediate 3 High*		
Weighting of criterion	*× 3*	*× 2*	*× 1*	*× 1*	*× 1*	**Score**	**Priority**
a. Install generator plug-in points at all critical powered infrastructure, and obtain backup generators on trailers to be located at short notice to key locations	3 High	3 Short	2 Intermediate	2 Intermediate	3 High	**22**	**High**
b. Construct sewage containment pondage in case of sewage treatment plant failure	2 Intermediate	1 Long	1 Low	1 High	1 Low	**11**	**Low**
c. Stockpile sanitation and hygiene products locally in case of areas becoming inaccessible	2 Intermediate	2 Intermediate	2 Intermediate	2 Intermediate	3 High	**17**	**Medium**

Priority ranking key:

8–12 Low	12–18 Medium	19–24 High

In this example, provision of generators/plug-in points would be the top priority, followed by stockpiling WASH products and then provision of sewage containment pondage.

3. WASH readiness assessment checklists

The following subsections contain the checklists for items A–E as set out in Fig. 2; section 3.F provides a template for the resulting improvement action plan. The final three columns of each checklist give generic illustrative example responses (in italics) to help guide users. Editable versions of the checklists and improvement action plan can be downloaded from: Checklists for strengthening water, sanitation and hygiene emergency preparedness and response: focus on Ukraine. Editable versions. Copenhagen: WHO Regional Office for Europe; 2025 (https://www.who.int/europe/publications/m/item/checklists-for-strengthening-water-sanitation-and-hygiene-emergency-preparedness-and-response), accessed 14 May 2025.

3.A Leadership and coordination checklist

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Stakeholders						
1.	Is there a **lead agency** or entity responsible for coordinating WASH preparedness and response in the local context?	Leadership and coordination are necessary for efficient and effective WASH services and activities to prevent the spread of infectious diseases that can cause widespread illness and outbreaks.	• Has a legitimate organization, or cluster of organizations, been designated as leading and coordinating WASH activities? • Is a document available that defines the leading body or organization? • Is the structure and reporting of the leading organization or cluster clear? • Who are the key stakeholders in the local context who need to be brought around the table to discuss WASH resilience, readiness and response? • Are key WASH functions (drinking-water, sanitation and hygiene) clearly identified, with leadership and coordination roles set out?	*We have identified leadership roles in the major City X, with the vodokanal leading on drinking-water and sanitation, and the local government leading on hygiene, but we have not done the same for the surrounding areas not served by the vodokanal.*	*We will identify the leadership and coordination agencies for WASH in the areas of the oblast not served by the vodokanal.*	*Vodokanal of City X*

3.A Leadership and coordination checklist contd.

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
2.	Have **clear roles and responsibilities** been allocated, agreed and clearly communicated for organizations, individuals and the community?	Confirmation and acceptance of roles and responsibilities are necessary for efficient and effective WASH services and activities to prevent the spread of infectious diseases that can cause widespread illness and outbreaks.	• Have roles and responsibilities for WASH functions and activities (drinking-water, sanitation and hygiene) been clearly identified, communicated and agreed among relevant local stakeholders who share responsibility for WASH services? • Is a summary available of organizations that are included in the WASH system, with a definition of their functionality? • Have alternative and backup organizations and individuals been identified in case of lack of availability?	*Many people in the community are used to having services provided by government agencies that are no longer able to service some of those needs fully.*	*More communication is required with the community to explain the WASH services that government agencies cannot currently deliver, and that community members need to take on.*	*WASH Cluster*
3.	Have **cross-discipline working groups** been formed to deliver specific tasks and exchange ideas?	Cross-discipline teams can help optimize the targeting of limited resources for maximal the health benefit.	• Have suitable cross-discipline working groups been formed to help draw upon one another's skills and experiences to optimize WASH-related interventions?	*The team has engineering expertise but lacks environmental health experience.*	*Environmental health expertise will be drawn into the working group.*	*Local working group*

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Priorities						
4.	Have **priorities** been identified to help focus limited resources on the most important aspects of WASH?	Targeting WASH services and activities to the areas of greatest importance or vulnerability helps to minimize the spread of infectious diseases.	• Has a rapid situation assessment been completed by gathering relevant information and conducting on-the-ground inspections of WASH systems to the extent that it is safe to do so? • Has a rapid needs assessment been completed to set priorities by mapping strengths and weaknesses in terms of human resources, strength of infrastructure and procurement? • Have the water supply and sewerage networks been mapped to identify vulnerabilities and critical points that need protecting and backing up? • Have health effects from microbial pathogens been identified as the number one priority concern? • Have vulnerable groups (including infants and elderly, disabled and immunocompromised people) been identified as those with the greatest need for support? • Have critical facilities, such as health-care facilities and shelter areas, been identified as first priorities for support? • Have priorities been specified for each community? • Is a system in place to revisit and revise priorities as the situation changes over time to ensure that they remain relevant?	*Our previous focus had been on sewer odour control since that was the major concern raised by the community, and we hadn't given much thought to pathogens as they were assumed largely under control before the war.*	*Some brackish water contains* Vibrio cholerae; *as a result, a breakdown in WASH services could lead to a cholera outbreak, so sewage containment becomes our wastewater team's priority now, taking precedence over odour control.*	*Ministry of Health with local authorities*

3.A Leadership and coordination checklist contd.

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Funding sources						
5.	Have **funding sources** been secured to pay for human resources, capital and operational expenditures?	Funding is required to sustain WASH services and activities to prevent the spread of infectious diseases that can cause widespread illness and outbreaks.	• Have costs of providing and supporting WASH services been calculated? • Do these calculations account for changes due to the conflict (e.g. increased costs of consumables and logistics)? • Have the effects of preparation for, and response to, attacks been factored into the cost estimates? • Are water and sanitation tariffs sufficient under the current conditions to cover the basic operating costs of services? • Are sources of revenue secure in the face of changes in population relocating, leading to regional increases or decreases in population levels? • Have backup revenue or financing sources been secured?	*The population in the area has dropped by about 70%, and the revenue is insufficient to cover service provision costs.*	*Loans and debt finance will be sought to provide funding until the population returns.*	*National government*
6.	Have **donor agencies** been given clear direction as to what the WASH support needs are?	To maximize public health, benefit donations from donor agencies need to be prioritized according to need and suitability for the context.	• Have the priority needs been clearly communicated to donor agencies? • Have the precise technical characteristics and specifications for supplies from donors been clearly communicated?	*A request was made for generators, but no detail was provided of the technical requirements.*	*The request will be updated to identify what type of fuel the generators should use, what type of power they should generate, their capacity and the need for uninterruptible power supply integration.*	*National government*

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Human resources						
7.	Have **essential workers** been identified, with personnel covering key roles always put on standby and in a state of readiness, and protected from military attack?	Lack of personnel capable of delivering WASH services and activities can lead to the spread of infectious diseases.	• Are alternative trained decision-making focal points available, who are familiar with emergency response plans, with the authority and resources to plan and direct emergency efforts? • Have critical WASH workers been identified and retained in readiness to support WASH services? • Have critical infrastructure workers been protected from mobilization to the defence forces to ensure their availability for WASH activities? • Have critical WASH workers been given security protection to complete their work (through arrangement of escorts, safe corridors, provision of appropriate ballistic personal protective equipment and armoured vehicles where appropriate)? • Can workers be transferred from neighbouring vodokanal systems if the need arises? • Have personnel and backup personnel been trained on how to operate systems, including during normal operations and if systems are compromised by conflict? • If systems run on automated electronic control systems, are procedures set up to operate them manually if those controls systems fail? • Does training cover alternative water supply and sewerage systems? • If necessary, has safe staff accommodation been organized near workplaces, including provision of drinking-water and food? • Has permission been provided to mobilize critical infrastructure specialists during curfew – in particular, specialists from the Regional Centre for Control and Prevention of Illness?	*Critical workers are currently fighting, and some have been casualties of the war, leading to personnel shortages.*	*Humanitarian agencies will be asked to supply trained, competent WASH services workers.*	*Ministry of Health, vodokanals and local authorities*

3.A Leadership and coordination checklist contd.

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Planning						
8.	Have WASH **preparedness and response plans** been developed, and have personnel been trained to undertake relevant action?	Lack of familiarity with plans due to poor training and rehearsal can lead to poor implementation of plans that prevent health benefits being realized. Rehearsals/drills can also reveal flaws in plans so that they can be improved.	• Have probable events been anticipated and emergency management plans put in place to be prepared to respond when needed? • Have key personnel been made aware of, and trained in, the WASH preparedness and response plans? • Have joint multiple stakeholder rehearsals and training exercises been undertaken to help with both training and practical testing of plans to respond to different scenarios? • Have backup materials, resources and facilities been made ready if the need for these is identified in the emergency management plans? • Are systems in place to ensure good communication and coordination among all local stakeholders in accordance with the emergency management plans? • Have lessons learned been documented, and plans revised following operational experiences from rehearsals and drills?	*The plans have been developed by a small team, but most people haven't seen them, and we haven't undertaken trial runs to test them.*	*Training will be undertaken, including some rehearsals, to help raise awareness of the plans and to test them out to help improve them.*	*Vodokanals and local authorities*
9.	Have **contact details** been documented for key personnel from all relevant organizations, along with their availability, to enable rapid contact when needed?	Inability to contact key personnel involved in delivering WASH services and activities can lead to the spread of infectious diseases.	• Have contact details been shared to enable key WASH workers to be contacted as needed? • Have backup communication systems been arranged, such as two-way radio networks, in case mobile phone networks are not working? • Can key workers be always contacted if the need arises? • Are contact details of key WASH organizations shared to improve communication (including availability during curfews, for example)?	*We have been relying on mobile phones, but we could restart our radio network as a backup – we just need to bring the units out of storage and train staff in their use.*	*Essential workers who are working or on standby in case of events will be provided with backup two-way radio communication systems from our stores.*	*WASH Cluster*

3.A Leadership and coordination checklist contd.

No.	Questions on leadership and coordination	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
10.	Have **WASH systems and infrastructure** been described in relevant documentation?	Health-related planning and prioritization draws on basic WASH systems information.	• Are maps, plans, descriptions and general information on WASH systems and infrastructure collated and made ready? • Are points and systems that are essential for WASH services and that are most vulnerable to attack, or that have been subjected to attack, been identified? • Have options for alternative water sources and distribution modalities been identified, based on mapping? • Have vulnerable communities or facilities been identified and documented (e.g. using geographical information system (GIS) mapping)?	*We do not have maps of the sewerage network. We have not mapped water distribution to health-care facilities, schools, homes for elderly people or individual users on home dialysis.*	*GIS layers or maps of the sewerage network will be sourced or prepared.*	*Vodokanals*
Rural areas						
11.	Have the **special WASH needs of rural areas** been considered?	Rural areas lack access to centralized WASH services; they can be isolated and vulnerable to adverse health consequences as a result.	• Have communication plans been put in place for rural areas on the principles of WASH that take into account that most are not served by a centralized water supply or connected to a sanitary drainage system? • Have minimum WASH requirements been documented for isolated rural areas that are sufficient to prevent disease transmission and protect dignity?	*No simple, targeted information package is in place for residents of rural areas to explain the importance of WASH and how to maintain WASH activities when people return to such areas.*	*For people returning to rural areas, tailored information will be provided through written and in-person awareness-raising on the importance of WASH activities, minimum WASH requirements and simple, practical guidance on safe WASH activities.*	*Local authorities*

3.B Drinking-water supply services checklist

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Supplies						
1.	Are plans in place to prepare for, and respond to, a ***temporary loss of electrical power*** supply to **centralized** systems for a few hours or days?	Power is often required for water treatment and disinfection, to maintain system pressure to stop contamination entering the distribution system, and to maintain a continuous supply of adequate quantities of safe and acceptable drinking-water. Thus, loss of power can lead to microbiologically unsafe drinking-water, or result in inadequate quantities of water for domestic needs (e.g. hydration and hygiene) and use of less safe alternative sources, which in turn can cause illness.	• What actions are undertaken in anticipation of possible power failure, such as keeping water storage facilities as full as possible, and reconfiguring the system to run off gravity where practicable? • What are the backup power supply options, such as batteries or generators; what is their capacity; and is this sufficient to meet critical power needs? • How long can the facility operate without power, based on available fuel supplies and/or system storage? • How sufficient is the generator fuel supply (including available funds, supply route/chain and safety/security of storage)? • What human resources are available to manage backup power supplies (including routine maintenance and testing)? • What communication protocols are available with energy generators and distribution system suppliers?	*We have generators but no spare fuel or safe place to store it.*	*We need to find a way to store fuel without it being a fire hazard.* *We need to build a protective shelter to shield fuel from direct hits.*	*Power generators, power distributors and vodokanals*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
2.	Are plans in place to prepare for, and respond to, a **prolonged loss of electrical power** supply to **centralized** systems for a few weeks or months?	Long-term loss of power can lead to the problems described in question 1 occurring for longer periods, and may permit outbreaks to arise by setting up new disease transmission cycles – leading, for example, to cholera and/or typhoid.	• If the power failure is prolonged, are there ways to set up alternative power transmission lines? • Are large-scale generators with fuel supplies available (and with sufficient capacity) to power treatment plants and pumps? • Are plug-in points in place to connect generators at all powered sites? • Is a plan in place for ensuring system integrity and water quality following system depressurization that would probably occur during an extended power outage? • Is a plan in place for ensuring system integrity and water quality following system depressurization that would probably occur during an extended power outage? • Is a plan in place for relaunching the power supply after restoration of water facilities that considers the effect on power stability? • Have safe water supply options not reliant on power been arranged (see question 18)?	*We only have one power feed for some critical powered infrastructure.* *We do not have sufficient mobile generator capacity.*	*We can construct second below-ground power feeds to some of our major treatment plants and pump stations.* *We will procure a fleet of appropriately sized mobile generator units.*	*Power generators, power distributors and vodokanals*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
3.	Are contingencies and alternative supply options in place in case of loss of **supply chain** for water disinfection, coagulation, pH adjustment and other essential chemical deliveries?	Loss of disinfection or coagulation can result in supply of microbiologically unsafe drinking-water that can cause illness.	• Which chemicals are delivered regularly to treatment plants and are therefore vulnerable to supply being cut off? • Are stock and inventory management processes in place – for example, suitable storage space, conditions (dry, sealed and out of sunlight) and turning over of stock to keep it in its useful shelf-life date? • Have required minimum reserves of relevant supplies been determined and documented to manage stocks and project how demand might change with increases or decreases in population or supply of water? • Are sufficient stocks of chemicals stored on site? • For short shelf-life chemicals, such as liquid sodium hypochlorite, what is the shelf-life? • Are backup chemicals stored (if required, such as gas, liquid, powder or tablets) following storage safety measures? • Is operator capacity sufficient to implement the use of alternate chemicals as needed (including alternative disinfectants such as potassium hypochlorite)? • Has regular communication with suppliers been established to review the situation in the supply chain? • Have multiple delivery routes been established that are appropriate for the typical delivery vehicle sizes anticipated? • Have logistics and safe transportation been arranged for hazardous or explosive substances? • Is there capacity for onsite chlorine generation using salt and electricity, rather than shipping in chlorine from elsewhere? • Who can be approached in an emergency if enough chemicals are no longer available (e.g. alternative vendors or neighbouring vodokanals)? • What are financing options to pay for disinfectants if funding is limited? • Can "emergency contracts" be set up (e.g. the public electronic procurement system Prozorro) in emergency situations?	*Our full-strength sodium hypochlorite won't last more than a few weeks in summer as it is currently stored in black plastic containers in direct sunlight and gets very warm.* *Our coagulant is delivered three times per week, but there is only one small road, which may be hit by strikes.*	*We will dilute our sodium hypochlorite to half-strength and store it out of the direct sunlight so that it lasts longer.* *We can construct a second access road to the site and store spare coagulant on site for a couple of weeks' supply.*	*Vodokanals*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
4.	Are contingencies in place in case of loss of **supply chain** for water supply materials, such as pipes and parts?	Lack of water supply infrastructure (such as pipes and parts) can delay repairs being made; this can lead to inadequate quantity of safe and acceptable drinking-water, or to microbiologically unsafe drinking-water. Inability to maintain distribution of adequate quantities of safe and acceptable water may lead to use of less safe alternative drinking-water sources, which may cause illness.	• Has an inventory been collated of what parts and fittings are required to repair and replace any damaged infrastructure? • Which parts and fittings are delivered only after failures occur and are not stored locally, making the system vulnerable to supply being cut off? • Who can be approached in an emergency if critical infrastructure parts are lacking? • What are financing options to pay for spare parts and repairs if funding is limited? • Is there a mechanism for activating "emergency contracts" for the purpose of prompt procurement of necessary materials (e.g. Prozorro) in emergency situations?	*We have very few available hydrants to replace those damaged by attacks, and would need to ship those in over long distances.*	*We can source and store additional hydrants and place them at strategic locations to enable rapid deployment.*	*Vodokanals*
5.	Are systems in place to ensure that only **suitable chemicals** are used to treat drinking-water that will not make the water unsafe or unacceptable?	Use of chemicals to treat water may introduce substances that are toxic or that make the water unpleasant to drink.	• What certification, accreditation or registration do chemical suppliers have with respect to the suitability of those chemicals for drinking-water? • Are agreements in place with chemical suppliers to warrant that the quality of the supplied chemical is suitable for drinking-water use? • If the required chemical grades cannot be obtained, have alternative grades been identified of a chemical that may be acceptable if drinking-water grade chemicals are not available (e.g. food grade or medical grade)?	*We have been using stabilized chlorine in the form of sodium dichloroisocyanu-rate (NaDCC), but do not know if it is suitable for safely adding to drink-ing-water.*	*We can require our suppliers of NaDCC to provide chemicals that have received suitable assurance of their quality.*	*Vodokanals*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Infrastructure						
6.	Are plans in place to prepare for, and respond to, **damage to the infrastructure** of **centralized** water supply systems, such as water treatment plants, pipelines, storage facilities and pumps?	Damage and associated loss of system pressure can lead to insufficient supply (and potential for use of less safe alternative water sources), and/or contamination of the water supply (e.g. due to ingress of harmful contaminants into distribution system), and thus to illness.	• Is an updated asset register in place, including an inventory of all key assets? • Does the asset register include information on the current performance of these assets (or proxies such as condition, age and usage) to be able to determine the nature (i.e. failure mode) and timing of possible failure (i.e. remaining functional life)? • Have stocks of materials, parts, fittings and chemicals been built up to allow for increased rates of damage during attacks? • Are the materials, parts, fittings and chemicals stored in multiple locations in case one is damaged or destroyed? • Are the materials to be used fit for purpose and safe for contact with drinking-water? • Will rapid inspection take place following attacks to assess damage to critical infrastructure? • Are manual backup systems in place and operable in case of loss of electromechanical or supervisory control and data acquisition (SCADA) systems – online telemetry systems for monitoring and control of operations (if present)? • Are mobile treatment units needed and, if so, are they available and with sufficient capacity to meet critical needs? • What human resources and equipment are available to carry out repair works? • Is there provision for limiting the use of water from the main water supply networks to the most essential users? • Is a mechanism or plan in place for prioritizing responses in the event of destruction in order to best target limited resources?	*If a water tank is hit and the roof damaged, we have no way of repairing it for months.*	*We can source temporary roof coverings and have them ready to attach if required.*	*Vodokanals*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
7.	Are plans in place to prepare for, and respond to, **loss of access and isolation** of **centralized** water treatment works and other infrastructure (such as storage tanks and pumps) due to bridges or roads being impassable or mined?	Inability to access the water infrastructure to operate it can lead to inadequate quantities of microbiologically safe and acceptable drinking-water, and thus to illness.	• Are backup plans in place to access sites if roads or bridges are lost or made impassable, or are not safe to access?	*One of our treatment plants requires at least daily attendance via just one road.*	*We can station operators at the empty apartment next door to the treatment plant.*	*Vodokanals*
8.	Are plans in place to prepare for, and respond to, **loss of decentralized water supply** systems as a result of strikes on wells, rainwater tanks and bores?	Loss of safe decentralized water sources due to physical damage or contamination events can lead to inadequate quantities of microbiologically safe and acceptable drinking-water and in turn to use of less safe alternative water sources, and thus to illness.	• Have local government authorities and community members planned where they will get their water from if their normal decentralized source is lost? • Have local partners and associated technical support been put on standby to respond to situations where the normal decentralized source is lost? • Have specific contingency plans been prepared to help respond to the failure of decentralized water supply systems (e.g. boreholes, wells and rainwater tanks)? • Have these contingency plans included necessary materials and equipment for capture, treatment and transport (if necessary) of water to consumers? • Has critical decentralized infrastructure been identified and prioritized (e.g. hospitals, schools and shelters)?	*There hasn't been community engagement on this problem.*	*Community members can be connected to share decentralized resources to help provide for one another if some sources are lost.*	*Local authorities*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
9.	Are plans in place to prepare for, and respond to, a **loss of electrical power** supply to **decentralized** systems (e.g. dug wells and boreholes)?	Power is often required for abstraction of water from certain decentralized systems (e.g. dug wells and boreholes serving households or community institutions), and may also be needed for bulk storage (e.g. filling overhead tanks) as well as for point-of-use water treatment and disinfection (where applied). In many such systems, a lack of bulk storage capacity means that power outages can result in immediate loss of water supply (e.g. in the case of private boreholes with electric pumping). Thus, loss of power can lead to microbiologically unsafe drinking-water, or result in inadequate quantities of water for domestic needs (e.g. hydration and hygiene), and can cause illness.	• What actions are undertaken in anticipation of possible power failure, such as keeping bulk water storage as full as possible (where present)? • What are the backup power supply options, such as batteries or generators; what is their capacity; and is this sufficient to meet critical power needs? • How long can the system operate without power based on available fuel supplies and/or system bulk storage? • How sufficient is the generator fuel supply (including available funds, supply route/chain and safety/security of storage)? • Have alternative pumping/distribution means been considered in the event of power outages (e.g. solar powered pumps or reconfiguring systems to run off gravity if possible)? • What capacity is there for those managing the decentralized supply to manage backup power supplies (e.g. generator routine maintenance and testing)?	*No assessment has yet been conducted, but it is expected that many households do not have generators, or have ageing generators that are unreliable or have too small a capacity to run the system for long periods.* *Many households do not have the financial means to purchase, repair or upgrade existing generators.*	*We need to assess in more detail the number of households and community institutions that require support with the provision of adequate backup power supplies.* *We need to explore the potential of solar pumps to help resolve these issues, and a just financing mechanism for those who need them to acquire them.*	*Local authorities*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Events						
10.	Are there means in place to monitor and ensure the supply of **safe drinking-water during an event**?	Microbiological and other forms of contamination of water can pose a threat to public health. Prevention of contamination is dependent on being able to monitor and control the system.	• Is there access to secure and reliable remote telemetry for monitoring and control of water treatment processes? • Is there access to basic field testing kits for monitoring critical treatment processes (e.g. pH of coagulant-dosed water, filtered water turbidity, treated water free chlorine residual and pH)? • Is it possible to undertake visual and manual operational checks (e.g. to check floc formation, filter height, filter bed distribution following backwash, pressure and flow rates, and perform visual checks on treated water storage covers)? • Is it possible to survey key water distribution assets, such as above ground storage tanks, underground storage tanks and buried transmission lines for signs of damage?	*We have a manual operational monitoring plan for the plant that we used to use before we got SCADA, but we have lost the skills.*	*We can update the manual operating manuals and practise operating in manual mode to allow supply to continue if we lose SCADA.*	*Vodokanals*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
11.	For **centralized** systems, are **source water contamination event preparation and response plans** in place in the event of fire, explosion, construction debris, landslips, dam bursts, floods, sewage, industrial or agricultural wastewater overflows or leakage from oil and gas stations, and other contamination events?	Source water contamination can make water microbiologically unsafe or even deadly, particularly as many contaminants cannot be removed by treatment. Chemical contamination can affect the taste/odour and acceptability of the water, but in many cases short-term exposure through drinking-water is not likely to lead to health impairment.	• Is an early warning system or any other communication mechanism in place to report on possible contamination due to damage to the sites in a timely manner? • Are a summary of potential contamination sources in the catchment area(s) and a plan to assess risk rapidly if contamination occurs in place? • Have arrangements been put in place to permit access and actions within sanitary and protective zones in cross-border territories? • Are response plans in place if contamination occurs that makes the water unsafe? • Have reporting lines been established with the relevant authorities and stakeholders (e.g. consumers) for notification of incidents leading to source water contamination and communication on health risks and preventing/protective measures? • Have systems been set up to undertake inspections of water sources in use to check for possible contamination following bomb damage or sabotage (e.g. major chemical spills or sewage overflows or leakage) in surface waters or groundwater recharge areas, and to identify potential pollution sources rapidly? • Is a credible water quality testing laboratory available that can provide rapid testing? • Are contingency plans in place to respond to findings of contamination, such as actions for disinfection of surface and underground water intakes and equipment – especially if there are unburied bodies of military and civilian personnel as well as natural burials at the sites, or to remove potential pollution sources (such as containers of toxic chemicals) from water sources, water catchments and recharge areas? • If water quality cannot be assured, are plans in place to distribute bottled water, or communications protocols to advise consumers to boil or treat water used for drinking or food preparation?	*We have not completed any recent catchment surveys to understand potential microbiological source risks.* *No cross-sectoral mechanism for event notification has been developed for key stakeholders and consumers.*	*We can map potential high-risk contaminants and be ready to respond if they spill into the water source.* *We will conduct cross-sectoral educational and training classes for those responsible for communication with the population.*	*Vodokanals*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
12.	For **centralized** systems, are **restoration and rescinding protocols** in place for areas that are being repopulated after being abandoned, covering recommissioning and restoring the treatment works, treated water storages, pipe networks and building plumbing?	Restoring safe water and communicating water safety to the community helps protect public health by reducing the time that people may use less safe alternative water sources.	• Are rapid assessment protocols in place to identify potential microbiological risks in repopulated areas that need to be mitigated? • Once microbiological risks have been assessed, are systems in place to identify chemical and radiological risks? • Are zone maps and flushing plans available to drive safe water through the system and flush out potentially contaminated water? • Are supplies and testing plans in place to check water quality after the flushing? • Are means in place to communicate with communities when it is safe to use water and what steps they need to take within their residences first (e.g. flushing internal plumbing for an appropriate velocity and duration, advice to boil water and so on)?	*We have no test kits for chlorine to enable us to confirm that we've completed water turnover.* *Well established interagency cooperation is lacking.*	*We need to source chlorine test kits: simple test strips will be sufficient to measure above 0.5 mg/litre, and then we can train people in their use with very simple guidance.* *We will develop a protocol for regulation of interagency cooperation.*	*Vodokanals*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
13.	For **decentralized** systems, are plans in place to prepare for, and respond to, **contamination** in the event of fires, explosives, building debris, landslips, sewage, industrial or agricultural wastewater overflows or leakage, oil from filling stations, and other contamination events?	Source water contamination can make water unsafe, particularly as many contaminants cannot be removed by onsite or point-of-use treatment devices.	• Is an early warning system or any other communication mechanism in place to report on possible contamination due to damage to the decentralized sites in a timely manner? • Do local government authorities have a summary of potential contamination sources in the area(s) in which decentralized water is used and a plan to assess risk rapidly if contamination occurs? • Do local government authorities have response plans if contamination occurs that makes the water unsafe? • What local partners are available to remedy such situations? • Have reporting lines been established to notify the community of incidents leading to source water contamination, and to provide updates on what steps are being taken and what their role is? • Are water testing services or advice available for the community to use, including on simple, rapid field tests? • Has clear guidance been provided on approved and suitable point-of-use water treatment devices and approaches, including boiling water? • Has clear guidance been provided on how to remediate contaminated water sources, or on experts that can be asked to provide such advice if required?	*We have not defined how we will communicate with the community if we believe the aquifer has become heavily contaminated.*	*We will identify suitable contact details and means of dissemination of messages to potentially affected communities.*	*Local authorities*

3.B Drinking-water supply services checklist contd.

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Supporting systems						
14.	Is a plan in place to prepare for, and respond to, a **loss of key personnel**, such as skilled operators?	Absence of skilled personnel can lead to inability to operate the water infrastructure appropriately to provide sufficient, acceptable, safe drinking-water, and thus result in illness.	• Are lists of key personnel and their functions and skills available? • Are practical training programmes in place to increase the availability of skilled operators and other key personnel – particularly on critical functions (e.g. filter backwashing, effective chlorination and mains repair)? • Can staff be transferred from neighbouring vodokanal systems if the need arises? • Could staff be relocated and based onsite at, or very close to, key locations to support continuity of service? • Are staffing needs systematically determined using a staffing schedule?	*We are extremely short of personnel with skills in water and sanitation operations.*	*We will provide training and clear safe work instructions for additional personnel, including bringing back recently retired personnel, along with motivational staff encouragement, and reservation of critical personnel from mobilization.*	*Vodokanals and local authorities*
15.	If the **laboratory is inoperable,** are means of undertaking water quality surveillance available?	Providing water quality assessment, quality assurance and surveillance can help demonstrate drinking-water safety and detect contamination.	• Have chlorine testing kits or test strips been procured and placed at points of need? • Are field test kits and sufficient consumables readily available at points of need to test water for faecal indicators and priority chemicals? • Have staff been trained to use field testing equipment and interpret results? • Do laboratories have backup power supplies in place for testing protocols that require electricity? • Have laboratories that are available for water testing been identified and contacted to be on standby?	*We cannot currently source and afford the reagents and equipment to conduct accurate chlorine field tests.*	*We can source acceptable test strips that are better than nothing and give us a reasonable indication of chlorine levels above 0.5 mg/litre.*	*Vodokanals and local authorities*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
16.	Have **credible international standards and guidelines** been identified that would permit solutions that include chemicals, materials, reagents, treatment systems, tests, procedures and similar to be used to fill gaps in those available within the country?	Delays arising from seeking Ukrainian authority approvals to use materials, chemicals or procedures, or to interpret results, may lead to delays or postponing urgent actions that could in turn prolong unsafe water supply scenarios.	• Have international standards or guidelines been defined that are considered acceptable in situations where there are no suitable Ukrainian versions? • Has a hierarchy of standards or guidelines been defined to help select the most suitable solutions for Ukrainian use rapidly?	*The acceptable Ukrainian water quality testing method for Escherichia coli that is normally used could not be undertaken due to laboratory capacity limitations and an alternative needed to be found quickly.*	*We will identify and use a simple method for testing E. coli in water that is widely accredited in other credible jurisdictions and that can be applied in the current context.*	*Vodokanals*
Alternative water supplies						
17.	If the **normal water supply becomes contaminated**, do stakeholders and the community have preparations and contingencies in place to enable point-of-use water treatment and safe storage and handling of drinking-water?	The community (including critical settings such as health-care facilities and schools) needs to have ways to make water microbiologically safe to prevent illness if their normal water source is still available but may be contaminated with substances that are hazardous to health.	• Have materials for point-of-use water treatment options (such as water disinfection tablets or household filters) been stockpiled or provided to the community and critical settings, along with clear directions and behaviour support for their correct and consistent use? • Is material available on safe ways to store and handle water in the household and in critical settings, including use of dedicated water storage containers that are covered and regularly cleaned, and shelf-life? • Has a system been established to monitor use of household water treatment and safe handling and storage practices?	*We have been suggesting boiling water, but if there is power failure we have no other advice or material.*	*We will source (and/or ask WASH Cluster partners for) point-of-use disinfection kits and advice on their use.* *We will advise on solar disinfection according to WHO protocols.*	*Vodokanals and local authorities*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
18.	Are alternative community-scale supply options available in case of **total loss of the water supply** that is used under normal conditions?	The community needs to have access to adequate quantities of microbiologically safe and acceptable quality water even if their normal water supply is lost, otherwise illness can arise.	• Have alternative local-scale or individual-scale water source options been mapped and communicated to the local population? • Have means of treatment of alternative water sources been made ready and put on standby? • Have alternative means of distribution of water (such as use of approved water tankers or temporary water distribution points) been devised and made ready? • Has consideration been given to how easily and safely such sources can be accessed (e.g. considering conflict-related dangers and similar)? • Has guidance been prepared on minimum water quantity requirements for health protection (e.g. hydration and hygiene)? • Has consideration been given to how to ensure continued supply to critical settings such as health-care facilities and food production, among others? • Has consideration been given to vulnerable groups, such as frail, elderly or disabled people, and whether they would have difficulty getting to alternative water sources? • Does the community have equipment (rapid tests) for monitoring free chlorine residual in drinking-water? • Does the community have equipment for rapid detection of microbial contamination of drinking-water? • Has a procedure been developed for monitoring and reporting the quality of drinking-water provided through these alternative water supply options?	*We have identified alternative groundwater sources, but we haven't organized pumps or drilled wells.* *There are many wells in the area, but we have given no guidance on which are safe to use or what treatment is needed to make them safe.* *We have no means to deliver bulk water quantities in emergencies.*	*We will arrange drilling of backup wells and source pumps.* *We will provide guidance on which wells are safe to use and what treatment is required to make others safe.* *We will procure dedicated water tanks and tankers for alternative water supply during supply outages.*	*Vodokanals and local authorities*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Communication						
19.	Are materials, messages and systems for **communication with the local population** in place?	Critical users (e.g. health-care facilities, aged-care/childcare facilities) and the broader community need to receive timely and effective information in a way that is accessible to all users, including disadvantaged and vulnerable people (e.g. users on home dialysis). Information should include whether the water is microbiologically safe to drink, and advice on where to find alternative sources and on how to make it microbiologically safe, to prevent illness.	• Is critical advisory guidance for the local population prepared, including advice on boiling water, water avoidance advisories, information on the location of alternative water sources, and advice for household water treatment and safe handling and storage? • Which options for communicating with the local population are available, such as short messaging service (text message), radio, newspaper, internet, public notices, social media, public loudspeaker announcements, communications through schools and direct visits (e.g. to elderly people)? • Can this information be accessed by all members of the community (e.g. community members who are vulnerable, disadvantaged, less literate, visual or hearing impaired, or who lack access to phone or internet)? • Have emergency lines/direct communication channels been established for critical users (e.g. institutions with vulnerable people)? • Is there a clear mutual understanding and agreement between local actors and authorities about who communicates what and when (e.g. different branches of government, their structural divisions and other institutions involved in the response, between executive authorities and so on)? • Has this messaging and communication considered vulnerable groups, such as frail, elderly and disabled people, and whether they would have difficulty getting to alternative water sources? • Has the effectiveness of communication been assessed, and the feedback used to improve communication in the future?	*We do not have clear guidance on how to treat water to make it microbiologically safe if it cannot be boiled.*	*We will develop guidance on treating water with chlorine tablets.*	*Vodokanals and local authorities*

No.	Question on drinking-water supply	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
20.	Is the community aware of the need to **conserve drinking-water** during times of conflict?	The community can help to conserve its microbiologically safe drinking-water, and thereby reduce the risk of running out, resulting in a requirement to use microbiologically unsafe water that may cause illness.	• Have water supplies been formally designated as critical facilities, with high priority for power supply reliability? • Have priority settings – such as hospitals and social/care institutions – been prioritized, and have contingency stocks of tanks for installation inside institutions been put in place? • Have measures been developed for centralized water storage, and are recommendations in place for the population on drinking-water storage in winter, including at sub-zero temperatures and in the absence of centralized heating? • Have recommendations been made to institutions and the general population, such as safe storage of water locally, promoting minimum use of water by the community to conserve it, minimizing the running of taps and using water-washed sanitation only when required, and considering promoting reusing and recycling some water where safe to do so – e.g. using water from washing of clothes or from kitchens for flushing of toilets or for irrigation uses? Is support in place if required to provide storage containers for targeted households to facilitate this? • Has use of alternative water been considered for purposes that may not require drawing from the drinking-water supply, such as irrigation, washing down surfaces or firefighting?	*We have been relying on water revenue, and so people are using water as they normally would, and we have not been encouraging water conservation.*	*We can restructure the water tariff arrangements to help support water conservation efforts by increasing the proportion of the water tariff coming from the connection rather than volume of water used.*	*Vodokanals and local authorities*

3.C Sewerage and sanitation services checklist

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Supplies						
1.	Are plans in place to prepare for, and respond to, a *temporary loss of electrical power* supply to **centralized** sanitary drainage systems for a few hours or days?	Maintaining wastewater treatment operation is essential to avoid the spread of infectious diseases. Maintaining pumping pressure is critical to remove sewage in water-washed systems. These systems depend on power.	• What actions are undertaken in anticipation of possible power failure, such as keeping sewer pump station wet wells at minimum levels, or reconfiguring the system to run off gravity where practicable? • What local actions are recommended to institutions and the general population, such as onsite sanitation and waste collection? • What are the backup power supply options, such as batteries or powerful generators; what is their capacity; and is this sufficient to meet critical power needs? • How long can the facility operate without power, based on available fuel supplies and/or system storage? • How sufficient is the generator fuel supply (including supply route/chain and safety/security of storage)? • What human resources are available to manage backup power supplies (including routine maintenance)? • What communication protocols are available with energy generators and distribution system suppliers? • Have sanitation services been formally identified as being high priority and critical facilities for power reliability?	*We have not thought through advice to the community if we lose power to the sewerage infrastructure.*	*We need to advise the community of alternative means of wastewater and sewage disposal during power failure events in areas that are not running entirely off gravity.*	*Power generators, power distributors and vodokanals*

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
2.	Are plans in place to prepare for, and respond to, a ***prolonged loss of electrical power*** supply to **centralized** sanitary drainage systems for a few weeks or months?	Long-term loss of power can lead to the problems described in question 1 for longer periods, and may permit new pandemics to arise by setting up new disease transmission cycles –leading, for example, to cholera and/or typhoid.	• If the power failure is prolonged, are there ways to set up alternative power transmission lines? • Are large-scale generators with fuel supplies available (and with sufficient capacity) to power treatment plants and pumps? • Are plug-in points in place to connect generators at all powered sites? • Is a plan in place for relaunching the power supply after restoration of wastewater treatment facilities that considers the effect on power supply stability? • Have alternative safe wastewater storage and management systems that do not rely on power been arranged (see question 14)?	*The system will currently discharge untreated sewage into a drinking-water source tributary if power is lost to one of the sewer pump stations, and the only power feed is an overhead line that is very vulnerable to attack.*	*We can put in place a second underground power feed to back up the overhead power feed.*	*Power generators, power distributors and vodokanals*
3.	Are emergency supply and alternative options in place in case of disruptions to the **supply chain** of materials for the **centralized** sanitary drainage system, such as pipes, parts and wastewater treatment plant components?	Maintaining wastewater containment is essential to prevent contamination of the environment and ensure safe disposal to avoid the spread of infectious diseases. Maintaining system connectivity is critical to removing wastewater.	• Has an inventory been collated of what parts and fittings are required to repair and replace any damaged infrastructure, and to maintain air supply and chemical dosing and cleaning? • Which parts and fittings are delivered only after failures occur and are not stored locally, thus being vulnerable to supply being cut off? • Who can be approached in an emergency if critical infrastructure parts are lacking? • What are financing options to pay for spare/ parts and repairs if funding is limited?	*We have not considered what parts and fittings may be vulnerable to attack and what may be required to be held on inventory.*	*We can complete a drive around to identify vulnerable points and consider what spares we need to have on inventory, placing them at strategic locations to enable rapid deployment.*	*Vodokanals*

3.C Sewerage and sanitation services checklist contd.

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
4.	Are emergency supply and alternative options in place in case of disruptions to the **supply chain** of chemicals for the **centralized** sanitary drainage system, including disinfectants?	Loss of chemicals can lead to failures in sewer operation and sewage treatment, and can lead to untreated wastewater and thus pathogens being discharged into the environment, which can become a source of infection.	• How much of each sewerage cleaning and treatment chemical is stored on site? • Which chemicals are delivered regularly and are not stored on site and are hence vulnerable to supply being cut off? • What is the shelf-life of the stored treatment chemicals, particularly disinfectants? • Is there established communication with suppliers to regularly review the situation in the supply chain? • Have multiple delivery routes been established that are appropriate for the typical delivery vehicle sizes anticipated? • Who can be approached in an emergency if we foreseeably no longer have enough chemicals available (e.g. alternative vendors or neighbouring vodokanals)? • What are financing options to pay for chemicals if funding is limited?	*Our carbon dioxide used to balance the pH in the secondary treatment process is supplied once per week, but deliveries are being slowed down due to backlogs.*	*We can change to a different, local source of carbon dioxide for our treatment plant from a nearby chemical production facility.*	*Vodokanals*

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Infrastructure						
5.	Are plans in place to prepare for, and respond to, extensive damage to major **centralized sanitary drainage system infrastructure**, such as treatment plants or sewerage pipelines and pumps?	Loss of operation to remove and safely dispose of wastewater away from areas where people reside can lead to the spread of infectious diseases.	• Is an updated asset register available, including an inventory of all key assets? • Does the asset register include information on the current performance of these assets (or proxies such as condition, age and usage) to be able to determine the nature (i.e. failure mode) and timing of possible failure (i.e. remaining functional life)? • Have downstream vodokanals, receiving environments and areas that need protecting from wastewater been identified? • Have stocks of materials, parts, fittings and chemicals been built up to allow for increased rates of damage during attacks? • Are the materials, parts, fittings and chemicals stored in multiple locations in case one is damaged or destroyed? • Will rapid inspection take place following attacks to assess damage to critical infrastructure? • Are manual backup systems in place and operable in case of loss of SCADA systems (if present)? • What human resources and equipment are available to carry out repair works?	*If a sewerage pipe near a raw water supply reservoir is hit and damaged, we have no way of repairing it rapidly and stopping it leaking into the drinking-water source, as we do not have spare parts stored locally.*	*We can obtain spare parts to repair damaged sewerage pipes and store them locally to enable rapid repair of sewerage pipes.*	*Vodokanals*

3.C Sewerage and sanitation services checklist contd.

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
6.	Are preparedness and response plans for **isolation** of the **centralized** sanitary drainage system and other infrastructure facilities (for example, storage tanks and pumps, sewage pumping stations and biological sewage treatment facilities) in case of impassability or mining bridges and roads?	Inability to access and operate systems to remove and safely dispose of wastewater can lead to the spread of infectious diseases.	• Where reasonably practicable to implement, are backup plans to access sites in place, in case roads or bridges are lost, made impassable or not safe to access?	*Our sewer wet wells regularly require manual cleansing to remove rags and blockages, and require at least weekly attendance at several problem locations.*	*We can source macerators to remove the need to attend some sites in person.*	*Vodokanals*
7.	For **decentralized** (local) systems (for example, hospitals, radiological departments, industrial premises and so on), are plans in place to prepare and respond to **pipeline failures, leakages or overflows**?	Overflows and leaks of wastewater in areas where the community resides, or where the sewage might otherwise cause contamination that can in turn exposure the community, can lead to the spread of infectious diseases.	• Have receiving environments and areas that need protecting from wastewater been identified? • Do local government authorities have response plans if overflows and leaks occur? • Have local government authorities established reporting lines with the community for the notification of incidents leading to wastewater leaks and overflows? • What local partners are available to remedy such situations?	*Decentralized systems are not mapped, and contact details are not available for residents.*	*We will identify priority areas and make contact with residents to map and assess decentralized sewage wastewater management systems.*	*Local authorities*

Checklists for strengthening water, sanitation and hygiene emergency preparedness and response

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Events						
8.	For **centralized** sanitary drainage systems, are **contamination event preparation and response plans** in place in the event of wastewater overflows or leakage that may affect local community?	Wastewater overflows or leakage can release pathogenic microorganisms onto land, into the aquifer and soil, and on areas that people may come into contact, which can result in illness.	• Does the community have advice about identifying and calling in leaking or overflowing sewerage infrastructure? • Does the community have advice about avoiding areas that are contaminated by leaking or overflowing sewage? • What local partners are available to remedy such situations?	*We do not have a system for responding to leaking sewerage systems noticed by the community.*	*We will set up a system and community education campaign to help identify leaking sewers to enable them to be fixed.*	*Vodokanals*
9.	For **centralized** sanitary drainage systems, are **contamination event preparation and response plans** in place in the event of wastewater overflows or leakage that may affect downstream users of water?	Wastewater overflows or leakage can release pathogenic microorganisms into drinking-water sources, recreational water and water used for irrigating food and livestock production, which can result in illness.	• Is a list available of the people at most risk (such as aquaculture, food production, recreation and drinking-water users), and is a plan available to assess risk rapidly and notify those people if contamination occurs? • What local partners are available to remedy such situations? • Are communication protocols in place to inform downstream stakeholders about possible wastewater contamination events?	*We know the locations of public drinking-water sources, but not private drinking-water sources, aquaculture, recreation or food irrigation users.*	*We can identify sensitive users and develop contingency plans with them in case of sewage contamination and resulting infection.*	*Vodokanals*

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
10.	For **centralized** sanitary drainage systems that rely on water-washed sanitation, are **preparation and response plans** in place in the event of loss of water resulting in lack of water for flow and blockage of sewer or poor quality of sewage?	Loss of hydraulic flows to remove and safely dispose of wastewater can lead to the spread of infectious diseases.	• Are estimates of the minimum flows required to keep the centralized water-washed sewerage system and wastewater treatment functional available? • Are regular assessments made of needs for modification of the sewerage system to operate with reduced water flows? If so, have costed modification plans been developed, and are the needs reflected in the municipal and/or national budget programmes? • Are backup plans in place if the sewer is blocked, such as methods to unblock the sewer?	*We do not have any understanding of how the sewerage system will behave or where blockages may occur, as we have not faced a loss of hydraulic flow before.*	*We can conduct some simple modelling and use sewer operator experience to identify potential choke points in the sewer, and to develop plans to unblock those at regular intervals if water flows drop too low for normal operation.*	*Vodokanals*
11.	For **industrial connections** that require wastewater pretreatment prior to discharge to **centralized** sanitary drainage systems, is a preparation and response plan in place (including notification protocols) in the event of pretreatment failure?	Failure to pretreat particular effluents prior to discharge to centralized sanitary drainage systems can lead to failures in sewer operation and sewage treatment, which can lead to untreated wastewater (and thus pathogens/chemicals) being discharged into the environment, which can become a source of illness.	• Is a documented list available of industrial connections that are known to require pretreatment, including the nature/volume of the wastewater being pretreated and the pretreatment processes that are in place? • Is a plan in place for what to do in the event of a loss of pretreatment (e.g. onsite holding tanks for the industrial wastewater)? • Are any early warning systems in place to monitor occurrence of a pretreatment failure (e.g. onsite at the industrial premises, or within the sewerage network)? • What notification/communication protocols are in place between the industrial connection and the sewerage system operators in the event of a known pretreatment failure? • What measures are in place at the sewage treatment plant to minimize the impact of shock loads arising from pretreatment failures (e.g. storage tanks and diversions)?	*We have a list of industrial connections that have onsite pretreatment in place for their wastewater effluent, but it is not up to date.* *We have no notification protocols in place in the event of pretreatment failure.*	*We will conduct a gap assessment of our industrial connection list and ensure that it is updated.* *We will develop a notification protocol, ensure that emergency contact details are provided, and conduct regular training on this.*	*Vodokanals*

3.C Sewerage and sanitation services checklist contd.

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Supporting systems						
12.	Is a plan in place to prepare for, and respond to, a **loss of key personnel** such as skilled operators?	Absence of skilled personnel can lead to inability to operate the wastewater infrastructure appropriately, and thus to unsafe discharge.	• Are lists of key personnel and their functions and skills available? • Are practical training programmes in place to increase the availability of skilled operators and other critical personnel? • Could staff be relocated and based onsite at, or very close to, key locations to support continuity of service? • Can staff be transferred from neighbouring vodokanal systems if the need arises?	*We are extremely short of personnel with skills in water and sanitation operations.*	*We will provide training and clear safe work instructions for additional personnel, including bringing back recently retired personnel.*	*Vodokanals and local authorities*
13.	Do you have means of **finding wastewater leakages**?	Leaking sewage can spread diseases. Locating and repairing points where wastewater is being discharged and polluting land and water can help to prevent transmission of diseases.	• Have methods for finding leaking septic and sewerage systems been deployed to locate leaks rapidly after strikes?	*We cannot currently find sewer leaks.*	*We can use fluorescein tracer dye to help find sewer leaks.*	*Vodokanals and local authorities*

3.C Sewerage and sanitation services checklist contd.

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Alternative wastewater services						
14.	Are alternative service options available at the level of the entire community in the event of a complete **loss of centralized** sanitary drainage systems?	Loss of sanitation can lead to microorganisms in faecal waste and food waste being disseminated. This may promote disease transmission.	• Are sufficient portable toilets, and associated handwashing facilities, ready to be mobilized to key locations if sanitation services are lost? • Are decentralized backup toilets with handwashing facilities available at critical facilities housing vulnerable populations, such as hospitals, homes for elderly people and shelters? • Have options for setting up temporary areas for safe disposal of excreta and hazardous waste been set up and communicated to the community, such as dry, mobile toilets or areas away from water sources? • Have alternative local excreta and hazardous waste disposal options been mapped and communicated?	*We have not designated suitable locations to store or dispose of sanitary waste safely.*	*We will locate suitable sanitary waste disposal locations.*	*Vodokanals and local authorities*
15.	Are preparations and contingencies in place for stakeholders and the community to enable **household-level** excreta and hazardous solid and liquid waste disposal in local areas in case of total loss of **centralized** water-washed sewerage systems and inability to set up community-scale options?	The community needs to be able to dispose of excreta and hazardous waste safely to avoid disease dissemination.	• Do people have advisory guidance along with the means (e.g. personal protective equipment and training) to help collect and dispose of excreta safely? • Are local government authorities prepared for designating areas for household products, hazardous solid and liquid waste, and excreta disposal and treatment, considering alternatives in local areas? • Have vehicles been dedicated to collecting excreta and hazardous solid and liquid waste, and has the community been advised on how to use those services?	*We have provided temporary toilets and advice on their use but not advice on where to dispose of the waste once they are full.*	*We will arrange collection services for waste from household-scale sanitation activities.*	*Vodokanals and local authorities*

3.C Sewerage and sanitation services checklist contd.

No.	Questions on sanitation services	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
16.	Are contingency plans in place to dispose of excreta and hazardous solid and liquid waste safely if **decentralized systems can no longer be maintained and serviced** due to loss of waste collection, power or servicing support?	The community needs to be able to dispose of excreta and hazardous solid and liquid waste safely to avoid disease dissemination.	• Has the importance of safe disposal of excreta and hazardous liquid and solid waste been clearly communicated? • Have alternative local-scale or individual-scale solid and liquid waste disposal options been devised and communicated to the local population? • If areas for disposal are not defined, are routes for the removal of waste defined? • Are local government authorities prepared for designating areas for excreta and hazardous solid and liquid waste disposal in local areas?	*Composting toilets and collection systems are not available in communities using decentralized systems that depend on powered treatment and regular maintenance and waste removal services that are no longer reliable.*	*We can source dry composting toilets and make them ready to be used if required.*	*Local authorities*
Communication						
17	Are materials, messages and systems for **communication with the local population** in place?	The community needs to receive timely and effective information on whether wastewater and hazardous solid and liquid waste management systems are functioning, what to do if they are not, and how they can play a role in keeping the systems functional. This will support safe disposal of excreta and hazardous solid and liquid waste to avoid disease dissemination.	• Is critical advisory guidance for the local population prepared, including advice on avoiding blocking pipes and pumps with rags and other debris, on reducing flows to water-washed sewers, and on hygienic use of alternative systems such as composting systems or designated defecation areas? • Which options for communicating with the local population are available (such as short messaging service (text message), radio, newspaper, internet, public notices, social media, public loudspeaker announcements, displays at apartment buildings and direct visits)? • Is there a clear mutual understanding and agreement between local actors and authorities about who communicates what and when? • Has the effectiveness of communication been assessed, and the feedback used to improve communication in the future?	*We do not yet know what we might want to communicate or when, and we have not developed communication materials for communities, taking into account possible critical situations.*	*We will work through what might need communicating, and devise means for its communication.*	*Vodokanals and local authorities*

3.D Hygiene checklist

Note that hygiene interventions depend on availability of water in sufficient quantity and quality. In addition, hand and other hygiene washing stations may require a connection to sanitary drainage systems. Therefore, hygiene needs should also be considered when completing checklists 3.B (drinking-water supply services) and 3.C (sewerage and sanitation services).

No.	Questions on hygiene	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Supplies						
1.	Are alternative **handwashing guidance and materials** in place in case water is not available?	Good hand hygiene is essential to prevent the spread of many infectious diseases.	• Are materials available for hand hygiene that do not require access to water and soap, such as alcohol-based hand rubs/ cleansers or sanitizer? • Are recommendations in place for minimum standards for hand hygiene-related supplies?	*We have no supplies of hand sanitizer in stock.*	*We will provide guidance on minimizing the potential for transfer of microorganisms on hands, such as avoiding handling food with unwashed hands.*	*Ministry of Health*
2.	Are alternative **menstrual hygiene guidance and materials** in place in case water and materials are not available?	Good menstrual health and hygiene is essential to prevent reproductive and urinary tract infections and mental health issues from social stigma.	• Are safe alternative materials for menstrual health and hygiene available if the locally preferred materials are not accessible?	*We cannot buy menstrual pads any more.*	*We will provide guidance on safe alternative materials to manage menstruation.*	*Ministry of Health*

3.D Hygiene checklist contd.

No.	Questions on hygiene	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
3.	Does the community have **availability of a reserve of sufficient** soap, menstrual hygiene products, toilet paper, nappies, cleansers, sanitizers, wipes and other hygiene products for personal, hand, menstrual and food hygiene activities?	Maintaining supplies that support adequate hygiene activities is important to prevent the spread of infectious disease and to maintain dignity.	• Has a systematic analysis been carried out of the required minimum materials and needs to ensure and maintain hygienic living? • Has a systematic analysis been carried out of the accessibility and availability of hygiene materials for the population? • What supply chains are available to replenish stocks in the community? • Are recommendations in place for a minimum personal hygiene kit for various contexts, such as health-care facilities, childcare facilities, food preparation facilities, schools, farms and households?	*The analysis found that there was a major shortage of household cleansing disinfectant chemicals due to the diversion of chemical manufacturing to munitions production.* *Safe and dignified access to menstrual hygiene materials for women and girls is not available due to displacement.*	*Household cleansing disinfectant chemicals need to be ordered urgently from other parts of the country (or international sources), as local production is not available in our region.* *A dedicated response strategy needs to be developed to enable safe and dignified access to appropriate menstrual hygiene materials for women and girls.*	*National government* *Ministry of Health*
4.	Is special attention given to the hygiene situation and needs of the most vulnerable groups?	Meeting the hygiene needs of vulnerable groups is essential to protect their health, prevent disease, and promote dignity and inclusion in society (e.g. good incontinence care is essential to prevent skin infections and urinary tract infections and mental health issues from social stigma).	• Are the specific hygiene challenges for vulnerable groups in the community understood? • Are adequate resources and support systems in place to meet these hygiene need? • Are vulnerable groups considered in the planning of hygiene supplies?	*We cannot buy new incontinence supplies, or care for people living with incontinence in a hygienic and dignified way.*	*We will provide guidance on safe alternative materials to manage incontinence.*	*Ministry of Health*

3.D Hygiene checklist contd.

No.	Questions on hygiene	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Infrastructure						
5.	Are provisions in place for alternative or communal hygiene facilities if dedicated domestic infrastructure (such as sinks with running water in kitchens or bathrooms) becomes unavailable (e.g. due to damage from an attack or the need to leave usual habitations for temporary shelters)?	Good hygiene (hand, personal, menstrual, food and household) is essential to prevent the spread of many infectious diseases, and is ideally enabled through the provision of dedicated infrastructure.	• Is guidance in place for the affected population on how to access safe alternative hygiene facilities (e.g. for handwashing, washing/drying reusable hygiene materials such as nappies and menstrual pads)? • Is guidance in place for responsible authorities on how to construct temporary infrastructure where required (e.g. handwashing stations)? • Is guidance in place for the affected population on how to practise hygiene safely where dedicated infrastructure is lost? • Is guidance in place for the affected population on how to use existing hygiene infrastructure in a safe, socially acceptable and dignified way?	*People are staying in a temporary shelter that does not have sufficient wash stations with running water.* *People do not have access to their usual washing machines any more as they have had to leave their homes.* *The usual waste management services are not available any more, and people need to dispose of used menstrual pads, nappies and so on safely.* *People do not have access to a kitchen any more, and prepare food without cooking utensils and a sink.*	*We will provide technical guidance and materials for temporary infrastructure, such as handwashing stations and food preparation/ cooking stations, which are appropriate for various settings (such as households and temporary shelters).* *We will provide additional waste bags for the sanitary disposal of used hygiene materials.*	*Ministry of Health and local authorities*

No.	Questions on hygiene	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Communication						
6.	Are materials, messages and systems for **communication with the local population** in place to promote appropriate hygiene behaviours?	Good personal, hand, menstrual, household and food hygiene are essential to prevent the spread of many infectious diseases.	• Are promotional messages in place that encourage diligent and regular hand hygiene practices with water and soap (if available)? • Do the public messages contain the indication that for hygiene purposes water may be used that is of sufficient quality, but which may be of lower quality than that required for drinking? • Are appropriate and accessible promotional messages in place that encourage diligent food and household hygiene practices to help educate the community, including most vulnerable groups, and to encourage good behaviours? • Is guidance and advice readily available on the use of alternative cleansers? • In areas that are being repopulated after being abandoned due to military activity, are public notices prepared warning of contact with debris, solid waste, dead animals and sewage spills, among others? • Are targeted promotional messages in place that encourage the use of safe alternatives for hygiene materials in case access to existing materials is disrupted (e.g. menstrual pads, nappies and incontinence materials)? • Has the effectiveness of communication been assessed, and the feedback used to improve communication in the future?	*There is a complacent attitude among many community members to hand hygiene.* *Women and girls are not sure where to get menstrual pads any more, and are relying on unsafe alternatives.*	*We will set up an active education campaign, using United Nations standard materials, to promote healthy habits.*	*Ministry of Health*

3.D Hygiene checklist contd.

No.	Questions on hygiene	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
Health-care facilities						
7.	Have health-care facilities been prioritized and targeted for education, awareness and provision of essential hygiene systems and resources?	Health-care facilities often house the most vulnerable members of the community, and can be locations that can spread disease readily if hygiene is of a poor standard; they therefore need special consideration.	• Are the locations and status of health-care facilities known? • Do health-care facilities have hygiene management plans and needs assessments? • Are promotional messages in place that encourage good hygiene practices in health-care facilities? • Are sufficient systems and resources in place to maintain high standards of hygiene and health-care facilities?	*The most vulnerable groups and their location at health-care facilities has not been mapped.*	*We will contact health-care facilities to understand where the most vulnerable residents and patients are housed to enable targeting of systems and resources to be prioritized.*	*Ministry of Health and health-care facility managers*

3.E Checklist for other considerations

No.	Question on other WASH aspects	Relevance to health	Key considerations	Identified gaps *(example response)*	Actions *(example response)*	Stakeholders *(example response)*
1.	Have the special needs of remote, rural and decentralized contexts been adequately considered?	Remote, isolated and rural locations are typically less vulnerable to direct impacts of conflicts, but are also less accessible by supporting services, such as health-care and alternative WASH services. This can leave people in such locations particularly vulnerable if WASH services become compromised.	• Decentralized systems are often less vulnerable to the impacts of conflict, but are there situations that need special consideration, such as power outages, and/or decentralized WASH services supporting health-care facilities? • Are supply chains and logistics vulnerable (which may include supply chains relating to emptying septic systems, supplying personal hygiene products and householder water treatment products) even if local residences are not being targeted?	*No coordination is in place to support isolated communities that will not have ready access to their usual household water treatment consumables.*	*We will place stocks of household water treatment consumables at strategic locations and maintain communications systems to keep supply chains in reliable operation.*	*Local government authorities*
2.	Have WASH services at critical nodes such as ports and transport hubs, and the protection of such hubs to ensure WASH supply chains, been considered?	A breakdown in transport hubs will have effects that prevent delivery of WASH services, since materials and chemicals will become unavailable.	• Have transport hubs been supported by reliable WASH services? • Have supply chains been secured through transport hubs for critical materials, chemicals and human resources, including for emergency deliveries?	*Recent orders of generators were held for prolonged periods at a transport hub as they were not prioritized for delivery.*	*We will put arrangements in place with border authorities to transport WASH-related resources rapidly through transport hubs.*	*National government*
3.	Have research organizations been mobilized to support WASH preparedness and response?	Research organizations can access expertise and analytical facilities that enable them to provide important information.	• Have research organizations been testing water and wastewater, and communicating the results to identify areas of contamination? • Are researchers predicting risks and recommending methods to reduce risk?	*Some universities have the capacity to test for pathogens and toxins in water, wastewater and solids, but we are not using their expertise at present.*	*We will mobilize universities to design and implement a programme to test for pathogens and toxins and make recommendations based on those results.*	*Research organizations*

3.F Improvement action plan template

The improvement actions identified through completion of checklists 3.A–3.E can be consolidated into an improvement action plan. A template is provided below for consideration, which can be adapted to the local context as needed.

No.	Improvement action	Reason for the action	Responsible party/parties	Source(s) of funding	Due date	Status
Example	*Protect vulnerable lengths of pipe and infrastructure by burying them or covering them with sandbags*	*Most of the infrastructure is underground, but a few vulnerable points are above ground and vulnerable to strikes*	*Vodokanal employees and local government staff to coordinate, with community members and volunteers to help deliver*	*Vodokanal operational budget, to be supplemented with financial assistance from oblast level*	*Within three months*	*In progress: vulnerable single points of failure identified, and approximately 20% of those points now protected*

Annex 1. Methodology for development of the checklists

This publication was prepared by the WHO European Centre for Environment and Health in Bonn, Germany, and associated agencies (see the Acknowledgements section). Its initial development involved a review of published literature, vodokanal reports, media reports and select case studies on WASH resilience in emergency and conflict contexts, through the lens of emergency preparedness and responsiveness. Case examples were developed from WASH professional and practitioner interviews to draw out and document local experiences of the challenges to providing WASH services during the war, and to share lessons learned on practical solutions to these challenges.

The development process was informed by a series of targeted multistakeholder consultations, meetings and focus group discussions. These engaged representatives of a number of stakeholders from various parts of Ukraine to form an overall understanding of gaps and needs in order to refine the checklists, supported by international agencies and advisers.

Development of the checklists was an iterative and collaborative process, and included the following steps.

◆ During September 2022, a first draft was prepared by experienced WASH sector professionals from WHO country and regional offices and headquarters, supported by Ukrainian and international WASH consultants.

◆ Independent feedback on the draft was provided by multiple parties.

◆ In-depth discussions were held via engagement of representatives from the Ukrainian Association of Vodokanals (intended to be a key stakeholder for application of the checklists) from three locations representing large (Kyiv), medium (Mykolaiv) and small (Chernomorsk, Odesa oblast) systems.

◆ Targeted interviews were held between September and December 2022 with international experts in emergency WASH response in country settings analogous to Ukraine.

◆ A stakeholder workshop was held in Kyiv on 4–6 April 2023, involving 67 delegates representing Ukrainian WASH and health sector professionals from Kyiv, Mykolaiv and Odesa oblasts.

◆ The publication was developed further in line with workshop feedback and additional expert and practitioner insights. It was finalized in 2024.

Annex 2. Additional resources

This annex lists a number of detailed technical external resources for further reference.[4] Note that this list is not considered to be exhaustive.

Resource specific to the Ukrainian context

Briefing note: water quality monitoring in emergencies for humanitarian partners in Ukraine. New York: Global WASH Cluster; 2022 (https://reliefweb.int/report/ukraine/briefing-note-water-quality-monitoring-emergencies-humanitarian-partners-ukraine-enuk).

This publication provides basic guidance for humanitarian partners involved in water supply, or who wish to learn about minimum water quality monitoring and control activities during the war in Ukraine. All humanitarian partners should refer to, and ensure compliance with, the Wartime Water Quality Standards (2022) proposed by the Ministry of Health. For those aspects not explicitly covered, partners should refer to the regular standards regulating potable water supplies: Про затвердження Державних санітарних норм та правил "Гігієнічні вимоги до води питної, призначеної для споживання людиною [Order of the Ministry of Health Protection of Ukraine dated 12 May 2010, no. 400, on approval of state sanitary norms and standards: hygienic requirements for drinking-water intended for human consumption (SanPiN 2.2.4-171-10) (updated 22 March 2023)]. Official Bulletin of the Verkhovna Rada of Ukraine. 2010;400 (in Ukrainian; this version is not currently available in English) (https://zakon.rada.gov.ua/laws/show/z0452-10#Text).

## Resources on drinking-water quality (including risk management and surveillance)
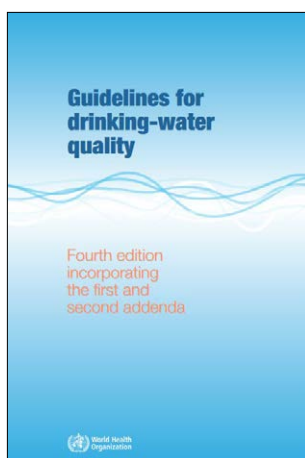
Guidelines for drinking-water quality: fourth edition incorporating the first and second addenda. Geneva: World Health Organization; 2022 (https://iris.who.int/handle/10665/352532).

The global reference on drinking-water safety and good practice, the guidelines include recommendations relevant to emergency contexts, including:

- short-term guidelines values for contaminants (including chemicals)
- minimum quantity requirements for hydration, hygiene and food preparation
- adequate disinfection requirements
- boil water requirements and notices

4   All references accessed on 18–19 November 2024.

- ◆ water avoidance requirements and notices
- ◆ effective point-of-use treatment and disinfection
- ◆ safe household collection, storage and handling practices
- ◆ acceptability of emergency water supplies
- ◆ alternative water supplies and availability of packaged water
- ◆ ensuring equitable access to emergency drinking-water supplies
- ◆ capacity to monitor water quality and take action during emergencies.
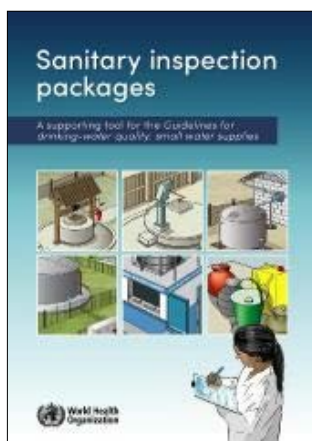
Sanitary inspection packages – a supporting tool for the *Guidelines for drinking-water quality: small water supplies.* Geneva: World Health Organization; 2024 (https://iris.who.int/handle/10665/375824).

These packages are designed to be used by field-based practitioners representing communities, water suppliers, health authorities, regulators and government representatives, as well as national and international organizations, to support sanitary inspection activities. They can support risk management and drinking-water quality surveillance. They can also support rapid assessment of basic water supplies in emergency contexts. The materials can be readily adapted to specific sites and situations (with editable versions provided). These include the following water supply technologies/scenarios:

- ◆ dug well with a hand pump
- ◆ dug well with a windlass
- ◆ spring
- ◆ tubewell with a hand pump
- ◆ borehole with a motorized pump
- ◆ rainwater collection and storage
- ◆ surface water source and intake
- ◆ piped distribution: storage tank
- ◆ piped distribution: network
- ◆ piped distribution: tapstand
- ◆ filling station and water cart
- ◆ kiosk
- ◆ household practices.
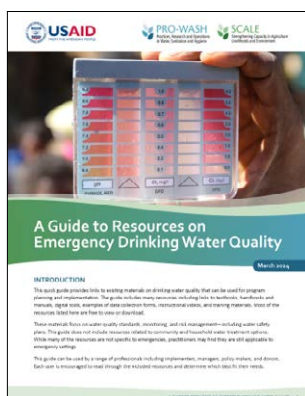
A guide to resources on emergency drinking water quality. London: Save the Children; 2024 (https://resourcecentre.savethechildren.net/document/a-guide-to-resources-on-emergency-drinking-water-quality/).

This quick guide provides links to existing materials on drinking-water quality that can be used for programme planning and implementation in emergency contexts. The guide includes many resources and provides links to textbooks, handbooks and manuals, digital tools, examples of data collection forms, instructional videos, and training materials.

These materials focus on water quality standards, risk management (including water safety plans) and monitoring that can be applied to emergency settings.
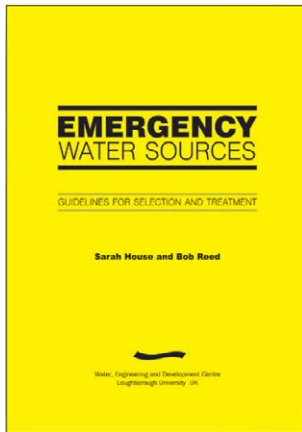
Emergency water sources. House S, Reed B. Loughborough: Water, Engineering and Development Centre; 1997 (https://wedc-knowledge.lboro.ac.uk/resources/books/Emergency_Water_Sources_-_Complete.pdf).

This resource supports assessment of emergency water sources to collect relevant information in a systematic way, in order that stakeholders can use this information to select a source or sources and to determine the appropriate level of treatment required to make the water suitable for drinking. The guidance is relevant to a broad range of emergency situations, including both natural disasters and those arising from conflict.

Resources on household-level water treatment
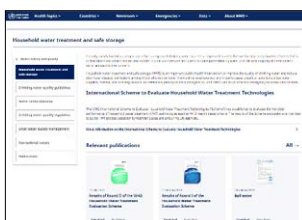
International scheme to evaluate household water treatment technologies [website]. World Health Organization; 2024 (https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/water-safety-and-quality/household-water-treatment-and-safe-storage).

This scheme evaluates the microbial performance of household water treatment against WHO health-based criteria, and includes technologies (such as filtration) and chemical disinfection. The purpose is to guide household water treatment product selection by national authorities and procuring United Nations agencies.
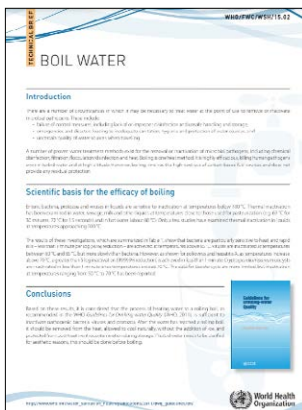
Boil water technical brief. Geneva: World Health Organization; 2015 (https://iris.who.int/handle/10665/155821).

This technical brief recommends bringing water to a rolling boil, but notes that longer boiling wastes resources and lowers acceptance in emergencies. Advice is also given on other water qualities that can be used for sanitation and hygiene purposes, and on natural cooling and safe storage.
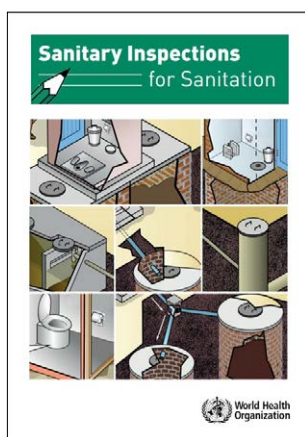
This resource is complemented by guidance on water-related disease surveillance (see below).

Resources on sanitation
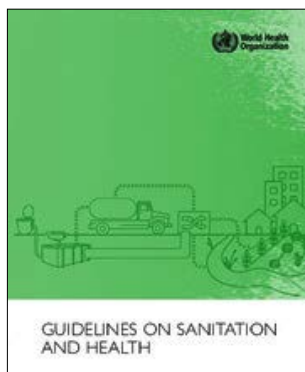
Guidelines on sanitation and health. Geneva: World Health Organization; 2018 (https://iris.who.int/handle/10665/274939).

These guidelines summarize the evidence on the links between sanitation and health, providing evidence-informed recommendations to maximize the health impact of sanitation interventions, including in emergency situations.

Sanitary inspections for sanitation [website]. World Health Organization; 2024 (https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/sanitation-safety/sanitation-inspection-packages).

Sanitary inspections are short, standardized observation checklists that can be adapted and used by stakeholders to assess risk factors at or near sanitation facilities, and identify appropriate actions to safeguard public health. They can also support rapid assessment of basic sanitation systems in emergency contexts. Packages are provided for the following sanitation systems:

- dry toilet with a single pit
- pour flush toilet with a single pit
- dry toilet with a double pit
- flush toilets with twin pits
- flush toilet to a septic tank and soakpit
- urine diversion dry toilet with cartridges or storage tanks
- flush toilet to sewerage system.
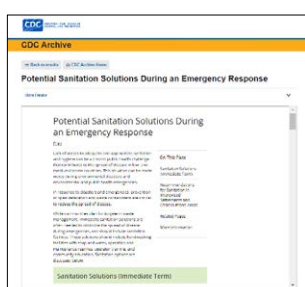
Potential sanitation solutions during an emergency response. Atlanta, GA: Centers for Disease Control and Prevention; 2021 (https://archive.cdc.gov/#/details?url=https://www. cdc.gov/healthywater/global/sanitation/sanitation-emergency-response.html).

While communities plan for long-term waste management, immediate sanitation solutions are often needed to minimize the spread of disease during emergencies. These solutions should include handwashing facilities with soap and water, operation and maintenance regimes, operator training, and community education. Corresponding sanitation options are presented in this reference guide.
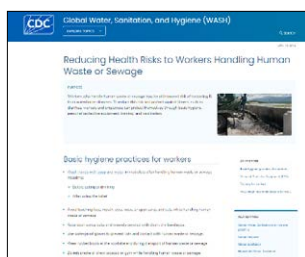
Reducing health risks to workers handling human waste or sewage [website]. Centers for Disease Control and Prevention; 2021 (https://www.cdc.gov/global-water-sanitation-hygiene/about/workers_handlingwaste.html).

This website provides basic guidance for workers who handle human waste or sewage to minimize the risk of becoming ill from waterborne diseases, including the use of basic hygiene, personal protective equipment, training and vaccination.
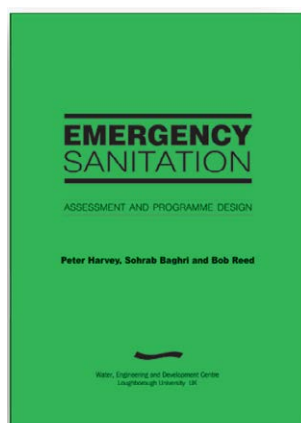
Emergency sanitation. Harvey P, Baghri S, Reed B. Loughborough: Water, Engineering and Development Centre; 2002 (https://repository.lboro.ac.uk/articles/book/Emergency_sanitation_assessment_and_programme_design/9585065).

This resource assists those involved in planning and implementing emergency sanitation programmes, and includes guidance on technical, sociocultural and institutional aspects of sanitation programmes. The guidance is relevant in emergency situations, including both natural and conflict-induced disasters, and links short-term emergency response to long-term sustainability.

Resources on hygiene
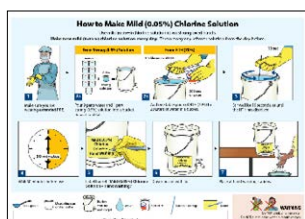
How to make a mild chlorine solution 0.05%. Atlanta, GA: Centers for Disease Control and Prevention; 2015 (https://stacks.cdc.gov/view/cdc/93640).

This simple poster describes how to make a simple mild chlorine solution of 0.05% for handwashing in health-care facilities and public locations.

Menstrual hygiene management (MHM) in emergencies toolkit: the full guide. London: International Rescue Committee; 2017 (https://www.rescue.org/resource/menstrual-hygiene-management-mhm-emergencies-toolkit).

This toolkit aims to improve the guidance available to humanitarian responders who need to incorporate menstrual hygiene management into their programming during emergencies. It is designed to support a range of humanitarian actors involved in planning and delivery of emergency responses. A mini guide version is available at: https://www.rescue.org/resource/toolkit-integrating-menstrual-hygiene-management-mhm-humanitarian-response-mini-guide.

Resource on water-related disease surveillance
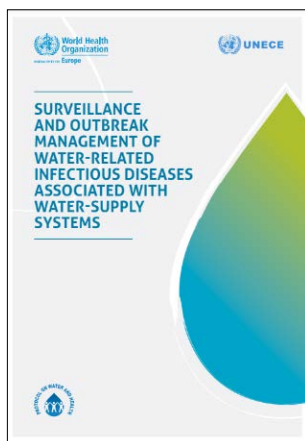
Surveillance and outbreak management of water-related infectious diseases associated with water-supply systems. Copenhagen: WHO Regional Office for Europe; 2019 (https://iris.who.int/handle/10665/329403).

This publication provides advice on how to set up, improve and maintain national systems for surveillance of water-related diseases, including contingency planning, steps in outbreak response and risk communication. It also includes a template boil water advisory notice for the public.
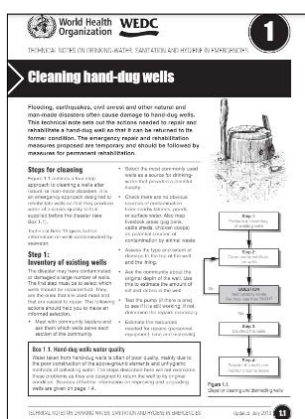
General resources on WASH in emergencies

The Sphere handbook: humanitarian charter and minimum standards in humanitarian response. Geneva: Sphere Association; 2018 (https://spherestandards.org/handbook/editions/).

These technical standards outline priorities to ensure response in four key life-saving sectors: WASH promotion; food security and nutrition; shelter and settlement; and health. The measurable minimum standards describe what needs to be achieved in a humanitarian response for people to survive and re-establish their lives and livelihoods and promote their dignity.

Also available in Ukrainian.

Technical notes on WASH in emergencies [website]. World Health Organization; 2013 (https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/environmental-health-in-emergencies/technical-notes-on-wash-in-emergencies).

These short, illustrated technical notes provide practical, evidence-based recommendations for responding to immediate and medium-term WASH needs of populations affected by emergencies. They are relevant to a wide range of emergency situations, including both natural and conflict-induced disasters. They are suitable for field technicians, engineers and hygiene promotors, as well as agency staff. The technical notes cover the following topics:[5]

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5   Unofficial translated versions in Ukrainian are available for selected technical notes upon request.

1. cleaning and disinfecting wells
2. cleaning and disinfecting borehole
3. cleaning and disinfecting water storage tanks and tankers
4. rehabilitating small-scale piped water distribution systems
5. emergency treatment of drinking-water at the point of use
6. rehabilitating water treatment works after an emergency
7. solid waste management in emergencies
8. disposal of dead bodies in emergency conditions
9. how much water is needed in emergencies
10. hygiene promotion in emergencies
11. measuring chlorine levels in water supplies
12. delivering safe water by tanker
13. planning for excreta disposal in emergencies
14. technical options for excreta disposal in emergencies
15. cleaning wells after seawater flooding.

Mobile-friendly versions of these technical notes, and others, can be found at: Mobile notes on WASH: the collection. Leicestershire: WEDC, Loughborough University; 2017 (https://wedc-knowledge.lboro. ac.uk/resources/e/mn/000-the-collection.pdf).

WASH in emergencies [website]. United Nations High Commissioner for Refugees; 2024 (https://emergency.unhcr.org/emergency-assistance/water-sanitation-and-hygiene/wash-emergencies).

This website highlights key principles underlying WASH in emergencies, interventions, indicators, and supporting resources. It supports access to minimum humanitarian standards for WASH at household and community levels, including institutions (such as schools, health-care facilities).
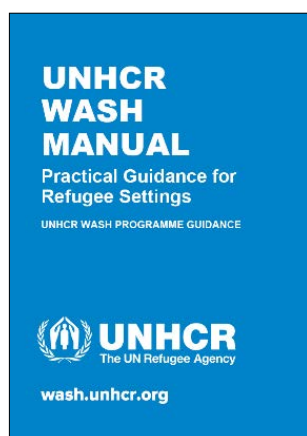
UNHCR WASH manual for refugee settings. Geneva: United Nations High Commissioner for Refugees; 2020 (https://emergency.unhcr.org/sites/default/files/UNHCR%20WASH%20Manual.pdf).

This manual provides practical guidance for provision of safe and adequate WASH in refugee settings. It is intended for use by WASH in emergencies actors, national governmental authorities, emergency response coordinating bodies, contingency planners, programme evaluators, and is a useful reference for any individuals or organizations involved in providing WASH services in refugee settings. The guidance is applicable for low-, middle- and high-income countries, emergencies and protracted situations. Its focus is on refugees, but in some contexts, its guidance may apply or be adapted to internally displaced and returnee settings.
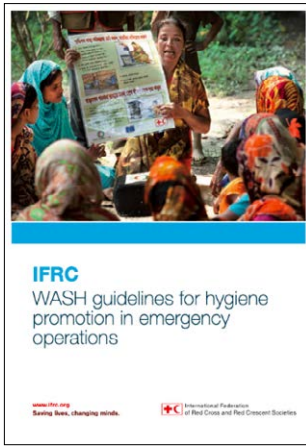
WASH guidelines for hygiene promotion in emergency operations. Geneva: International Federation of Red Cross and Red Crescent Societies; 2017 (https://communityengagementhub.org/resource/ifrc-wash-guidelines-for-hygiene-promotion-in-emergency-operations/)

These guidelines outline a step-by-step process to plan and implement effective, context-appropriate hygiene promotion in emergencies, starting with understanding the problem and target groups, the barriers and motivators for behaviour change by involving the community at all stages and ensuring the response is effective and appropriate to the needs.
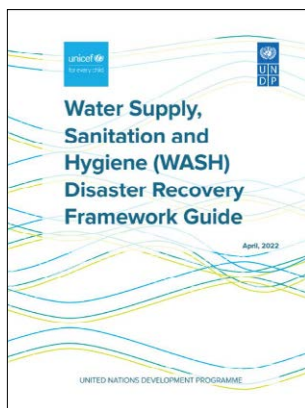
Water supply, sanitation and hygiene (WASH) disaster recovery framework guide. New York: United Nations Development Programme; 2022 (https://www.preventionweb.net/publication/water-supply-sanitation-and-hygiene-wash-disaster-recovery-framework-guide).

The Disaster Recovery Framework is a government-led and owned exercise that is conducted in association with the stakeholders relevant for the recovery of the country and affected sectors, including civil society, the private sector and international partners. The general guide provides an understanding of the main steps that each sector should take to develop a recovery framework that will be included in the overall Framework for the country. This is intended to assist government and nongovernmental stakeholders engaged in development of a framework to implement post-disaster recovery programmes for the WASH sector.

Annex 3. Stakeholders to involve in the WASH readiness checklist exercise in Ukraine

A number of authorities and institutions in the Ukrainian context contribute to WASH sector functions and services, and may play a role in the WASH readiness checklists exercise. Neither of the lists in the following tables should be considered exhaustive, and the appropriate stakeholders for the local context should be identified.

Table A3.1 provides examples of local and subnational stakeholders who should be considered for involvement in the exercise (the nature of which can be to varying degrees), divided into four key domains. It includes a brief summary of their responsibilities as they relate to WASH emergency preparedness and response.

Table A3.1. Local and subnational authorities and institutions in Ukraine and responsibilities in the context of WASH in emergencies

Authority/institution	Responsibilities in the context of WASH readiness in emergencies
Governance and emergency response – subnational coordination (implementation of all policies delegated by the government to oblasts and local communities)	
Oblast or city administration	Develops and oversees implementation of oblast/local WASH programmes and initiatives, as well as relevant subnational preparedness and response plans
	Communicates WASH activities to the public and provides support for water treatment, sanitation and hygiene practices
	Coordinates WASH programmes/initiatives with oblast and national bodies, and manages resources during WASH emergencies
Regional or local commission on technogenic and ecological safety and emergency situations	Coordinates activities to ensure technogenic and environmental safety, protecting the population and territories from the consequences of emergencies, and preventing and responding to emergencies in the relevant territories
WASH service delivery	
Oblast/city administration department of housing and communal services (or equivalent)	Leads water and sanitation governance and resource management at the subnational level
Vodokanal (or equivalent)	Provides drinking-water and sanitation services, including infrastructure maintenance and repairs
	Responsible for development and implementation of emergency preparedness and response planning at the system level, and for ensuring a continuous supply of safe drinking-water during emergencies – includes ensuring resilient services through upgrading/protecting facilities, securing alternative water sources and emergency response coordination with local authorities

Authority/institution	Responsibilities in the context of WASH readiness in emergencies
Public health functions and services	
Network of Regional Centres for Disease Control and Prevention	Coordinates and implements regional and national public health programmes, including disease surveillance and water quality monitoring
	Provides situational public health information and corresponding technical assistance and advice to local authorities on provisions for health protection, disease prevention and health promotion, including for alternative and decentralized water and sanitation systems
WASH standards and compliance	
State Service on Food Safety and Consumer Protection (regional and local)	Ensures sanitary control (inspections) over WASH service providers on compliance with sanitary legislation, and sanitary norms and standards (coverage including food products, drinking-water supplies and sanitation services)

Table A3.2 presents examples of high-level national stakeholders and their responsibilities in the context of WASH in emergencies, divided into two key domains. Such stakeholders should be kept aware of the process and its outcomes (for example, where outputs from the checklist exercise conducted by local stakeholders should inform priority-setting at the national or subnational levels), and involved as appropriate.

Table A3.2. National authorities and institutions in Ukraine and responsibilities in the context of WASH in emergencies

Authority/institution	Responsibilities in the context of WASH readiness in emergencies
Governance and emergency response – national leadership and coordination (overall policy-making and execution of national system governance and leadership in activation of response mechanisms in emergencies)	
Cabinet of Ministers	Ensures main policy governance directly and through ministries, other central executive bodies and local state administrations, and directs, coordinates and controls the activities of these bodies
National Commission on Technogenic and Ecological Safety and Emergency Situations	Coordinates the activities of central and local executive authorities related to ensuring technogenic and environmental safety, organizational measures to counteract terrorist activities and military threats, and protecting the population by preventing and responding to emergencies
Ministries and other state authorities with responsibility for WASH policy-making and implementation (of which branches are responsible for managing implementation of the relevant functions at the subnational level – see Table A3.1)	
Ministry of Health	Develops policy and oversees its implementation in the field of health care and health protection, epidemiological surveillance (monitoring), regulation of environmental factors, hygienic regulation of hazardous factors, response to health hazards and emergencies in public health
	Oversees policy-making in the field of sanitary and epidemiological well-being of the population
	Sets sanitary norms and standards that are mandatory for implementation by all service providers

Authority/institution	Responsibilities in the context of WASH readiness in emergencies
Public Health Centre of the Ministry of Health	Implements essential public health functions at the national level and coordinates the Network of Regional Centres for Disease Control and Prevention. Responsibilities for emergency preparedness and response including epidemiological surveillance; monitoring of risk factors (including environmental risks) for human health; assessment of risks and delivery of expertise on risk mitigation measures; creation of preparedness and response plans to address health risk/threat prevention and response management; early detection, verification and notification; risk communication; and health promotion
Ministry of Environmental Protection and Natural Resources	Oversees policy-making in the areas of environmental protection, management and use of water resources; state supervision (control) in the field of environmental protection, and rational use, reproduction and protection of natural resources
State Agency of Water Resources	Implements state policy on management, use and reproduction of surface water resources, and on development of the water sector, including state monitoring of surface water (surveillance, operational and investigative in case of accidental pollution or unknown exceedances) and environmental assessment of water resources, and prevention of harmful effects of water and elimination of its consequences, including flood protection
State Geological and Subsoil Service	Implements state policy on management and monitoring groundwater resources
State Environmental Inspectorate	Implements state policy on state supervision (control) in the field of environmental protection, rational use, and recovery and protection of natural resources, including water
Ministry of Communities and Territories Development	Ensures policy-making and its implementation in settlement improvement, housing and communal services, and household waste management Plans, develops and maintains WASH infrastructure, ensuring sustainable and resilient construction and rehabilitation of water supply and sanitation systems
State Emergency Service	Directed and coordinated by the Cabinet of Ministers through the Minister of Internal Affairs, implements state policy in the fields of civil protection; protection of the population and territories from emergencies and prevention of their occurrence; elimination of the consequences of emergencies; rescue; firefighting; fire and industrial safety; emergency services; and hydrometeorological activities – including prevention and response to water-related emergencies
State Service on Food Safety and Consumer Protection	Ensures implementation of state policies in the field of, inter alia, sanitary legislation enforcement, sanitary and epidemiological well-being Ensures state sanitary control

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