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INFRASTRUCTURE AND SERVICES OF DRINKING WATER AND SANITATION

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INTRODUCTION

In the face of the current health crisis, drinking water and sanitation systems need to take measures to cope with the risk of slow-onset disasters, such as epidemics.¹ Hydraulic infrastructure requires planning and to be adapted to mitigate any of the adverse effects of coronavirus, by expanding its coverage, addressing the gaps that hinder its universal access and improving the quality of services, specially focused on people and groups in vulnerable situations.

¹ It refers to an unusual increase in the cases number of an infectious disease, which already exists in the concerned region or population, or to the appearance of an infection, which was previously absent in a region. For more conceptual information on disasters, their registration and classification, it is recommended to review the EM-DAT technical notes, The International Disasters Database. Available at <https://www.emdat.be/explanatory-notes>

Therefore, Thus, it is acknowledged that by guaranteeing access to drinking water and sanitation in the Americas, we could contribute to the prevention and mitigation of outbreaks of infectious diseases, including the pandemic due to the coronavirus SARS-COV-2 or COVID-19. Water supply and sanitation services are complementary to public health strategies, as they facilitate basic hygiene measures at home, schools, markets, and health facilities.²

The Pan American Health Organization (PAHO) and the World Health Organization (WHO) recognize that handwashing with soap and clean water is an important action in order to avoid the COVID-19 contagion. Likewise, they recommend taking personal hygiene measures, cleaning and disinfecting the containers intended for water storage, as well as periodically disinfecting bathrooms and frequently touched surfaces in case of having patients at home, in addition to proper management of waste resulting from personal hygiene and the safe management of human excreta throughout the entire sanitation chain.³

Likewise, the PAHO and WHO recommend the adequate provision of safe drinking water for the health-facilities staff, caregivers, and patients. Given the exposure of health personnel to COVID-19, constant hand washing is instructed before and after touching the patient, before performing aseptic tasks, after any risk of exposure to body fluids and contact with the patient's environment, who is under suspicion or confirmed to have the virus.⁴

Therefore, the water sector and water supply and sanitation services are key to emergencies and health crises associated with disasters, i.e., with serious disruptions regarding the operation of a community or society,⁵ as is the case with the current pandemic.⁶ Therefore, it is essential to guarantee everyone access to safe and sufficient water, as well as the sanitation of wastewater, as part of an integrated public health policy. Water is one of the main means of disease contagion,⁷ although there is no evidence that the coronavirus is found and transmitted in drinking water or wastewater.⁸

4 Idem.

5 UN General Assembly, "Reporte A/71/644. Recomendaciones del grupo de trabajo intergubernamental de expertos de composición abierta sobre los indicadores mundiales para las metas mundiales del Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030 y sobre el seguimiento y la puesta en marcha de los indicadores", 2016.

6 The current pandemic has required physical distancing measures, whether it be voluntary or forced confinement at home, so the activities of almost all economic sectors at the local and global levels have reduced. Meanwhile, the International Monetary Fund forecasts a 3% decrease in the world GDP for this year.

7 PAHO, "El agua en situaciones de emergencia", 1999. Available at <https://www.paho.org/es/documentos/agua-situaciones-emergencia>

8 WHO/Unicef, op. cit.

2 WHO/Unicef, "Water, Sanitation, Hygiene, and Waste Management for the COVID-19 Virus. Interim Guidance", 2020. Available at <https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-COVID-19>

3 PAHO, "Recomendaciones clave de agua, saneamiento e higiene. COVID-19 en la comunidad. 2020. Available at <https://www.paho.org/es/documentos/recomendaciones-clave-agua-saneamiento-e-higiene-COVID-19-comunidad>

In Latin America and the Caribbean, 1 out of 20 health establishments lacks water service.⁹ It is known that sanitation services lag behind, however, sector data for the region is not available. Regarding domestic use water, it is estimated that 35 million inhabitants did not have access to improved water sources¹⁰ in 2015.¹¹ In addition, 18 million people still practiced open defecation in the same year.¹²

THE EXPERIENCE AGAINST DISASTER CRISIS IN THE AMERICAS

The Americas is the second most prone region to disasters due to threats of natural origin¹³ and 70% of these are hydrometeorological (see Table 1). In addition, some countries in the region present latent risk of earthquakes. Both types of threats are associated with destruction in the territory, trauma, and loss of human life, mainly in the case of earthquakes.

Hazardous phenomena can lead to disasters with impacts on the infrastructure and facilities of drinking water and sanitation systems.

Regularly, the continuity of public services is interrupted, due to damage to facilities and pipes, as well as power outages. In contrast, water is the main resource that should be provided to affected people, as well as to hospitals and clinics.¹⁴

As an experience, Hurricane Mitch (category five), which hit Central America in November 1998, caused severe damage to the region's drinking water and sanitation systems. More than 90% of Honduras population was left without these services.

32% of the hydraulic works in Nicaragua were damaged. In Guatemala, 396 communities suffered damage to their public systems and 20,000 latrines were destroyed. In El Salvador, 32% of the works in the water sector were damaged.¹⁵

Regarding flood emergencies, there is the case of the municipality of Alto Baudó, Colombia, in 2015, in which a population that already had few public services in advance, was left without water supply due to the intake collapse of their aqueduct,¹⁶ leaving its inhabitants more vulnerable to gastrointestinal and skin diseases, among others.

9 WHO, "El agua, el saneamiento y la higiene en los establecimientos de salud", 2019. Available at https://www.who.int/water_sanitation_health/publications/wash-in-health-care-facilities/es/

10 It refers to sources located in household facilities, available when needed and primarily free of microbiological and chemical contamination.

11 Sanitation and drinking water inequalities in Latin America and the Caribbean. A regional perspective based on data from the WHO / Unicef Joint Monitoring Program (JMP) for Water Supply and Sanitation and an inequality analysis from recent national household surveys and censuses. See WHO / Unicef, 2016.

12 Ibid.

13 According to the reports of the EM-DAT database on emergency events, from the Center for Research on Epidemiology of Disasters (CRED). Available at <https://www.emdat.be/database>

14 PAHO, "El agua en situaciones de emergencia", op. cit.

15 PAHO / AIDIS, Emergencies and disasters in drinking water and sanitation systems: a guide for an effective response, 2004. Available at file: :///Users/antonioalvarez/Downloads/4.15emergencias_agua_potable.pdf

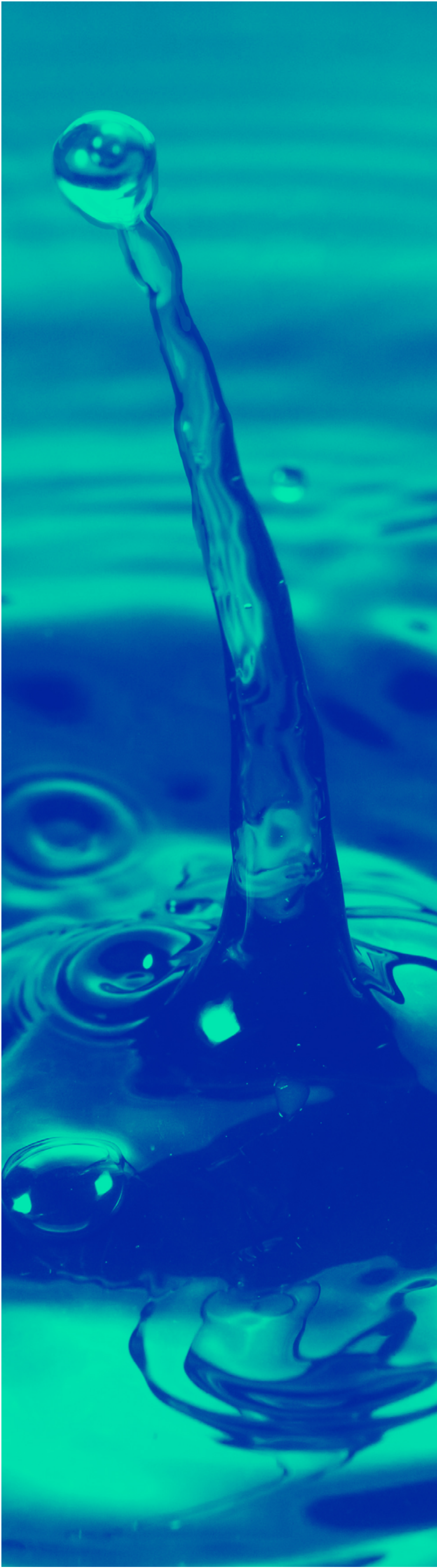
16 Reliefweb, "Colombia: Emergencia por inundaciones en Quibdó, Bojayá y Alto Baudó (Chocó)", Flash Update No. 1, 4 of February 2015. Available at <https://reliefweb.int/report/colombia/colombia-emergencia-por-inundaciones-en-quistado-bojaya-y-alto-baud-choc-flash-update-no>

During floods, water in pipes may become contaminated by waste seepage and wastewater.

In April 2016, the 7.8 Mw magnitude earthquake in Ecuador caused serious damage to the key infrastructure of drinking water and sanitation systems, such as reserve tanks, wastewater treatment plants and drinking water and sewage networks.

The necessary investment to rehabilitate the infrastructure was estimated at \$ 269 million.¹⁷ The main impacts on drinking water and sanitation infrastructure and facilities in the most common disaster situations in the Americas are shown below.

As can be seen in Table 1, the impacts to the drinking water and sanitation systems are differentiated by type of threat.¹⁸ Meanwhile, the needs in a crisis situation and, above all, the prevention and preparedness measures will be in function of the threat materialized in a dangerous phenomenon, in addition to the disaster scale.¹⁹



¹⁷ Daniel Arteaga and Javier Ordóñez, “Guía para la gestión del riesgo en sistemas de agua y saneamiento ante amenazas naturales,” IDB, 2019. Available at <https://publications.iadb.org/es/guia-para-la-gestion-del-riesgo-en-sistemas-de-agua-y-saneamiento-ante-amenazas-naturales>

¹⁸ or this reason, it is important to prepare drinking water and sanitation systems by considering multi-threats with possible scenarios of affectation.

¹⁹ The small scale corresponds to multiple affectations in local communities; therefore, assistance is required from abroad to each community. If it is a large scale, the affected society requires national and international assistance.

TABLE 1. IMPACTS ON DRINKING WATER AND SANITATION SYSTEMS, BY THREAT

| Threat | Hazardous phenomena | Impacts |
|----------------|-----------------------|--|
| Hydrological | Floods and landslides | Collapse of foundations Bacteriological water contamination (by wastewater), chemical and physical (by sediment) Damaged roads and bridges Components obstruction and clogging by sediment displacement |
| | | Structures physical damage Pipes rupture Obstruction of water intakes and pipes Electrical equipment damage Indirect impacts, blocked access roads |
| Meteorological | Tropical storms | |
| Geophysical | Earthquakes | Structures physical damage Aquifer changes or losses Decreased water pressure due to leaks Increased demand for water Damage to well structures Possible fires, causing additional damage |
| | | |

Source: Own elaboration based on Daniel Arteaga and Javier Ordóñez, “Guía para la gestión del riesgo...”, *op. cit.*

Part of the impacts can be avoided if measures are taken in the construction of infrastructure and drinking water and sanitation facilities, in addition to the fact that their resilience can be developed by means of anticipatory measures regarding those risks that cannot be eliminated. Therefore, a local plan is required for both preparedness and response to emergencies and disasters, associating local action frameworks with international action frameworks.

Local plans to reduce the impacts of emerging diseases should focus on those that are transmitted by lack of sanitation or by vectors such as rodents or insects. People in emergencies and disaster crises are much more susceptible to infectious diseases such as dengue and diarrheal diseases, namely cholera.²⁰

For example, after the 2010 7 Mw magnitude earthquake in Haiti, the deadliest of its history, occurred the worst cholera outbreak in the region, which affected more than 500,000 people and killed almost 7,000 during the same year.

²⁰ Unicef, Emergency Field Handbook, 2005. Available at https://www.unicef.org/publications/files/UNICEF_EFH_2005.pdf

CRITICAL DRINKING WATER AND SANITATION INFRASTRUCTURE AND SERVICES WITH A RIGHTS APPROACH

One of the global goals of the Sendai Framework for Disaster Risk Reduction 2015-2030, goal D, focuses on “a significant reduction of vital infrastructure damages and basic services discontinuation caused by disasters, as in health and education premises, including the development of their resilience by 2030.” In this sense, the infrastructure of the water sector is vital, and the corresponding services are basic for society and for the continuity of other services, such as health and education centers.

On the other hand, SDG 6 of the 2030 Agenda for Sustainable Development is focused on “guaranteeing the availability of water and its sustainable management and sanitation for everybody”. Water availability, associated with the hydraulic infrastructure, contributes to secure access to drinking water and sanitation.

In turn, the six targets of SDG 6 consider universal, equitable, affordable, adequate, environmentally sustainable, and efficient access to drinking water and sanitation, based on international and cross-border cooperation, social participation and with priority for groups in a vulnerable situation. However, it does not express the need to guarantee access in emergency and disaster situations.

The current health crisis demands, service systems to be designed and managed based on risk, which implies expanding a multi-threat preparation for drinking water and sanitation systems, namely during epidemics, in order to secure access to drinking water and to sanitation at home, but also in hospitals and clinics, to contribute to the fulfillment of the right to health²¹ from a prevention perspective.

In other words, having sufficient, safe drinking water at home or in the immediate vicinity of the households for constant hand-washing and for the hygiene measures recommended by the WHO, is a measure to mitigate the COVID-19 impacts. From a risk management perspective, mitigation is based, on the one hand, on raising public awareness for hygiene measures and, on the other, on engineering and construction techniques that may reinforce public services.²²

Unlike the other threats referred to above, epidemics do not lead to drinking water and sanitation systems structural damage. Instead, they reveal access inequalities due to factors such as income level, location, and population groups.

²¹ In Ecosoc General Comment No. 15, it is noted that the right to water is inextricably associated with the right to the highest attainable standard of health, referring to General Comment No. 14 (2000), paragraphs 11, 12 a) , b) and d), 15, 34, 36, 40, 43 and 51.

²² UN General Assembly, “Reporte A/71/644...”, op. cit., 2016.

As an example, in 2017, urban populations in Latin America and the Caribbean were twice as likely to have services from an improved water source than rural populations. This same year, less than 50% of wastewater (urban and rural) of the region received treatment. The gap of access to water and sanitation between the poorest and highest-income households has narrowed. However, there is evidence that this lingers in some countries such as Trinidad and Tobago, Haiti, Mexico, and Paraguay.²³ Regarding population groups, the household head's ethnic origin of has been identified as a determining factor in terms of access to water in countries such as Panama, Guatemala and Ecuador.²⁴

Currently, water and sanitation services operators in the urban areas of Latin America have deficits in terms of service coverage, especially in peri-urban areas, as well as in terms of the wastewater treatment. Likewise, they show a low quality, mainly in terms of continuity,²⁵ i.e., people do not always have water when they need it, despite being connected to distribution and supply networks.

²³ WHO/Unicef, "Progress on Household Drinking Water, Sanitation and Hygiene 2000-2017: Special Focus on Inequalities". Available at https://www.who.int/water_sanitation_health/publications/jmp-report-2019/en/

²⁴ WHO/Unicef, "Progress on Household Drinking Water, Sanitation and Hygiene 2000-2017: Special Focus on Inequalities". Available at https://www.who.int/water_sanitation_health/publications/jmp-report-2019/en/

²⁵ Emilio Lentini, "El futuro de los servicios de agua y saneamiento en América Latina. Desafíos de los operadores de áreas urbanas de más de 300,000 habitantes", IDB, 2015. Available at <https://publications.iadb.org/publications/spanish/document/El-futuro-de-los-servicios-de-agua-y-saneamiento-en-Am%C3%A9rica-Latina-Desaf%C3%A1os-de-los-operadores-de-%C3%A1reas-urbanas-de-m%C3%A1s-de-300000-habitantes.pdf>

7 GLOBAL GOALS OF THE SENDAI FRAMEWORK (2015-2030)

REDUCE:

- Number of deaths / Global population by 2030
- Affected population / Global population by 2030
- Damage to critical infrastructure and interruption of basic services by 2030.

INCREASE:

- Countries with national and local RRD strategies by 2020.
- International cooperation for developing countries by 2030.
- Availability and access to early warning systems and information and evaluation on disaster risks by 2030.

CONSIDERATIONS TOWARDS A NEW NORMALITY

For this reason, investment in infrastructure and water and sanitation services supply, together with a distribution networks expansion, as well as the collection and treatment of wastewater, should focused on improving quality and considering a disasters risk management.

The COVID-19 pandemic has generated new expectations about the essential sectors for the correct operation of societies. Health is one of the main ones, and it requires strengthening along with the continuity of basic services. Securing universal access to drinking water and sanitation, from a rights-based approach, contributes to consolidating public health promotion, prevention, and education. In this respect, emergencies and disasters crises risk management for drinking water and sanitation systems requires:

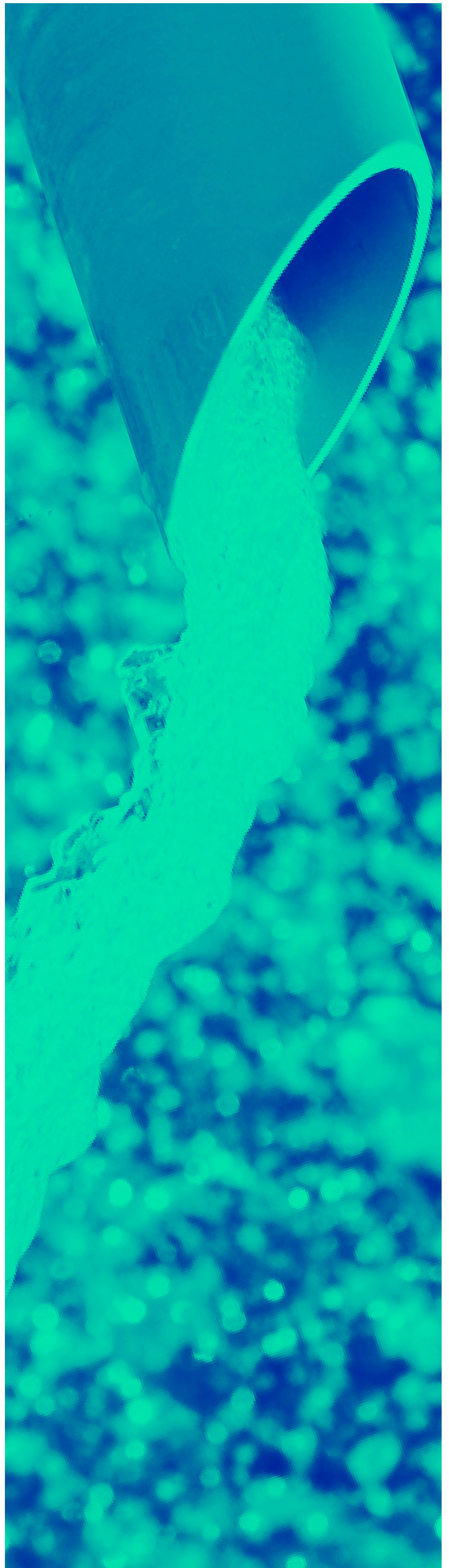
1. Disaster risk assessment by analyzing potential threats during planning, construction, and operation phases.
2. Risk prevention so that infrastructures continue operating in the event of multi-threat impacts.

3. Mitigation, in other words, minimizing the adverse effects of slow-onset disasters, such as epidemic diseases and droughts, which do not directly impact infrastructures or hydraulic installations.
4. Disasters resilience through constant development of local coping capacity.
5. The focus on mitigating the adverse effects on people, mainly those who are more exposed and in a greater situation of vulnerability. This necessarily implies diagnosing and addressing inequalities in access to water, sanitation, and even health services.
6. Ensure the water microbial safety for human consumption²⁶ and the capacity to respond to possible demand increases for the treatment volumes of drinking and wastewater.

²⁶ PAHO, "Recomendaciones clave de agua..." op. cit.

Finally, it is advisable to consider that at present the epidemiological behavior of COVID-19 is not fully known. It is estimated that a regrowth may occur, so it is necessary to strengthen public service systems to universally secure access to drinking water and sanitation.

In the Americas, normal activities are starting to be resumed, however, if hygiene measures are not maintained based on services continuity, recovery may be slower and cause spikes in the pandemic that may have an impact on the attention capacity of health systems. In addition, it is necessary to consider that the hurricane season is approaching in the Pacific and the Atlantic, which on average occurs from June to November, so it is essential to strengthen multi-threat response plans to health crises.

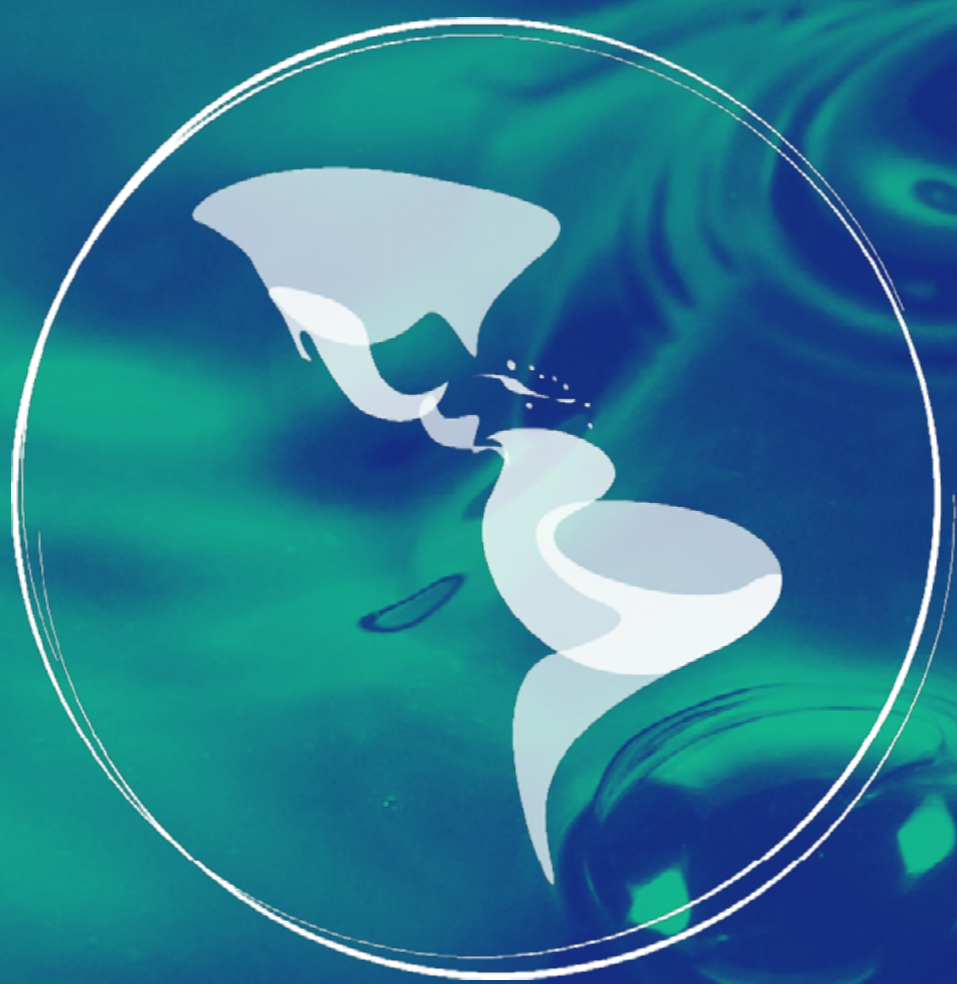


BIBLIOGRAPHY

- Arteaga, Daniel, and Javier Ordoñez, "Guía para la gestión del riesgo en sistemas de agua y saneamiento ante amenazas naturales", IDB, 2019. Available at <https://publications.iadb.org/es/guia-para-la-gestion-del-riesgo-en-sistemas-de-agua-y-saneamiento-ante-amenazas-naturales>
- Ecosoc, "Observación general N.º 15. El derecho al agua" (Articles 11 y 12 of the International Agreement on Economic, Social and Cultural Rights), UN, Geneva, 2002.
- Kullmann, Craig Phillip et al., "Reducing Inequalities in Water Supply, Sanitation and Hygiene in the Era of the Sustainable Development Goals. Synthesis Report of the Wash Poverty Diagnostic Initiative", World Bank, 2017. Available at <http://documentos.es/554021528950823000/pdf/Reducing-Inequalities-in-Water-Supply-Sanitation-and-Hygiene-in-the-Era-of-the-Sustainable-Development-Goals.pdf>
- Lentini, Emilio, "El futuro de los servicios de agua y saneamiento en América Latina. Desafíos de los operadores de áreas urbanas de más de 300,000 habitantes" IDB, 2015. Available at <https://publications.iadb.org/publications/spanish/document/The-future-of-water-sanitation-services-in-Am%C3%A9rica-Latina-Desaf%C3%ADos-de-los-operadores-de-%C3%A1reas-urbanas-de-m%C3%A1s-de-300000-inhabitants.pdf>
- WHO, "El agua, el saneamiento y la higiene en los establecimientos de salud. Medidas prácticas para lograr el acceso universal a una atención de calidad", 2019. Available at <https://apps.who.int/iris/handle/10665/330043>
- WHO/Unicef, "Water, Sanitation, Hygiene, and Waste Management for the COVID-19 Virus. Interim Guidance", 2020. Available at <https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-COVID-19>
- -----, "Desigualdades en materia de saneamiento y agua potable en América Latina y el Caribe", 2016. Available at <https://www.unicef.org/lac/reports/inequalities-in-matter-of-sanitation-and-water-potable-en-am%C3%A9rica-latina-y-el-caribe>
- -----, "Progress on Household Drinking Water, Sanitation and Hygiene 2000-2017: Special Focus on Inequalities". Available at https://www.who.int/water_sanitation_health/publications/jmp-report-2019/en/
- UN General Assembly, "Reporte A/71/644. Recomendaciones del grupo de trabajo intergubernamental de expertos de composición abierta sobre los indicadores mundiales para las metas mundiales del Marco de Sendai para la Reducción del Riesgo de Desastres 2015-2030 y sobre el seguimiento y la puesta en marcha de los indicadores", 2016.



- PAHO, “El agua en situaciones de emergencia”, 1999. Available at <https://www.paho.org/es/documentos/agua-situaciones-emergencia>
- _____, “Preparativos en salud, agua y saneamiento para la respuesta local ante desastres”, 2007. Available at <https://www.paho.org/es/documentos/preparativos-salud-agua-saneamiento-para-respuesta-local-ante-desastres>
- _____, Manual de evaluación de daños y necesidades en salud para situaciones de desastres, Serie Manuales y Guías sobre Desastres, núm. 4, 2004. Available at <http://hdl.digicollection.org/en/d/Js8251s/>
- _____, “Recomendaciones clave de agua, saneamiento e higiene. COVID-19 en la comunidad”, 2020. Available at <https://www.paho.org/es/documentos/recomendaciones-clave-agua-saneamiento-e-higiene-COVID-19-comunidad>, (2020). Recomendaciones clave de agua, saneamiento e higiene. COVID-19 en los establecimientos de salud.
- PAHO/AIDS, Emergencias y desastres en sistemas de agua potable y saneamiento: guía para una respuesta eficaz, 2004. Available at file:///Users/antonioalvarezDownloads/4.15emergencias_agua_potable.pdf
- Reliefweb, “Colombia: Emergencia por inundaciones en Quibdó, Bojayá y Alto Baudó (Chocó)”, Flash Update No. 1, February 4th, 2015. Available at <https://reliefweb.int/report/colombia/colombia-emergencia-por-inundaciones-enquibd-bojay-y-alto-baud-chocflash-update-no>
- Unicef, Emergency Field Handbook, 2005. Available at https://www.unicef.org/publications/files/UNICEF_EFH_2005.pdf



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