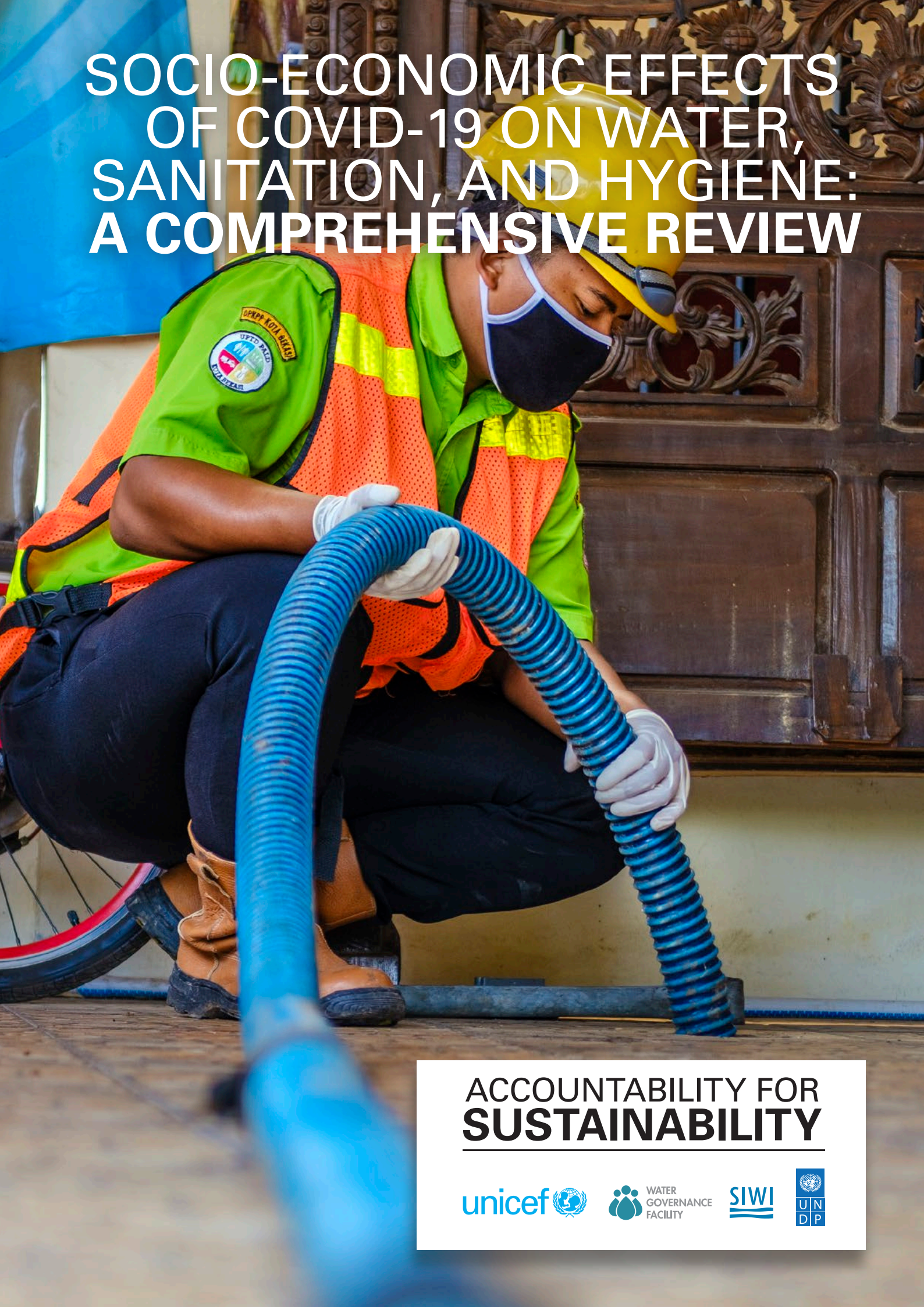
SOCIO-ECONOMIC EFFECTS OF COVID-19 ON WATER, SANITATION, AND HYGIENE: **A COMPREHENSIVE REVIEW**



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UNICEF and SIWI are grateful to all individuals from different organizations contributing to this report, including Sigifredo Ruales (Ministry of the Environment and Water, Ecuador); Cecilia Pozo (Association of Ecuadorian Municipalities, Ecuador); Pedro Carrasco (Fundación Avina, Ecuador); Viviana Muñoz (Water, sanitation, and hygiene consultant, Ecuador); Koenraad Vancraeynest (UNICEF, Ecuador); David García, Maria Paula Zapata Benavides, and Angela Maria Escarria Sanmiguel (Vice Ministry of Drinking Water and Basic Sanitation, Colombia); Diego Felipe Polanía Chacón (Drinking Water and Basic Sanitation Regulatory Commission, Colombia); Hector Alexander Serrano (World Bank, Colombia); María Botero Mesa (National Network of Community Aqueducts of Colombia, Colombia); Diana Britez Scolari (Empresa de Servicios Sanitarios del Paraguay, Paraguay); Giovanni Espinal Ferrufino (Potable Water and Sanitation Regulatory Agency, Paraguay); Monther Shoblaq (Coastal Municipalities Water Utility, State of Palestine); Nofilia Kiki (Business Sweden, Indonesia); Shahid Kamal (HEKS/EPER, Bangladesh); Laxman Kharal Chettry (Terre des hommes, Nepal); Satyanarayan Ghosh (Terre des hommes, India); Bobby Whitefield (Liberia National Water, Sanitation and Hygiene – WASH Commission, Liberia); Goulam Soundi (Société Nationale d'Exploitation et de Distribution des Eaux, Union des Comoros); Kasenga Hara (Eastern and Southern Africa Water and Sanitation Regulators Association hosted by National Water Supply and Sanitation Council, Zambia); Itsuro Takahashi (UNICEF, Ethiopia); Richard Cheruiyot (Water Services Regulatory Board, Kenya); Martina Rama (UNICEF, Burkina Faso); Thomas Dechentinnes (UNICEF, Democratic Republic of the Congo); Faustin Ekah (UNICEF, Cameroon); Hamza Tidjani Ousmane (UNICEF, Niger); Joachim Peeters (UNICEF, Senegal); Sebastien Truffaut (UNICEF, Ukraine); Julie Perkins (Secretariat at UN-Habitat's Global Water Operators' Partnerships Alliance, Spain); Jovana Gojkovic and Milo Fiasconaro (Aqua Publica Europea, Europe); and Oriol Barbosa (Polytechnic University of Catalonia, Spain).

The report was peer reviewed by Bisi Agberemi, Laure Anquez, Niall Boot, Silvia Gaya, Guy Hutton, and Kelly Ann Naylor (UNICEF).

HOW TO CITE

Stockholm International Water Institute (SIWI) & United Nations Children's Fund (UNICEF) (2021). Socio-economic effects of COVID-19 on water, sanitation, and hygiene: a comprehensive review. Stockholm and New York. Available from http://www.watergovernance.org/

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EXECUTIVE SUMMARY

The provision of water, sanitation, and hygiene (WASH) is a key preventative measure in reducing the spread of COVID-19, and handwashing has been at the forefront of many countries' response. However, this response to COVID-19 has posed, and continues to pose, detrimental effects on services delivery and sustainability. This study analyses, assesses, and discusses the socio-economic effects of the pandemic in relation to its impact on WASH systems and services.

The assessment is structured around two different stages of the crisis: i) the immediate effects in the early stages of the pandemic and ii) the indirect secondary effects caused as the crisis evolves into new phases. The first stage discusses effects such as limited access to safe WASH services, ruptures in supply chains and interruptions of services, and decline in the quality of response due to restricted or no movement of utility staff. The pre-pandemic context has undoubtedly mitigated or exacerbated the severity of these effects, with the highest impact felt in countries with weak governance and poor services. Therefore, contextual elements, such as fragile or inadequate services, limited capacities, etc. are also integrated in this first stage of the discussion. The second stage relates to the effects caused by the measures taken to contain and control the pandemic. The secondary effects have affected, and will continue to affect, the continuity, affordability, and safety of water and sanitation services in the short-, mid- and long-term. This study identifies i) the negative consequences and emerging threats that are already challenging and will continue to jeopardize the delivery of services, paying special attention to the most vulnerable segments of population and ii) the opportunities for transformation and recovery, which can support and accelerate progress towards safely managed services for all. To do this, the study combines a comprehensive, non-systematic review of the literature and interviews with key informants, including government officials, regulators, service providers, donors, and WASH programme implementers.

The immediate effects of COVID-19 on WASH

From its beginning, the COVID-19 pandemic has impacted delivery of WASH services to different extents. WASH services have been mitigated or exacerbated by the pandemic according to the context in which they have been operated. Below are some of the contextual elements and the immediate effects of the pandemic on the sector.

- **Inadequate and fragile water and sanitation services coupled with poor hygiene behaviours** | Prior to the pandemic, the global WASH sector faced a number of significant stresses (e.g. the uncertainties of climate change; growing urban populations, particularly in informal settlements; ageing infrastructure, etc.) (Butler and Adamowski, 2015). Not only has COVID-19 cast light on these cracks, it may also have broadened them. Together with waste management and cleaning services, access to WASH is a key factor in the prevention and control of a multitude of diarrhoeal and respiratory diseases; thus, it can be expected that areas with reduced access to WASH will face greater risk of disease transmission (Anim and Ofori-Asenso, 2020; JMP, 2019b).
- **Delivering services in a challenging environment** | Since the beginning of the pandemic, the lack of maintenance and poor operation of WASH infrastructure have resulted in gaps in service provision, ranging from partial disruption to irreparable deterioration or collapse. In part, interruption of services has been the consequence of supply chain disruptions; failures to purchase fuel for pumping stations and treatment plants; and increases in prices for chemicals, spare parts, and WASH commodities (USAID, 2020; GWC et al., 2020). In addition, daily and routine operations of water supply and sewerage infrastructure have been affected

by restricted to no movement of staff due to lockdowns and quarantine measures and the increased risk of contagion among utility staff. This has impacted operation and maintenance as well as construction works.

- **Economic crisis caused and/or aggravated by the pandemic** | The COVID-19 crisis has hit the economy tremendously and created subsequent repercussions, such as a severe unemployment crisis, an increase in extreme poverty, and an increase in inequalities. The mobility restrictions imposed by many governments around the world have hampered businesses both in the formal and informal sectors, and where these measures have been extended in time, many businesses have filed for bankruptcy, creating massive job losses. The WASH sector has not been an exception, with drilling companies closing down or utilities reducing their staff levels, for example.
- **Limited capacities for implementing the WASH response** | The immediacy of the WASH response to COVID-19 has uncovered gaps or capacity limitations in both government coordination and the use of evidence for policy making, which has directly affected the nature, the quality, and the impacts of WASH responses. Many development partners (e.g. the United Nations Children's Fund) have consequently put in place initiatives to identify capacity gaps and promote appropriate reforms to building the capacity of governments, utilities, and regulators (UNICEF, 2021b). Specific focus has been on three domains: i) coordination and strategic planning, ii) the use of evidence to inform decision-making, and iii) communicating decisions to the public.
- **Limited fiscal space** | While many governments have increased their public expenditures to address the pandemic, they have often failed to include the WASH sector in the response plans (AMCOW, 2021). In addition, pre-pandemic estimates already pointed to a funding shortfall across WASH, particularly regarding sanitation and hygiene where the service gap is greatest. In addition, further limitations to the sectoral fiscal space are to be expected, as the governments will be obliged to continue allocating important amounts of financial resources to emergency generated priorities. Being limited in their fiscal capacities, several low- and middle-income countries may turn to private sector or development partners as a last resort to cover their financial gaps.
- **Increased awareness of the relevance of WASH for public health** | The recognition of hand hygiene habits as a way to prevent infections has spread throughout the world. United Nations agencies, development partners, and the private sector have advocated to promote these messages and propel campaigns to individuals, health care facilities, schools, and other institutions. Furthermore, governments around the world have promoted services that are operational for effective handwashing. Two essential sectors include health and education, since health care facilities and schools are mostly lacking adequate services (JMP, 2020b; WHO, 2020b).

The secondary effects of COVID-19 on WASH

COVID-19 has severely impacted WASH services provision and sustainability. It has posed, and continues to pose, a significant risk to the operational reliability of services and financial viability of providers due to shifts in demand patterns, supply disruptions, and the various emergency measures employed by governments to cope with the pandemic. This might limit access to safe WASH services, particularly for the most vulnerable populations, and slow down investments in the sector worldwide. Below are some of the predicted secondary effects on WASH.

- **Lower level of water and sanitation services** | Service providers have been delivering services in a challenging context (USAID, 2020; GWC et al., 2020). In some countries, this has resulted in reduced service levels, which disproportionately affect the poorest households in urban, peri-urban, and rural areas. Remarkably, some of the challenges faced by service operators and consumers alike are the side effects of COVID-responsive policies, which

unintentionally crowd out the most vulnerable (USAID, 2020; McDonald et al., 2020).

- **Threatened financial sustainability of providers** | The most common response by authorities to the pandemic crisis, globally, has been the partial suspension of water billing for low-income users and moratoriums on water service cut-offs, which have been justified by the importance of hygiene in reducing the spread of the virus (Butler et al., 2020). These crisis emergency measures have affected operators' revenues. For example, data collected by the International Benchmarking Network for Water and Sanitation Utilities reveals that global collection rates have fallen by 40 percentage points for the utilities monitored (World Bank, 2020b; 2020c). In addition, utilities have experienced budgetary problems due to a decline in access to, and increases in, prices for chemicals and supplies.
- **Limited new investments and capital expenditures (CAPEX)** | While the big WASH infrastructure projects generally remained undisturbed during the pandemic lockdowns, primarily due to their classification as essential works, it is almost certain that future investments and CAPEX will be affected in the short- to mid-term. This comes as a logical consequence of shifted priorities by the national and local authorities towards emergency responses and by utilities towards operation and maintenance costs. Additional complexities, such as allocation issues or anticipated delays in foreign investments, suggest the CAPEX may drop in most of the low- and middle-income countries by as much as a two-digit number percentage (GWI, 2020).

Despite these limitations and risks imposed on WASH services and operations, the pandemic has also shown opportunities for a transformation to more sustainable management of water and sanitation for all. By and large, a variety of response and recovery measures have been implemented to secure and increase access to WASH, which may be sustained and managed so that progress extends beyond the end of the COVID-19 crisis. Below are some opportunities for WASH transformation.

- **Increased access towards progressive realization of the human right to water and sanitation** | Ensuring that all people have access to sufficient WASH has been a top priority since the beginning of the COVID-19 crisis, and most governments have implemented several measures to maintain and increase access to these services (Cooper, 2020a; SIWI, 2021b; Antwi et al., 2021; Giné-Garriga et al., 2021). Despite these efforts, response measures have not necessarily reached the poorest populations, and there is no evidence that WASH responses were tailored to the needs of vulnerable groups (SIWI, 2021b; Giné-Garriga et al., 2021). In addition, there is still much uncertainty as to whether countries will continue with these practices, i.e. there may not be the political will of governments and institutions to make a decided commitment towards the realization of the rights to water and sanitation when the pandemic ends.
- **Enhanced communication and coordination (within WASH and with other sectors)** | The implementation of the COVID-19 response has required political commitment at the highest level and the participation and coordination of a range of stakeholders from many different sectors (e.g. health, education, social policy). Many countries have established or revitalized multi-actor emergency coordination mechanisms. A high level of activity has also been observed on multi-sectoral coordination, often between the education, WASH, and health sectors (SIWI, 2020a; 2021a; 2021b; Giné-Garriga et al., 2021). The pandemic has, however, shown that more and better collaboration and coordination is needed (Anim and Ofori-Asenso, 2020), including improved institutional arrangements that are adequately resourced and, more importantly, greater political will of governments and the commitment of all stakeholders at all levels.
- **Increased innovation and improved efficiency** | The pandemic has created a fertile breeding ground for novel solutions and approaches, which are essential for an effective response to, and recovery from, the COVID-19 pandemic, particularly in low- and middle-income settings (Antwi et al., 2021;

Miglietta et al., 2018; Water Europe, 2020). Technological innovation is critical, but so are social, organizational, and financial innovations (Sharifi and Khavarian-Garmsir, 2020). The COVID-19 crisis may also be a springboard for transformational sector reform towards resilience. Reforms such as digitalization of the WASH sector, water leakage reduction and increased water efficiency, water recycling and use, as well as stakeholder engagement and citizen participation in WASH governance and management are needed to ensure that the WASH sector can withstand future pandemics (Antwi et al., 2021). Support for reformations in gender equality, inclusiveness, and human rights is also needed (Water Europe, 2020).

- **Earmarking necessary resources for WASH** | The way the WASH sector is financed is one of the key determinants of whether it provides equitable access to WASH for all. Given that the pandemic has generated weak fiscal space and anticipated lower capacities for future investments, some countries have put in place funding mechanisms and other instruments to earmark additional resources for WASH. A range of additional funding has therefore helped the sector when most needed and has originated from numerous governmental and non-governmental organizations and public and private sources. In addition, some interesting innovative financing mechanisms have been put in place to sustain financial viability of systems and services in the long-term.
- **Green recovery and higher contribution to climate adaptation and mitigation** | Efforts to improve access to water (e.g. free-water initiatives) must be accompanied by water conservation measures. A variety of complementary policy areas might be promoted to improve conservation of available water, reduce water use and increase reuse, and reduce non-revenue water. For example, nature-based solutions can help shift WASH programmes towards more climate resilient systems and services while providing other social and economic benefits. Countries have so far fallen short of a "building back better" rhetoric in their COVID-19 responses (O'Callaghan and Murdock, 2021), but there are still opportunities to spend wisely on green recovery, such as prioritising circular economies.

Lessons learned and recommendations

One year into the pandemic, many lessons have been learned on how to manage and deliver services for all in a challenging and complex context. In the past few months, for example, service providers have introduced and extended measures to promote access to services (e.g. stopping disconnections) and to support safe return to schools, several knowledge platforms have been improved to facilitate cooperation among stakeholders and the exchange of experiences, and many stakeholders have implemented digital solutions as part of their COVID-19 recovery efforts. What is different now is that many of these new initiatives have been implemented locally. The sector is learning how to adapt and put in place a combination of time-limited and long-term measures that are capable of supporting more and better access to clean water and sanitation.

Despite some progress, much remains to be done. Often, response and recovery measures are not benefiting the vulnerable groups and are deepening the gap between served and underserved populations. In addition, with reduced access to WASH materials and equipment, ruptures in global and local supply chains, many service providers facing serious financial and cash-flow difficulties, and a shrinking fiscal space, WASH services in specific contexts are at grave risk of collapsing. This will be further aggravated by weak governance, policies, and strategies; inadequate regulatory frameworks; and insufficient coordination mechanisms, which already plague the WASH sector.

Therefore, technical and financial support to service providers and regulators, together with capacity development, require urgent strengthening at all levels. In the short-term, the goal of WASH stakeholders is to ensure availability and continuity of services for all to alleviate the severity of the COVID-19 impacts and prioritize the most vulnerable populations. Looking forward, the aim is to enhance the WASH sector's resilience to future shocks.

Key lessons learned from this study and recommendations are summarized in Figure 1 below.

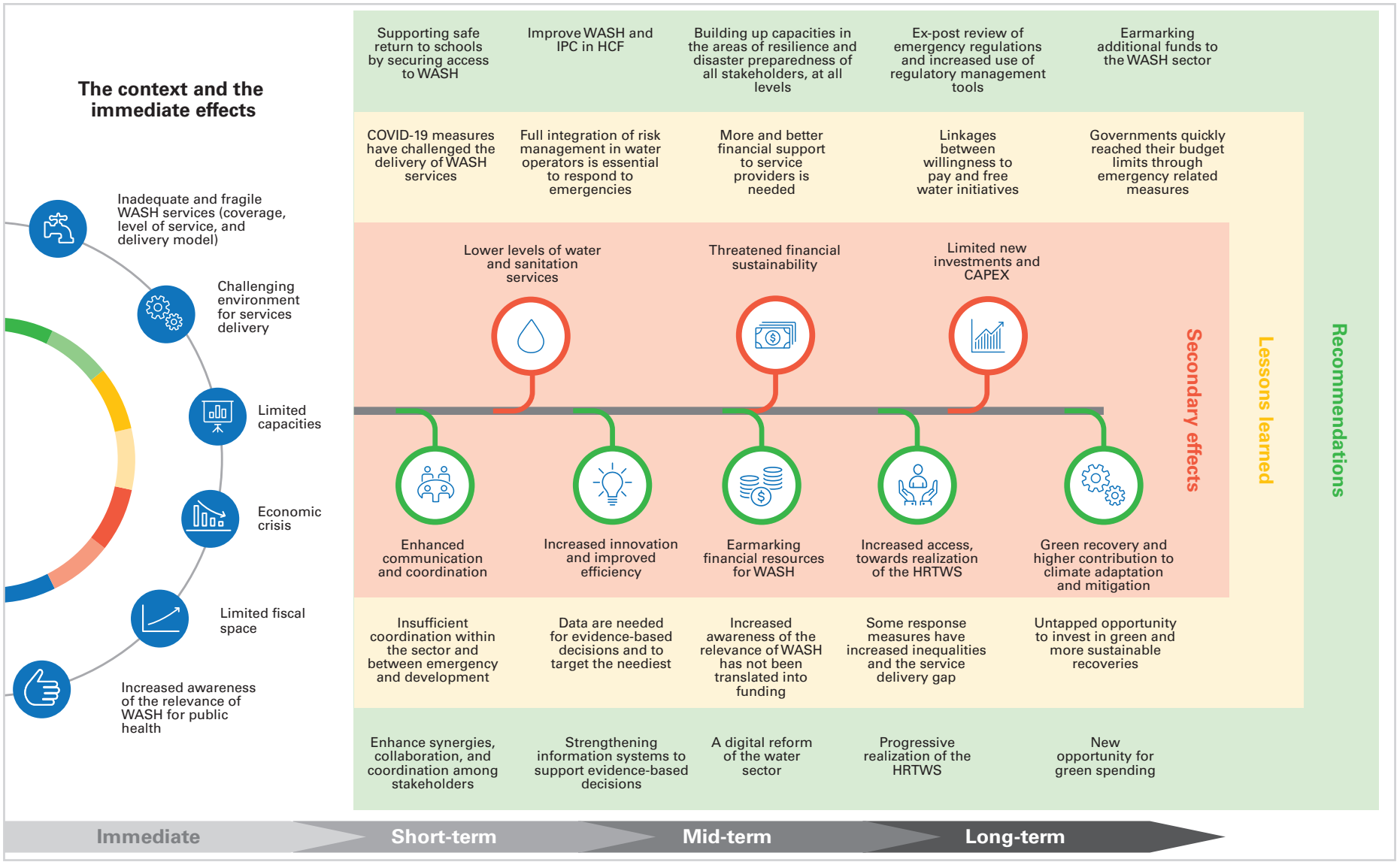

Figure 1 | Summary of lessons learned and recommendations. IPC = infection prevention and control. HCF = health care facilities. CAPEX = capital expenditure. HRTWS = human right to water and sanitation.

1. INTRODUCTION

The United Nations (UN) framework for the immediate socio-economic response to COVID-19 warns that "The COVID-19 pandemic is far more than a health crisis: it is affecting societies and economies at their core. While the impact of the pandemic will vary from country to country, it will most likely increase poverty and inequalities at a global scale, making achievement of SDGs even more urgent". This requires "assessing the impacts of the COVID-19 crisis on societies, economies and vulnerable groups … to inform and tailor the responses of governments and partners to recover from the crisis and ensure that no one is left behind in this effort" (UN, 2020a).

The pandemic has heightened the awareness of both the extent and the consequences of inadequate access to water, sanitation, and hygiene (WASH) services. The pandemic has also shone a light on handwashing as an inexpensive, widely applicable protection measure and has been at the forefront of many countries' response. For those reasons, governments and WASH practitioners have endeavoured to enable and prioritize the provision of safe WASH conditions for all during the COVID-19 outbreak. On the other hand, the pandemic has painfully evidenced a number of shortcomings related to the governance and delivery of WASH services. Yet a quarter of the

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world's population lacks access to a reliable water supply, and over half lack access to safely managed sanitation facilities (JMP, 2019a). Lack of basic water infrastructure is not, however, the only limiting factor for having a handwashing facility with soap and water at home. According to the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) data, only 60 per cent of the world's population has basic household handwashing facilities, and in least developed countries, this percentage drops to 28 per cent (JMP, 2020a).

During the first months of the pandemic (March–June 2020), the Stockholm International Water Institute (SIWI), in collaboration with UNICEF, mapped the initiatives that countries and WASH stakeholders implemented during the COVID-19 response. Initially, 15 countries in Latin America and 20 countries in the Middle East and North Africa (MENA) region were mapped, compiling 84 countries worldwide. Through this exercise, an analytical framework of 5 pillars and 45 activities was developed as a template for structuring the WASH response at the country level. In addition, discussion papers and briefing notes were published (SIWI, 2020a; 2020b; 2020c; 2020d), and early lessons from countries were shared widely via webinars, blogs, ministerial meetings, and through intense engagements at national level with the country WASH cluster coordination mechanisms.

This report continues the previous extension efforts and aims primarily to analyse, assess, and understand the effects of the pandemic on the WASH sector, with specific focus on the socio-economic impact of the response on vulnerable segments of population and the financial impact of COVID-19 on water operators and regulators in both urban and rural areas. In addition, it seeks to complement other recently published studies (USAID, 2020; GWC et al., 2020; Butler et al., 2020; UNICEF, 2020b) by not only capturing negative effects of the pandemic (e.g. decline in the financial viability of WASH services due to loss of revenue and subsidies, decline in governments' ability to deliver WASH services, etc.) but also by identifying potential positive impacts (e.g. strengthened coordination within WASH stakeholders and with other sectors, increased innovation in service delivery modalities, etc.). There were three main research questions that guided this study:

1) How has the COVID-19 pandemic affected the delivery of WASH services and products to the people?
2) Which are the key negative effects, i.e. those that are hampering access to water supply services, sanitation services and hygiene practices? How have these access effects impacted on vulnerable populations? To what extent has the pandemic affected the technical and financial viability of WASH services?
3) Which are the key positive effects, i.e. those that are accelerating progress by reducing WASH service vulnerabilities and re-building WASH services? How have these effects been implemented in practice?

Overall, this study provides a snapshot of the WASH response to COVID-19 and its effects on both WASH service provision and WASH access conditions. Equitable access to WASH must be protected and extended for all, but COVID-19 is posing detrimental impacts on quality, equity, and sustainability of services. Mitigating the negative impacts caused by COVID-19 and strengthening the positive effects is key to increasing the WASH sector's resilience to future shocks.

2. METHODS

This study combines a comprehensive review of literature and interviews with several WASH stakeholders. In addition, to illustrate findings from the literature, it presents good practices and lessons learned from a mapping of WASH response measures jointly conducted between SIWI and UNICEF during the first months of the pandemic.

To start with, this study conducted a literature review to document the immediate and secondary effects of initiatives and activities that different countries have launched and implemented during the COVID-19 response. In addition to peer-reviewed works and published studies on COVID-19 from a wide range of sources, the review considered grey literature from websites of government portals and other sector stakeholders, since the body of knowledge on the COVID-19 effects on WASH systems and services is still emerging. The literature review therefore focused on:

- Peer-reviewed publications in academic journals (a total of more than 60 papers).
- Reports, publications, webs, press/media sources, etc. from external support agencies (e.g. UNICEF, WHO, US Agency for International Development, Global WASH Cluster), development banks (e.g. World Bank, Inter-American Development Bank, Asian Development Bank, etc.), emergency and development non-governmental organizations (NGOs) (WaterAid, Oxfam, etc.) as well as private sector professional associations and data sets. More than 125 documents were reviewed.
- Webinars accessible through WASH stakeholder websites and other knowledge platforms and repositories (e.g. Sanitation and Water for All, WASH LAC, etc.)

Following the literature review, a number of key informants were purposively selected for in-depth discussions of response measures and their effects, including national and local government officials, policymakers and regulators, providers of water and sanitation services and products, implementers of donor-funded WASH programmes, and multilateral and bilateral donors from different regions. Semi-structured interviews were conducted via video conferences with key informants between February and April 2021. Interviews were aimed at i) presenting and validating the conceptual framework proposed for the study (i.e. the classification of COVID-19 immediate and secondary effects) and ii) deepening the understanding of specific impacts in given contexts. Interviews thus served to complement the literature review, providing first-hand insights from well-positioned observers, which could not be gained from reports and publications. In total, 26 interviews were conducted (see in Annex 1 the full list of key informants).

Finally, to the extent possible, specific findings from the literature were illustrated through lessons learned and good practices identified in 84 countries from different world regions through a comprehensive mapping of implemented response measures and initiatives (SIWI, 2020b). The mapping was conducted between the end of February and June 2020. In addition, data from the UNICEF "Tracking the situation of children during COVID-19" dashboard developed by the Division of Data, Analytics, Planning and Monitoring were also exploited to document response measures and initiatives (UNICEF, 2021f; 2021g; 2021e). This dashboard is based on regular data updates of collection efforts from UNICEF country offices, which draw on the best available sources in each country, including administrative data or representative survey data collected in the last three months. When survey data are not available, information is extrapolated from reliable localized quantitative and/or qualitative reports. It is important to note that the database estimates may not accurately represent the full national response to the COVID-19 pandemic. Data from three different rounds of consultation were analysed for i) June 2020 (85 countries), ii) August–September 2020 (134 countries), and iii) March–April 2021 (124 countries).

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3. ANALYSING THE IMMEDIATE AND THE SECONDARY EFFECTS OF COVID-19 ON WASH: THE CONCEPT

Since the start of the COVID-19 outbreak, national and local governments, together with WASH stakeholders, have actively employed a variety of emergency measures to secure access to services for all, albeit to different scales, scopes, and levels of ambition. Indeed, the WASH responses to the pandemic have varied across the type of stakeholders (national or local governments, service providers, regulators, etc.), the targets (e.g. households, schools, service providers, non-essential businesses), the mechanisms selected (e.g. stay-at-home orders, moratoria on utility disconnections, payment deferrals, etc.), the degrees of implementation and enforcement (voluntary vs. mandated), and in the timing of policy enactment and expiration (Jowers et al., 2021). Beyond the type of response measures implemented and their duration, countries experienced the COVID-19 effects on WASH services in different ways. The different experiences have also been influenced by the underlying strength of the country's economy and social services, the fragility of service delivery modalities before the pandemic, and the existing capacities and the level of preparedness of sector stakeholders to implement the response (UNICEF, 2020b). Overall, measures implemented have undoubtedly helped to mitigate the immediate effects of the crisis and the consequences of the pandemic on the delivery of WASH services. However, as the crisis has evolved into new phases, the implemented measures have also generated other secondary effects that may pose detrimental impacts on both services and products if not adequately addressed. The concept of this study is illustrated in Figure 2, which shows the linkages between the WASH response to COVID-19, the pre-pandemic context, the immediate effects in the early stages of the pandemic, and the secondary effects.

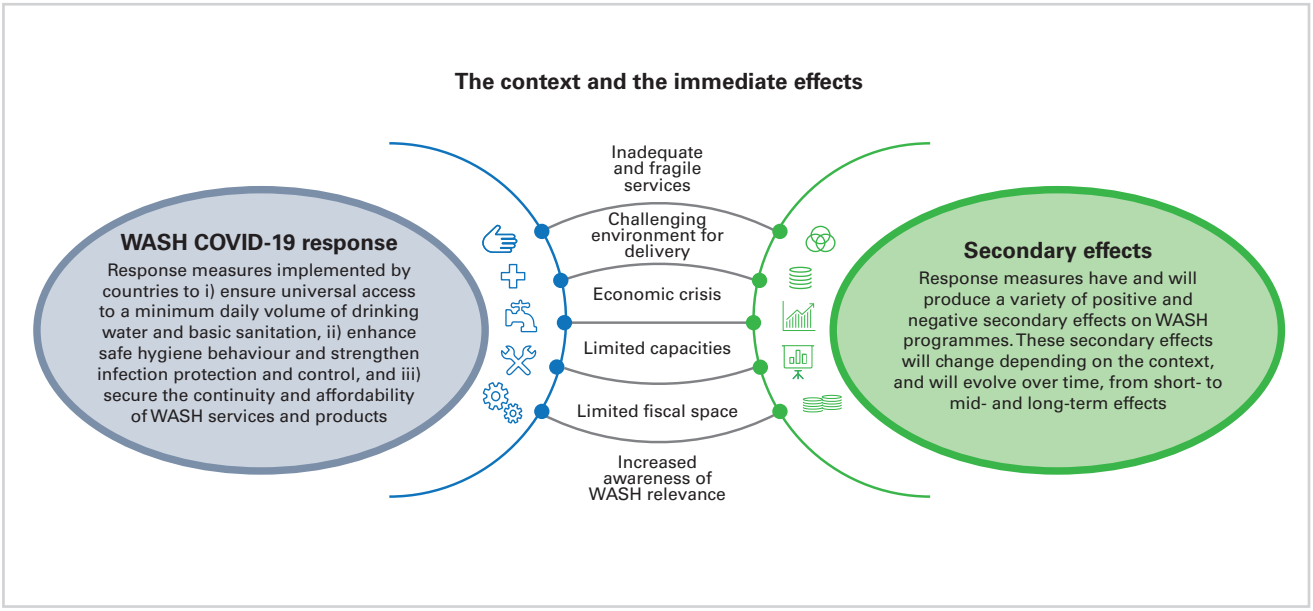

Figure 2 | Linking the response, the context and the immediate effects, and the secondary effects of WASH response to COVID-19.

WASH response measures have taken place in very complex and often fragile contexts. In turn, these contexts have mitigated or exacerbated the severity of COVID-19, with the highest impact felt in countries with weak governance and poor services. On that basis, the first part of the study jointly analysed the contextual elements as well as the immediate effects of the pandemic. Restricted mobility of workers and people, poor access to supplies coupled with price increases for WASH services and commodities, and an acute financial crisis at all levels – from the household to the institutions – have hampered the delivery of safe water and sanitation and the ability to promote and maintain good hygiene practice, particularly in growing informal settlements not connected to water grids and sewer systems (USAID, 2020; GWC et al., 2020). Those with no access to adequate WASH have been hit the hardest, such as vulnerable people already affected by poverty, disability, ill-health, social exclusion, and humanitarian crises (e.g. refugees, migrants, and internally displaced). At the same time, there has been an increased awareness of the relevance of WASH from a public health perspective, particularly concerning the need to ensure frequent and proper handwashing. In most countries, a strong focus of WASH response has been placed on implementing risk communication and community engagement (RCCE) by disseminating messaging and materials on COVID-19 prevention and risk reduction practices and by tracking and combating misinformation and fake news.

The second part of this study relates to the indirect secondary effects of COVID-19 caused by the measures taken to contain and control the pandemic as it evolves into new phases. The secondary effects have affected, and will continue to affect, the continuity, affordability, and safety of water and sanitation services in the short-, mid-, and long-term. In some countries, the COVID-19 response has resulted in mild to severe effects on services, ranging from partial disruption to irreparable deterioration or collapse. Some response measures have affected the ability of fragile and vulnerable populations to secure access to sufficient water and hygiene materials, whilst others have threatened the financial viability

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of WASH services due to loss of revenue and subsidies. They have all jeopardized governments' abilities to deliver WASH services and products, which might continue to decline in the mid-term. However, COVID-19 has also brought opportunities for sector transformation and recovery. It has reinforced the importance of access to safe and reliable water, and various responses have supported and accelerated progress towards ensuring availability and sustainable management of water and sanitation for all. For instance, some countries have addressed the historical access gap to WASH services by reconnecting users and implementing emergency facilities, such as water trucks. The pandemic has also helped to boost the application of automation and digital processes, which usually performed better during the crisis (Butler et al., 2020). Similarly, COVID-19 social distancing measures have pushed utilities to prioritize the use of other customer-utility channels of engagement, such as phones, apps, or the internet. If these measures are extended after the pandemic, they will promote sustainable and equitable access to safely managed services while increasing WASH sector preparedness and resilience for the future.

Figure 3 summarizes the key immediate and secondary effects of COVID-19 plus the elements that define the context in which WASH services have been delivered. The immediate and secondary effects are discussed in more detail in Section 4 and Section 5, respectively.

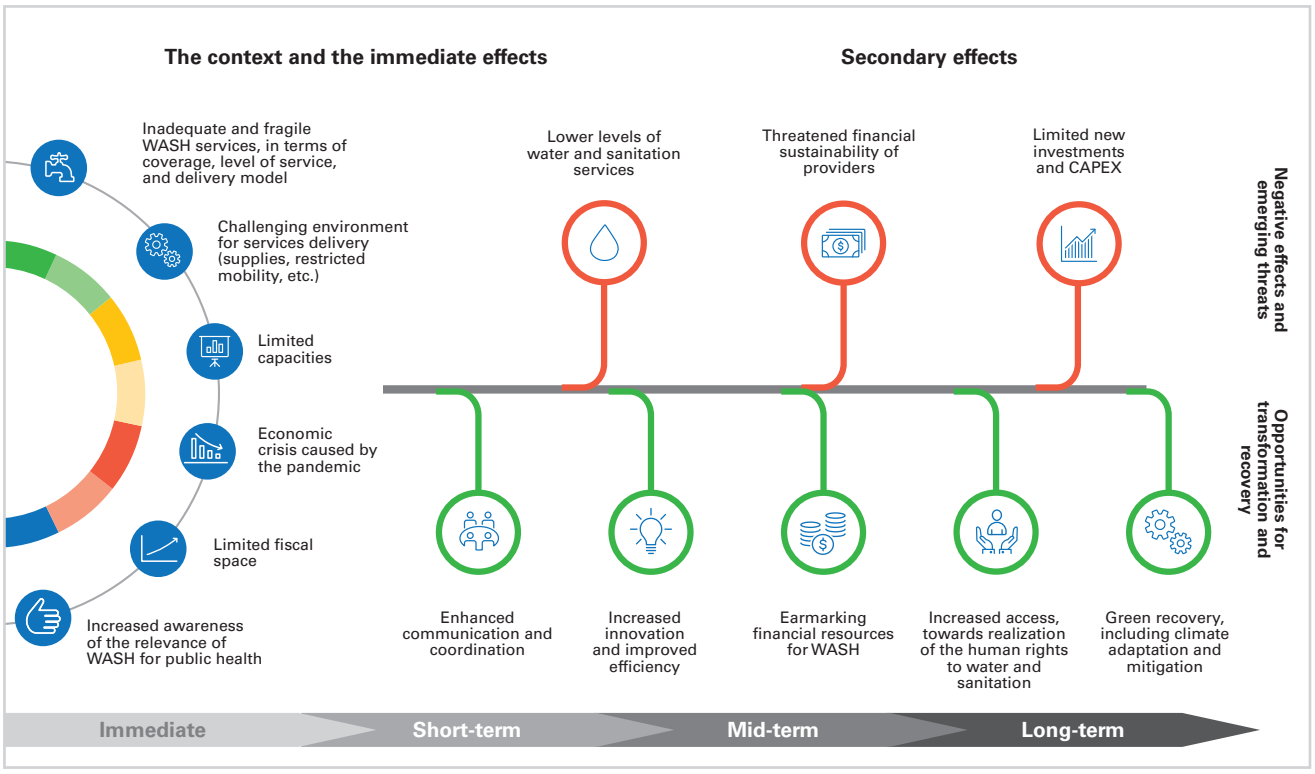

Figure 3 | Immediate and secondary effects of COVID-19 on WASH services for households and utilities.

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4. THE IMMEDIATE EFFECTS OF COVID-19 ON WASH

4.1 Inadequate and fragile water and sanitation services coupled with poor hygiene behaviours

Two out of five people in the world do not have a handwashing facility with soap and water on their premises | Since the onset of the pandemic, national governments encouraged handwashing with soap as a defence against COVID-19. But what if you do not have access to the basic resources of soap and clean water to carry out that task? The message of "wash your hands" is difficult to follow for 2.4 billion people who lack access to domestic handwashing facilities with soap and water (Brauer et al., 2021). Similar cases exist for 43 per cent of health care facilities, which lack soap and water at critical points (JMP, 2019b) and 47 per cent of schools with no handwashing facilities at all (JMP, 2020b). These disparities become even more clear when comparing rural vs. urban and rich vs. poor households and communities.

In a 16-country review of domestic handwashing facilities in Sub-Saharan Africa (Figure 4), Jiwani and Antiporta (2020) found that, on average, 33.5 per cent of households lacked a handwashing facility with both soap and water, with national estimates ranging from 64 per cent in Angola to as low as 5 per cent in Burundi. Among the poorest households in Burundi, only 1.7 per cent had proper handwashing access. In South Africa, the disparities in access across rich and poor were most visible, with roughly 25 per cent of the poorest households having access, contrasted against nearly 90 per cent of wealthy residents. In Rwanda, urban–rural disparities were highest, showing a gap of 41 percentage points.

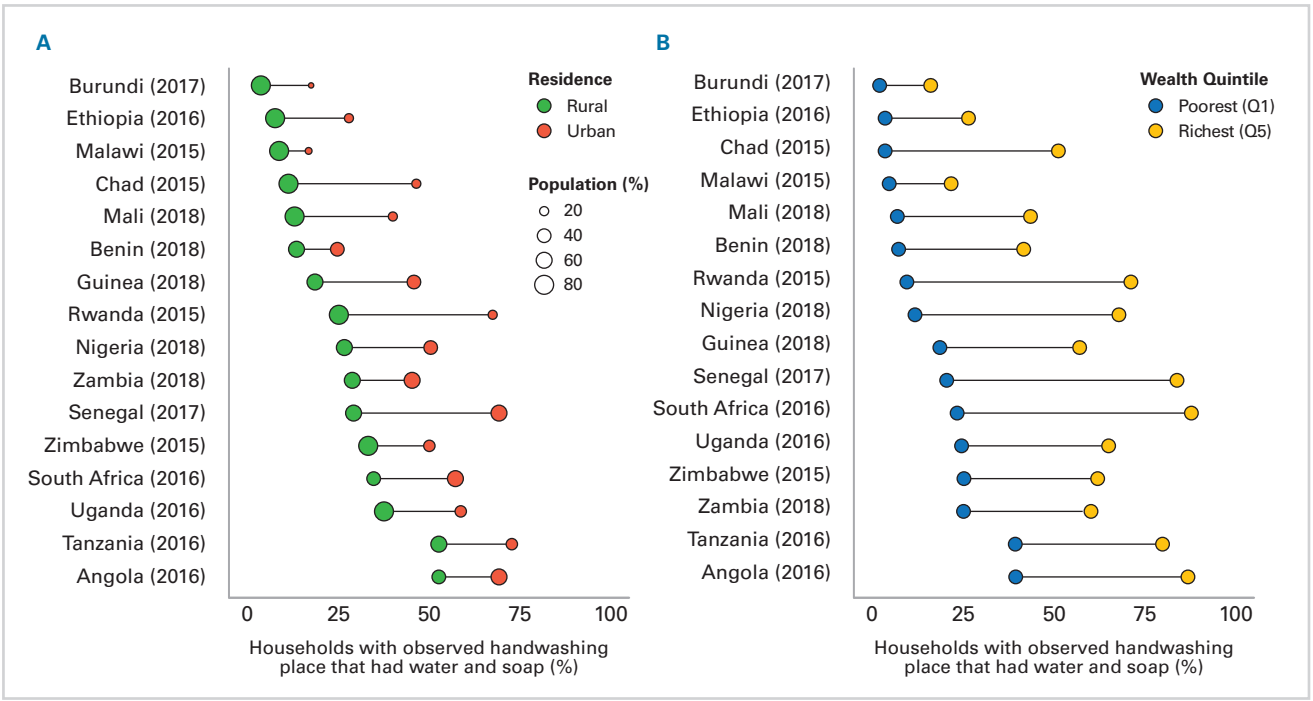


Figure 4 | Inequalities in the proportion of households with an observed handwashing place that had water and soap, by (a) place of residence and (b) wealth.
Source: Jiwani and Antiporta (2020).

Access to handwashing becomes even more challenging when water is not available on site and/or is only available in small quantities. A study by Nwobodo and Chukwu (2020) surveyed residents of rural communities in Eastern Nigeria. Among respondents without a handwashing facility, 67 per cent said the primary reason for not having a facility was due to lack of sufficient water. The same study indicated that only 9 per cent of respondents felt that a lack of a handwashing facility was their biggest barrier to following government recommendations on handwashing, while 51 per cent cited lack of water, and 24 per cent cited distance to water source as their primary barrier. The latest estimates by the UNICEF/ WHO Joint Monitoring Programme (JMP, 2019a) showed that three in ten people do not have access to a safe water source at home. For many of these households, water must be collected from far away, meaning that only a limited supply is available for hand hygiene, likely not enough to meet the needs of more frequent and rigorous handwashing required to prevent a multitude of diarrhoeal and respiratory diseases (Howard et al., 2020). Where piped water access is available, many people must manage with smaller quantities of water due to rationing by utilities; such is the case in Ghana and Kenya where residents have expressed concerns about staving off COVID-19 due to reduced water availability (Anim and Ofori-Asenso, 2020).

Box 1. Improved access to essential hygiene supplies for conflict-affected people in Eastern Ukraine

In Ukraine, the WASH situation has worsened in the last two years, mostly thanks to regular and frequent water supply interruptions, hindrances for the water treatment service providers, and lack of money for households to pay for hygiene supplies. Thus, hygiene products are infrequently used, negatively impacting hygiene practices for the most vulnerable and raising the risks of diseases. Emergency WASH needs have been stronger closer to the contact line between government-controlled and non-government-controlled areas, where access to basic WASH services is very limited.

The United Nations Children's Fund (UNICEF), in partnership with Triangle Generation Humanitaire, has been implementing hygiene item distribution activities via electronic vouchers since 2016. This innovative system works by sending a virtual sum of money to the targeted beneficiaries via SMS. This amount can then be redeemed for predefined hygiene products from the partner shops. Cash transfers have received a lot of attention globally and are a suitable approach in Ukraine to meet the needs of people experiencing displacement, lost income, and disruption to government welfare programmes.

In the current pandemic, and based on past experiences, UNICEF was able to coordinate in a few days a three-month contingency project to support healthcare facilities and households with e-vouchers for hygiene supplies. The project was scaled-up and developed to continue and extend support for hygiene and cleaning supplies to households and institutions in Eastern Ukraine for another six-month period. The total number of beneficiaries under the contingency project was 185,615, and under the scale-up project, 415,069 people were reached through support to households and institutions (health care, social, and educational facilities). The overall cost of all e-vouchers redeemed under both projects in 2020 was USD 587,572. The project was complemented by other direct measures (hygiene kits for hard-to-reach areas,

partnership with the private sector for in-kind donation of sanitizing gel, risk communication and community engagement and hygiene promotion, distribution of personal perspective equipment to front-line workers, etc.) and indirect measures (advocacy for the poorest households to receive subsidies to pay utility bills).

Source: UNICEF (2021a, 2020c).

Inadequate WASH services jeopardize hand hygiene | Access to a sufficient amount of water is considered a key factor in the control of COVID-19; thus, it can be expected that households that have reduced access may face greater risk of transmission (WHO and UNICEF, 2020). For instance, in the Navajo Nation (USA), a clear relationship between limited access to water and a rise in COVID-19 cases was observed in the early days of the pandemic (Chappel, 2021).

More than 627 million people use a toilet facility that is shared with at least one other household (JMP, 2019a). This number is based on those using improved facilities, and it is likely underestimated (Caruso and Freeman, 2020). While in some cases sharing of toilet facilities may be between just one or two families, in other cases sharing may involve the use of toilet blocks among several dozen households. When used by an infected person, shared toilet facilities may become a source of airborne and contact exposure to COVID-19, particularly when soap and water are lacking (Caruso and Freeman, 2020). Again, women may be at greater exposure risk due to their heavy reliance on sanitation infrastructure during menstruation or pregnancy and in assisting other family members (Caruso et al., 2017). In addition, self-isolation of infected people is next to impossible for those who rely on shared WASH services (Parikh et al., 2020), meaning that without adequate WASH services at home, greater exposure of the most vulnerable will likely present a risk for public health. Caruso and Freeman (2020) also highlighted the dependence upon shared WASH facilities in migrant centres, prisons, internally displaced people (IDP) camps, and among the homeless.

Inadequate WASH services in institutions, such as health centres, referral hospitals, schools, and public spaces, such as transportation hubs, may further impede any progress to overcoming the impacts of COVID-19. According to WHO (2020b), one third of health care facilities do not have what is needed to clean hands where care is provided, putting critical front-line workers, such as nurses, doctors, and support workers, at risk. Similarly, in 2019, four out of ten schools did not have handwashing facilities (soap and water). This meant that 818 million children lacked a basic hygiene service at their school, including 355 million whose schools had facilities with water but no soap and 462 million whose schools had no hygiene service (JMP, 2020b).

WASH services are at greater risk when they overlap with external shocks, such as natural disasters, climate change, and water scarcity | Natural disasters or extreme water scarcity events that further hinder fragile WASH services, such as those observed in Cape Town, Chennai, and Sao Paolo, are a significant threat to the long-term pandemic recovery (Brauer et al., 2021; Sadoff and Smith, 2020). Longer dry seasons, often observed as result of a changing climate, also put more people at risk of contracting COVID-19 due to lower water pressure and flow at standpipes, resulting in longer filling queues and crowding, as well as less water available for hygiene needs (McDonald et al., 2020).

4.2 Delivering services in a challenging environment

Service providers and utilities have struggled to protect essential workers from exposure to COVID-19 and ensure continuity of WASH services and products | By and large, regular operation and maintenance of water and sanitation services have been affected by COVID-19 by the increased risk

of contagion among utility staff. In response, service providers have put in place a variety of measures to protect essential workers from exposure to the virus. They have been primarily based on the development of preventive measures through new organization, operation, and commercial protocols for increased safety and security, including training and capacity-building initiatives, the provision of personal protective equipment (PPE), the adjustment of the code of conduct, and new ways to rationalize processes and workforce management (physical distance, efficiency, remote working). For example, the National Water Secretariat of Ecuador developed a "protocol for the protection of the personnel that operate the drinking water and sanitation systems", which applies to both public and community operators to ensure the continuity of service delivery during the COVID-19 emergency. Similarly, the Brazilian utility, Companhia de Saneamento Básico do Estado de São Paulo S.A, implemented emotional support programmes with the objective to support those employees who faced situations of emotional discomfort, especially during the lockdowns, which could cause interference in their personal and professional life (SIWI, 2020d).

During the pandemic, the adoption of more flexible operational approaches, according to the circumstances and the context, has been crucial to keep essential water and sanitation services running while pushing forward with ongoing construction works. Many governments identified people working in the water and sewerage industry as essential workers, enabling utilities to maintain continuity of service (Butler et al., 2020; Gude and Muire, 2021). In addition, to increase employees' protection, utilities applied a wide range of measures ranging from thorough check-ups of health conditions, the provision of PPE, and the prevention of close contact among staff and with customers (JWA, 2020). Physical distancing protocols have meant that utilities can only retain operationally critical staff on site (Butler et al., 2020). Therefore, other measures taken by operators have included the organization of work crews, restricted visits to the water treatment plant, the development of alternative channels for customer services, and the organization of teleworking for non-technical staff (GWOPA, 2020). In Chile, Aguas Andinas implemented voluntary confinement for workers in several of its precincts in Santiago, together with the arrangement of operational and rest camps within its drinking water production plants, bio-factories, cooperative precincts, and its subsidiaries (SIWI, 2020d).

Finally, utility's day-to-day work activities and routine field operations have been also affected. For instance, utility staff reported problems with collecting mandatory routine compliance water quality samples and to read or replace water meters. In both cases, customers have been reluctant to allow utility personnel entrance to their homes because of the risk of contagion (States, 2020). In rural areas, other problems encountered by community organizations have related to their ability to meet due to mobility restriction and confinement policies, with severe impacts on the participation of users on decision-making processes.

Service providers and utilities have faced operational challenges due to shortage of treatment chemicals, critical supplies, and equipment resulting from disruptions in the supply chains and increased prices | Global and local disruptions or ruptures in supply chains caused by restrictions on the entry and movement of materials and equipment, coupled with price increases for WASH services and commodities, have had a grave impact on securing the continuity of services (GWC et al., 2020).

In Honduras, for instance, water utilities reported difficulties in guaranteeing safe drinking water due to lack of supplies for water treatment because of mobility restrictions. Consequently, users did not pay the tariffs, which led to limited financial capacities for purchasing treatment chemicals (SIWI, 2020d). Service disruptions also caused significant challenges for smaller operators, since they rapidly exhausted cash reserves and were unable to cover electricity costs to operate pumps, for example.

Similarly, sanitation service providers suffered because of declines in demand during

lockdowns; although there was some recovery of activities in different countries as movement restrictions were lifted. In addition, faecal sludge treatment plant operators faced a steep path to recovery, given their dependency on government and donor funding to close financial gaps (USAID, 2020). Supply chain problems and increased costs of hardware and chemicals also made the provision of sanitation products and services less profitable, with significant margin contraction among suppliers of both on-site sanitation and faecal sludge management services (USAID, 2020).

Finally, in some cases, manufacturers and distributors of hygiene products reported margin losses despite increased demand. These losses were driven by i) a shift in preference from luxury brands towards lower margin economy brands, ii) increases in raw material costs, and iii) the inability to raise prices because of increased competition and a recognition of the weakened purchasing power of consumers (USAID, 2020).

Box 2. Tracking of the situation of children during the COVID-19 pandemic

Since the beginning of the pandemic, the United Nations Children's Fund country offices have conducted regular surveys to monitor the socio-economic impact of the COVID-19 pandemic on women and children. These surveys are aimed at gaining a better understanding of the level of disruption to vital services as well as government adaptations and responses in several thematic areas. Although issues related to water, sanitation, and hygiene (WASH) are indirectly covered in different sections of the survey, the section "WASH socio-economic impacts and national response" is fully dedicated to WASH. All surveys were completed via an online questionnaire and drew on the best available sources for each country[1], including administrative data and representative survey data collected in the three months prior to the survey, or where necessary, extrapolations from reliable localized quantitative and/or qualitative reports. All data is published in an open-access *dashboard*.

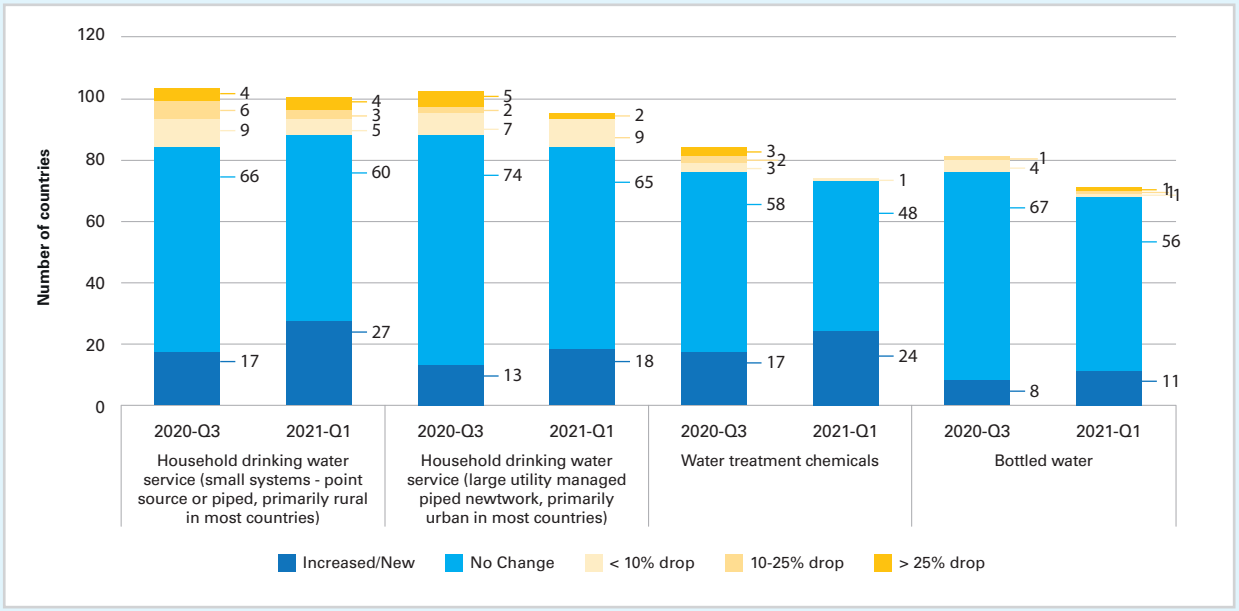
This box analyses data from three different surveys:

1. Q1 2020 (data collection until June 2020), including responses from 85 countries
2. Q3 2020 (data collection from August to September 2020), including responses from 134 countries
3. Q1 2021 (data collection from March to April 2021), including responses from 124 countries.

COVID-19-related disruption in WASH services and use | One section of the survey sought to understand the level of COVID-19-related change in coverage of WASH services and supplies nationally, whether due to change in availability, access, and/or use of services.

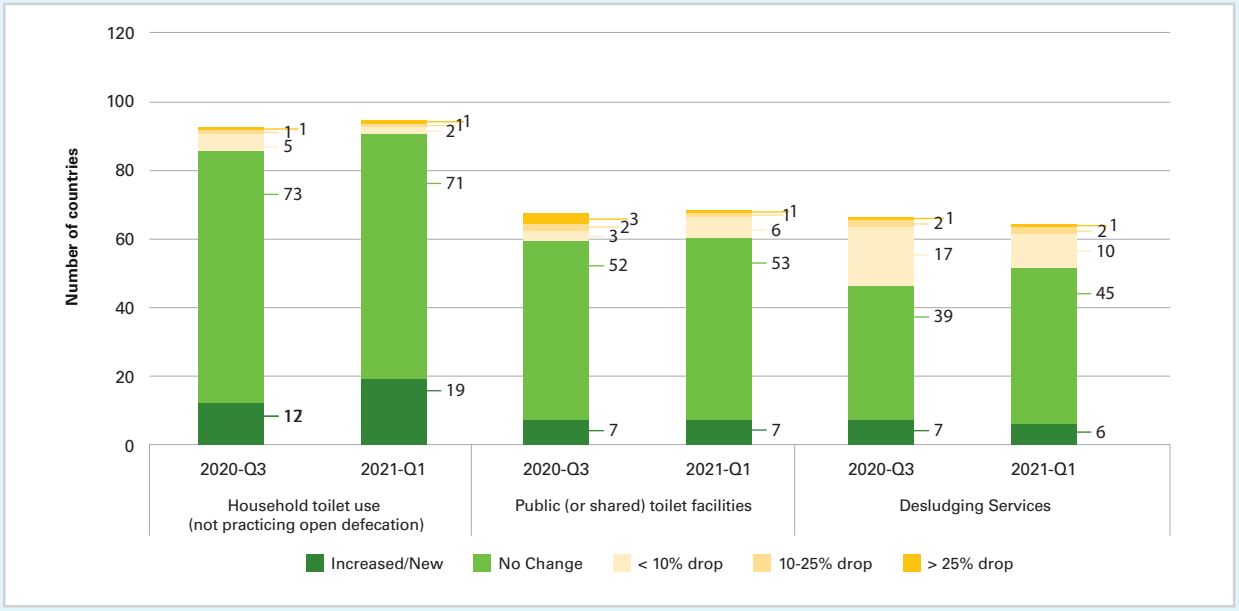
1 Estimates may not accurately represent the full national response to the COVID-19 pandemic.

Drinking water services and supplies – The surveys showed that most countries either experienced no change during 2021 compared to the previous year (on average, over 70 per cent); or increased drinking water coverage, maybe including new services (on average, roughly 15 per cent). No major differences were seen when comparing the different water-related services. The trend over the different reporting periods shows that the number of disruptions tended to slightly reduce in the first quarter of 2021.



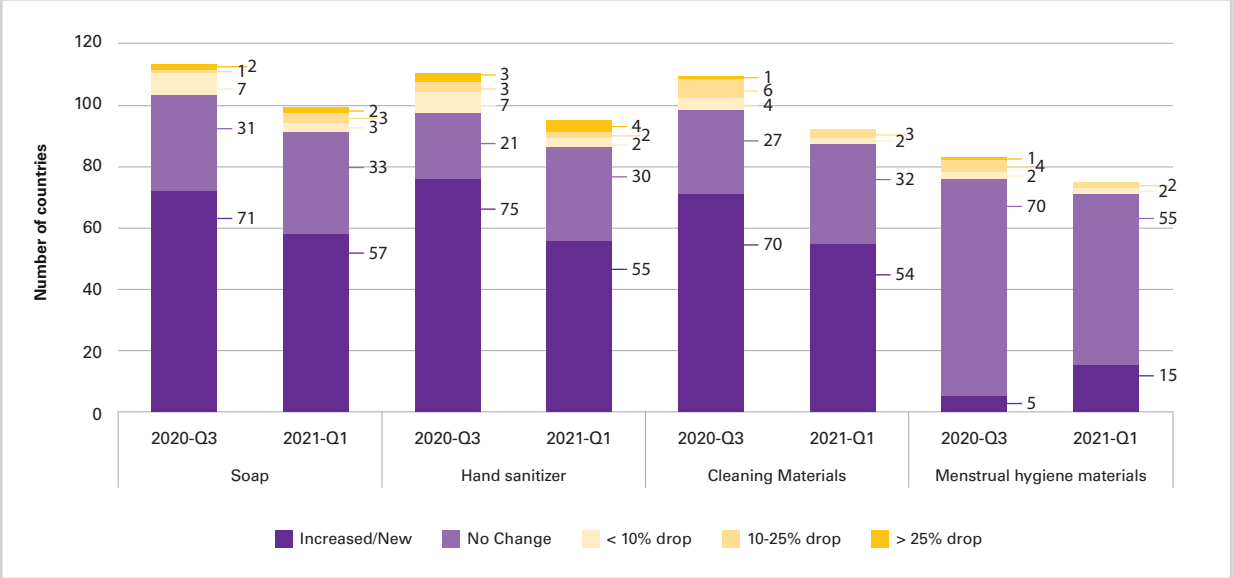
COVID-19-related change in coverage of drinking water services and supplies.

Sanitation services and supplies – Overall, similar trends were observed in relation to sanitation services: i) most countries reported no major changes compared to the same period the previous year (on average, over 70 per cent) and ii) minor improvements were observed in the last reporting period (Q1 2021). However, the data also show that services related to desludging activities were the most affected by COVID-19, while in contrast, only a few countries reported disruptions related to household toilet use.



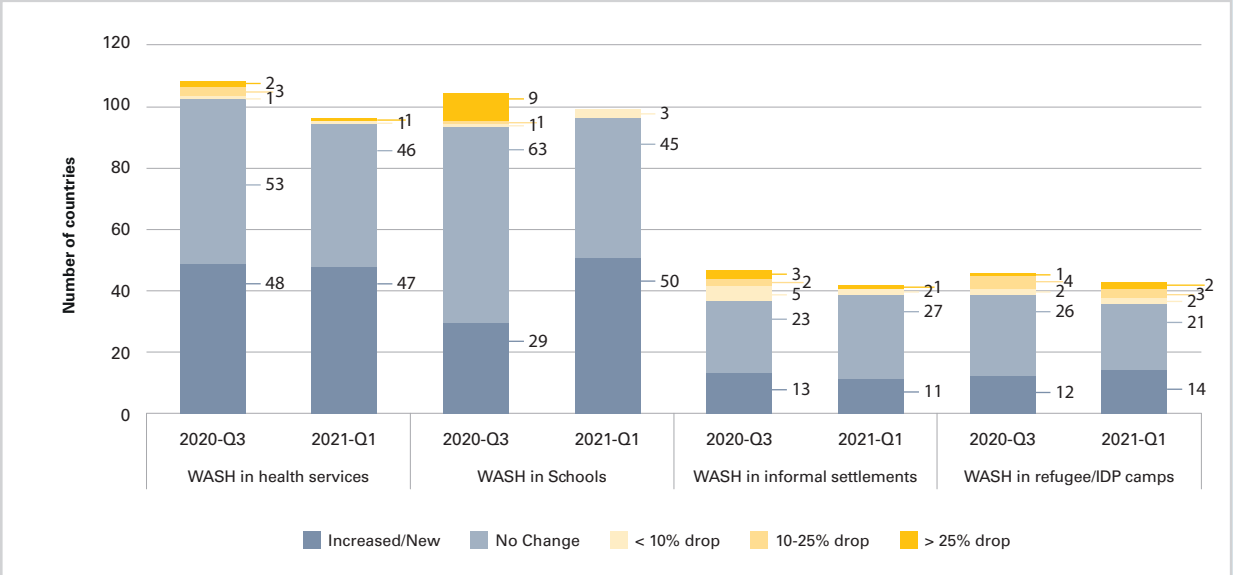
COVID-19-related change in coverage of sanitation services and supplies.

Hygiene-related services and supplies – During the pandemic, the focus of many governments has been on ensuring hand hygiene. Not surprisingly, more than half of the countries reported higher availability of soap, hand sanitizer, and cleaning materials; or no significant changes in relation to the provision of menstrual hygiene materials. Therefore, apart from the first months, only a few countries (on average, less than 10 per cent) continued to report hygiene-related supplies disruptions.



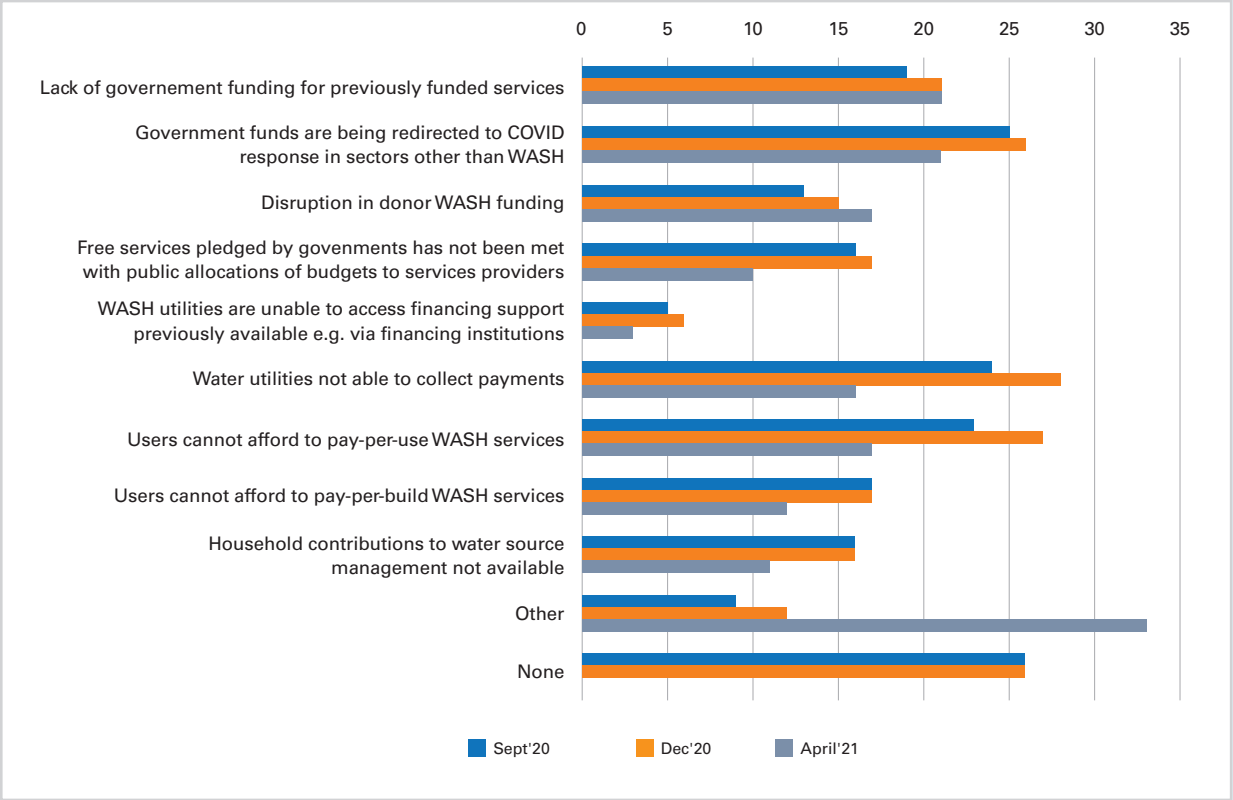
COVID-19-related change in coverage of hygiene-related services and supplies.

WASH services and supplies in other settings – In other settings beyond the household, it is interesting to observe that WASH service disruptions were rarely observed in schools and in health centre facilities. On average, only 10 per cent of countries reported lower levels of service during 2020 and less than 5 per cent during the first quarter of 2021. On the other hand, this percentage doubled (on average, 20 per cent) when referring to lower coverage of WASH services in refugee and internally displaced people (IDP) camps or informal settlements.



COVID-19-related change in coverage of WASH services and supplies in other settings.

COVID-19-related disruptions in financing of WASH services | Another topic addressed in the survey related to COVID-19-related disruptions in financing of WASH services. The graph below shows that a significant number of governments reported financial-related difficulties for continued funding of WASH services during the pandemic. Many of them had to redirect funds to COVID-19 response in sectors other than WASH. It can be also seen that water utilities in many countries were not able to collect water revenue from users due to free-water initiatives launched by national governments. From the user perspective, it can be observed that affordability issues were also reported, with a small improvement in the last reporting period.



Number of countries reporting COVID-19-related disruption in financing of WASH services in the past three months.

Source: UNICEF (2021g).

Change in water consumption patterns and demand during the lockdowns | COVID-19 has changed water consumption patterns in both domestic and non-domestic settings (Antwi et al., 2021). The changes have been mainly attributed to the closure of non-essential activities and other social restrictions introduced by governments. At the household level, the increase in water consumption was primarily due to the number of consumers who had to stay at home due to lockdown restrictions, including smaller businesses that had to operate from homes, and restrictions of some site works and operations. As a result, activities such as washing, cooking, flushing, handwashing, gardening, and filling of pools became common during the lockdowns (Cotterill et al., 2020). In contrast, the greatest reduction in water consumption was observed in industrial activities, followed by the commercial sector. The closure of schools, shopping malls, restaurants, and hotels also decreased water consumption.

The assessment of water consumption patterns under emergency or pandemic situations is

Box 3. Disruption of supply chains and poor quality of products and materials in rural areas in Bangladesh

Many changes occurred for water, sanitation, and hygiene (WASH)-related services in Bangladesh due to COVID-19. During the initial period of the pandemic, there was a huge shortage of hygiene materials. Despite the manufacturers' capacity to deliver, the quality of the products was insufficient. Many areas have already been struggling to ensure the provision of safe drinking water and water for household use. Due to COVID-19, there are now even greater WASH service provision challenges in rural area and internally displaced people camps.

After the first case of COVID-19 reached Bangladesh, the government decided to impose mobility restrictions all over the country. The most immediate consequences were shortages of different life-saving materials, including soap, hand sanitizer, cleaning materials, water treatment chemicals, and menstrual hygiene products, among others. It was reported from all over the country that the market lacked these materials. In city areas, especially in the big cities, there were some online shops with home delivery services. However, in rural areas it was difficult to obtain these materials. The pandemic created an increased demand on such products, and therefore, prices skyrocketed. This, in turn, made the products inaccessible for people who could not afford them.

Rohingya refugees were already struggling to get adequate supplies of safe water and sanitation facilities. Due to COVID-19 restrictions, many basic and life-saving services were suspended for a considerable amount of time, and many organizations also suspended their operations following the government-imposed restrictions. However, with the ending of mobility restriction, regular WASH services resumed for the refugee population. Therefore, the impact of COVID-19 was not only felt as an economic impact at the household level but also as an impact on the affordability of basic WASH materials.

Source: interview with Shahid Kamal Regional Humanitarian Aid Coordinator- ASIA - HEKS/EPER.

important for decision-makers to define actions that ensure the availability of water for the population and for the provision of essential services (Kalbusch et al., 2020). Regarding the control of water consumption during the pandemic, the recommendation was made to prioritize and guarantee the water supply to health services and other essential activities, such as activities directly or indirectly linked to the pandemic's spread prevention. However, uncertainty over water availability and management in various countries hampered these monitoring efforts and challenged the response, particularly in water-scarce contexts.

In the MENA region, for example, water demand for handwashing in households increased by 9–12 litres per person per day as a result of COVID-19 mitigation measures, representing an average increase of 5 per cent in household water demand, which is equivalent to 4–5 million cubic metres. This conservative estimate does not include projected increases in household water demand that may be associated with increased laundry, cleaning, and food washing. The situation gets worse with the insufficient and intermittent piped water supplies in 10 Arab countries, where 70 million people do not have a continuous water supply (UNESCWA, 2020). Since mitigating the effects of the pandemic requires changes in behaviour and consumption patterns, it may also result in a new normal of increased expenditures and domestic water demand relative to industrial and agricultural water uses (UNESCWA, 2020).

Box 4. COVID-19 impacts on community-based water provision in Colombia

Some of the response measures decreed during the pandemic, such as the total or partial confinement of the population or restrictions on mobility, have conditioned the normal operation of rural water operators and their organizational capacity. The digital gap in rural areas, for example, has hampered citizen participatory processes (e.g. in the preparation of local development plans). Instead, other coordination mechanisms, together with innovative communication strategies, have been promoted between civil society organizations and territories.

One major challenge related to the continued urban–rural migration during first months of the crisis was the increasing number of requests for new connections to the water system in a short time. The need to cover the growing demand, together with certain administrative restrictions to public financial support, to subsidies, and to new water concessions access, made it difficult to build new water-system connections and conditioned the operation of many community aqueducts. In addition, this migration process triggered conflicts with the new inhabitants, who did not understand the local norms and the operational and organizational rules of the community. As described by the National Network of Community Aqueducts (Red Nacional de Acueductos Comunitarios de Colombia, RNAC), "rural inhabitants do not feel that they are the providers of a service, but rather the guarantors of a human right". Therefore, it has been difficult for them to integrate new urban dwellers into the organizational tasks of the aqueducts and their multiple participatory processes. The COVID-19 crisis has, however, helped to disseminate and visualize the challenges related to community service delivery modalities in rural Colombia.

Source: interview with María Botero-Mesa, RNAC.

Decline in quality of humanitarian WASH response and limited access to services by populations already affected by pre-COVID-19 humanitarian situations | The Global WASH Cluster and other NGOs were quickly alerted to the COVID-19 detrimental effects on WASH service provision, particularly those experienced by people already affected by humanitarian crises, including refugees, migrants, and IDP (GWC et al., 2020; McDonald et al., 2020). Government restrictions on movements and gatherings of individuals has hampered the ability of humanitarian actors to distribute aid, requiring more distribution sessions to allow for smaller crowds and increasing logistic costs. The movements of drilling companies and suppliers were restricted during lockdown measures, as they were not always considered essential services. Bans on public transport resulted in higher operational costs, as staff had to be moved using service vehicles. International personnel and equipment were held at borders or unable to travel or be transported due to lockdowns. Many humanitarian WASH programmes rely on a cash or coupon programme, which requires functioning markets, many of which closed during the pandemic. In order to avoid crowds, some individuals sought to collect water during the night; however, this was also prevented by enforced curfews (GWC et al., 2020; McDonald et al., 2020).

In response, humanitarian WASH actors have had to put in place all the necessary protection and mitigation measures to reduce the risk of COVID-19 contagion in camps and other humanitarian settings. In Burkina Faso, for instance, the estimated reduction in the number of beneficiaries of WASH humanitarian assistance was 60 per cent per month due to the abovementioned restrictions. The WASH Cluster called on the national government to authorize a waiver of restrictions for humanitarian actors to allow for the delivery of aid to the most vulnerable populations (UNICEF, 2020a).

4.3 Economic crisis caused and/or aggravated by the pandemic

The COVID-19 pandemic has delivered a heavy blow to economic activities worldwide | The pandemic hit the developed economies the hardest, with an estimated output decline of 5.6 per cent in 2020. The contraction was comparatively milder in developing countries, with output shrinking by 2.5 per cent in 2020. However, these aggregate figures mask significant regional variation (UN DESA, 2021). This pandemic-induced economic crisis will have severe repercussions on the global economy. It is estimated that the global economy contracted by 3.5 per cent in 2020, and the extreme measures taken by many governments around the world, such as lockdowns, have caused the loss of millions of jobs (O'Callaghan and Murdock, 2021). In the UK, for instance, many families and individuals now face dire situations and have difficulties meeting their financial obligations, which are expected to increase significantly in the coming months of de-escalation (Owfat, 2021).

The pandemic unleashed a severe employment crisis worldwide | According to the International Labour Organization (ILO), the pandemic has had a devastating effect on working-hour losses, causing a massive drop in labour income around the world (ILO, 2021). It is estimated that global labour income has declined by 10.7 per cent in comparison to the previous year (January–August 2020). This is equivalent to USD 3.5 trillion, and it excludes any support given by government measures. For the last quarter of 2020, the global working-hour losses were projected to reach 8.6 per cent, which corresponds to 245 million full-time equivalent (FTE) jobs. In comparison with the previous estimates made by the ILO, there was an increase of 4.9 per cent, which is equivalent to 140 million FTE jobs. Overall, the Americas have been hit the hardest, with labour income losses of 12.1 per cent (ILO, 2021). For example, in Latin America and the Caribbean, unemployment reached 5.4 percentage points (CEPAL and OPS, 2020). Moreover, almost 1.6 billion informal workers were affected by lockdown and mobility restrictions and/or were working in the hardest-hit sectors (ILO, 2020b).

Global extreme poverty increased in 2020 and will continue to rise in 2021 | The COVID-19 pandemic is estimated to have pushed an additional 119–124 million people into poverty in 2020, with the total rising to as many as 143–163 million by 2021, depending on the severity of the economic contraction (Lakner et al., 2021). This economic crisis, in turn, has led to increasing levels of poverty and extreme poverty in regions where there were already prevailing inequalities. In Latin America, for example, it was estimated that poverty increased by 7.1 per cent in 2020 to 37.3 per cent in 2021, while extreme poverty increased by 4.5 percentage points (from 11.0 to 15.5 per cent) (CEPAL and OPS, 2020). In Africa, compared to the pre-COVID-19 forecasts, an additional 14 million Africans became extremely poor in 2020. By 2030, at the end of the Sustainable Development Goals (SDGs) period, an additional 38–70 million more people will be classified as extremely poor. This will raise the poverty rate of the continent's population from 35 to 37 per cent (AMCOW, 2021).

Lockdown situations have severely impacted the most vulnerable groups | Women, children, slum dwellers, migrant workers, and the elderly have been hit hardest by the COVID-19 crisis (UN DESA, 2021). The differentiated impact of COVID-19 on women and girls is increasingly evident, which deepens the gender inequalities that already exist in many countries. It is mostly women who are responsible for care in the home, in the health sector, and in care centres for the elderly and the sick that have been impacted. Moreover, considering that most of the informal work is performed by women, the economic impacts will also be considerable (IASC, 2020). Women, who make up more than 50 per cent of the workforce have also been hit hard in labour-intensive sectors (UN DESA, 2021). Moreover, in the health sector, where it is observed that there is a higher gender pay gap than the overall gender gap of 16 per cent, 70 per cent of workers are women (UN Women, 2021).

Confinement during lockdowns has also led to school closures and remote learning, causing more than 1 billion children to be at risk of

falling behind in their educational prospects. It is estimated that 31 per cent of school children around the world, equivalent to 463 million, cannot be reached by broadcast and internet-based remote learning, either because they have no access to the necessary technological assets at home or because they may have not been directly targeted by adopted policies. Moreover, many face the risk of never returning to school, thus undoing the progress made in education during the past decade around the world (UNICEF, 2020e). These prolonged closures will not only have an impact on learning outcomes but also on the school-based services that are essential for nutrition, health, welfare, and the protection of vulnerable children (UNICEF et al., 2020).

Box 5. Water, sanitation, and hygiene (WASH), COVID, and women's economic empowerment

COVID-19 has been impacting women and men, girls and boys in different ways and will likely deepen the gender inequalities that already exist as a result of insufficient WASH services.

As primary caregivers, responsible for water and food in the home, women and girls spend considerably more hours in unpaid domestic labour than men and boys. Pre-pandemic, women were already spending about three times as many hours in unpaid domestic work than men. Now, with more time needed to collect water due to longer queues, market closures, and social distancing measures, plus greater demands for childcare and homecare, insufficient WASH services may further impact women's economic empowerment by allowing less time for studies or productive activities. This increased burden is a significant contributing factor to the global exodus of women from the workforce, and as evidenced in the Ebola outbreak, poses a significant risk to girls' continued education.

Less time available for productive uses outside of the home may further reduce access to WASH and menstrual hygiene management essentials for women and girls. In a WaterAid survey, which looked at the gendered WASH impacts of the pandemic, 61 per cent of respondents claimed the costs of water and soap have increased, and 73 per cent of respondents said women and girls cannot afford to manage their periods during the pandemic.

Not only does this reverse years of progress towards gender equality, it also has serious implications on global economic growth. Doing nothing to address the differentiated impacts of the pandemic on women's participation in the workforce will cost global gross domestic product USD 1 trillion; however, taking action now to course correct could add USD 13 trillion to the global economy.

Sources: Madgavkar et al. (2020), UN Women (2021), Stielow et al. (2021), Fry and Lei (2020) and Benini (2020).

4.4 Limited capacities for implementing the WASH response

Limited coordination capacity within WASH stakeholders and between WASH units might have hampered the provision of WASH to vulnerable groups | Ensuring access to water, to sanitation, and to handwashing facilities with soap for all, with specific attention to vulnerable populations and groups, requires a strong coordination capacity among a variety of stakeholders from different sectors (e.g. WASH and health, or WASH and education) and of different natures (e.g. humanitarian and development). People such as those living in social homes for the elderly, disabled people, homeless, migrants or even orphanages, are at risk when institutions lack adequate

Credit: ©UNICEF/UNI319153/Romenzi

coordination of sanitation measures. Camps for IDP and refugees both formal and informal, and urban slums are also at risk and require specific coordination mechanisms. In general, however, local authorities have limited capacities in conducting quick WASH assessments or in running existing WASH monitoring systems to capture services functionality in affected places. They also lack response capacities to train community health workers and local volunteers on basic infection prevention and control measures and know-how to ensure prevention of all kinds of harassment during a chaotic response to outbreak.

National and local authorities are often weak in their decision-making due to limited access to reliable and updated information | Without adequate data and information, efforts to improve access to WASH services or promote hygiene behaviour become ineffective and inefficient. Without appropriate monitoring and information systems, national and local authorities are limited in their capacities to apply adequate hygiene precautions at home and in institutions. Similarly, limited capacity to use of new data tools, such as water accounting and urban water accounting, often constraints decision-making and urban planning. Data gaps, such as how many people live in informal settlements, how many people have access to WASH, trends in water supply and demand, and the amount of water entering and leaving cities, can hamper decision-making and water management. For example, only 12 per cent of 115 countries and territories surveyed for the UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) reported that urban drinking water surveillance was carried out at 100 per cent of the required frequency (WHO, 2019).

Box 6. Access to reliable and updated information to support decision-making during the pandemic

During the pandemic, in a changing and challenging context, the need for reliable information to support decision-making has increased. However, this information has been rarely available, hampering the operational capacities of the regulators.

In Colombia, the Superintendency of Residential Public Services (SSPD for its acronym in Spanish) has the mandate to request information, including accounting and financial data, from service providers and utilities for surveillance, control, and inspection. Based on available data collected by the SSPD, the Colombian Water and Sanitation Regulatory Commission (CRA) make regulatory decisions.

In the context of the COVID-19 emergency, the SSPD set up a temporary monitoring and reporting scheme, to be updated daily by service providers and utilities, with the aim of identifying their liquidity needs and to monitor the implementation of measures adopted by the national government and the CRA to address the crisis.

However, there were deficiencies in the quality and timeliness of information. In fact, according to the SSPD's June 2020 report, the number of water and sewerage utilities that reported information consistently did not exceed 15 per cent, and the data showed several inconsistencies. In addition, there were failures in the coordination between the SSPD and the CRA that hindered the timely transmission of information for regulatory decision-making.

The crisis generated by COVID-19 has made evident the need for structural changes in the management of information in the drinking water and basic sanitation sectors in Colombia to ensure that the information available to the CRA for regulatory decision-making is timely and of high quality.

Source: interview with Diego Felipe Polania, Executive Director, CRA.

The WASH response might have been inadequate, in part due to insufficient and inadequate communication | During the pandemic, local authorities often lacked capacities to directly communicate key messages on infection prevention and control to ensure equal access of WASH services for all. This applied to the household level and in public settings, such as health centres, schools, hotels, social institutions, or working places. One example relates to the limited capacities to increase awareness among populations to make efficient use of water in countries where free-water initiatives were implemented, particularly in water-scarce contexts.

Inadequate resilience capacity of many utilities hampered their response | The level of preparedness of utilities to respond to the pandemic has shown weaknesses and capacity gaps. Capacity-building and the use of digital tools can increase the sustainability of service delivery organizations who often have problems with cost recovery, non-revenue water, and low-revenue collection (Cooper, 2020a; Rodriguez et al., 2020). In turn, these problems pose challenges for capital investment and future expansion (Rodriguez et al., 2020). Tackling these challenges is important to ensure that water shut-offs do not occur and households have access to water during pandemics, particularly if asked to self-isolate. By and large, donor support to help bolster utilities' capabilities and increase their resilience to continuing pressures has been low (SIWI, 2020b).

Adequate capacities in good governance have been claimed as essential to ensure an adequate delivery of WASH services to

fight and prevent future pandemics | Limited policy, institutional, and regulatory capacities were even more visible during the pandemic (Cooper, 2020b). For instance, cities needed to stop unsafe sanitation practices and regulate new approaches to protect public health. Capacity-building may be needed to ensure effective protection for public health, as many cities have weak or non-existent regulatory capacities (Satterthwaite et al., 2019). In addition, the limited capacities of institutions and regulatory bodies to ensure stakeholder participation and multi-stakeholder platforms misses the opportunity for inclusive water management and strengthened resilience for future outbreaks. Limited knowledge in various stakeholders' institutions hampers good governance and management.

4.5 Limited fiscal space

Mitigating the economic impacts of the COVID-19 pandemic has caused a substantial increase in public spending and amendments to existing budgets for almost all governments | Increases in public spending and budgetary amendments were primarily aimed at adapting to the new emergency circumstances and include a range of measures in all economic sectors with an objective to protect people's health, lives, and livelihoods. Local authorities also advanced their decentralized budgets to the extent available, implementing various costly public health measures to prevent the spread of the virus, and in some cases, to provide health treatments and services to infected populations. Local authorities also played a significant role in social protection by, for example, providing financial support to citizens or businesses that were out of work. These measures, whether applied at national or decentralized levels, turned out to be highly resource intensive and will need to be continuously applied in the short-term. When combined with the reduced economic activity, these measures rapidly affected national and local fiscal capacities. Without the financial means necessary to continue addressing the emerging issues caused by the pandemic, authorities are becoming less relevant for socio-economic recovery.

In many countries, WASH has been left outside the national response plans due to limited fiscal space | WASH is one of the most important sectors for COVID-19 recovery, and many African countries, for example, have made several policy decisions to improve coordination and information flow and to strengthen the capacity for WASH service delivery, interventions, procurement, or new installations (AMCOW, 2021). However, due to limited fiscal space, the principal partners for implementation of these measures were primarily reached through partnership with critical non-state actors, especially in the private sector (e.g. in Angola, Egypt, Ethiopia, Malawi, Senegal, and South Africa). Many countries claimed this was necessary to strengthen resource mobilization towards plugging the financing gaps that were widespread during the response strategies.

As the COVID-19 outbreaks are difficult to predict and can repeatedly affect the same countries, it is very difficult to speculate about the pandemic's potential negative impacts across the WASH sector. However, for many analysts, the most common thread from repeated outbreaks concerns finance, specifically public expenditures being dependent on tax revenues (Howard et al., 2020). As the logic of this pandemic is that insufficient soap and water pose a public health risk to society, investments in water supply infrastructure by households, governments, and development partners is a critical part of the solution.

A funding shortfall has occurred across WASH | Low- and middle-income countries have reported as little as 0.08–2.54 per cent of gross domestic product (GDP) invested in WASH during the pandemic[2]. In addition, the report illustrates lower average per capita WASH expenditures for countries in low- and lower-middle-income categories as compared to upper-middle- and high-income countries (WHO, 2019). Therefore, to properly prepare for future pandemics, governments must increase their

2 In the GLAAS 2018/2019 country survey, 35 countries, representing 1.3 billion people, were able to categorize their WASH expenditures (WHO, 2019).

Box 7. Including water and sanitation needs in the COVID-19 response

While many countries failed to include WASH in their response to the COVID-19 pandemic, there are a few examples where WASH was included, though perhaps not to the extent needed. In Colombia, for instance, an economic reactivation plan for 2021–2024, worth a total of COP 35.7 trillion (about 3.1 per cent of gross domestic product (GDP) projected for that period, according to official estimates) was submitted to Congress at the end of July 2020. Of that amount, COP 24.3 trillion (2.5 per cent of GDP) will be used in 2021 to reinforce existing programmes in the areas of education, social inclusion, health, employment, and housing. In addition to the above funding, a less robust amount of COP 11.4 trillion (0.6 per cent of GDP) will be shared by water and sanitation, transportation, and housing sectors.

Another example is Chile, where the COVID-19 Transitionary Emergency Fund was approved, through which USD 12 billion (equivalent to 4.8 per cent of GDP) will be distributed over a period of 24 months in an effort to reactivate the economy. In addition to investment projects focused on sustainability and climate change mitigation, measures for reactivating the economy include strengthening instruments to protect households' incomes and expanding liquidity support for the private sector backed by the government (State guarantees or recruitment subsidies, among other measures). Less ambitiously, the Chilean government announced the plan, "Paso a paso, Chile se Recupera", which provides for additional resources to streamline and promote infrastructure investment projects focused on addressing the water crisis, supporting municipalities, improving mobility and integration in cities, upgrading roads, and building motorways and bridges.

Source: World Bank (2020b)

spending in the WASH sector. Given the current pandemic circumstances, it is very important for the international development community to reaffirm its commitment to WASH in both policy engagement and investment. As this seems to be difficult to accomplish with pandemic-affected and limited public funds, external development assistance becomes even more critical, such as grant funding from official development assistance (ODA). For example, foundations and loans from international sources only accounted for 12 per cent of finance in 2016–2018 (WHO, 2019). Significantly greater capital spending is particularly needed in Sub-Saharan Africa, where slow progress to date has resulted in capital expenditures (CAPEX) of 0.64 per cent (range: 0.29–1.0 per cent) of the gross regional product (GRP)[3], and in Southern Asia, a GRP of 0.21 per cent (range: 0.13–0.29 percent) is needed to close the gap. Similarly, some 50 per cent of the capital costs of basic water and sanitation and 58 per cent of the capital costs of becoming open defecation free (ODF) needs to be spent on extending coverage to the poorest two wealth quintiles (Hutton and Varughese, 2016).

4.6 Increased awareness of the relevance of WASH for public health

Increased awareness about proper handwashing at all levels | As the pandemic spread, millions of people around the world received the same message from authorities and health experts: one of the most effective actions to prevent infection was to perform adequate handwashing habits (WHO and UNICEF, 2020; WHO, 2020a; 2020c; 2020d; UNICEF and WHO, 2020). A variety of mechanisms were put in place to promote hand hygiene, including massive awareness

3 GRP is based on the aggregated GDP of countries in each region.

campaigns, messaging, and education as well as behavioural tools and tactics. For example, through a clear and integrated RCCE strategy and response, UNICEF reached 3.01 billion people during 2020, who now better understand the benefits of handwashing (UNICEF, 2021c). The private sector also played an active role in supporting these efforts. Unilever, for instance, backed by UK Aid, launched a GBP 50 million initiative to support programmes directed towards raising awareness and prompting behaviour change for a billion people worldwide. The campaign included countries such as Kenya, Ghana, and Bangladesh, and used different engagement and extension methods, such as TV, radio, print, and social media (Unilever, 2021).

The pandemic has renewed the interest of all WASH stakeholders in hand hygiene (SDG Target 6.2) | Many governments have taken the lead in prioritizing the WASH sector in different ways but with the same goal: improving hand hygiene. Dozens of countries and partners have joined the Hand Hygiene for All initiative (see Box 8), as well as other national initiatives. In Kenya, the regulator, in collaboration with the Ministry of Water, Sanitation and Irrigation, guaranteed that all water points were operational for effective handwashing with soap (WASREB, 2020). In Uganda, the water utility was mandated with the responsibility to install handwashing facilities in markets, as well as the installation of rainwater harvesting technologies in rural areas that lacked access to piped water supply (Ministry of Water and Environment of the Republic of Uganda, 2021). In Ukraine, the government, with the cooperation of the WASH Cluster, put emphasis on providing IPC assistance to health facilities in conflict-affected areas, including the provision of soap and cleaning materials, as well as the provision of water supply improvements in regards to reliability, volume, quality, and storage (WASH Cluster, 2020).

Box 8. The Hand Hygiene for All (HH4A) initiative

COVID-19 swept over a world unprepared for the worst pandemic in a century. As countries – developed and developing – scrambled to respond and provide guidance to their populations, they universally turned to one of the simplest and cost-effective public health solutions: wash your hands with soap.

In response to this unprecedented situation, WHO and UNICEF launched the HH4A initiative in June 2020, which brings together governments and leading organizations in the hand hygiene sector to convert fleeting attention to sustained programmes. The HH4A initiative focuses on strengthening supply of hygiene goods and services, generating demand through evidence-informed behaviour change programmes, and developing robust policy environments to facilitate accelerating hand hygiene.

Central to the initiative are costed hand hygiene roadmaps. The roadmaps are guidance documents designed to support national efforts to develop new, or strengthen existing, national efforts to achieve universal hand hygiene by 2030. They encompass step-by-step guidance for sector engagement and provide tools for constructive dialogue among all sector stakeholders. The roadmaps guide countries to identify actions that bridge the COVID-19 response, including medium- and longer-term development programming to achieve Sustainable Development Goal 6.2 and prepare for future crises. As of mid-2021, over 40 countries around the world were engaged in the roadmap process.

Source: UNICEF and WHO (2020)

The importance of WASH for quality of health sector | Health centres have faced many challenges with respect to lack of the necessary infrastructure to implement IPC measures and prevent overcrowding. In addition to poor waste management and poor environmental management and cleaning, other obvious flaws that the COVID-19 pandemic has brought to the surface include deficiencies in water access, water quality, proper sanitation, and hand hygiene facilities (WHO, 2020b; McGriff and Denny, 2020). The last data published by the WHO/UNICEF Joint Monitoring Programme (JMP) showed that one in four health care facilities, globally, lack functional water sources on premises (JMP, 2020b). In Sub-Saharan Africa, 50 per cent of all health care facilities have no basic water (WHO, 2020b).

Ensuring the reliable supply of clean water in health care facilities, however, has primarily been hampered by the lack of financing needed for health infrastructural development, coupled with inadequate WASH assessments to identify needs and prioritize improvements (e.g. portable handwashing stations, improve storage solutions, etc.). Additionally, leadership in the health sector and its coordination with WASH actors has not always been as effective as desired. For example, IPC committees could have played a role in recognizing the importance of WASH in the sector and identifying champions to be accountable to local and national authorities (WHO, 2020b; McGriff and Denny, 2020).

The importance of WASH for a safe return to schools | Based on the latest available JMP data, there was a total of 900 million school-age children that lacked handwashing facilities with water and soap in their schools before the pandemic (JMP, 2020b).

As schools are beginning to reopen, WHO, UNICEF, and other stakeholders have been advising and providing technical support to governments to implement WASH IPC measures in schools to protect children from the spread of COVID-19 and any other WASH-related diseases (UNICEF et al., 2020). In parallel, numerous protocols and guidelines have been elaborated and disseminated to provide the education authorities with technical recommendations and inputs for planning, preparing, and implementing a safe school reopening (UNICEF, 2020e; UNICEF et al., 2020; UNESCO, 2020; UNESCO et al., 2020). Considering the low percentages of access to WASH in educational establishments, reopening schools needs to be done safely (UNICEF, 2020e; UNESCO et al., 2020). Finally, there is a threat of increase in the inequality gap between students in urban schools (with better WASH conditions) and those in rural schools, and between those schools that have WASH services and can open safely and those that might be closed because of the absence of minimum WASH services.

In response, some countries have already shown initiatives to prepare themselves for reopening schools (SIWI, 2021a; 2021b; Giné-Garriga et al., 2021). For example, in Ecuador, a virtual course on WASH in schools was developed for directors, teachers, technical, and administrative personnel of educational institutions. In Mexico, the Ministry of Public Education, in collaboration with UNICEF, developed the subject "Healthy Life", with one specific section called "Health in Your Hands", which focused on showing children and adolescents effective ways of preventing the spread of COVID-19. In Paraguay, an operational guide for schools in indigenous territories has been developed, including numerous references to COVID-19 prevention and action protocols. In Pakistan, a WASH/IPC package for safe reopening of schools was developed with a unit cost for different types of WASH interventions; while in Côte d'Ivoire, in partnership with the Ministry of Education, UNICEF organized trainings of trainers on the implementation of the health and safely protocol in school and its integration with UNICEF's "Three Star Approach for WASH in Schools".

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5. THE SECONDARY EFFECTS OF COVID-19: NEGATIVE CONSEQUENCES AND EMERGING THREATS

5.1 Lower level of water and sanitation services

Decline in the quantity and quality of WASH services due to operational challenges of utilities | As first introduced in Section 4.2, operational challenges faced by utilities because of the pandemic included mobility restrictions, which did not always consider water operations as essential services; employees prohibited from completing their work at water and wastewater treatment plans and in sewage collection (Freitas et al., 2020); ruptures in supply chains and increases in prices for WASH commodities (GWC et al., 2020); reduced operational staff due to illness (UNICEF, 2020b); as well as increased expenditures due to the cost of PPE. In several countries, many of these problems are unsolved, leading to a decline in the ability of service providers to deliver services and secure continuity, quantity, and quality of drinking water and sanitation (SIWI, 2020b).

In addition, as further discussed in Section 6.1, many governments and utilities around the world implemented tariff-free-water initiatives and other measures to increase access to water. However, in low-income countries, where many public utilities operate at a loss, the additional pressures from even greater revenue loss may impact the ability to provide water at all. This is especially true for small operators who are more susceptible to system disruptions and may not receive support to cover costs of electricity and maintenance (USAID, 2020). Lack of capital for maintenance works may also put handpumps, a primary source of water for many rural communities, at risk of increased downtime or failure (USAID, 2020).

In humanitarian contexts, a decline in quality of the WASH response has also posed a grave threat to service provision, limiting access to services by populations already affected by pre-COVID-19 humanitarian situations, including refugees, migrants, and IDPs. The centralized nature of humanitarian WASH services, as well as their reliance on international expertise, has left them vulnerable to the operational challenges cited above and other global effects of the pandemic (GWC et al., 2020; McDonald et al., 2020).

Basic water access has pushed out many vulnerable groups due to affordability and shortages | In an effort to promote good hygiene, many countries introduced free-water initiatives to remove financial barriers to water access and agreed to defer or forgive bill payments without cut-offs (Alleyne et al., 2020; Amankwaa and Ampratwum, 2020; FGV CERI, n.d.). While these initiatives were well intentioned, they may actually serve to deepen the divide between wealthy and poor.

For the most part, these initiatives have provided tariff-free water from public utilities to areas where piped access or standpipes are already in place (USAID, 2020). However, urban slums and rural communities, which are not connected to piped water, rely on multiple sources to meet their daily water needs, such as packaged water, informal water vendors, or commercial resellers, all of which are not eligible for tariff-free abstractions (USAID, 2020). Not only is packaged water not included in the free-water initiatives, it may also be more difficult to access because of market closures and other lockdown measures. In addition, informal arrangements are subject to price volatility, particularly in environments with weak

regulation, leaving poorer populations even more vulnerable and possibly unable to afford water at all (USAID, 2020; McDonald et al., 2020). For homes located far from standpipes, individuals may solicit informal vendors to transport water to their homes, which is another cost not covered by the free-water initiatives (McDonald et al., 2020).

Yemen provides an illustrative case. Instability due to ongoing conflict and fuel shortages was compounded by the arrival of COVID-19, with residents reporting that COVID-19 directly affected their ability to access safe water, including the rise in cost of purchasing water (Sanan'a et al., 2020). The pandemic has made an already bad situation worse, meaning more people will need to spend more time and resources on buying water from private vendors who may take advantage of the crisis to reap bigger profits (McDonald et al., 2020).

Other free-water initiatives included a basic lifeline level or minimum subsistence volume of tariff-free water, where any additional water needed to be paid for (Amankwaa dn Ampratwum, 2020; FGV CERI, n.d.). However, it has been observed that this provision particularly benefits wealthier single-family households that have a designated meter. In many poorer communities, several households and families may share a meter, and easily consume more than the lifeline amount, thus incurring higher costs for water (Amankwaa and Ampratwum, 2020). These different user experiences and costs may ultimately influence consumption and willingness to pay for services, which could translate into longer-term impacts for utilities.

Free-water initiatives have not been universal. With many households unable to afford their water bill due to loss of income, they face being cut off from their water supply, which is a widespread problem observed in the USA (Maqbool, 2020) and other countries.

Water shortages due to free-water initiatives | Water tariffs are a common tool for demand management (Fuente et al., 2016); however, once these tariffs are lifted, it can be reasonably assumed that demand for water will also rise (Kayaga and Smout, 2014; USAID, 2020). Burkina Faso's National Office for Water and Sanitation observed a 25 per cent year-on-year increase in water consumption soon after introducing free-water measures (McDonald et al., 2020).

The rise in water consumption as a result of reduced tariffs and greater demand for hygiene has resulted in water cuts and low flow for many households, with many households unable to cover operational costs and/or lack available water resources. The Greater Accra Region experienced severe water shortages in the weeks following the introduction of a free-water initiative by the Ghana Water Company Ltd (Amankwaa and Ampratwum, 2020). When the water was flowing, pressure was low or it occurred during the night when most were sleeping, making the recommendations to store water very difficult to follow (McDonald et al., 2020; Amankwaa and Ampratwum, 2020; IWA, 2021). Similar challenges were observed in Burkina Faso, as well as long queues and crowding at standpipes (McDonald et al., 2020). In Rwanda, queues at standpipes were cited by urban residents as a barrier to accessing water, while economic hardship may have further exacerbated the demands on standpipes by making bottled water less affordable.

5.2 Threatened financial sustainability of providers

Loss of revenues severely challenged cash flows of water and wastewater utilities and has created increasing dependency on government or donor funding | Despite some discrepancies in the magnitude of losses reported, all studies and projections show a common trend: water and wastewater utilities around the world expect to see revenue collection reductions as a result of the COVID-19 crisis. The World Bank, for instance, estimated revenue losses by 40 per cent when the pandemic started due to suspension of water charges and free-water initiatives implemented by some countries or municipalities (World Bank, 2020b), while a few months later (June 2020), the Global Water Leaders Group reported revenue collections reductions by both water

and wastewater utilities of 15 per cent on average (Butler et al., 2020). In the USA, a study developed during July 2020 by the American Water Works Association found that the economic impact of both water and wastewater utilities will be around USD 27 billion (Gude and Muire, 2021).

In short, the pandemic has created a major loss of revenue through a combination of two elements: i) lower demand, particularly from industry; and ii) a decrease in payments, mainly due to tariff-free-water initiatives, growing poverty, and job losses. The result has been a crunch on daily cash flows and long-term capital budgets. In addition, many public water operators have been subsidizing consumption and reconnecting users to the network to help combat the spread of the virus (sometimes because of government legislation but also due to internal decision-making), thus exacerbating financial losses (McDonald et al., 2020). In a recent survey of around 50 utilities by Global Water Operators' Partnership Alliance, these cash-flow problems were acknowledged as the second biggest challenge for water operators. In the same survey, a global sampling of utilities expressed that increased subsidies and new financial approaches were among the most-needed support to prepare for emergencies like COVID-19. If the COVID-19 pandemic is prolonged, or if it is indeed followed by another crisis – be it economic, environmental, or social – utilities may not have the financial or operational redundancy to respond effectively (McDonald et al., 2020).

In turn, decreasing revenues during emergency/crisis situations have affected utilities' financial autonomy, leading to increased reliance on government or donor funding (Diep et al., 2017). For example, low-cost recovery by utilities in the MENA region during protracted crises has been supplemented by direct financial support from central governments, often via grants or loans from the international community (Diep et al., 2017). In Jordan, the central government covered utility energy bills or paid staff salaries to retain employees (Diep et al., 2017), and this situation has repeated itself in other places, such as in Kenya (WASREB, 2020) and Zambia (NWASCO, 2020).

In rural areas, the situation has been even worse, making clear the need for efficient distribution of rescue funds to operators other than the largest urban utilities (USAID, 2020). In Ghana, for instance, there have been strong indications that small water suppliers have been in dire financial positions from having collected little to no revenue for six months. Significant decline in household demands for pit emptying services and increasing operational costs from supply chain disruptions have also dampened sanitation service providers' revenues and driven down profit margins (USAID, 2020).

Similarly, informal water and sanitation vendors have faced high losses of revenue, as they have not been able to work due to mobility restrictions. In addition, the role of these informal water resellers has not been considered in the measures taken by the state (subsidies, financial support, etc.). Unlike public services, informal sanitation and water supply systems and their workforce were not obligated to operate under emergency conditions (Stoler et al., 2020).

Increase of costs due to price fluctuations of consumables and spare parts, acquisition of new PPE, new organization arrangements, and expansion of Information Technology (IT) services | Besides a sharp decline in revenue collection, COVID-19 has increased the financial stress of utilities due to the challenging context in which services have been delivered, such as ruptures in global and local supply chains (GWC et al., 2020), and the need to undertake new tasks not performed prior to the pandemic (USAID, 2020).

Water provision is a labour-intensive industry, with high energy utilization and consistent demand for chemical supplies and other consumables (e.g. electricity or fuel). These account for the bulk of operating expenses (OPEX) for water utilities, which have suffered a significant increase during the outbreak (Butler et al., 2020; Cotterill et al., 2020). In the pandemic, OPEX have also included installing handwashing stations and trucking in water to fill these tanks, mainly in informal settlements and remote off-grid areas, increased transport due to social distancing, and the need to liaise with and support other stakeholders helping

Box 9. COVID Financial Impact Assessment Tool for Water and Sanitation Providers

One year on from the beginning of the COVID-19 pandemic, most operators are downgrading their investment forecast to cover their uncertainty of their accumulated losses and the impact of the pandemic on their financial viability. To help operators more accurately calculate the cost of the pandemic, the World Bank, with support from the Global Water Security & Sanitation Partnership (GWSP), has developed a financial diagnostic tool. The tool looks at revenue; debt; operational expenditures, such as wages and rent; and additional costs associated with the crisis, such as chemicals, PPE, additional water points, and tanker services. It can be updated on a monthly basis to provide an ongoing picture, and with informed inputs, it can help service providers project the financial impact on their operations in the coming months. GWSP is also providing virtual training courses across multiple regions on these subjects. Analytical work such as this can shape and benefit World Bank projects at the country level by providing the tools, frameworks, and resources needed for effective and evidence-based decision-making. GWSP support in quickly adapting to changing circumstances and delivering resources in a timely manner has aided the speedy response.

For example, in Zambia, the World Bank is helping the Lusaka Water and Sewerage Company review and develop its emergency response plan. In Ethiopia, the World Bank is helping the Addis Ababa Water and Sewerage Authority tap into expertise and experience from across the world and helping other local utilities procure necessary chemicals and reagents. In Ghana, the World Bank has partnered with the Ghana Water Company Ltd to prepare an action plan to address the impacts and plan recovery from COVID-19, as well as modernize utility services.

Source: World Bank (2020b)

with the WASH response (USAID, 2020; Butler et al., 2020). South Africa, for example, has set up water supply points across the country for handwashing, and similar measures have been adopted in Ghana and Peru (Butler et al., 2020), as well as in many other countries (SIWI, 2020b).

Additional costs have been incurred due to the need to acquire PPE for utility staff, the organization of new work arrangements (e.g. teleworking), increased cleaning protocols, or expanded IT services and digitalization to, for example, implement new systems for consumer relations (McDonald et al., 2020).

Finally, other revenue pressures have come from inefficient operations, such as high non-revenue water (leakages, water theft, uncollected revenues), which exceeds 40 per cent in several emerging market economies. However, despite the importance of operational reliability – highlighted during the pandemic due to the cost of disruption – water utilities have not looked at non-revenue water as a priority (Butler et al., 2020).

The need to compensate for revenue losses and the evolution of willingness to pay | Due to the unfolding nature of the current COVID-19 pandemic, its impact on water and sanitation access for the poorest people is yet unknown (Cooper, 2020a). It is, however, recognized that COVID-19 has intersected with the issue of poverty in pernicious ways, exacerbating the vulnerabilities of those households already suffering from poor and inadequate services (e.g. the water shut-offs in the US for lack of payment) (March and Sauri, 2017).

Water prices and tariffs have always been politically sensitive (Pinto et al., 2018). Yates et al. (2020) argue that political promises to lower or abolish water tariffs or over-promising on water delivery could lead to a cycle of utility decline. This includes utilities that are unable to cover their costs and that consequently decline in their performance levels. In turn, water users

use water inefficiently and become less willing to pay as service deteriorates (Yates et al., 2020). Moreover, introducing water tariffs after a period of free water can be controversial (Pinto et al., 2018), as tariff-free-water initiatives might also impact user payment culture, especially if prolonged for extended periods (Butler et al., 2020). Weak revenue management systems can also reduce customers' willingness to pay (Banda and Mwale, 2018).

The quality-of-service provision and willingness to pay are often interlinked, regardless of the crisis (UNICEF and WHO, 2021). Evidence suggests that the poor are willing to pay for water under certain conditions, including affordability and reliability (Cooper, 2020a). A study on urban water in Ghana found that poor people would be willing to pay for water if they received it on time and regularly, and if it was of good quality (Mosello, 2017). The contrary is also true, and poor service provision prior to and during crises can impact customers' willingness to pay. A vicious cycle is then created (Diep et al., 2017; UNICEF and WHO, 2021). A crisis impacts both a utility's financial resources and its operations and maintenance capacity, resulting in poor service provision. Customers are unwilling to pay for poor service and become more reluctant to pay, thereby further decreasing utilities' revenue base (UNICEF and WHO, 2021).

The following cases present three different solutions to address the same problem. In Uganda, during the move towards de-escalation and recovery, the Water Utility Regulation Department (WURD) stressed the need to adopt pro-poor approaches in increasing access to water and sanitation by conducting affordability and willingness studies to inform targeted interventions for the poor (Ministry of Water and Environment of the Republic of Uganda, 2021). In many countries, it was observed that the lack of administrative capacity to identify and determine which households or family units require financial assistance led to untargeted measures and inefficient use of limited resources. In Zambia, the National Water Supply and Sanitation Council managed to secure social tariffs for all utilities, freezing their amounts to the pre-pandemic level and until the government declares the country is COVID-19 free (NWASCO, 2020). In contrast, the Brazilian federal regulatory authorities stated that without a clear national financial strategy, sectoral economic recovery of losses will only be able through increased tariffs over a period of time (IWA, 2021).

Credit: ©UNICEF/UNI332887/Dicko

Box 10. Revenue losses and other financials in the WASH sector, Ecuador

Since the beginning of the pandemic, both the national government and local administrations and operators in Ecuador have implemented a set of measures to mitigate the effects of the COVID-19 crisis in relation to water and sanitation services and hygiene promotion. These include a set of resolutions and presidential decrees to ensure the continuity of services and prohibit their interruption during the emergency. Many of these measures have significantly affected the ability of utilities and rural operators to continue operating their services.

Based on information available through the Internal Revenue Service, a comparison has been made between 2019 and 2020 of the sales and purchases of four water, sanitation, and hygiene (WASH) sector-related activities: i) mineral waters and other bottled waters; ii) water services; iii) management of sewerage systems and water treatment facilities; and iv) drinking water supply management activities. Total losses in the sector are estimated at USD 28 million. Approximately USD 7 million is accounted for by the private sector and USD 21 million by the public sector. It is also important to note that the contribution of activities related to sewerage services amounts to USD 15 million (more than 50 per cent), despite the fact that they represent a much lower volume of economic activity than water services. In this regard, the data show that the sanitation sub-sector has always operated at a loss, with operation and maintenance costs exceeding the revenues recovered through tariffs. In addition, significant losses have been identified for mineral and bottled water producers.

Complementing this information with data provided in a survey by the regulator on "Water management during the COVID-19 emergency" to public water and sanitation service providers, it was observed that part of this loss is explained by a sharp decrease in revenue collection. Although in 2020 there was an increase in the amounts billed of 17 per cent – due to an increase in the volumes billed – the variation in revenue collection was lower and showed a decrease of 8 per cent. Similarly, the ratio between the revenue collected and invoiced decreased in 2020 to 82 per cent. It is estimated that this difference between the amounts billed and collected can be attributed, in part, to the measures implemented to ensure access to water and alleviation of the economic hardship caused by the pandemic.

Source: interview with Koenraad Vancraeynest, WASH Specialist in UNICEF Ecuador; and Viviana Muñoz, independent consultant.

Box 11. Measures implemented in Colombia by the government to compensate loss of revenues by services providers during the pandemic

In Colombia, various measures implemented by the national government during the first months of the pandemic to ensure affordable access to services for the entire population (directly or indirectly) penalized the financial sustainability of service providers. In order to minimize the possible negative impacts, a set of five actions were gradually put in place: i) suspending tariffs for water treatment inputs; ii) adapting and extending a credit line to ensure liquidity and compensate for the drop in revenues due to deferred payment of bills by consumers (with the same amount and under the same conditions); iii) allowing territorial entities to assume all or part of the cost of services with the surplus of different funds (benefiting 7 million people); iv) establishing mechanisms for voluntary contributions from users with greater capacity to pay; and v) direct transfer systems to rural providers (2 million potential beneficiaries). Despite government support, many providers suffered changes in cash flows due to payment delays and tariff freezes, thus delaying some improvement projects until capital from deferred payments of subscribers was recovered.

In the rural context, the problems of promoting the financial viability of community operators multiplied. In the process of urban–rural migration during first months of the pandemic, many water organizations could not cope with the connection of new users without institutional support, and in part, these problems were aggravated by administrative difficulties in community organizations when accessing subsidies and benefits. In short, the pandemic showed that the measures implemented in both urban and rural areas, despite their intersecting nature, needed to be further adapted for rural areas.

Source: interview with anonymous source

5.3 Limited new investments and CAPEX

Reduced operators' revenue has been almost immediately transformed in many countries into reduced investment capacity | As some of the emergency response measures imposed by the authorities, being charged under the regular operational maintenance, caused shortfalls in operator revenues, it is clear that operators' investment capacity in the future will be compromised (World Bank, 2020a). Global Water Intelligence estimates may resume at pre-crisis forecast levels from the downward adjustment of 7 per cent that is expected in 2020 (GWI, 2020).

In addition, with the current estimate that 15 per cent of the revenue shortfall is due to reduction in industrial consumption (GWI, 2020), it is expected that over half of global operators intend to reshuffle these loses by cutting back on capital spending programmes. The anticipated impact is even stronger in emerging markets, where the low domestic tariffs make utilities more dependent on industrial, tourism, and commercial revenues. With the national and local budget being primarily allocated towards pandemic emergency response plans, often missing water and sanitation infrastructure, the CAPEX prospect appears even less optimistic. Cost of capital is also higher in places where there are currency fluctuations and debts are calculated in foreign currency. As many low- and middle-income countries are speeding up to reach their GDP ratio debt ceiling, water and sanitation infrastructure investments will be at even more risk in coming years. For example, in Indonesia, where only 40 per cent of utilities operate on full cost recovery levels, the sector, being dependent on government subsidies, is likely to be particularly affected by government restriction in public expenditures.

Credit: ©UNICEF/UN0352626/Ose

In the developing world, the effects of the crisis appear to be lasting longer than expected | The longer lasting impacts of the COVID-19 crisis for the low- and middle-income countries has resulted in an even more pessimistic growth forecast (GWI, 2020). More specific reasons for pessimistic growth forecasts in these countries include budget restrictions required to compensate for the lost revenue, difficulty in raising tariffs, and expected delays in the dependency on externally funded infrastructure. With a projected two-digit drop in CAPEX in 2020/21 in emerging markets, water treatment and wastewater treatment projects are hit hardest, primarily due to higher procurement volumes.

Zambia is a good example of the complexity in low- and middle-income countries. With the cross-cutting effects of the pandemic being the economic downturn, expected consequences include already low productivity and contracted GDP. The government will in turn be limited in its further financial allocation to the sector, apart from the USD 5 billion 2011–2013 investment plan, which is funded through the government budget, corporate loans, and loans from the African Development Bank and aimed at sustaining on-sanitation in three provinces, among other goals. However, during its pre-pandemic execution, the sector only received half of the planned budget over the last five years due to delays in allocation. Given the COVID-19 impact, the project allocation will be probably even lower. Looking at the overall sector performance over the years, which has been low, the pandemic may only worsen the situation (interview with Mr Kasenga, Zambia National Water Supply and Sanitation Council, 2021).

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6. THE SECONDARY EFFECTS OF COVID-19: OPPORTUNITIES FOR TRANSFORMATION AND RECOVERY

6.1 Increased access to progressive realization of the human rights to water and sanitation

A wide range of measures have been announced to maintain and increase access to water and sanitation for all during the crisis | In order to put positive hygiene behaviours into practice, governments and WASH stakeholders implemented a variety of response measures to increase access to water and sanitation at the beginning of the crisis. Globally, initiatives prohibiting the disconnection of water supply to users and enforcing the reconnection of previously disconnected, together with the partial suspension of water billing for low-income users were widespread (Butler et al., 2020; SIWI, 2020b). Measures adopted included i) moratoriums on cutting off the water supply (justified by the importance of hygiene in reducing the spread of the virus), ii) immediate reconnection of previously disconnected households because of their inability to pay, iii) deferments on or exemptions from utility bill payments for vulnerable groups, iv) suspensions of meter reading and invoicing, and v) tariff adjustments freezes. In Uganda, for instance, WURD requested that its operators suspend all disconnections of water during the lockdown period and ordered all disconnected consumers to be reconnected immediately (Ministry of Water and Environment of the Republic of Uganda, 2021). Similarly, many USA states imposed moratoriums on water disconnection for low-income households (Warner et al., 2020).

However, these measures did not cover the WASH needs of many populations, especially in poor or informal urban areas and in rural locations, where there is no networked service or single provider that can provide such a limit of free water consumption per capita or household (UNICEF, 2020b; 2020d). Hence, direct provision of water to informal settlements and the poorest people was secured through a range of alternative mechanisms. Typically, emergency water responses included water trucks, water storage tanks, digging additional boreholes, opening up of more standpipes and kiosks, urgent water infrastructure repairs, and community mobilization to address utilities' embedded vulnerabilities (Cooper, 2020a). Cash transfers to households themselves became another way to ensure the liquidity of households to pay for essential items, such as rent, food, health care, and WASH (UNICEF, 2020d).

Free water, waiving payment of bills, and other direct measures to secure water have not necessarily benefited the poorest | Together with the exceptional measures to ensure access to water and handwashing facilities for all, governments and sector stakeholders scaled-up their efforts to leave no one behind. For instance, the National Emergency Response Committee in Kenya requested that water be provided for free in informal settlements and public places (USAID, 2020) and the WURD of Uganda requested its operators provide free water to all isolation centres within their operational area (Ministry of Water and Environment of the Republic of Unganda, 2021).

However, one major obstacle that hampered the effective implementation of pro-poor response measures was the lack of mechanisms to map and target the vulnerable consumers and identify their needs. In the absence of such information, free water and other response initiatives did not always benefit the poorest (Amankwaa and Ampratwum, 2020; Cooper 2020a). In Ghana, for instance, the lifeline tariff

Box 12. The impact of Ghana's free-water initiative

Having recorded its first COVID-19 case on 12 March, Ghana declared a free-water initiative on 5 April for three months (April–June), which was later extended to six months (April–September 2020). The free water was exclusively for domestic, non-commercial use and was to be delivered by water providers in both public and private water markets. Water providers were reimbursed monthly by the Ministry of Finance for their services after submitting data on water production and consumption to the Ministry of Sanitation and Water Resources via sector agencies. This initiative was mainly led by the Ghana Water Company Ltd (GWCL) and the Community Water and Sanitation Agency (CWSA), which serve water for urban and rural areas, respectively. In doing this, the GWCL provided water to their metered customers through their piped networks and through community standpipes, water supply tankers, and COVID Free Tank services to unconnected urban households. Disconnected customers were not liable to pay their arrears in order to enjoy the free water. Also, the CWSA ensured that normal water vending at standpipes was carried out whilst those who relied on CWSA-managed prepaid public standpipes were given tokens that enabled them to have daily access to up to 40 litres of water per person. The cost of providing the free water service for the extended six months was estimated at USD 98 million and was absorbed by the Government of Ghana.

While the free-water initiative is commended for resolving the affordability challenge of access to safe water, reports point to many implementation and operationalization challenges, especially to the poor, vulnerable, and the unconnected populations who do not have direct access to service points. Even if a significant proportion of citizens were to benefit from this initiative, key questions remain. What impact does this initiative have on the poorest and the marginalized? Should water be either free or subsidized for those who cannot afford it? What is free about free water? What are the implications of this initiative for different water market operators and ultimately for sustainable service delivery? Amankwaa and Ampratwum (2020) attempted to answer these questions in four arguments. First, low-income and off-grid households were at a high risk of exclusion from this initiative. Second, on-grid connected households who had no or an unreliable water supply were likely not to benefit from the initiative. Third, rural communities who did not have access to CWSA services or any source of safe drinking water were left behind. Last, the initiative had the potential to heighten or amplify the complex financial and operational challenges faced by water service providers.

Source: Amankwaa and Ampratwum (2020).

set by the public utilities regulator benefited richer (metered) households rather than poor households, who easily exceeded the lifeline consumption because they live in compounds with several households and share meters (Mosello, 2017).

Another restriction concerned the mandate and actual capacities of utilities and service providers to reach the poorest, particularly in peri-urban areas. For example, in Nairobi, Kenya, only 35.9 per cent of informal settlement residents had access to in-house or plot connections. In addition, the reality of utility water access is more complex than statistics suggest due to informal connections and vendors who resell utility water at higher prices (Cooper, 2020a). As mentioned before, alternative measures have been implemented for direct provision of services to informal settlements (e.g. water trucks, water kiosks, etc.). However, these solutions are temporary and do not guarantee a basic level of service. In addition, they are not always matched with adequate regulatory mechanisms to protect the consumer.

Box 13. Response measures implemented during the COVID-19 emergency in Latin America and the Caribbean to provide drinking water and sanitation to unconnected populations

Last January, one year after the COVID-19 outbreak, the Inter-American Development Bank conducted a study to analyse the response implemented in the Latin American and Caribbean region to supply safe water and sanitation to unserved populations. An online survey was conducted with service providers, and a total of 30 responses were recorded.

The results of the survey showed that the most commonly implemented solution for water provision was water distribution through water trucks (52 per cent). This is a flexible solution, as it can cover a wide range of beneficiary populations, from less than 500 to 10,000 people. It should be noted, however, that in certain regions, its implementation is difficult due to the state of the roads or adverse weather conditions. The second most commonly implemented solution was the installation of elevated tanks for water storage and water distribution by gravity (14 per cent). In flat topography, pumping to elevated tanks involves extra energy consumption, reducing system performance. Other solutions that were implemented include mobile tanks, the interconnection of water networks to increase the redundancy of distribution systems, fog-catching systems, and the installation of community taps. Regarding the implementation of wastewater disposal solutions, only 4 of the 30 entities reported measures. They all opted for different systems, such as building low-cost domestic septic tanks, planting bio-gardens where grey water is filtered and reused (1 cubic metre of planter processes 135 litres of grey water), constructing percolation pits to separate water from solid parts, and collecting domestic water for use in washing feet and flushing toilets.

The pandemic has therefore highlighted the gap between drinking water supply – which many providers prioritized – and sanitation. In addition, the pandemic has shown the need for service providers to have contingency plans in place for the provision of water to their populations, especially the most vulnerable who are not served by networks.

Source: Espinosa (2021).

Calls to build back better and maintain sustainable water and sanitation access to the poor when the pandemic is over | It has been 10 years since the UN recognized water and sanitation as a fundamental human right. As emphasized by the UN Secretary General, António Guterres, in his report "COVID-19 and Human Rights: We are all in this together", the realization of economic and social rights, such as the rights to water and sanitation, makes populations far more resilient to crises (UN, 2020b). Undoubtedly, the pandemic has shown the importance of these rights in both the global North and global South, where water insecurities, cut-offs, unaffordability, and inaccessibility have undermined the ability of populations to deal with the pandemic (Fiasconaro and Gojkovic, 2020). Indeed, the attention to the underlying injustices involved in the denial of the rights to water and sanitation have perhaps been even more evident in discussions of the global North, where commentaries have tended to revolve around the question of water disconnections for those in new poverty and vulnerable contexts (Fiasconaro and Gojkovic, 2020).

By and large, there has been a substantial improvement in access to WASH services. When the pandemic is over, however, populations that gained access to drinking-water and to basic sanitation have acquired a right that should not be suspended (Espinosa, 2021). There have been repeated calls urging national and local governments to find the fiscal space to continue these practices and sustain

the promotion of handwashing post-COVID (The Lancet Global Health, 2020). If countries worldwide were to keep moratoriums in place when the pandemic is over, recognizing the critical role of water access in public health would help shift WASH policies away from its commodity focus. This, however, requires building political will to recognize the human rights to water and sanitation and to identify the best technical and financial approaches to address long-term affordability and access (Warner et al., 2020; Espinosa, 2021).

Box 14. Participatory and inclusive approaches to target the poor and identify their needs

Malawi | The Ministry of Water and Irrigation Development put in place response measures to ensure that the vulnerable were taken into consideration, using explicit mapping and targeting of potentially disadvantaged to find out where they were located and ensure their needs were addressed, especially the visually impaired, people with physical disabilities, people with albinism, the old, and the chronically sick. In addition, the national government and local authorities adopted more inclusive approaches in their decision-making processes, making sure to include voices of interest groups, such as the Federation of Disability Organizations in Malawi and the Malawi Council for the Handicapped. Some other measures included consulting with disadvantaged people, strengthening partnerships with civil society organizations, working with vulnerable communities, and training Finger Braille and sign language interpreters on technical content to further reach people with disabilities.

Nepal | To identify the most vulnerable populations, the Ministry of Water Supply elaborated a preparedness plan based on estimated caseload and population, coordinated through a water, sanitation, and hygiene (WASH) cluster. The ministry trickled down guidance to local governments and built on existing management information systems (MIS) to identify unserved areas and populations, with data showing the category of service against vulnerability profiles. The WASH assessments of health care facilities were also used to target support. Other digital platforms were developed. Hygiene data were not covered in the MIS, and specific subsidies for hygiene were considered for vulnerable households. Integrated WASH planning from local governments using the robust and live MIS with financial planning was instrumental to removing inequalities.

Source: SWA (2020).

6.2 Enhanced communication and coordination (within WASH and with other sectors)

Enhanced communication approaches and stakeholder consultation has increased the understanding of COVID-19 risks and opportunities | Since the beginning of the pandemic, RCCE has been an essential part of the outbreak response. A combination of innovative processes with more traditional approaches have been implemented to enable real time information, exchange of opinions and advice; and consultations, engagement, and communication with communities and other vulnerable groups who are at risk, by developing, translating, and disseminating messaging and materials on COVID-19 prevention and risk reduction practices. Communication channels included social media, community radio, community-based organizations, etc., with the aim to limit human-to-human interaction and to ensure all population groups were reached, including the most vulnerable. For instance, utilities sent

hygiene messages to customers' mobile phones throughout the pandemic, as well as water conservation messages (Cooper, 2020a).

In parallel, the COVID-19 pandemic has been accompanied by a global spread of misinformation that has posed a serious problem for public health, since false or misleading information has the capacity to change behaviours and consequent transmission patterns (Bridgman et al., 2020). This information has been shared by all types of media, but social media, such as Facebook and Twitter, seemed to play a more prominent role in boosting misperceptions. In contrast, specific techniques to reduce the spread of dangerous misinformation included traditional fact-checking and debunking approaches (Ecker et al., 2020; MacFarlane et al., 2020) and reminding people to carefully consider the accuracy of online information and the credibility of the source (Pennycook et al., 2020). Building trust in government and health authorities is also a protective factor for citizens (Pierre, 2020; Hyland-Wood et al., 2021); although this pandemic has also shown that national governments might not strictly follow recommendations given by the WHO and opt for implementing alternative approaches to fight the pandemic.

Finally, comprehensive stakeholder consultation has been more difficult during the crisis response phase, although governments have been utilizing a range of targeted engagement methods to communicate the various rationales behind their COVID responses. Choosing the appropriate consultation tools (e.g. Information and Communications Technology consultation tools or representative deliberative processes, such as citizens juries) has been particularly important in light of the reduced timelines and the need to minimize human-to-human interactions while developing COVID-19 responses (OECD, 2020).

Box 15. COVID-19 misperceptions: the role of news and social media

In a recent study conducted in Bangladesh to investigate water, sanitation, and hygiene behaviour during the pandemic, it was found that most of the participants (89.80 per cent) mentioned that they were aware of measures to prevent and control the transmission and spread of COVID-19. Facebook and other social media platforms were mentioned by most research participants (61 per cent) as their source of information, which corroborates with studies that showed social media platforms were increasingly becoming the primary sources of news. Other channels through which research participants gained information regarding COVID-19, such as measures to limit its spread, included radio and television (24 per cent), newspapers (6 per cent), friends and relatives (4 per cent), and other sources (5 per cent).

However, consumption of information from social media platforms sometimes boosts misperceptions. In fact, another study highlighted a significant difference in the behaviours and attitudes of people who get their news from social media versus traditional media. It showed that comparatively more misinformation circulated on Twitter, while mainstream media tended to reinforce public health recommendations, like social distancing. The authors also noted that exposure to misinformation on social media platforms generated misperceptions concerning COVID-19, and misperceptions were linked with lower compliance with preventive actions (e.g. mask and gloves use, social distancing protocols, etc.). There is, therefore, a clear link between misinformation circulating on social media, notably Twitter, and behaviours and attitudes that potentially magnify the scale and lethality of COVID-19.

Sources: Adapted from Islam et al. (2021) and Bridgman et al. (2020).

Attempts to strengthen coordination in a challenging context | From the very beginning of the pandemic, substantial efforts were put in place to promote and to establish emergency coordination platforms, ideally activating existing mechanisms. Good coordination adapted to the context has been a top priority for both governments and external support agencies. UNICEF, for instance, urged all country offices to coordinate with governments at all levels and key WASH, health and education IPC stakeholders to strengthen governments' leadership and accountability, ensuring cross-sectoral coordination, with special attention to the most vulnerable children and their families (UNICEF, 2021b). Similarly, the Global WASH Cluster elaborated protocols and guidance notes to improve country-level coordination and to clarify the developing coordination structures, roles, and responsibilities of the WASH Cluster Coordination platform during the COVID-19 response (GWC, 2020a; 2020b).

However, improved collaboration and enhanced coordination requires the political will of governments and the commitment of all stakeholders at all levels. In this regard, it has been observed that despite coordination being one of the pillars of the UN response to COVID-19 (UN, 2020c), many countries failed to put in place institutional coordination practices to avoid sector silos and to promote multi-sectoral coordination anchored in territories with local authorities.

In addition, certain restrictions put in place by governments to limit the speed of the disease's spread, primarily the ban on gatherings and the gradual move to remote working, also had a profound impact on coordination strategies. There are three key elements to achieving good coordination: i) communication and regular consultations among all stakeholders, ii) information exchange, and iii) participation in decision-making (Hyland-Wood et al., 2021). All three elements were affected by the pandemic. Whilst the coronavirus crisis accelerated, the uptake of digital coordination solutions and tools, such as videoconferences, virtual meetings and missions, webinars, etc., simultaneously exposed the wide chasm between the connected and the unconnected, revealing just how far behind many people are on digital uptake (UNCTAD, 2020). Therefore, coordination has been hampered during the pandemic by two additional elements: i) the lack of efficacy of remote and virtual mechanisms to promote dialogue, discussions, and information exchange; and ii) the digital gap, particularly in poorly connected areas or with those who are less digitally equipped.

The COVID-19 pandemic has provided an opportunity to enhance and strengthen coordination within WASH stakeholders and with other sectors, such as education and health | With the aim of working collaboratively with all stakeholders in a coordinated manner, efforts were soon directed towards ensuring representation from and participation of different government ministries with mandates for water and sanitation services in various settings (homes, schools, health facilities, shelter, and other public spaces), humanitarian and development partners, private sectors, academia and civil society groups. Each stakeholder, whether public, private, donor, or civil society, was relevant and had something to offer to improve delivery of WASH services in the emergency.

Indeed, coordinated action is not only more effective but also necessary to unlocking synergies between WASH and health, education, gender, and social protection, for example (Parik et al., 2020). In addition, partnerships that break down traditional silos and integrate knowledge from a multitude of disciplines are required to produce locally grounded actions that connect concerns at the site level with multiple concerns at other scales (Parik et al., 2020). In informal settlements, for instance, multi-sectoral approaches supported by multi-disciplinary partnerships improve the understanding of and responses to the relationships between ecosystems, land, labour, and property, and what this implies for urban governance (Brenner, 2013). Therefore, only partnerships that involve government stakeholders, national and international funding agencies, utilities, and organized citizens (e.g. through community leaders) have established an adequate integration of WASH in interventions in housing, health, livelihood, and education (Mitlin, 2020; Wilkinson, 2020).

Box 16. Multi-sectoral coordination and rapid needs assessments.

The United Nations Children's Fund (UNICEF) education and water, sanitation, and hygiene (WASH) teams have been particularly active in leading or supporting multi-sectoral coordination – often between education, WASH, and health sectors – and rapid needs assessments.

In Sudan, the "WASH in Schools Working Group" was activated, and there is an ongoing "Back-to-school working group", led by the Education Cluster, which has met every two weeks since August 2020. The WASH in School Working Group shares information among education and WASH sector partners regarding preparation for school re-opening. Building on an ongoing WASH in Schools Sustainable Development Goal 6 assessment, the education sector quickly summarized Educational Management Information Systems data to target priority schools to be supported for COVID-19 re-opening. In Jordan, UNICEF is WASH Sector Chair and established a sub-working group on WASH in Schools, aimed at finding appropriate solutions to COVID-related issues. In Iraq, a national level WASH in Schools assessment is ongoing through a UNICEF–World Health Organization collaboration, partnering with local health staff.

Source: SIWI (2021a).

With COVID-19 having multiple impacts on children's rights, the safe reopening of schools has also required a coordinated multi-sectoral approach among those responsible for education, health, WASH, nutrition, and protection, with a focus on equality, gender, and inclusion. This has required, in practice, the articulation and collaboration of government ministries and institutions at national and sub-national levels, local governments, and other stakeholders, including teachers' unions, associations, civil societies, private sectors, communities, parents, and students themselves (UNICEF, 2020e). Similarly, coordination with health has been significantly important, as many health care facilities do not have reliable WASH facilities, which is a prerequisite for proper IPC. Therefore, WASH has coordinated its response with health (GWC, 2020a). A high level of activity on multi-sectoral coordination has been observed in some countries (SIWI, 2020b, 2021a, 2021b; Giné-Garriga et al., 2021).

A nexus approach between emergency, development, and peace sectors enables both development and peace programmes and emergency responses to join forces in a common strategic approach to meet response needs at the county level |
COVID-19 has provided an opportunity to strengthen the nexus approach between emergency, development, and peace, enabling development and peace programmes and emergency responses to come together to meet response needs. Whilst emergency responses tackle urgent needs, they need to be matched with more long-term development and peace interventions to build resilience against future crises. In other words, rapid COVID-19 response assistance to contain the emergency is critical, but in the absence of a long-term vision, it will not allow a resilient response to the pandemic risk or even generally to a systemic crisis (Groupe URD, 2020b). Therefore, the urgency is to strengthen synergies across the humanitarian-development-peace nexus to address all dimensions of fragility. Effective mechanisms to coordinate the response can then be used to ensure that vulnerable and disproportionately affected groups, including women, girls, and migrant workers, are not left behind in the mid-term.

One illustrative example is the need to invest in more sustainable WASH solutions for IDPs and refugees. This has been a key concern during the pandemic, as most IDPs and refugees live in congested camps where there are no adequate WASH services. Adequate coordination between the WASH sector and other sectors, especially concerning health and shelter, has therefore been prioritized in most

fragile contexts in response to COVID-19 (GWC, 2020a), with the aim to implement the response and management of the epidemiological crisis (emergency) while strengthening the resilience of communities, organizations, and governments to deal with these situations (development) (Groupe URD, 2020a).

Box 17. Enhanced multi-sectoral humanitarian coordination and response to mitigate the impact of COVID-19 in Ethiopia

Identification and analysis of needs | In May 2020, while COVID-19 cases were increasing in Ethiopia, internally displaced people (IDPs) in collective sites were recognized as one of the most vulnerable groups to COVID-19. Their living standards and environments were much worse due to limited space for social distancing and lack of access to reliable water and sanitation, which made IDPs unable to practice regular handwashing. The Shelter Cluster took the initiative to analyse the Displacement Tracking Matrix (DTM) database to identify congested IDP sites without the minimum WASH services. As a result, the Shelter and WASH clusters listed 56 IDP sites as priority areas for humanitarian response to mitigate the risk of COVID-19.

Multi-sectoral humanitarian advocacy | The Health, Protection, and Nutrition clusters also joined hands with the Shelter and WASH clusters to advocate for a multi-sectoral response plan to COVID-19, which targeted the most vulnerable IDP sites. The Inter-Cluster Coordination Group and the Humanitarian Country Team raised additional funding to support vulnerable IDPs. As a result, the Ethiopian Humanitarian Fund (EHF), which is a Country-based Pool Fund in Ethiopia administered by the United Nations Office for the Coordination of Humanitarian Affairs and funded by several humanitarian donors, decided to allocate USD 6.4 million under the Second Standard Allocation of EHF to extend WASH, Shelter and Health responses to the most vulnerable 10 IDP sites, targeting 108,823 people.

It was a very successful multi-sectoral response planning actively led by the Health, Shelter and WASH clusters. The advocacy message was jointly delivered to humanitarian stakeholders and donors so that EHF decided to allocate funding to this specific purpose for the first time in Ethiopia. As COVID-19 affected most people in need of humanitarian support, identification and prioritization of IDPs as target groups using the existing database of DTM, together with multi-sectoral coordinated effort, was an example of good practice on how to strengthen communication, collaboration, and coordination among different humanitarian stakeholders.

Sources: interviews with Itsuro Takahashi, WASH Cluster Coordinator and Yodit Gutema, Shelter Cluster Coordinator in Ethiopia.

6.3 Increased innovation and improved efficiency

A digital transformation has been boosted to overcome traditional bottlenecks and barriers, and to enhance service delivery modalities | The COVID-19 pandemic has affected the water and sanitation systems on multiple fronts at all stages of the water and sanitation cycle (Poch et al., 2020). For instance, the pandemic has changed social behaviour and, consequently, the water use patterns of society, which has also directly impacted wastewater collection and treatment (Poch et al., 2020). This has triggered actions on new fronts. For instance, some studies highlighted the need to do more with less, suggesting that self-managed systems could gain more traction, such as remote operation and monitoring (Butler et al., 2020) or low-cost, nature-based solutions, which use or mimic natural processes to enhance water availability, improve water quality, and reduce risks associated with water-

Credit: ©UNICEF/UN0431803/Mulala

related disasters and climate change (WWAP/UN-Water, 2018; Cotterill et al., 2020).

In addition, COVID-19 social distancing measures have pushed companies and customers to avoid contact in physical utility services centres and to prioritize the use of other channels of engagement (Butler et al., 2020). More customer-utility interactions have been conducted via phone, apps, or the internet. For example, digital payments and pre-paid solutions, such as smart cards, vouchers and tokens, which reduce human contact, help poor customers to manage their water payments and use, increase revenue collection for utilities, and extend customer reach (Cooper, 2020a). In Malawi, the Lilongwe Water Board emphasized digital payments in its social media campaigns in light of COVID-19 (Cooper, 2020a), while the Safe Water Network in Ghana went from a 30 per cent net loss to 1 per cent net surplus by introducing digital payments tied to a prepaid service (Waldron et al., 2019). The pandemic has also heightened the potential for increased use of mobile phones in data collection, to monitor service disruptions, to assess effectiveness of response interventions, or to target vulnerable groups and their needs. In Zimbabwe, for instance, the Rural WASH Information Management System integrated community-based informants into the data collection process, who provided real-time feedback on the quality of WASH services through mobile phone short message service messaging (UNICEF, 2021a).

Taking the effects of COVID-19 into account, global spending on digital solutions is estimated to grow 8 per cent annually, on average, from USD 32 billion in 2019 to USD 47 billion by 2024 (Butler et al., 2020).

Alternative organizational approaches have transformed the way of operating and interacting within water utilities | The effect of COVID-19 confinement policies, such as partial or full lockdowns and limited numbers of people that can meet, has driven the swift and overall successful move to remote working (Cotterill et al., 2020; Poch et al., 2020), providing an incentive to rethink conventional organizational models, such as productivity assessment, role of social interactions and peer-learning, organization of internal spaces, mobility, and many other elements of work organization (Aqua Publica Europea, 2020). In

Box 18. Facilitating working from home (WFH) with the adapted instrument

During the United Kingdom lockdown, a questionnaire was distributed to water professionals to understand their experiences and perceptions of organizational response. Findings were evaluated on the measures of mitigation, adaptation, coping, and learning. The survey questions focused on the challenges faced by employees, what their organization had done to prepare and mitigate the COVID-19 threat, how their organization might adapt in the mid-term, and longer-term outlooks on future operations and what might become the new normal.

WFH was the most prevalent theme in the survey responses, with 771 individual mentions across 12 of the 14 open-response questions.

Most survey respondents (58 per cent) did not expect a return to pre-lockdown working practice. Consultants and those working for water service providers (WSPs) were twice as likely to think normal working practices will return after the COVID-19 lockdown compared to regulators or researchers (12 per cent of contractors and 10 per cent of WSPs, compared to 6 per cent of regulators and 5 per cent of researchers). There was a perception that WFH would remain for a long period of time, with some regulators and consultants stating that it may become the norm or business as usual. Some discussed this adaptation further with suggestions of how this might be realized in practice. They are currently looking at rotas for employees to come into the office without having everyone in at the same time. Participants perceived there would be a change in attitudes and perceptions regarding WFH with it being considered more acceptable. This demonstrates that, generally, the workforce was able to adapt well to the new situation.

Another survey question related to how the physical office environment might change. Participants perceived that, with the shift to WFH, offices would only be used for occasional and necessary face-to-face meetings. They suggested there may be smaller offices, fewer staff, or the potential closure of office locations. When asked to reflect on the learning from preparing for lockdown, participants again referred to WFH, suggesting it was possible to work effectively from home and there should be more provision for this in the future. However, some stated that not everyone is able to WFH. More learning is required to ensure WFH is inclusive and does not exclude people who do not have access to the necessary equipment (e.g. computers or smartphones).

Source: adapted from Cotterill et al. (2020).

Europe, for instance, many service providers have reported that the transition to remote working occurred seamlessly with no loss in productivity, although in some cases this shift required quick upgrade of the the IT infrastructure and adaption of work organization (Aqua Publica Europea, 2020).

However, the digitalization of services raises questions on the role of technology in the new workplaces, together with significant challenges for service providers, including addressing ethical questions regarding worker and citizen privacy in the use of monitoring technology; providing learning opportunities for workers to use the new technology, to maximize the resulting opportunities for workers; and providing equal access to advanced digital infrastructure.

Moreover, while countries with high technical capacity may make these e-measures permanent and widespread, others without this capacity may lag behind (ILO, 2020a). Therefore, the pandemic has accelerated some transformation trends related to the internal organization of water utilities, but at the same time, remote working and workplace

Box 19. Low-cost adaptation to promote handwashing and access to WASH supplies in Ecuador

One priority during the pandemic has been to ensure the availability of water points and handwashing stations in public spaces, such as bus stations, markets, health centres, etc. to prevent the spread of the virus.

Non-governmental organizations and other external support agencies, such as the United Nations Children's Fund, implemented several handwashing stations to secure hand hygiene in remote areas, presenting up to eight mobile models that could be easily transported and installed and that could work with no connection to a water system. Major advantages of the models were adaptability to the local context, limited human contact in their use (they are activated with a foot pedal), and easy access and handling for both adults and children. They have a tank for clean water and another tank for grey water, both ranging between 20 and 40 litres, which gave them a certain degree of autonomy. In addition, their components were made of environmentally friendly materials. The diversity in designs and functionalities was also reflected in the final price, with proposals starting at USD 73 and going up to more robust options of USD 700.

On the other hand, most rural operators faced difficulties in accessing the chlorine needed for water treatment, mainly due to logistical difficulties, over-demand, and increase in price. For this reason, they were encouraged to use on-site chlorine production equipment, which not only responded to their needs but also generated local capacities. Several devices were available that manufacture sodium hypochlorite (liquid chlorine) through the electrolysis of brine (a solution of water and common salt). These containers produced between 2 and 9000 litres of liquid chlorine per day, which meant that 0.3–1350 cubic metres of water could be treated (if water quality at the intake was medium to high). The total cost of chlorine produced was 1 cent per litre of water treated.

Source: adapted from WASH Cluster, Ecuador

digitalization may increase disparities within and among countries. Adequate resources will need to be directed towards ensuring a fair and inclusive transition into a new era of remote and digitized working.

Strengthened and more flexible regulatory frameworks | Beyond the immediate crisis response, responding to the pandemic should have involved regulatory issues to enable economic and social recovery and to increase resilience to future shocks and crises. Governments have been faced with a particularly challenging set of policy trade-offs as they develop new regulations. While they have been under extraordinary time pressure to swiftly develop policy responses to the COVID-19 pandemic, they have generally used shortened administrative procedures and new forms of coordinating committees to urgently pass a range of crisis-related regulations (OECD, 2020). In addition, some regulators have also opted for relaxing performance commitments (see Box 20). The potential consequences of any regulatory (or non-regulatory) decision are perhaps far more widespread than normal, with significant economic and social impacts (OECD, 2020).

Therefore, identifying the appropriate tools to assist policy makers and regulators in assessing costs and benefits of new measures in place is an ongoing challenge, particularly in a crisis scenario where much of the evidence is incomplete or uncertain and information is evolving rapidly (OECD, 2020). Traditional methodological approaches (e.g. cost-benefit and cost-effectiveness analyses) are unlikely to

be applied. Instead, digital technologies provide opportunities to cut through the information challenge and increase regulatory capacity. They provide avenues for water quality surveillance or monitoring performance of utilities, for example. These, in turn, can help policy makers adapt regulatory responses accordingly and monitor compliance with the measures taken by governments.

Box 20. Innovative regulatory approaches in the water, sanitation, and hygiene sector

The Italian Regulatory Authority for Energy, Networks and Environment (ARERA) improved its informal relations with operators and consumer associations with an objective to collect real time inputs, data, and information for executive decision-making purposes. ARERA acknowledged that the legislative process was interrupted, resulting in less democratic regulation but much faster responses to the pandemic emergency. ARERA also established a task force for quick impact analysis, preparing the ground for more frequent interaction with consumers and stakeholders. This analysis suggested the need to shift much of ARERA's attention from prior crisis priorities towards emerging ones.

In parallel, the England and Wales regulator flexed its monitoring requirements to help its operators cope with the current challenges and deliver the same service quality. It recognized that the sector was likely to face significant staff shortages and limitations to its ability to undertake some routine work because of social distancing requirements, and these limitations could make it difficult for every operator to meet some of the performance commitments in the regulatory settlement. In planning for these constraints, operators prioritized meeting their core service obligations. In this situation and for the avoidance of doubt, incentives, and penalties, the operators were assured that there was no need to wait for any approval from the regulator before implementing prioritized working arrangements. Instead, the regulator considered the need for any ex-post adjustments to its regulatory system following an in-the-round assessment as part of its normal reconciliation process. This required operators to demonstrate how their operations have been impacted by COVID-19 and how they made their decisions.

The Japan Water Agency also applied a wide range of measures to innovate and make its work more efficient during the pandemic, including:

- Ongoing contracted works and operations, including temporary suspension of them upon contractors' request for suspension, and extension of work period, modifications on design document, etc.
- Flexible treatment (extension and others) of deadlines against applications for regulator bids and related works, etc.
- Maximizing the number of online inspections and meetings.
- Simplification and prompt processing of various procedures, especially for payments (to help avoid delayed payment to the contractors who are facing impending payment deadlines related to the temporary suspensions of the contracted works).
- Appropriate evaluations given to the contractors who have taken flexible and proper actions for the prevention of the spread of new coronavirus infections.

Sources: IWA (2021), Owfat (2021), and JWA (2020).

6.4 Earmarking additional resources for WASH

In many countries, both humanitarian and development actors reprogrammed activities and included the COVID-19 response in their programmes | Many national and international agencies developed their programming and emergency response modalities to respond to the pandemic. In over 20 fragile states, the UN Humanitarian Coordinator launched the inter-agency COVID-19 response plan, and different cluster partners from local NGOs, international NGOs, and UN agencies contributed to the development of this response plan, either with new funding or with reprogrammed funds. In Palestine, for instance, the inter-agency response plan prioritized funding access to – among other projects – WASH services in public facilities; the provision of hygiene items to vulnerable families and communities; the maintenance of the service provision by securing cleaning materials and equipment; the enhanced awareness communication and campaigns; and the provision of water to households, health care facilities, and quarantine centres (Wash Cluster, 2021). Similarly, in the eastern conflict-affected area of Ukraine, humanitarian appeal earmarked about USD 5.4 million primarily towards risk communication, community engagement, WASH at health facilities, community level hygiene, and IPC and WASH assistance to schools and other institutions (WASH Cluster, 2020).

Low- and middle-income countries have been largely supported in their WASH-earmarked financing by development banks and external support agencies | During the pandemic, all development banks and other external support agencies have been actively providing finance assistance to countries, albeit to varying degrees and through different mechanisms. For instance, the Gambian government developed a national COVID-19 response plan and budget that incorporates interventions to ensure continuity of WASH services (e.g. basic service provision in public institutions, enhanced capacity for WASH management, and improved infrastructure for vulnerable groups). The World Bank committed USD 10 million towards supporting the government to prepare, plan, and implement the response plan (SWA, 2020). In Bangladesh, the national government was given USD 4 million to provide handwashing stations and make hygiene products available to the public. In addition, the World Bank and UNICEF provided some financial support for purchasing soaps and conducting awareness campaigns in rural and urban areas (SWA, 2020). In Zambia, UNICEF subsidized the procurement of PPE and treatment chemicals for up to USD 1 million (interview with Mr Kasenga, Zambia National Water Supply and Sanitation Council, 2021).

Credit: ©UNICEF/UNI340879/Diéguez

Some analysts, however, highlighted the risk of seizing the COVID-19 pandemic as an opportunity to apply a marketized view of WASH services (McDonald et al., 2020). One example for this is the financing loan mechanism that the World Bank developed specifically for operators affected by COVID-19. Although primarily intended to support short-term crisis management, this mechanism is envisaged to become a mid-term financing facility for the WASH sector. While this mechanism employs blended finance models to assist creditworthy or near-creditworthy utilities to replace donor to more sustainable market financing within the context of the pandemic, the proposed World Bank loans are pre-conditioned by performance contracts, key performance indicators, certain efficiency of utility costs and cost-effective tariffs (World Bank, 2020a). Some international organizations, such as UN-Habitat and UNICEF, are also encouraging public-private partnerships with multi-national companies to procure soap and other hygiene materials to the most vulnerable populations in informal settlements. Also, small private vendors are lately incentivized through grants by UN agencies to ensure service continuity in informal settlements and support provision of PPE (McDonald et al., 2020).

There are examples of public, governmental earmarked funds for WASH | In the Maldives and Zimbabwe, several million USD have been allocated under the COVID-19 response plan, with water treatment chemicals or rehabilitation of water supply systems being among the funding priorities along with communication campaigns and provision of hygiene kits (SWA, 2020). Another example comes from the Italy regulator, ARERA, which introduced the Energy and Environmental Services Fund to guarantee the sustainability of current and future regulatory measures in favour of consumers and users (e.g. price adjustments) in the authority's areas of competence. To finance the proposed regulatory measures, the fund may transfer up to EUR 1 billion from available funds on a temporary basis and consistently with the operator's payment cycle, and only under the pandemic purposes for which their management accounts have been set up. These amounts must then be returned to the relevant management accounts once the pandemic is over (IWA, 2021).

More blending and innovative funding is needed | Integration of more democratic forms of public finance will be critical to the recovery of public services after the pandemic. The potential for public banks, in particular, to assist with gaps in funding for water and sanitation should be explored. For example, there are more than 900 public banks around the world (excluding central and multilateral banks), which collectively hold more than USD 48 trillion in assets and account for about 17 per cent of global banking resources. Some public banks, like the Dutch Nederlandse Waterschapsbank and the German Kreditanstalt für Wiederaufbau, have been already lending to public water operators at low rates and providing expert public sector advice for decades (McDonald et al., 2020). With potential new lenders, the prospect for expanding these relationships and building cross-sectoral trust and expertise is significant. COVID-19 may therefore further help to create awareness and opportunities for new and innovative forms of public-public partnerships (McDonald et al., 2020).

Similarly, in some countries, the WASH sector seems to be back in the financial hotspot because of a better understanding by many governments of its importance and potential return of sectoral investments through new jobs. For example, federal investment in water infrastructure per capita in the USA is now measured at about USD 11, in a similar fashion to the energy sector and transportation systems, which are USD 46 and USD 136, respectively. The current national capital required is about USD 123 billion per year, which once allocated, will potentially result in over USD 220 billion annual economic activity in the country, creating 1.3 million jobs over 10 years (Gude and Muire, 2021).

Finally, a few good examples can be found of innovative blended finance to trigger regular investors to invest in sustainable water and sanitation projects (Aqua for All, 2020). However, they remain an exception. More good practices are needed to change the perception of the sector as a risky money sink or a non-profitable endeavour (Gude and Muire, 2021).

Box 21. Bill and Melinda Gates Foundation, the Eastern and Southern Africa Water and Sanitation Regulators Association (ESAWAS) additional earmarked funds for regulation

The WASH sector is increasingly attracting investments for the necessary soft skills related to various governance issues, such as regulation or resilience capacity. A good example is the Bill and Melinda Gates Foundation, which has earmarked a USD 3.8 million grant for ESAWAS. The main objective of ESAWAS is to increase access to safely managed sanitation services for an estimated 50.76 million urban people, particularly the urban poor, in the Eastern and Southern African countries, by improving non-sewered sanitation service delivery through regulation.

Specifically, this project will help the national regulators of Burundi, Kenya, Lesotho, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia, and Zanzibar to include informal urban sanitation providers within their regulatory frameworks. The project outcomes range from country-level workshops, regulatory tools to support compliance and enforcement decision-making, country and regional benchmarking performance reporting mechanisms, to sector financing capacity building and regional awards. For example, Kenya Water Services Regulatory Board (WASREB) currently covers only urban areas, and with 50 per cent of the population living in rural areas, aims to formalize rural area providers by introducing new indicators to match these areas' criteria, among other measures. Every informal provider will be licenced through a contract with another small urban provider, delegated to monitor its performance on behalf of WASREB.

Source: interview with Mr Kasenga Hara, ESAWAS.

6.5 Green recovery and higher contribution to climate change adaptation and mitigation

Climate-friendly measures to increase water efficiency | An effective long-term COVID-19 response will fundamentally rely on improving access to water, primarily through the optimum and sustainable use of water resources, and the efficient operation of utilities and systems (UNICEF, 2021h). Specifically, there are three core and interlinked policy areas that are needed for a strong recovery while addressing pressing environmental and social concerns: i) improve conservation of available water, ii) reduce water use and increase reuse, and iii) reduce non-revenue water.

With increased water demand pressures, there is an urgent need to implement strategies for improving the conservation of available water. Green or nature-based solutions can help to improve storage and supply, lower costs, produce more resilient services, enhance system performance, and better protect communities (Browder et al., 2019). This is particularly needed today, considering expectations that water shortages will worsen due to climate change and risk of drought-induced decline of water levels in dam and freshwater supply sources (Anim and Ofori-Asenso, 2020). In addition, nature-based solutions can help with trade-offs between different water users (Cooper, 2029b). For example, conservation agriculture, rainwater harvesting, and enhancing aquifer storage can have positive benefits for water supply, potentially reducing competition between different users (Browder et al., 2019). Integrating green and grey infrastructure (e.g. dams, canals, and treatment plants) can also increase climate resilience (Browder et al., 2019). With future uncertainties, climate resilient water resource management will require an integrated strategy to address both short- and long-term impacts of climate change by balancing robustness with flexibility. There is also the need for robust adaptation options that have the primary

objective of supporting sustainable water resources use (Anim and Ofori-Asenso, 2020).

Another entry point to move towards more sustainable service models relates to tariffs, and their linkages with water conservation measures (Cooper, 2020a). The traditional tariff/tax component needs to evolve towards smarter and fairer approaches that better reflect the differentiated pressure on water resources caused by different types of users. Approaches to raise additional revenue can include, for example, the mechanisms to charge the cost of water pollution across users, like the approach based on the so-called "polluter pays" principle (Fiasconaro and Gojkovic, 2020). In this regard, Pinto and Marques (2015) criticized the use of free allowances, which have been widely implemented during the pandemic, for leading to efficiency losses, as customers do not have a marginal incentive to conserve water. For instance, in the MENA region, flat tariffs do not provide incentives to save water, and in urban areas in Jordan, water conservation at the household level is low. Water authorities have suggested this is due to a lack of public awareness of the need to conserve water (Diep et al., 2017). Another study examined the tariffs in 60 cities across 43 countries in Africa, Asia, Europe, North America, and Australia, and concluded that many utilities implement fixed water charges to ensure they generate a target level of revenue each year. Often, such tariffs include a relatively low volumetric price for delivered water, thus providing little financial incentive for households to use water wisely (Hoque and Wichelns, 2013). Especially in water-scarce contexts, consumers need to be sensitized on responsible water use. Therefore, when utilities are not charging for water (or wastewater) services, and there is no longer a price mechanism to regulate their usage (where water meters are used), measures are needed to ensure households do not waste water (UNICEF, 2020d).

Finally, aging infrastructure is a problem in many cities (Cooper, 2020a). For example, in Dar es Salaam, 20 per cent of supply is lost due to aging infrastructure and illegal water abstractions in a context where the utility is only able to meet just over 50 per cent of water demand. Moreover, approximately 20 per cent of water supplies to Dakar from Lac de Guiers, which is 250 kilometres away and supplies approximately 50 per cent of Dakar's water, are lost along the water pipe (Niasse and Varis, 2020). In consequence, fixing leaks will reduce non-revenue water and increase the amount of water available in the system.

Credit: ©UNICEF/UN0412709/Chikondi

Box 22. Non-revenue water reduction: a critical step towards commercial viability

Combining technical and institutional solutions to tackle non-revenue water, Jiro sy rano Malagasy (JIRAMA), Madagascar's state water and electricity utility, supported by Water and Sanitation for the Urban Poor (WSUP), increased the amount of water supplied to vulnerable customers by 12 million cubic metres and the continuity of water supply from 3 hours per day to 6–24 hours per day between 2012 and 2015. These benefits were translated into better services, including new water kiosks built in underserved areas and 710,000 low-income customers benefitting from the non-revenue water (NRW) reduction programme since 2010. Financial projections suggest a net gain of USD 1.4 million (including operation and maintenance costs) in 10 years from 2017.

Analysis by JIRAMA estimated that the utility was losing 19–20 million cubic metres of water per year in Antananarivo due to infrastructure and commercial losses. This contributed to JIRAMA being unable to provide an adequate service to existing customers and unable to extend services into new areas. Customers can be reluctant to pay for a bad service, which further reduces the revenue available for network improvements.

Technical solutions included setting up district metered areas in peri-urban areas and part of central Antananarivo to measure and isolate the amounts of water piped to these zones so leaks could be identified and active leak management undertaken. Another solution was introducing pressure reducing values to deal with pressure management, including reducing nightly leakage rates and improving water delivery. Institutional solutions included establishing a NRW unit, a leakage and repair detection service, and a low-income customer unit.

Source: Renouf (2017).

The need to invest in green recoveries

So far, the world has missed an opportunity. The spending announced in 2020 paints a disappointing picture for overall efforts thus far to build forward with green priorities. In 2020, only 18.0 per cent of recovery spending and 2.5 per cent of total spending had positive green characteristics (O'Callaghan and Murdock, 2021). Their study suggests that despite the efforts of a small number of nations (e.g. South Korea, Spain, Germany, and the United Kingdom), most countries lacked a green focus in 2020 COVID-19-related spending and will need to reorient to ensure a sustainable global recovery (O'Callaghan and Murdock, 2021).

A shift towards a more circular economy can create new opportunities for financing water services. For instance, water recovery from wastewater can contribute to the financial sustainability of water supply and sanitation systems and the water utilities operating them (Rodriguez et al., 2020). As cities in developing countries continue to grow, development approaches will need to minimize resource consumption and focus on resource recovery, including energy, bio-solids, and nutrient management (Rodriguez et al., 2020). These can provide financial returns to utilities to cover operation and maintenance costs, either partially or fully (Rodriguez et al., 2020). In addition, there is significant potential to reduce emissions from sanitation and wastewater systems through recovery of energy and nutrients contained in waste (Li et al., 2015), and indirect reduction of emissions can be reduced through renewable energy production and reduced dependency on fossil-based chemical fertilizers (Dickin et al., 2020). Therefore, from nutrient recovery to energy neutrality, water operators hold a strategic position in tackling climate change. In this framework, conducive regulation and incentives can foster the creation of new value chains connected to other sectors (agriculture,

construction, etc.) that can open new economic opportunities, trigger investments, and support the shift towards a more sustainable economy (Fiasconaro and Gojkovic, 2020).

Box 23. Focus on livelihood creation in response to COVID-19 and beyond in Pakistan

The Federal Ministry of Climate Change in Pakistan is responding to COVID-19 through a series of flagship initiatives, such as the Clean Green Pakistan Index (CGPI), Clean Green Champions Program, and a recent Green Economic Stimulus package. These programmes are being used to mobilize resources to rapidly respond to this pandemic while protecting the environment and livelihoods of people. These flagship programmes were launched by the Prime Minister of Pakistan, thereby signalling a high-level mobilization on the issue.

The CGPI is the first ever city-focused competition that has been conceptualized for creating a mechanism of strengthening municipal service delivery by local governments for five pillars of Clean Green Pakistan: i) water, ii) sanitation, iii) hygiene, iv) solid waste management, and v) plantation. The CGPI is being piloted in 12 cities of Punjab and 7 cities of Khyber Pakhtunkhwa. The citizen engagement programme, called the "Clean Green Champions", has registered around 120,000 champions (volunteers). The registered volunteers, on a self-help basis, assist in creating basic services, supporting local authorities and promoting behavioural change under Clean Green Pakistan. The Clean Green Champions are also being engaged to advocate behavioural change among hard-to-reach communities to control the spread of COVID-19 in Pakistan. These programmes have led to an increase in budgetary allocations for the water, sanitation, and hygiene (WASH) sector. An overview of the overall WASH allocations for 2019–2020 and comparison with earlier trends reflect that there has been an increase in budgetary allocation of 57 per cent.

Recently, the Prime Minister of Pakistan approved the Green Economic Stimulus package as part of the government's efforts to extend green cover in the country, especially in the wake of the COVID-19 crisis. As an innovative livelihood creation initiative, the Green Economic Stimulus package will increase the daily wage job opportunities for clean and green initiatives, largely around forestry in rural areas and WASH in urban centres. For 2019–2020, the Green Economic Stimulus package generated a minimum of 65,000 jobs, which scaled-up to 200,000 by December 2020. Along with this, the Ministry of Climate Change launched a post-COVID response in two Union Councils of Rawalpindi (Dhook Hassoo and Dhook Syedan) to emphasize job creation around hygiene and sanitation, thereby ensuring people living in urban slums were reached with information and economic stimulus.

Source: SWA (2020).

Credit: ©VUNICEF/UN0388651/Panjwani

7. LOOKING FORWARD

7.1 Lessons learned

COVID-19 measures have challenged the delivery of WASH services in different ways and to different extents | Service providers and external support agencies have faced multiple challenges to deliver WASH amidst lockdown and social distancing measures. Water and wastewater operators have experienced and managed a high level of pressure to ensure the continuity of an essential service in a context characterized by heightened uncertainty and heavy limitations to normal operability. The specific nature of WASH services and systems has also required extra considerations when developing and enforcing social distancing rules and characterization of essential services. In some countries, social distancing rules that limit gatherings have created difficulties in the distribution of hygiene items, while some WASH service providers (e.g. suppliers, drilling companies, and maintenance services) not deemed essential were halted in some areas. Governments must take into consideration how these policies impact the overall delivery and availability of basic WASH services.

Most utilities have had to completely rethink the way they have managed and operated services to adapt to the exceptional COVID-19 situation and avoid interruption of services. Specific challenges have related to the rupture in supply chains, restricted mobility of essential staff, and increases in prices for WASH commodities. That said, many operators have registered a rise in the level of satisfaction and trust among their users. Thanks to the extraordinary commitment of operators' employees, the continuity of water provision has been ensured in many places with most people appreciating the reliability of the service (Aqua Publica Europea, 2020).

Operating during the pandemic has also translated to increased costs for humanitarian assistance programmes due to factors such as higher transportation costs, more time needed to roll programmes out, and supply chain shortages. The rise in costs has been coupled with a sharp decline in bilateral humanitarian aid and an overall flattening of ODA growth over the past several years (Dodd et al., 2021). Now, more than ever, wealthier countries must commit to supporting WASH services in humanitarian settings to ensure everyone has safe and reliable access to WASH.

Full integration of risk management in water and sanitation operators is essential to respond to emergencies and crisis situations | The disruptive effects caused by the pandemic have attested to the importance of water and sanitation operators having solid risk management approaches in place. However, recent experiences highlight that, when a hazardous event occurs, having a well-designed risk management is just a starting point to effectively address the implications of adverse events. Methodologies to assess the likelihood and impact of risks are essential to support decision-making and adopt informed actions that prevent or mitigate the risk in a proportionate way. Risk management also requires involving staff in continuous and reiterative learning processes, enabling personnel to improve from experience. Furthermore, the information needed to carry out risk assessment involves horizontal communication processes that cut across operators' departments and functions, and new collaborative dynamics must be established to facilitate circulation of information. The full integration of risk management in water and sanitation operators is therefore a process that should deeply influence and transform the way of operating and interacting within utilities (Aqua Publica Europea, 2020).

Access to WASH services for all? Some response measures have increased inequalities and the service delivery gap | Many policies enacted during the pandemic, such as free-water initiatives, have deepened the gap between wealthy and poor, giving more service to the wealthy, while providing little to no benefit to the poor due to an insufficient understanding of the ways in

which the most vulnerable consume WASH services and an inability to reach them through appropriate measures. Responses to COVID-19 must capture the layered vulnerabilities and contextual specifics of different communities and nations, such as shared meters, multiple water sources, a reliance on informal service providers, and the increased burden on women and girls to collect water. Extra attention must be paid to serving the most vulnerable, including migrants, refugees, and those housed in informal settlements. This may be a critical space in which international assistance can play a role in priority setting.

The requirement to socially distance as well as greater demand for water will mean that more time is spent collecting water. When enforcing curfews, additional time required to access essential services, such as water points and toilets, must be considered. Additionally, more time spent collecting water may roll back progress made in women's empowerment and gender equality. To not undo decades of progress, policy makers must ensure expedient access to water among rural and vulnerable communities.

High-quality and updated data are needed for evidence-based decisions and to target the neediest | Governments and WASH stakeholders (e.g. regulators, service providers, etc.) need reliable, up-to-date, and accurate information to make informed decisions. The context of the pandemic has been evolving, creating new scenarios and emerging challenges that required specific and tailored solutions. Three major bottlenecks have been identified: i) lack of capacities to produce and collect data (e.g. poor digitalization of water systems), ii) inadequate instruments to share data between sector stakeholders (e.g. between service providers and the regulator), and iii) limited capacities of decision-makers to analyse data and use them to inform decisions.

For instance, governments have been advised to prioritize public funding for the provision of basic services for the poorest and most vulnerable populations, including those without pre-existing basic WASH services (UNICEF, 2020d). If non-poor households whose income is not affected considerably by the crisis are provided free WASH services, it will lead to loss of income of the utility and a greater burden to government finances. Adequate identification and selection of beneficiaries should therefore be based on comprehensive lists of the most vulnerable households in the area of interest, typically obtained and updated through involvement of social services, local authorities, and civil society organizations.

Insufficient coordination within the sector and between emergency and development actors has often weakened the response | In the absence of coordination, critical aspects of prevention can become delayed, resources may be poorly used due to replication of efforts, and populations can be confused by public health messaging (White, 2021). There is also the risk of implementing coordination through standardization (i.e. standardized interventions being implemented with relatively little context adaptation). Standardized nation-wide messages might curtail the ability for organizations to adopt innovative or context-adapted responses, while populations might be disengaged with the public health messaging because it seemed to lack relevance to them (White, 2021).

The pandemic has triggered collaborative efforts between all stakeholders and several good coordination practices within WASH stakeholders (e.g. the government and water utilities in Colombia), and between WASH and other sectors (e.g. the Health, Protection, Nutrition, and Shelter clusters joining hands with the WASH Cluster to advocate for the Multi-sectoral Response Plan to COVID-19 in Ethiopia). However, by and large, coordination mechanisms have shown gaps and weaknesses in different aspects, including a lack of political will and prioritization, poor institutional coordination practices to break traditional response silos, and inadequate resources. In the same vein, despite considerable efforts by emergency and development actors to adapt their response plans and collaboratively manage the crisis, there has often been overlap, fragmentation, and gaps that have not been properly addressed (Groupe URD, 2020a).

Enhanced communication to raise awareness and improve service delivery | In dealing with a complex emergency, mass communication of

information is important (Groupe URD, 2021). During COVID-19, in many southern countries, public health advice has been successfully advertised and posted in public places, such as schools, markets, hospitals, bus stations, etc. National and local radio stations were also used to broadcast messages and information, with songs being part of messaging campaigns. The crisis has seen both good and less good – or bad – practices. Communication has, for instance, been effective to link reduction of COVID-19 spreading with good hygiene practices, but free-water initiatives failed to communicate that only a minimum subsistence volume of water would be offered without tariff, which resulted in over consumption by many, water wastage, and water shortages.

Hyland-Wood et al. (2021) presented ten recommendations for effective communications in the era of COVID-19, which are founded on public trust, to harness public cooperation and sustainable behaviours, underpinned by transparency and civic engagement. Indeed, trust, transparency, and engagement are needed to combat misinformation. False rumours have sometimes spread more quickly than legitimate communications on measures to contain the pandemic. In consequence, a variety of measures and specific techniques have been adopted throughout the crisis to reduce the spread of dangerous misinformation and counter fake news.

Increased awareness of the relevance of WASH for public health has not been sufficiently translated into priority funding for WASH | Despite the recognition of the importance of the WASH sector for public health, the sector remains insufficiently funded. COVID-19 has highlighted the remaining gaps of the WASH sector in households and institutions. Although many governments have taken provisions for ensuring that these services reach the populations in need, this has not necessarily translated into additional funding. In addition, priorities from national and local authorities and several emergency response measures have affected operator's revenues. While this short-term response has the best interest of the population in mind, guaranteeing that all people can always have access to WASH services, the long-term repercussions are unclear; they might affect financial viability of services and jeopardize the overall sustainability of the sector.

Governments quickly reached their budget limits (GDP public debt) through emergency-related pandemic measures | With WASH not being systematically included in the current pandemic emergency packages, the sector was further harmed by most of the governments around the world. Being limited in their fiscal capacities, several governments in low- and middle-income countries left the WASH sector to cope with the pandemic emergency on its own, which often forced it to turn towards the private sector for help. While the big WASH infrastructure projects in general remained in place, being classified as essential works, the shifted priorities by the national and local authorities towards emergency response and by utilities towards operation and maintenance costs translates into fewer CAPEX in the near future. Some initial data suggest a two-digit drop in CAPEX in most low-income countries (GWI, 2020). With some allocation issues carried from the past, the sector's future does not appear very optimistic at the moment. The reasons for a pessimistic growth forecast range from budget restrictions required to compensate for the lost revenue, difficulty in raising tariffs, to dependency on externally funded infrastructure projects expected to be significantly delayed.

Better news is additional earmarked funding, which in some cases helped the sector when most needed. Originating from a variety of governmental organizations and NGOs, public and private sources, and sometimes reaching interesting innovative financing mechanisms, these funding opportunities, if multiplied, could help to sustain the WASH sector in the long-term.

Need of financial support to service providers | The measures adopted by some governments regarding suspension of water billing for low-income users and moratoriums on water service cut-offs, for example, have created a financial gap in service providers' incomes. For instance, estimates from the World Bank show that revenue collections for water companies fell by 40 per cent when the

pandemic started due to suspension of water charges as a strategy to cushion consumers from the effect of COVID-19 on their personal finances (World Bank, 2020b). Many public water operators have also been subsidizing consumption and reconnecting users to the network in an effort to help combat the spread of the virus (sometimes as a result of government legislation but also due to internal decision-making), exacerbating financial losses (McDonald et al., 2020). With few exceptions, a general lack of financial support to water and sewerage utilities has been observed (SIWI, 2021b; Giné-Garriga et al., 2021), although many of them have expressed that increased subsidies and new financial approaches are among the most-needed support to prepare for emergencies like COVID-19. All service providers will require some sort of rescue funding, whether this comes from donors or government funding. It will be important to consider the specific needs of smaller providers, since they are in a particularly vulnerable situation. In addition, the focus should not be on addressing short-term financial needs but on promoting long-term operators' resilience capacity-building, such as through a review of tariffs.

The informal sector, who often provide water to low-income and off-grid communities, is a special case that has been particularly affected by the pandemic. It has rarely benefited from any support, since response measures have seldom considered informal vendors. For instance, they have not been able to work during mobility restriction hours, and some informal systems have fallen through the pressure of temporarily ceasing operations to respect social distancing measures.

The linkages between willingness to pay and free-water initiatives | The quality-of-service provision and willingness to pay are usually linked, regardless of the crisis. Whilst the poor are willing to pay for water under certain conditions, including affordability and reliability (Cooper, 2020a), inadequate service provision or poor service levels might impact customers' payment culture. During the pandemic, many free-water initiatives were implemented, and monitoring the potential effects on the willingness to pay culture of consumers is essential.

Also, once populations are given free services, they may come to expect them in the future; hence, careful messaging is needed around the temporary nature of government support (UNICEF, 2020d). In Colombia, for example, Empresas Públicas de Medellín has been very clear that emergency measures put in place to make water more affordable to the poor are temporary reprieves from market-orientated cost recovery policies, and have been keen to emphasize that they are not offering free water (McDonald et al., 2020).

The world has so far missed the opportunity to invest in green and more sustainable recoveries | The COVID-19 response has primarily focused on improving access to water sanitation and hygiene for all, albeit at the cost of ensuring optimum and sustainable use of WASH services and the efficient operation of utilities and systems. Several factors have hampered the adoption of solutions and delivery modalities that simultaneously address environmental and social concerns: aging infrastructure, poor digitalization of systems, inadequate management of non-revenue water, and little or no incentives for innovative and green solutions, including financing, etc.

Recent studies show that the sector is not yet building back better when moving from the rescue to the recovery phases of the COVID-19 response (O'Callaghan and Murdock, 2021), with most countries lacking a green focus in recovery spending. On the whole, it is observed that global green spending does not match the severity of the crises of climate change, nature loss, and pollution. Countries will therefore need to reorient themselves to ensure a sustainable global recovery from the COVID-19 pandemic (O'Callaghan and Murdock, 2021).

7.2 Recommendations

Support the progressive realization of the human rights to water and sanitation | The pandemic has clearly demonstrated why water and sanitation must be available, accessible, and affordable to all to keep populations safe,

healthy, and more resilient to public health emergencies and other shocks. For example, one recent study shows that policies that stop utility disconnections during the pandemic have been effective and have decreased the number of COVID-19 cases and deaths (Jowers et al., 2021). The UN has consequently urged governments to implement policies to prohibit cuts of water supply and guarantee a minimum essential amount of water for those who cannot afford them (OHCHR, 2020a; 2020b).

While great strides have been made towards the full realization of the human rights to water and sanitation, much is left to be done. Many response measures have not benefited the poorest and those who were already lacking adequate WASH services, whilst others (e.g. utility disconnection moratoria) have merely delayed, but not stopped, the negative financial and socio-economic impacts of the pandemic (e.g. the disconnection process for financially stressed households). If governments and decision-makers want to holistically address the availability and accessibility to water and sanitation for all, then adopting policies that provide both immediate and long-term relief is necessary.

Now is the time to capitalize on the gains made during the pandemic and continue to build political will to ensure that those who have gained water and sanitation access are able to keep it during recovery and that many more will be able to enjoy affordable and sustainable access in the future. Could the COVID-19 pandemic mark a step change in the urgency with which the international community supports the realization of the human rights to water and sanitation? Will this support address the challenge of available and sustainable management of water and sanitation for all? There seems to be widespread agreement that if ever there was a moment to seize upon the small gains prompted by a global event, the moment is now.

Supporting safe return to schools by securing access to WASH | Education has been one of the most impacted sectors by the COVID-19 outbreak, with a growing fear of generational loss and regression in learning and skills region-wide. The decision of safe reopening of schools has been very much influenced by the evolution of the pandemic in the different countries as well as the public opinion with regards to the safety of schools and the lack of sound evidence to guide the national response.

Although a number of health and hygiene protocols and guidelines have been prepared to support safe school reopening (UNICEF, 2020e; UNICEF et al, 2020; UNESCO, 2020; Bender, 2020), their implementation will require additional resources matched with adequate capacities. In addition, mid- to long-term actions will be needed to strengthen the enabling environment and achieve more resilient and sustainable WASH services in schools (SIWI 2021a; 2021b; Giné-Garriga et al., 2021).

Improving WASH and infection prevention and control in health care facilities | The linkages between poor IPC and WASH services in health care facilities have been highlighted since the beginning of the pandemic. Major gaps in the delivery of these services in health care facilities have also been highlighted (JMP, 2019b).

It is therefore necessary to accelerate investments and improvements in WASH services in health care facilities. In a recent report, WHO and UNICEF suggest four complementary actions: i) implement costed national roadmaps with appropriate financing; ii) monitor and regularly review progress in improving WASH services, practices, and an essential enabling environment; iii) develop the capacities of the health workforce to sustain WASH services and promote and practice good hygiene; and iv) integrate WASH into regular health sector planning, budgeting, and programming, including COVID-19 response and recovery efforts to deliver quality services (WHO, 2020b). It is only with these WASH fundamentals in place that the ultimate aim of delivering safe, quality essential health services for all will be achieved.

Ensuring adequate emergency response coordination arrangements between WASH and other sectors (e.g. education, health, and social protection) | From the very beginning of

the pandemic, it was essential that emergency coordination was enhanced within the WASH sector and with other sectors, together with the establishment of coordination platforms that promote effective communication mechanisms. More and better collaborative efforts are needed between all stakeholders to rethink and act for improved water services during this pandemic and in future shocks. They need to be coupled with strong leadership capacity of governments to successfully coordinate the sector in emergency situations.

In addition, rapid response assistance to contain the emergency aspects of the pandemic may be pointless in the absence of a long-term vision, as this does not allow a resilient response to the pandemic risk. In this regard, greater synergies need to be created across the humanitarian-development-peace nexus to address all dimensions of fragility by linking the response and recovery efforts to ongoing actions that promote more sustainable and resilient WASH services. Effective coordination mechanisms can then focus on ensuring that vulnerable and disproportionately affected groups, including women, girls, refugees, and migrant workers, are not left behind in the design of the crisis response.

Building up capacities of all stakeholders, at all levels, to increase preparedness and improve WASH response to the pandemic | Weak systems and inadequate institutional capacities pose a challenge for both water resources management and expanding access to WASH. The pandemic has shown significant capacity gaps in the level of preparedness of sector stakeholders to respond to the pandemic at all levels (human, institutional, and enabling environment). For instance, only a few utilities had contingency plans to respond to and recover from the outbreak, and most faced serious challenges in putting them into a functional framework.

Therefore, long-term support for knowledge and capacity development for institutions and service providers is needed to promote good WASH governance and management. It takes years to strengthen institutional capacity (WWAP/UN-Water, 2018), and recommendations for humanitarian and development agencies could include better analyses and understandings of the needs and capacity gaps of the sector to improve preparedness and increase resilience to continuing pressures (Cooper, 2020a; Diep et al., 2017). At the same time, capacity development plans for future repeated outbreaks should be adequately resourced, together with the necessary political will from institutions to support their actual implementation.

A digital reform of the water sector as part of post-COVID-19 recovery efforts | An increasing number of WASH service providers, regulators, and sector stakeholders underwent a digital reform to reduce operational expenses and streamline service delivery (Miglietta et al., 2018; Water Europe, 2020). A digital WASH reform includes data analytics, cloud computing, and augmented intelligence to give new capabilities to analyse, automate, correct in real time, predict, and minimize risks. Digital technologies have the power to help water and wastewater utilities address many of the challenges they face, including extending the life of aging assets; reducing leakages, attacks, or other abnormalities in the distribution network; improving water quality monitoring service levels and reliability of supply; promoting water conservation; enhancing disaster management processes; improving customers' willingness to pay; or increasing revenue through operational efficiencies (e.g. reduce energy demands). While there is an increase of digital adoption in WASH, the sector still lags behind other industries in integrating new, smart technologies into the whole water ecosystem (Jiminez, 2018).

Going digital, however, not only refers to technology but also implies a cultural change in the organizations. For instance, obstacles to be aware of when digitizing payments include an insufficient number of mobile money users, the impact of digital fees on customers' willingness to pay, and the difficulty in integrating mobile money providers (Waldron et al., 2019). Therefore, the intensification in the dialogue with all stakeholders, including end users, is key to achieving automation and digitalization because it eliminates fears and unknowns about digital solutions (Water Europe, 2020).

Strengthening of national and local information systems to support evidence-based decisions | The pandemic has shown how utility and regulator performances have been impacted by lack of data and poorly informed decisions (Cooper, 2020a). Inadequate targeting of beneficiaries and poorly tailored response measures are two recurrent outputs from unaddressed information gaps. Investing in data management is therefore crucial for developing a timely response on three different fronts: i) making sure decisions are evidence-based, ii) increasing accountability, and iii) tracking progress. In contrast, without high-quality data providing the right information on the right things at the right time, designing, monitoring, and evaluating effective policies becomes almost impossible (IEAG, 2014).

This is of particular importance in rural areas and in peri-urban settlements due to informal or non-formal service provision networks and the lack of records, which impedes adequate responses from governments and the range of supporting actors (Wilkinson, 2020). In these settings, closer collaboration with local actors and communities is crucial to supporting the production of reliable local data. For instance, community health workers can play an important bridging role given their position on the front line (Parikh et al., 2020).

Earmarking additional funds to the WASH sector | The COVID-19 crisis has suggested that there is a lack of resilience in WASH financial systems to shocks and stresses, which has allowed failures to cascade from finance to service delivery. Therefore, governments will need to embed concepts, such as systems thinking and resilience, into financing to prepare water and sanitation systems for future systemic shocks (e.g. climate change). In addition, governments will need to reassess their budgetary needs and the availability of funding due to COVID-19. Financial response plans should adequately include WASH and consider the impact of the socio-economic crisis when designing financing mechanisms for the sector (e.g. loans, microcredits, cash transfers, etc.), with particular focus on their adaptation to the context and most vulnerable populations (UNICEF, 2020d).

In these efforts to improve financial resource allocation towards the WASH sector, governments will need to be supported as soon as possible by the international community. More coordinated financial mechanisms must be put in place to harmonize emergency fund distributions along the development priorities. When jointly initiated, rather than forced by existential necessity and pandemic circumstances, better structured public-private

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partnerships could reach their maximum potential for both sides. Innovative and often blending financing mechanisms should be further triggered and strengthened. Briefly, the international community must, as a matter of urgency, strengthen financial capacities of low- and middle-income countries to cover the WASH-pandemic-related gaps through more financial aid, also covering the CAPEX required to reach the SDG 6 goal. In short, overall aid should be more systematically structured and generally disbursed.

Ex-post review of fast track and emergency regulations to strengthen the use of regulatory management tools and approaches in a time of crisis | The COVID-19 crisis has made the need for well-designed, evidence-based, and well-enforced regulation particularly acute (OECD, 2020). For instance, response measures intended to protect consumers should be mandatorily applied through regulators to ensure their proportionality and spare the operators from unnecessary revenue shortfall (IWA, 2021). In the past months, governments across the globe have been forced to develop emergency regulatory responses in a challenging and evolving context with the lack of a robust evidence base on the effectiveness of containment measures. It is therefore very important that emergency regulations, as well as any administrative flexibilities or relaxations of certain rules, undergo some form of ex-post review in the future to ensure that the effectiveness and efficiency of these new regulatory measures are scrutinized, good practices are identified, and lessons learned are systematized (OECD, 2020).

One of the most salient concerns facing regulatory bodies in the future is their ability to develop new, timely responses to fast changing economic, technological, and public health environments. Another concern is their need to ensure the resilience of the regulatory system to future systemic threats. Digital technologies provide potential opportunities to address, in part, the challenges posed by future shocks and to choose the right regulatory (or non-regulatory) response. Robust and adequately resourced regulatory oversight bodies will play a crucial role in ensuring that better regulation habits do not inadvertently fall in priority in a time of crisis (OECD, 2020).

COVID-19 recovery spending may be the greatest — and perhaps the last — chance for governments to meaningfully spend on environmental and social issues | On the one hand, the pandemic has revealed the necessity of rethinking the WASH sector without delay to be prepared for future challenges, such as climate change and potential further COVID-19 outbreaks (Poch et al., 2020). On the other hand, a growing body of evidence suggests that green fiscal spending can deliver stronger economic returns compared to traditional spending alternatives (Hepburn et al., 2020; O'Callghan and Murdock, 2021). National governments and international institutions will continue to have a key responsibility in the prioritization and financing of the protection, management, and efficient use of water resources. Despite local differences, the pandemic provides a new opportunity to rethink traditional models, and it is likely that it will accelerate a general development of new models of financing (Aqua Publica Europea, 2020). The traditional tariff/tax component will need to evolve and to better reflect the differentiated pressure on water resources caused by different categories of users, such as mechanisms to charge the cost of water pollution across users (Fiasconaro and Gojkovic, 2020). New opportunities for the financing of WASH services may also arise from the shift towards a more circular economy. For instance, adopting circular economy principles in wastewater management might lead to sanitation transforming from a costly service to one that is self-sustaining and adds value to the economy (Rodriguez et al., 2020), and one that reduces the CO_2 footprint of the water sector.

It seems clear, therefore, that regardless of the approach for recovery chosen, it will be impossible to disregard the sustainability challenge. The adoption of green solutions, however, needs to match and make the best use of existing assets, capacities, and resources, ideally moving from isolated solutions to fully integrated planning approaches that can lead to more sustainable and resilient systems.

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ANNEX 1. KEY INFORMANTS

List of key informants in Latin America and the Caribbean

NAME	COUNTRY	AFFILIATION
Mr Sigifredo Ruales	Ecuador	Ministry of the Environment and Water – Ministerio del Ambiente y Agua
Mrs Cecilia Pozo	Ecuador	Association of Ecuadorian Municipalities – Asociación de Municipalidades del Ecuador
Mr Pedro Carrasco	Ecuador	Fundación Avina
Mrs Viviana Muñoz	Ecuador	Water, sanitation, and hygiene (WASH) Consultant Former Director of Drinking Water and Sanitation Dept., Water Regulation and Control Agency – Agencia de Regulación y Control de Agua
Mr Koenraad Vancraeynest	Ecuador	WASH Specialist UNICEF Ecuador
Mr David García; Mrs Maria Paula Zapata Benavides; Mrs Angela Maria Escarria Sanmiguel	Colombia	Vice Ministry of Drinking Water and Basic Sanitation – Viceministerio de Agua Potable y Saneamiento Básico
Mr Diego Felipe Polanía Chacón	Colombia	Executive Director Colombian Water and Sanitation Regulatory Commission–Comisión de Regulación de Agua Potable y Saneamiento Básico
Mr Hector Alexander Serrano	Colombia	Water Resources Management Specialist World Bank
Mrs María Botero Mesa	Colombia	National Network of Community Aqueducts of Colombia – Red Nacional de Acueductos Comunitarios de Colombia
Mrs Diana Britez Scolari	Paraguay	Social Specialist Empresa de Servicios Sanitarios del Paraguay
Mr Ing. Giovanni Espinal Ferrufino	Honduras	Director Potable Water and Sanitation Regulatory Agency – Ente Regulador Agua Potable y Saneamiento

List of key informants in Middle East and North Africa

NAME	COUNTRY	AFFILIATION
Mr Eng. Monther Shoblaq	State of Palestine	Director General Coastal Municipalities Water Utility

List of key informants in East Asia and the Pacific/South Asia

NAME	COUNTRY	AFFILIATION
Nofilia Kiki	Indonesia	Business Sweden
Mr Shahid Kamal	Bangladesh	Regional Humanitarian Aid Coordinator – Asia HEKS / EPER
Mr Laxman Kharal Chettry	Nepal	South Asia WASH and Climate Change Adviser Terre des hommes WASH consultant
Mr Satyanarayan Ghosh	India	National Coordinator Terre des hommes

List of key informants in **Eastern and Southern Africa / West and Central Africa**

NAME	COUNTRY	AFFILIATION
Mr Bobby Whitefield	Liberia	Chief Executive Officer Liberia National Water, Sanitation and Hygiene – WASH Commission
Mr Goulam Soundi	Union des Comoros	Director Société Nationale d'Exploitation et de Distribution des Eaux
Mr Kasenga Hara	Zambia	Executive Secretary Eastern and Southern Africa Water and Sanitation Regulators Association hosted by National Water Supply and Sanitation Council, Zambia
Mr Itsuro Takahashi	Ethiopia	WASH Cluster Coordinator, WASH specialist UNICEF Ethiopia
Mr Richard Cheruiyot	Kenya	Director, Monitoring and Enforcement Water Services Regulatory Board
Mrs Martina Rama	Burkina Faso	WASH Cluster Coordinator, WASH specialist UNICEF Burkina Faso
Mr Thomas Dechentinnes	Democratic Republic of the Congo	WASH Cluster Coordinator, WASH Officer UNICEF Democratic Republic of the Congo
Faustin Ekah	Cameroon	WASH Cluster Coordinator, WASH specialist UNICEF Cameroon
Hamza Tidjani Ousmane	Niger	WASH Cluster Coordinator, WASH specialist UNICEF Niger
Joachim Peeters	Senegal	UNICEF West And Central Africa Regional Office

List of key informants in **Europe**

NAME	COUNTRY	AFFILIATION
Mr Sebastien Truffaut	Ukraine	Chief WASH UNICEF Ukraine
Mrs Julie Perkins	Spain	Officer-in-Charge Secretariat at UN-Habitat's Global Water Operators' Partnerships Alliance
Mrs Jovana Gojkovic and Mr Milo Fiasconaro	Belgium	Senior Officer, External Relations/Executive Director Aqua Publica Europea

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