



The COVID-19 Crisis Response and Lessons Learned in the Water, Sanitation and Hygiene (WASH) Sector

1. The Importance of WASH as a COVID-19 Countermeasure

- ✓ **Regular handwashing with soap is extremely important for preventing the spread of COVID-19.** The major modes of transmission of SARS-CoV-2 are through droplets. However, transmission can also occur through contact with contaminated objects or surfaces if people touch their eyes, nose, or mouth with their hands. Therefore, WHO underscores the importance of proper handwashing as general infection prevention control measures for individuals and for health care settings (WHO, 2020a¹).
- ✓ Among children under 5 years of age, Water Supply, Sanitation and Hygiene (WASH) attributable deaths represent 13% of the total deaths and 12% of DALYs, thus resulting in the loss of 2 million preventable lives every year (WHO 2019²). **The epidemiological evidence on the importance of handwashing for the prevention of water-borne and respiratory infections was accumulated even before the outset of COVID-19.** By improving WASH, the risk of diarrhea (water-borne illness) is reduced by about 42-47%, as well as the respiratory infections by more than 21% (Curtis et al. 2003³, Aiello et al. 2008⁴).
- ✓ Transmission of SARS-CoV-2 through drinking water has not been confirmed. However, presence of SARS-CoV-2 is possible in untreated drinking water. Therefore, **it is important to maintain safe water supply.** Conventional, centralized water treatment methods that utilize filtration and disinfection should significantly reduce the concentration of SARS-CoV-2 (WHO 2020b⁵).
- ✓ The history of Japan has observed that the installation of modern water supply system which has been promoted since the Meiji era has significantly contributed to the reduction of water-borne diseases such as cholera and typhus. **Water supply is positioned as an important measure for infectious disease control.**
- ✓ 71% (5.3 billion people) of the world's population use "safely managed drinking water services"ⁱ. Only 60% (4.5 billion people) of the world's population have basic handwashing facilities with water and soap at home. In the Sub-Saharan Africa, only 27% have access to "safely managed drinking water services" and only 25% have

ⁱ Five levels of water supply service are defined by the WHO / UNICEF Joint Monitoring Program (JMP). "Safely managed drinking water" is defined as the use of an improved drinking water source which is located on premises, available when needed, and free of faecal and priority chemical contamination.

handwashing facility with water and soap at home. **There are huge disparities in access to WASH.**

- ✓ Proper handwashing is extremely important as an infection prevention control for health care facilities, but one-quarter of the world's health care facilities do not have access to water services and one out of three do not have adequate facilities at the point of care (WHO/UNICEF 2020⁷), thereby **exposing health-care workers and patients at high infection risk.**
- ✓ Amidst COVID-19 crisis, some countries required schools and factories to have adequate handwashing facilities as a condition for reopening. **WASH is a key element for safe reopening of socio-economic activities.**
- ✓ 50% of the world's malnutrition is associated with water-borne diseases (WHO 2018, Walker et al. 2013⁹). Some reports say that handwashing reduces maternal mortality by about 8% (Pierre et al. 2013¹⁰) and that handwashing of midwives and mothers reduces neonatal mortality rate by 41% (Victor et al. 2008¹¹). **Since WASH is inseparably linked with other sectors, multisectoral cooperation is a key strategy to resolve the global development challenges.**

2. Impact of COVID-19 on Water Utilities

- ✓ As the result of the pandemic and the associated government directives, water utilities in developing countries are confronted with various issues, namely, **infection prevention measures for employees and customers, expansion/continuation of services to low-income and vulnerable groups, revenue reduction due to the decline of water demand from economic stagnation and increase of non-payment.**
- ✓ Some of the urgent responses adopted by water utilities (Table 1), such as tariff exemption and WASH promotion to non-accessible population, are costly and burdensome to maintain it for a long period. This demonstrated their vulnerability to emergency. **Thus, it is important to ensure the sustainability of water supply as an essential service.**
- ✓ **Water Utilities that have been operating soundly since the normal times seems to have been able to minimize the impact of the pandemic on the continuation of water supply services.** In developing countries, non-payment of water tariff is one of the major factors behind the decrease in revenue. However, there are reports that even under the COVID-19 crisis, introduction of prepaid meters has enhanced the collection rate.
- ✓ To become the resilient utilities against external shock in the With/Post Corona Era, it is important to enhance the management soundness by **building a reliable tariff collection system, securing net income and internal reserves in case of an emergency, and formulating a Business Continuity Plan (BCP).**

Essential chemicals for water purification were procured for Société des Eaux de Guinée (SEG) in the Republic of Guinea by JICA



Responses of Japanese Water Utilities against COVID-19

- ✓ Japan's water utilities have been also facing severe changes in the business environment such as decline in revenue due to tariff mitigation and remission and stagnant economic activities, while at the same time they have to guarantee safe and stable water supply. The nationwide trend of water use is increase of household use and decrease of commercial use. Since the impact of COVID-19 will continue for a certain period, further management efforts such as Digital Transformation (DX) are required.
- ✓ Many of the water utilities that implemented the tariff remission measures utilized government financial support against COVID-19. However, some utilities utilized their retained earnings that were supposed to be used for facility renewal in the future. **The impact of COVID-19 on medium- to long-term management strategies and asset management needs to be examined.**
- ✓ Japan's water utilities are successfully continuing safe water supply during the pandemic as in case of normal times, which indicates the "safety", "strength" and "sustainability". **One of the reasons of this success is Business Continuity Plans (BCPs)** which was already in place following the "Guidelines for Countermeasures against New Strains of Pandemic Influenza in Water Supply Utilities" compiled by the Ministry of Health, Labor and Welfare when the new strains of pandemic influenza occurred in 2007. Japanese Water Utilities could rapidly response to COVID-19 crisis by reviewing these Guidelines and Plans. According to a survey conducted by the ministry in January 2021, about 57% of total water utilities nationwide and about 77% in 11 prefectures where a state of emergency has been declared have formulated their BCPs accordingly¹². The response to the crisis was rather smooth because the preparation such as stockpiling and procurement of materials /equipment, and cooperation with contractors were already done in advance based on BCPs.

Table 1 COVID-19 Countermeasures Taken by Water Utilities in Japan and in Developing Countries (DC)

Identified Challenges		JP	DC	Countermeasures	Further Challenges and Necessary Cooperation
Ensure the Business Continuity	Infection prevention of staff to ensure the business continuity	○	○	Securing physical distance, temperature measurement, shortened working hours, remote work, web conferencing	<ul style="list-style-type: none"> Formulation of a Business Continuity Plan (BCP) that also assumed the epidemic/pandemic Stockpile of PPE, in case of emergency
		○	○	Providing masks, hand sanitizers and PPE for staff	
		○	○	Installation of handwashing and sole disinfection facilities for staff	
		○	○	Implementation of staff rotation	
			○	Promotion of mental health support for employees	
			○	Disinfection of offices (spraying disinfectant)	
			○	Installation of disinfection booth (tunnel)	
			○	PCR test and antibody test for staff	
		○	○	Temporary closure of tariff payment offices or shortened business hours	
			○	Decrease the number of teams going to the site	
	Difficulty to read meters and send invoices due to lockdown		○	Meter reading and water leakage countermeasure team go directly to the site without stopping by the office	
			○	Interruption of meter reading work and tariff estimation from past water consumption	
			○	Request customers to send a photo of the water meter	

Identified Challenges		JP	DC	Countermeasures	Further Challenges and Necessary Cooperation
			○	Outsourcing of meter reading and billing	<ul style="list-style-type: none"> • Introduction of online payment and bank transfer • Improve efficiency of meter reading and billing operations (digitization such as introduction of handy terminals) • Introduction of smart water meters
Ensuring the quality and quantity of water	Growing need for safe and adequate water supply		○	Strengthening monitoring of residual chlorine concentration in water distribution networks	<ul style="list-style-type: none"> • Monitoring system for water quantity and quality • Reduce non-revenue water
			○	Strengthening chlorine concentration in water pipe network	
			○	Call for water saving	
Decrease in water supply revenue	Insufficient operation / maintenance costs (current account deficit), shortage of facility investment budget		○	Accepting support from funding facilities	<ul style="list-style-type: none"> • Funding facility • Long-term planning
			○	Acceptance of support for chemicals, fuel, etc.	
		○	○	Introducing an online payment system and strengthening the promotion of payment using SNS, etc.	
Infection prevention measures in customer service	Office closure due to lockdown, Risk of infection in the office	○	○	Installation of handwashing equipment at the entrance of the office, temperature measurement at the entrance, installation of alcohol dispenser, physical distancing	<ul style="list-style-type: none"> • Promotion of online payment • Online customer service
		○	○	Online reception for service connection	
		○	○	Introduction and utilization of online payment	
Correspondence to households, etc. who have difficulty paying water charges	Necessity to continue water supply as infection control measure, even for households that have difficulty paying water charges due to the worsening economic situation	○	○	Discount on household water charges	<ul style="list-style-type: none"> • Sustainable measures for the poor by utilizing cross subsidy, water funds, government subsidy, etc.
		○	○	Tariff exemption or subsidies for several months for customers in specific categories	
		○	○	Partial exemption from past charges that are due, reconnection charges, delinquency charges, etc.	
		○	○	Extension of payment deadline	
		○	○	Suspension of disconnections due to non-payment	
			○	Registration of small-scale water companies to prevent tariff from being raised by cartels.	
			○	Cancellation to raise water tariff	
WASH promotion for vulnerable groups who cannot access water services	Necessity to expand water supply and promote hygiene for vulnerable groups who cannot access water services from the viewpoint of infection control		○	Installation of hand-washing equipment and water supply tank	<ul style="list-style-type: none"> • Securing funds for expanding the piped water supply areas • Promotion of house connections • Promotion of decentralized water supply systems
			○	Water kiosk and water distribution network construction	
			○	Installation of Prepaid water dispenser (PPD)	
			○	Providing sanitary kits such as soap	
			○	Drilling a new well	
Hygiene awareness / Risk communication	Necessity to disseminate knowledge on infection control such as handwashing, wearing masks, and physical distancing		○	Creating a booklet regarding water hygiene	<ul style="list-style-type: none"> • Training and monitoring support for community care workers etc. for continuous intervention for behavior change • Hygiene awareness-raising in school curriculum, etc.
		○	○	Raising awareness for handwashing, wearing masks, etc. (posters, SNS, etc.)	
		○	○	Developing songs and animations promoting handwashing	
			○	Creating operational guidelines for public taps	
			○	Supply handwashing tools (soap, bucket) to private operators and provide guidance on handwashing methods	

Identified Challenges		JP	DC	Countermeasures	Further Challenges and Necessary Cooperation
Others			○	Mandatory inspection and registration of water tankers for quality assurance	
			○	Disinfection of streets and places of worship	
			○	Food distribution for the vulnerable groups	
		○	○	Production of disinfectants	

*DC: Developing Countries

3. Lessons learned from JICA's Emergency Responses for Water Utilities: For Further Cooperation in the Transitional Phase

- ✓ JICA has responded to the emergency requests from the water utilities of partner countries to help them to mitigate the challenges faced due to COVID-19 pandemic. The responses include Procurement of Protective Equipment (PPE) for employees, procurement of chemicals, fuel and spares, procurement of water tanks, support for operation of water trucks, support for formulation of business continuity plans (BCPs), procurement of handwashing equipment, support for handwashing awareness-raising activities, and technical support for residual chlorine management (Table 2). These were provided mainly by adding inputs to JICA's ongoing technical cooperation projects. **These responses have contributed to ensure continuing operation and maintenance of water utilities affected by the significant revenue reduction, preventing infection of water utility staff, providing water to areas where water services are inadequate, and encouraging handwashing to prevent transmission of infection.**
- ✓ In Palestine, for example, **the swift response was possible due to the mobilization of local staff and early flexible change of contracts and inputs of ongoing cooperation.** The first batch of chlorine agent was delivered to the site on the 11th day after receiving the support request. The trusting relationship with the local water utility and mobilization of local staff allow the rapid and precise collection of information about local needs and thus provision of necessary supports was available.
- ✓ Several cases of JICA's emergency cooperation have **medium to long term benefit to help the country "Build Back Better".** In Palestine, prepaid meters were introduced to ensure the collection of tariffs. In Tajikistan, the introduction of high test bleaching powder helped to lessen the clog of chemical injection equipment due to less impurities and realized easy control of residual chlorine concentration. In Rwanda, capacity building was initiated by supporting the formulation of BCPs derived from the original project involving master plan formulations.
- ✓ On the other hand, in some cases where water utility staff and local staff were not able to carry out sufficient activities due to the lockdown, it took much time to remotely collect indispensable information for determining the validity, quantities and specifications of the emergency cooperation.
- ✓ Even in normal times, when the service of water utility is not adequate such as intermittent water supply, low pressure and low water quality, customers are discouraged to pay tariff. Due to low willingness to pay, water tariff cannot be set at an appropriate level in consideration of cost recovery. Insufficient revenue leads to lack of financial capacity to invest, and thereby resulting in lack of improvement of water service. This negative spiral is commonly seen in water utilities in developing countries. JICA's policy of cooperation is to turn around this negative spiral to positive spiral and develop a "growing water utility", which can independently finance the needed improvement and expansion of water services. However, COVID-19 crisis has increased the risk of water utilities "dropping out" from the positive growth spiral due to reduced water demand, increased unpaid payments, and associated revenue reduction. In future cooperation, **it is important to support those water utilities that are likely to "drop out" to bring them back on the track of growth and develop more resilient water utilities which are resistant to external shocks and can continue and expand water services.**

Table 2 JICA's Response to Urgent Requests of Water Utilities

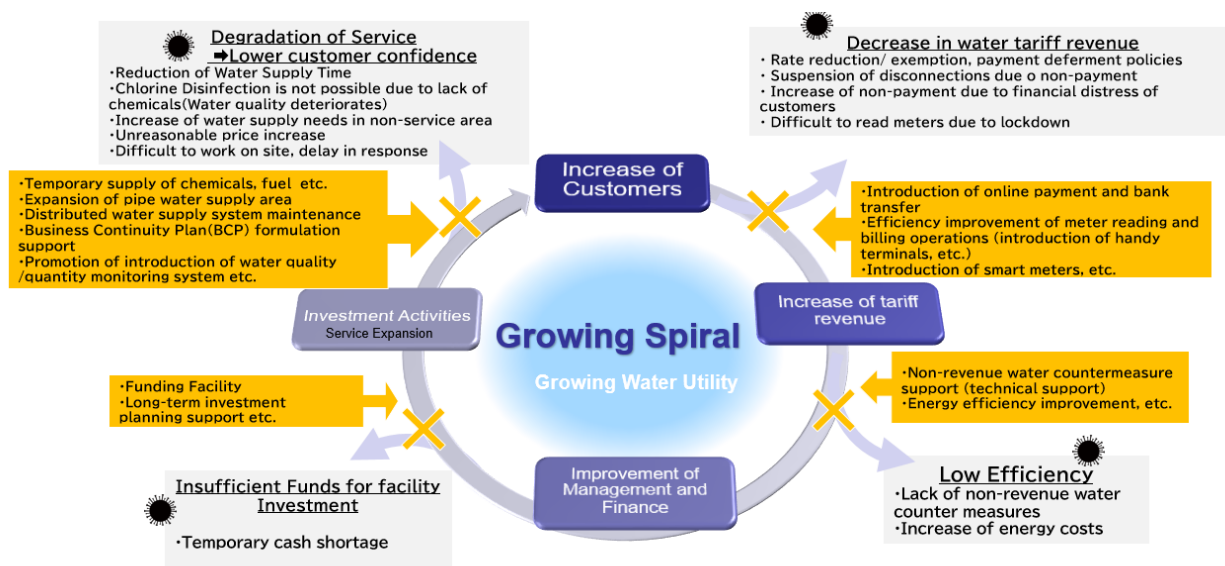
JICA's Response	Name of the Project
Provision of water tanks and water trucks	<ul style="list-style-type: none"> • Project for Water Supply Master Plan for City of Kigali (Rwanda) • Project for Improvement of Water Supply Management of Yangon City (Myanmar) • Project for Capacity Development on Integrated Water Management in Cochabamba (Bolivia)
Procurement of chlorine, fuel etc.	<ul style="list-style-type: none"> • Project for Water Supply Master Plan for City of Kigali (Rwanda) • Project for Management Capacity Enhancement of South Sudan Urban Water Corporation (South Sudan) • Project for Strengthening the Capacity of Non-Revenue Water Reduction for Lilongwe Water Board (Malawi) • Project for Capacity Development on Water Supply in Semi-urban Areas in Nepal (Phase2) • Project for Strengthening the Water Service Management of Pyanj and Khamadoni Vodokanal (Tajikistan) • Project for Strengthening the Capacity of Water Service Management in Jenin Municipality (Palestine) • Project for Strengthening Capacity of Institutional Management, Operation and Maintenance in State Water Corporations (Sudan) • Project strengthening capacity in Non-Revenue water reduction (Kenya)
Residual chlorine management (technical support)	<ul style="list-style-type: none"> • Project for Strengthening the Capacity of Non-Revenue Water Reduction for Lilongwe Water Board (Malawi)
Provision of materials and equipment for residual chlorine management	<ul style="list-style-type: none"> • Project for Strengthening the Capacity of Non-Revenue Water Reduction for Lilongwe Water Board (Malawi) • Project for Strengthening Administrative Capacity of Urban Water Supply in Cambodia
Support for developing Business Continuity Plan (BCP)	<ul style="list-style-type: none"> • Project for Water Supply Master Plan for City of Kigali (Rwanda)
Provision of handwashing facilities and equipment	<ul style="list-style-type: none"> • Project for Operation & Maintenance for Rural Water Supply and Improved Hygiene and Sanitation (Uganda) • Project for Capacity Development on Integrated Water Management in Cochabamba (Bolivia)
Provision of PPE	<ul style="list-style-type: none"> • Project for Management Capacity Enhancement of South Sudan Urban Water Corporation (South Sudan)
Provision of spare parts	<ul style="list-style-type: none"> • Project for strengthening capacity for training operation and management for Ethiopian Water Technology Institute (Ethiopia) • Project for Strengthening the Capacity of Water Service Management in Jenin Municipality (Palestine)



Fuels necessary for operation of the water treatment plant were procured for South Sudan Urban Water Corporation (SSUWC) by JICA



Handwashing equipment was procured for the Ministry of Water and Environment (MWE) in Uganda by JICA



Source: Modified from JICA Water Field Study Group Materials Sub-cluster "Water Supply Business Growth Support" (August 2019)

Figure 1 Impact of COVID-19 on Water Utility's Growth and Emergency Measures

4. The Importance of WASH in Slums and Informal Settlements

- ✓ Today, more than 1 billion people live in slums and informal settlements, out of which 80% are concentrated in East / Southeast Asia, Sub-Saharan Africa and Central / South Asia (UN 2019¹³). Urban slums are characterized by lack of basic services such as WASH, high density and overcrowding, unstable legal status and property rights, and poverty. Due to the complexity of their challenges, **they have been left behind on social development for many years.**
- ✓ Slums and informal settlements face various vulnerabilities in terms of COVID-19 infection risks. They are: (1) a high proportion of slum dwellers suffer from chronic diseases and thus faces an epidemiologically high risk of infection or aggravation, (2) lack of access to health systems, (3) high density living spaces and poor urban infrastructure, which makes it difficult to prevent infection transmission, (4) control measures such as lockdown and travel restrictions directly hitting dwellers' livelihoods (SSHAP 2020¹⁴). **Due to these vulnerabilities, slums and informal settlements have emerged as COVID-19 hot spots (weaknesses) in the cities.**
- ✓ Improving access to water supply and sanitation in slums and informal settlements is an urgent issue for building a resilient city not only to address COVID-19 but also for other future infectious diseases. However, following issues would act as obstacles; (1) **Dwellers' economic and capacity issues** (payment ability, etc.), (2) **Geographic and spatial issues** (difficulty in covering with network-type water supply facilities due to congestion/narrowness, steep/bad ground, and disaster risks such as floods) (3) **Supplier-**



side issues (absence of administration, presence of informal water supply vender), (4) **Legal issues** (residential status, etc.).

- ✓ **Comprehensive measures as shown in Table 3 are required** for medium- to long-term solutions based on the above issues.
- ✓ Similar to slums, peripheral areas of the city also have risk that virus might be easily introduced and transmitted rapidly, as the peri-urban areas are densely populated and currently the development of water supply facilities has not caught up. If the infection spreads in the peri-urban areas, it may spread to the rural areas from that point. **Measures to prevent the spread of infection in the peripheral area of the city are extremely important.**

Table 3 Comprehensive Measures for Slum and Informal Settlements

Categories	Issues	Measures and Framework of Support
Dweller's economic and capacity issues	<ul style="list-style-type: none"> Unstable income, difficulty in paying water connection charges 	<ul style="list-style-type: none"> Flexible payment schemes such as reduction of connection charges and installment payments Reduction of minimum charge Revolving fund Installation of water meter and water kiosk Cash benefits to the most vulnerable groups Job creation
	<ul style="list-style-type: none"> Lack of information 	<ul style="list-style-type: none"> Collection of information by geographic information system (GIS)
	<ul style="list-style-type: none"> High risk behavior by lack of education and insufficient knowledge on hygiene 	<ul style="list-style-type: none"> Providing information and awareness-raising by utilizing local community organizations (CBO), etc.
Geographical and spatial issues	<ul style="list-style-type: none"> Residential area where infrastructure construction is difficult 	<ul style="list-style-type: none"> Cooperation with city administration and sharing the responsibilities (slum clearance, city policy, etc.)
	<ul style="list-style-type: none"> Lack of public space 	
	<ul style="list-style-type: none"> Distance from existing infrastructure and water resources 	<ul style="list-style-type: none"> Expansion of infrastructure by water utilities Utilization of distributed water supply and support by water utilities Utilization of local innovation
Supplier-side issues	<ul style="list-style-type: none"> Absence of administration, procedural issues 	<ul style="list-style-type: none"> Easier procedure for house connection at the front door
	<ul style="list-style-type: none"> Lack of administrative support for water supply (administrative hole) Prevalence of informal water service providers 	<ul style="list-style-type: none"> Monitoring, regulation, and supervision of private service providers and their tariff
	<ul style="list-style-type: none"> Insufficient information on housing and living conditions, which makes it impossible to accurately grasp water demand 	<ul style="list-style-type: none"> Aggregation of information by GIS
Legal issues	<ul style="list-style-type: none"> House connection based on normalization of legal status 	<ul style="list-style-type: none"> Relaxation of land ownership requirements Cooperation with city administration

5. Handwashing and Behavior Change

(Handwashing method)

- ✓ Scientific evidence on infection prevention and control (IPC) of COVID-19 through handwashing has not been reported. However, it is reported that **99% of viruses can be removed by handwashing with running water and 99.9% by the combination of rubbing with soaps for 10 to 30 secs followed by rinsing with running water for 15 secs** (Mori 2006¹⁵). Although dirt, bacteria and virus on hands are removed by handwashing with only running water, its reduction ratio is smaller in comparison with handwashing along with soaps.
- ✓ **The water quality used for handwashing does not need to meet the drinking water standards if proper handwashing with soaps is done** (Verbyla et al. 2019¹⁶; WHO and UNICEF 2020¹⁷; CDC 2000b¹⁸). At a minimum, however, the water from improved water sources is recommended to be used for handwashing.
- ✓ Ideally, 0.5 to 2L of water is needed for proper handwashing per person at a time (Hoque 2003¹⁹). **The minimum water quantity is 0.2L per handwashing** (PAHO 2020²⁰). The important point is **to use running water**.
- ✓ Wiping off is also effective to remove virus from hands, so **drying hands is also an important factor** for IPC.
- ✓ **It is reported in many papers that handwashing with soaps is rarely done in low-income countries**. They are mainly due to the burden on households to purchase soaps (Zeitlyn 1991²¹), risks for stealing and wastage of soaps if left at a handwashing facility, inconvenience to bring soaps from household to the handwashing facility, and lack of adequate time for proper handwashing (at least 20 sec rubbing) (Scott 2007²²).
- ✓ Sanitizers containing more than **60% alcohol is also effective as an alternative way of IPC instead of handwashing with soaps**. The required quantity of sanitizers is a volume that does not make hands feel dry after rubbing for 10 to 15 secs (Marples et al. 1979²³; Machkintosh et al. 1984²⁴; CDC 2002²⁵).
- ✓ Sanitizers have an immediate microbicidal action and deemed effective to COVID-19 prevention if correctly used. However, the **hand sanitizers as 60% alcohol are not effective to certain types of microbes** such as Noroviruses and *Cryptosporidium* (CDC 2020b¹⁸).
- ✓ In conclusion, **handwashing with soaps is a basic method and usage of sanitizers is a complementary way for infection prevention and control (IPC) in households and schools**. In health facilities, a combination of handwashing with soaps and sanitizers are recommended as IPC.



A cartoon prepared by JICA for awareness-raising of proper handwashing methods

(Behavior Change)

- ✓ For ensuring behavior change and habituation, **hygiene education and communication** (environmental

arrangement, motivation raising, strengthening of collaboration with communities, utilization of existing conceptions, implementation of practical steps) **should be conducted**. In addition, **continuous efforts are needed** (UNICEF 2016²⁶; JICA 2008²⁷).

- ✓ Behavior could be effectively changed by adopting a particular action based on the **transtheoretical model of behavior change**. In addition, **it is necessary to understand the situation and recognition of target persons, build a sense of danger by using evidence, explain that advantages of the target behavior are greater than its disadvantages, and provide suggestions and negotiate to change the behavior**. It is recommended to set a lower target so that the target persons are motivated through their successful experiences. (LEARN approach, health belief model, conviction-confidence model)
- ✓ In Japan, actions towards behavior change on good sanitation and hygiene were conducted from at least approx. 200 years ago, and various approaches are adopted and continuously provided to all its citizens right from childhood. Also, environment for handwashing is arranged, and people can access handwashing facilities anytime and anywhere as they want. **Multidirectional actions on both soft and hard components were continuously provided in Japan, and this approach is considered as a key reason for handwashing habituation.**
- ✓ **Key factors affecting behavior change for handwashing** are as follows;
 - Improvement of access to water supply, handwashing facilities and soaps
 - Provision of continuous and various interventions such as “care” for infants, “upbringing” for early childhood and “education” from school-aged children on not only WASH but also on education, maternal and child health, nutrition etc.
 - Inclusion of handwashing aspects into the legal and institutional frameworks such as policies, strategies, plans and guidelines at the government level and the local level
 - Clear setting of mandate and raising of common understanding among related institutions
 - Continuous budget securement
 - Framework setting for continuous implementation of hygiene promotions (e.g., incorporation to school textbooks and curriculum)
 - Capacity development and establishment of collaboration/support structures
 - Periodical monitoring and support provision for behavior change
 - Necessary requirements for handwashing facilities
 - Design which meets body height of users (for schools)
 - Universal design (especially for health care facilities and communities)
 - Those for easy utilization and easy O&M
 - Stable water supply
 - Environment to enable easy access to soaps (affordable price, supply chain)

6. Conclusion

- ✓ The spread of COVID-19 infection had a greater negative impact on originally vulnerable low-income groups and slum dwellers, which has reaffirmed the importance of development agenda raised by the SDGs, such as poverty, health, and WASH. **The SDGs' principle of "No One Left Behind" is being reaffirmed and it is becoming a major factor while envisioning the With/Post COVID-19 society.**
- ✓ With this COVID-19 pandemic, the enhancement of water access, promotion of handwashing behavior, and promotion of digitalization have been accelerated in the WASH sector. However, the water tanks and handwashing devices emergently installed may not be sustainable, or handwashing awareness may not take root and lead to a behavior change. **Establishment of hygiene behavior and rebuilding for more resilient WASH system (Build Back Better) will be the keys in the rebuilding phase.**

- ✓ Water utilities whose financial management had been vulnerable were more negatively affected, and thus, sound management of utilities is essential to fight against external shocks. For the rebuilding phase, **cooperation for the water utilities damaged by COVID-19 to bring them back to the positive growth spiral is important.**
- ✓ The vulnerable like slum dwellers who are left behind are also highlighted. **Ensuring the access to WASH for all people, including the most vulnerable groups, is the key in the rebuilding stage.**
- ✓ Awareness on the importance of handwashing has increased. **Further promotion of “mainstreaming”** that incorporates handwashing in various sectors including education and health is needed to lead to **behavior change and habituation.**
- ✓ Based on the above, Fig. 2 shows the direction of JICA's cooperation from the emergency phase to the rebuilding phase.

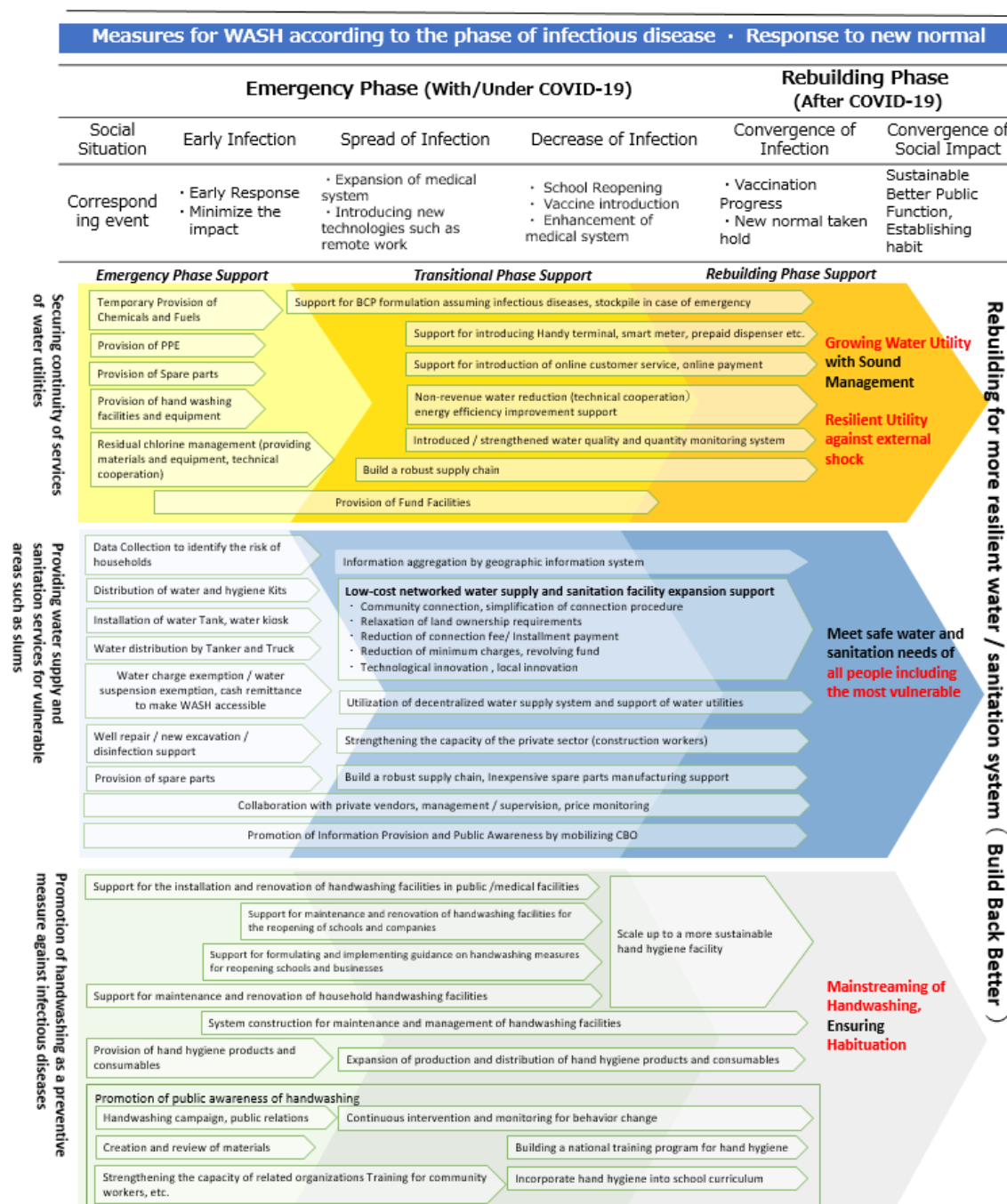


Figure 2 Support measures from the emergency phase

to the rebuilding phase

References

1. WHO (2020a) 'Transmission of SARS-CoV-2: implications for infection prevention precautions, Scientific brief', 9 July 2020
2. WHO (2019) 'Safer Water, Better Health 2019 update', ISBN 978-92-4-151689-1
3. Curtis, V and Cairncross, S. (2003) 'Effect of washing hands with soap on diarrhoea risk in the community: a systematic review.' The Lancet infectious diseases, 3, 275-281
4. Aiello AE (2008) 'Aiello AE, Coulborn RM, Perez V, Larson EL. 2008' Effect of hand hygiene on infectious disease risk in the community setting: A meta-analysis', Journal of Public Health, 98(8), 1372-1381
5. WHO (2020b) 'Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19 Interim guidance'
6. WHO/UNICEF (2019) 'Progress on household drinking water, sanitation and hygiene 2000-2017. Special focus on inequalities.
7. WHO/UNICEF (2020) 'Global progress report on water, sanitation and hygiene in health care facilities: fundamentals first'
8. Uganda, Ministry of Education and Sports, Sep.23.2020 'Guidelines for Reopening of Education Institutions and Implementation of Standard Operating Procedures for Education Institutions During COVID-19'
9. Myanmar, Ministry of Health and Sports, Apr.19.2020 'Guideline for Prevention and Control of Covid-19 Disease in Factories, Work-places and Construction Sites'
10. WHO (2018) 'Malnutrition: fact sheet', <http://www.who.int/news-room/fact-sheets/detail/malnutrition> (Access Apr.2021), Walker CLF et al. (2013) 'Global burden of childhood pneumonia and diarrhoea', Lancet, 381, 1405-1416
11. Pierre La Rochelle and Anne-Sophie Julien (2013) 'How dramatic were the effects of handwashing on maternal mortality observed by Ignaz Semmelweis', J R Soc Med, 106(11), 459-460
12. Victor Rhee et al. (2008) 'Maternal and Birth Attendant Hand Washing and Neonatal Mortality in Southern Nepal', Arch Pediatr Adolesc Med, 162(7), 603-608
13. Ministry of Health, Labor and Welfare "Reiwa 2nd year National Water Services Personnel Meeting Material (in Japanese)
14. UN (2019) 'The Sustainable Development Goals Report 2019, 44
15. SSHAP (the Social Science in Humanitarian Action Platform) (2020) 'Key considerations: COVID-19 in informal urban settlements'
16. Kohji MORI et al. (2006) 'Effects of Handwashing on Feline Calicivirus Removal as Norovirus surrogate', Kansenshogaku Zasshi, 80, 496-500 (in Japanese)
17. Verbyla ME et al. (2019) 'Safely Managed Hygiene: A Risk-Based Assessment of Handwashing Water Quality', Environmental Science & Technology, 53 (5), 2852-2861
18. WHO and UNICEF (2020) 'Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19: Interim guidance
19. Centers for Disease Control and Prevention (2020b) 'Show Me the Science - How to Wash Your Hands' <https://www.cdc.gov/handwashing/show-me-the-science-handwashing.html> (Access Jan.2021)
20. Hoque BA (2003) 'Handwashing practices and challenges in Bangladesh', Int J Environ Health Res, 13 (1), S81-87
21. PAHO (2020) 'Handwashing while conserving water', <https://www.paho.org/en/news/12-5-2020-video-paho-barbados-psa-handwashing-and-saving-water-during-COVID-19-pandemic> (Access.Dec.2020)
22. Zeitlyn S, Islam F (1991) 'The use of soap and water in two Bangladeshi communities: implications for the transmission of diarrhea', Reviews of Infectious Diseases, 13 (4), 259-264
23. Scott B et al. (2007) 'Health in our hands, but not in our heads: understanding hygiene motivation in Ghana', Health Policy Planning, 22 (4), 225-233
24. Marples RR and Towers AG (1979) 'A laboratory model for the investigation of contact transfer of micro-organisms', J Hyg, 82, 237-248
25. Mackintosh CA and Hoffman PN (1984) 'An extended model for transfer of micro-organisms via the hands: differences between organism and the effect of alcohol disinfection', J hyg, 92, 345-355
26. Centers for Disease Control and Prevention (2002) 'Guideline for hand hygiene in health-care settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force', Morbidity and Mortality Weekly Report, 51(No. RR-16), 1-45
27. UNICEF (2016) 'Water, Sanitation and Hygiene: Hygiene Promotion', https://www.unicef.org/wash/index_43107.html (Access Nov.2020)
28. Japan Bank for International Cooperation, Japan International Cooperation Agency (2008) 'Hygiene Support Guidebook for Japan's International Cooperation (Draft)' in Japanese

Prepared by Global Environment Department, Japan International Cooperation Agency (JICA)

