Forum: Health Committee

Agenda: On measures to promote equitable access to safe drinking water

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Introduction

The consumption of water is crucial for the survival of the human body. It is a necessity to every living human being, and a human right recognized by the UN General Assembly. However, despite existing mature methods to process water to make it safe for human consumption, and that that the majority of the global population (approximately 75% in 2020) indeed enjoy safely managed drinking water services, accessibility to safe drinking water is still poor or non-existent to many people worldwide, and have to either spend great amounts of time and effort to collect safe drinking water, or cannot access safe drinking water at all.

As water is the "universal solvent", able to dissolve more substances than any other liquid on Earth, it is particularly vulnerable to contaminations. Water may be contaminated with a variety of harmful substances or pathogens, which may damage its consumers' health, such as by causes diseases like diarrhea or schistosomiasis, to varying levels of severity up to fatal. Accessibility of safe drinking water also has social implications: worse accessibility equates to more time and effort spent collecting it, as well as more temporal and financial expenditures on treating its health effects, translating to weaker productivity and weaker opportunity for improving quality of life. In addition, conflicts between groups or states may arise over scarce water resources, harming the lives and property of the affected population and offending their human rights.

The United Nations had recognized safe drinking water as a human right, and had established programs and objectives aiming at achieving its universal access. One such objective, the Sustainable Development Goal 6, established 5 categories for drinking water services, which are: Safely managed: Improved source accessible on premises, available when needed and free of contamination; Basic: Improved source within 30 minutes round trip collection time; Limited: Improved source over 30 minutes round trip collection time; Unimproved: An unprotected dug well or unprotected spring; Surface water: Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal. The rights to water and sanitation is further elaborated in General Comment No. 15 of the Committee on Economic, Social and Cultural Rights, and in the works of Mr. Pedro Arrojo-Agud, Special Rapporteur on the rights to water and sanitation, which defined several key elements that makes up the rights to water and sanitation, as follows: Accessibility, that facilities must be physically accessible and within safe reach for all sections of the population, taking into account the needs of particular groups; Availability, that supply for each person must be sufficient and continuous to cover personal and domestic uses; Affordability, that Water services must be affordable to all; Quality and safety, that water for personal and domestic use must be safe and free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health; Acceptability, that All water and sanitation facilities must be culturally acceptable and appropriate, and sensitive to gender, life-cycle and privacy requirements.

Key Terms

Renewable Water Resources – As defined by the UN FAO, renewable water resources represent the long-term average annual flow of rivers (surface water) and recharge of aquifers (groundwater) generated from precipitation.

They are computed on the basis of the water cycle.

Poverty – A term for poor economic conditions unable to fulfill basic needs. It can be divided into relative and absolute poverty, the former defined as in economic conditions unable to achieve the average standards of living within the same environment, the latter defined as in economic conditions unable to fulfill basic needs. The World Bank has set the International Poverty Line, the global minimum level of income deemed adequate, which is periodically adjusted. In 2022, it has been adjusted from US$ 1.90 per person per day to US$ 2.15 per person per day.

Climate Change – Defined by the UN as long-term shifts in temperatures and weather patterns. The shifts may be natural, but human activities had been the main driving factor since the 19th century. The main contributor to climate change is the emission of greenhouse gases due to burning off fossil fuels.

Fragile Contexts – UNICEF defines fragile contexts as contexts where there is an accumulation and combination of risks as a result of context-specific underlying causes combined with insufficient coping capacity of the state, system and/or communities to manage, absorb or mitigate those risks. For instance, a region suffering from prolonged conflict and violence would be deemed fragile.

Drinking water treatment – Refers to the methods of treating water to make it suitable for human consumption in public drinking water systems. The specific procedures differ between communities due to factors such as the quality of the source water. A common procedure is to first sediment suspended solids in the water by adding positively charged chemicals to bind with the solids, filter the clear water at the top, then to add chemical disinfectants, such as chlorine or chloramine, into the water, in addition to or instead of applying ultraviolet light to disinfect. Some examples of other technologies used for water treatment can be found below.

Aeration – the process of transferring contaminants from water to air, used for treating water. Types includes packed tower aeration, in which water falls in a tower through a packing media while blowers forces air upwards through the tower, transferring volatile contaminants from water to air, and multi-stage bubble aeration, in which water is placed in a shallow basin divided into compartments, and small air bubbles are released at the bottom, rising through the water and causing turbulence to transfer volatile contaminants from water to air. Both methods might require air control devices that would increase the cost.

Anion and Cation Exchange - a water treatment method in which the water passes through a bed of synthetic resin or zeolite abundant with negatively or positively charged ions. Ion contaminants in the water would be exchanged with the less innocuous ions of the same charge that are on the material, removing the contaminants. Treatment capacities for different contaminants varies depending on the resin used and the influent water. The capacity for treatment can be regenerated by applying saturated solution of sodium chloride, however the regenerate would become laden with the removed contaminants and excess ions, and needs to be disposed with proper procedures.

Biological Water Treatment – the method of converting chemical contaminants into innocuous compounds by

exchange of electrons, mediated by bacteria. This method does not generate contaminant-laden waste streams and remains effective even with certain co-occurring contaminants. However, excess biomass needs to be periodically disposed and the treatment may deplete oxygen in the treated water, requiring post-treatment processing.

Reverse osmosis and nano filtration – methods of treating water by forcing it at high pressure through semi-permeable membranes to filter out contaminants based on their molecular weight. It is effective for a broad range of contaminants and can function well even with multiples types of contaminants present. However, the removed contaminants would require disposal, and pre-treatment processes are often required to prevent the membranes from fouling or clogging. In addition, about 15% to 30% of the influent water would be rejected by the membranes and thereby lost, presenting a problem when water is scarce. The high pressure required would also mean higher energy consumption. Finally, reverse osmosis can lower the pH of the treated water, and hence may need corrosion control.

Active rainwater harvesting – The practice of collecting, storing, and treating non-potable rainwater for human use and consumption.

Solar Water Disinfection (SODIS) – A method of treating water for drinking by putting the water inside a transparent PET container and place it in sunlight for 6 hours, using the UV-A rays in the sunlight to exterminate microbial pathogens. Non-microbial contaminants would require other treatments.

Atmospheric Water Generation – Technology of producing potable water from moist air, via condenser and cooling coil technology.

Desalination – Process of removing salt from saline water to produce water suitable for human use and consumption. With contemporary technology, this process is often energy-intensive and costly on a large scale. Common methods include distillation and reverse osmosis.

General Overview

Data indicates that approximately globally 2 billion people lack access to safely managed drinking water services in 2020, which is 27% of the global population, out of which about 1.2 billion people (16%) has access to basic services, 282 million people (4%) has access to limited services, 367 million people (5%) using unimproved sources, and 122 million people (2%) drinking surface water.

It is noted that roughly 80% of people who still lacks basic services lives in rural areas and around half of them lived in LDCs, and that people living in fragile contexts are roughly twice as likely to lack safely managed drinking water service than people who lives in non-fragile contexts. Many countries lack sufficient data on the subject, mainly in Africa, east and South-eastern Asia, and Oceania.

According to data, the ratio of population using safely managed drinking service globally had been on an increasing trend in the last decade with only slight shifts in its rate of change. From 2015 to 2020, the aforementioned ratio increased from 70% to 74%. However, despite efforts at promoting access to safe drinking water, the WHO/UNICEF Joint Monitoring Program, in a 2020 report, predicted that the Water, Sanitation, and

Hygiene targets set by Sustainable Development Goal 6 could not be achieved by 2030 unless the current rate of progress quadruples. At the current trend, global coverage of safely managed drinking water service would only reach 81% by 2030, leaving 1.6 billion people globally without access, not fulfilling the target of universal access of SDG 6. Challenges lies before accelerating the rate of progress, for instance population growth, land use changes, climate change, as well as other regional factors that increase scarcity of safe water.

Upon investigation, inadequate accessibility to safe drinking water could be attributed to the following general causes: lack of adequate water sources to be treated for drinking; climate change affecting irrigation and diminishing adequate water sources; overly rapid population growth and urbanization growing beyond the capability of systems; lack of ability to construct and maintain systems of treating and delivering drinking water, often due to poverty and/or instability. Specific regional causes may also be involved.

The cost of building and maintaining infrastructure to treat and deliver the water varies depending on numerous factors such as the needed efficiency, the quality of the untreated water, the target quality of the treated water, the methods applied, and the construction cost, ranging widely. For reference, the Croton water filtration plant of New York City, United States, which entered service in 2015, capable of treating as much as 290 million gallons of water per day, and providing 10% of NYC's drinking water, was built at a cost of 3.2 billion 2015 US dollars. The NYC water and sewer system expended a total of about 3.93 billion US$ in 2021, of which 1.69 billion of US$ were spent on operation and maintenance.

Sub-Saharan Africa

Sub-Saharan Africa is one of the regions that suffers the most from the problem of inequitable drinking water access. By 2020, it has 30% coverage of safely managed drinking water services, 35% of basic services, 13% of limited services, 16% of unimproved sources, and 7% of surface water. It also has the greatest disparity in coverage of safely managed drinking water: urban areas enjoy 54% of coverage while rural areas possess 13%. In addition, while European oversea departments, namely Saint Helena, Mayotte, and La Réunion, enjoy approximately 90% coverage of safely managed drinking water service, the region's other countries has no more than 50%.

The region's dilemma stems from both its poverty and its inadequate exploitation of its water resources. First, infrastructures and management cannot keep up with the rapid urbanization and population growth of Sub-Saharan Africa, pushing communities to resort to undeveloped sources such as wells, boreholes, or surface water. Second, water resources of Sub-Saharan Africa are in fact underexploited. Third, predictions states that uncertainties regarding precipitation would increase due to climate change, possibly worsening droughts. In addition, according to data provided by GRID-Arenal, Sub-Saharan Africa possesses little renewable water resources, averaging at 3,930 billion cubic kilometers in 2020, representing less than 9% of the global total.

Oceania

Data indicates that Oceania has 57% coverage of basic drinking water services in 2020, 2% limited services, 18% unimproved sources, and 23% surface water. Disparities exists between its urban areas (53% coverage of safely managed drinking water service in 2020) and rural areas (no data on safely managed services; 47% coverage of basic services in 2020); Four of its countries and oversea territories (Kiribati, Tonga, Samoa, and the Wallis and Futuna Islands) has less than 60% of safely managed drinking water coverage, while the 7 others all enjoy over 80% coverage.

Climate change is cited as a major cause behind this deficiency. For example, the critical drought that occurred in Kiribati in mid-2022 caused by below-normal rainfall due to La Niña climate phenomenon. The limited freshwater resources on small island nations as well as the nations' weak economic prowess are also reasons of the poor availability.

Central and Southern Asia

Since 2015, Central and Southern Asia has achieved the fasted rate of progress on expanding the coverage of its safely managed drinking water services. Data indicates that this region has 62% coverage of safely managed drinking water in 2020, 29% of basic services, 4% each of limited services and unimproved sources, and 1% of surface water coverage. Disparity between urban and rural areas is small, with the former possessing 1% more coverage of safely managed service and 5% more of basic service. However, disparity is pronounced between countries, forming into several distinct groups, with Nepal having 18% coverage of safely managed service; Afghanistan, Pakistan, and Bhutan having 28%, 36%, and 37% respectively; Tajikistan, Bangladesh, Uzbekistan, and Kyrgyzstan having 55%, 59%, 59%, and 70% respectively; while Kazakhstan, Islamic Republic of Iran, and Turkmenistan all having coverage above 85%. Sri Lanka has 92% of its population using at least basic services, 93% of urban population using safely managed services 91% of rural population using at least basic services; Maldives has 100% coverage of at least basic services.

Poverty is often cited as a major cause of poor drinking water accessibility in Southern Asia. Installing and maintaining water supply systems is often too costly for governments of the region, resulting in communities either lacking a system or the existing systems is worn and requires maintenance. Climate change is also affecting the region, with rural and economically poor areas being the most affected. Reoccurring extreme weather events such as droughts and floods had damaged the region's improved drinking water accessibility while the rising sea level had contaminated freshwater sources. In addition, hydrological information and data are remarked to be noticeably untransparent between governments, despite existence of laws and legislations supporting the transparency of hydrological data, as transboundary water related issues are often considered from national security due to geopolitics and border tensions in this region, making cooperation between governments difficult. In addition, in countries such as Bangladesh, India, and Nepal, it is reported that hydrological data are not being collected, maintained, or published in a systematic manner.

Fragile contexts

Globally, fragile contexts have 43% coverage of safely managed drinking water services, 74% basic services, 9% limited services, 11% unimproved sources, and 5% ground water in 2020, compared to non-fragile contexts' 82% coverage of safely managed services, with Sub-Saharan Africa as the most severely deficient region, with 25% coverage of safely managed services. Similar to other regions, accessibility in rural areas is worse than in urban areas, with the former having 33% coverage of safely managed drinking water while the latter having 55%.

Although basic drinking water coverage has improved by 4% since 2015, the current outlook is not bright. Projections indicates that by 2030, the coverage of at least basic services in fragile contexts would only reach 78%, and the coverage of safely managed services only 45%. It is predicted that 4 times the

current rate of progress is needed to achieve universal access to at least basic services by 2030, and 23 times the current rate of progress would be needed to achieve universal access of safely managed services.

Timeline of Events

Date	Description of Event
1960s	Long-lasting conflicts between Israel and Arab nations over water resources of the Jordan River escalated into a war lasting from 5 to 10 June 1967, resulting in over 20,000 casualties for both sides. Israel captured the Gaza Strip, the Sinai Desert (which Israel withdrew from in 2005 and 1982 respectively), the Golan Heights, the West Bank and East Jerusalem, gaining territory.
1977	The Action Plan from the Mar de Plata UN Water Conference, for the first time, explicitly recognized adequate drinking water as a human right.
2010	Target 7.C of the Millennium Development Goal 6, adopted in 2000, aiming to halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation, is achieved five years ahead of schedule.
2011	A prolonged lack of rainfall caused the Horn of Africa to experience the worst draught it had in 60 years; more than 10 million people are thought to be affected. The UN classified large areas of Somalia, Ethiopia, Djibouti and Kenya as a crisis or an emergency.
2015	70% of the World's Population are using safely managed drinking water service. The SDGs are adopted.
2018	In mid-2018, Cape Town, South Africa, with a population of approximately 4.4 million people, narrowly avoids "Day Zero", the day the city would undergo a cutoff of tap water after suffering three years of droughts, causing its dams and reservoirs to run dry. If this had indeed happened, Cape Town would be the first major city to run dry of water supplies.
2019	A UNICEF report states that every year, 85,700 children under-15 die from diarrhoea linked to unsafe water, sanitation and hygiene facilities.
2021	The United States Bureau of Reclamation declared a water shortage on part of the Colorado River for the first time in 99 years, affecting the surrounding population.

2022	Italy has declared a state of emergency in the Po Basin, with a 17 million population, on 4 July 2022, due to a drought caused by lack of rain and rising temperature. Prime Minister Mario Draghi of Italy stated that "For the Po basin, this is the most serious water crisis of the last 70 years, according to analysis by the Po River District Basin Authority", and that "There is no doubt that climate change is having an effect". In August, an emergency is declared in the State of Mississippi, United States, due to a water crisis, caused by a treatment plant breakdown. The state governor warned citizens against drinking tap water, and bottled drinking water was distributed instead.

UN Involvement, Relevant Resolutions, Treaties and Events

- Article 25 of the Universal Declaration of Human Rights adopted by the UN General Assembly in 1948 states that everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, which concerns equitable access to safe drinking water and makes it an universal human right. The International Covenant on Economic, Social and Cultural Rights adopted in 1966 further specified in its Article 11 that The States Parties will take appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent.
- The Action Plan from the Mar de Plata UN Water Conference, for the first time, explicitly recognized adequate drinking water as a human right, stating that all peoples, whatever their stage of development and social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs.
- The Committee on Economic, Social and Cultural Rights adopted General Comment No. 15 on the right to water, stating that the human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights. General Comment No. 15 also defined the right to water as defined in Key Terms section of this chair report.
- Resolution adopted by the UN General Assembly on 28 July 2010 recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights.
- The Sustainable Development Goal 6 adopted in 2015 aims to achieve universal and equitable access to safe and affordable drinking water for all by 2030.
- The SDG 6 Global Acceleration Framework is a unifying initiative that aims to deliver fast results, at an increased scale of achieving SDG 6 by 2030. Launched in 2020 as a part of the UN's Decade for Action, it mobilizes UN agencies, governments, civil society, private sector, and other stakeholders around five 'accelerators': optimized financing, data and information, capacity development (a better-skilled workforce), innovation, and governance (collaboration across boundaries and sectors).
- Over 30 UN organizations and involved in addressing water and sanitation concerns, coordinated by UN-Water, a 'coordination mechanism' which identifies emerging issues and develop collaborative responses, provides data for monitoring and reporting on water and sanitation, and raise public awareness to inspire

action.

- The UN had launched multiple "Decades for Action" focusing on addressing water and sanitation concerns, including the International Drinking Water Supply and Sanitation Decade from 1981 to 1990, the International Decade for Action "Water for Life", 2005-2015, and the ongoing International Decade for Action on 'Water for Sustainable Development' 2018-2028.
- The UN adopted World Water Day in 1992 as an annual event held on 22 March, which is used to advocate for the sustainable management of freshwater resources and support the achievement of Sustainable Development Goal 6.

Possible Solutions

Studies proposed that providing access to clean water at an affordable price requires four major criteria to be met: first, a source of sufficient quantity; second, adequate water quality or means to improve water quality for the intended use; third, a transmission network delivering to locations proximal to usage clusters; fourth, a pricing structure that reflects the economic and social capacity.

Cooperation programs between nations and organizations

Nations and organizations could cooperate to install water treatment facilities or devices in communities lacking such services. Relevant education and training on the operation and maintenance of the facility/devices would have to be provided to the local population.

Financial and economic support to struggling nations

It is noted that in many regions, poor economic prowess is a major cause behind lack of adequate drinking water service, as the region does not have the necessary finances to construct and maintain an adequate service and infrastructures. Hence, financial support should be provided, and a specialized fund could be created for this particular purpose. As a long-term action, providing aid to permanently improve the regions' economy as a whole with the aim of achieving self-reliance on the matter would also be beneficial.

Financing and programs prioritize the most affected population

It is noted that there are significant disparities of safe drinking water service coverage between urban and rural areas, globally and across all SDG regions. Disparities are also noted to exist between SDG regions and nations of the same region. According to projections, to reach the universal access to safely managed water target set by SDG 6 by 2030, the current rate of progress would need to quadruple, while progress in LDCs needs to increase tenfold, and in fragile contexts 23-fold. Hence, regions with the direst situation could be prioritized to support the population most in need, and to achieve a more synchronized and equitable progress of improvement.

Improving collection of data

Deficiency in data and statistics related to the topic still exists in certain regions, causing difficulty in assessing and monitoring situation and progress regarding accessibility of safe drinking water. Support could be allocated to nations and governments to improve its ability in collecting, maintaining, and publishing hydrological data effectively.

Transboundary sharing of water-related data

It is noted that hydrological data and statistics are untransparent between nations in certain regions,

such as Central and Southern Asia, making transboundary cooperation difficult. Nations and governments should be encouraged to improve the transparency of their hydrological data and participate in transboundary cooperations.

Further research into the effects of climate change

Evidences points to climate change affecting water resources and availability around the world. It would be beneficial if further researches into the impacts of climate change on the topic is conducted, so better-informed decisions and actions can be made in the future regarding this aspect of the problem.

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