Water security

– a critical base for sustainable development

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"Without Water, Nothing is Secure"[1]

The increasing demands for water and the increasing uncertainty of water relating to climate change has highlighted the need to address water in a more holistic way – e.g. the availability of adequate quantities and qualities of water at the time needed for resilient societies and ecosystems in the face of risks and increasing competition. To ensure and sustain water security is one of the grand challenges to achieve the sustainable development goals[2] and measurements of water security includes both the water experiences of households and its impact on human well-being, assessment of freshwater availability and water resources security, respectively.[3] Considering that more than 90 percent of disasters are water-related, with climate change hitting hardest through water, both spatial scale and temporal variation is equally important in the interpretation and assessment of water security, as distribution of water resources and water governance decisions will change water security in space and time.[4]

The term water security, an emerging concept since the 1990s, has evolved over time and several, slightly different definitions exist, from i.a. World Bank[5], UN-Water[6] and ADB[7]. However the following working definition, with four elements **(Figure 1)**, encapsulates the above definitions and could provide a solid foundation for how Sida addresses water security with a poverty- and rights-based focus:

"Water security ensures that poor and vulnerable people have sustainable supplies of water of sufficient quantity and quality to meet the requirements for health, dignity and sustainable economic growth while also supporting equitable decision-making processes that enable participation of stakeholders while ensuring that freshwater ecosystems are sustained in order to maintain services for the benefit of humankind and biodiversity while minimizing risks, for example, relating to climate change, pollution and conflict."

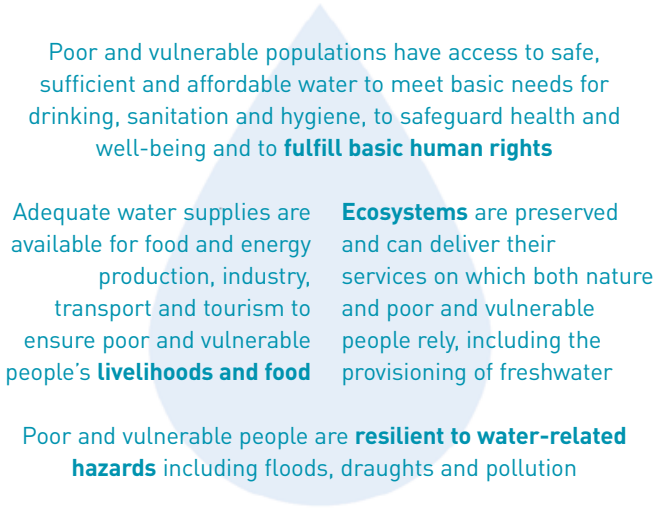

Figure 1 The four elements of water security (adapted from UN Water 2013)

Hence, water security captures complex and interconnected challenges and highlights water's central role for achieving security, sustainability, development and human well-being. Factors contributing to water security are ranging from biophysical to infrastructural, institutional, political, social, and financial – which intersect with the water sector. Geopolitical aspects of water security is especially relevant in settings with transboundary waters, where control over water politics and unequal power relations can impact on the distribution of water resources between states and regions.[8] In this respect, water security is at the center of many security areas, each of which is linked to water, rooted in aspects relating to power dynamics, poverty and inequality.[9]

CURRENT SITUATION AND CHALLENGES

Global assessments of water security suggest that countries in Africa, South Asia and Middle East experience very low water security[10], but this is also a matter of increasing concern across Latin America and the Caribbean (LAC)[11]. The levels of water security in Africa overall are unacceptably low and not a single country or subregion has yet achieved satisfactory levels in measurements of national water security[12] and

1 UN-INWEH 2017
2 Mao et al. 2022
3 Octaviani and Staddon 2021
4 Marcal et al. 2021
5 Grey and Sadoff 2007
6 UN-Water 2013
7 ADB 2020
8 Octavianti 2020
9 water serves as a central link between health, economic, political, personal, food, energy, and environmental aspects of human security (UNESCO 2019)
10 Gain et al. 2016
11 World Bank 2022
12 Oluwasanya et. al. 2022

intensifying climate change has put an additional 75 million to 250 million people at risk[13]. In Asia and the Pacific about 300 million people still have no access to safely managed or basic services of drinking water, and 1.2 billion lack adequate sanitation[14] and 80 percent of wastewater being discharged into waterways without adequate treatment[15] and water scarcity is increasing.

Between 2000 and 2020, the global population using safely managed drinking water and sanitation services increased by 2 billion and 2.4 billion, respectively. However, 2 billion people lacked safely managed drinking-water services, 3.6 billion safely managed sanitation services and 2.3 billion basic hygiene services in 2020. Adding to the pressure, humanity's demand for water keeps growing, with pressure on freshwater projected to increase by more than 40 per cent by 2050.[16]

Twenty-five countries – housing one-quarter of the global population – face extremely high water stress each year, regularly using up almost their entire available water supply. At least 50 percent of the world's population – around 4 billion people – live under highly water-stressed conditions for at least one month of the year.[17] In these areas people live with high food and nutrition insecurity and poverty[18].

Water security is essential for *food systems functioning,* as a key input into food production and more than 70 percent of all freshwater withdrawals are currently used for agriculture.[19] Water security also relies on *healthy freshwater ecosystems* that are able to deliver water resources to local communities. As most riverine systems are heavily altered by human interventions this is a big challenge that makes sustainable water resource management difficult and thus affects water security and biodiversity negatively.[20] Despite advancements in water security measures, *waterborne diseases* kill more children each day than AIDS, malaria, and measles combined.[21]

Water security is already compromised by the *consequences of climate change,* as the vast majority of its impacts are on the water cycle, resulting in higher climatic and hydrological variability (i.e. irregular rains, unexpected droughts and/or floods), and higher water insecurity with important consequences for societies.[22] Increasingly, climate-related hazards such as floods and droughts further increase the pathogen load in water, making it unsafe to drink[23]. Climate change-induced floods can damage water infrastructures, wastewater and sanitation facilities, reduce water quality, and can mix up drinking water with industrial and agricultural waste, increase the risk of waterborne diseases while droughts lead to shortages of water and poor water quality.[24] Financial impacts from water risks can be five times higher than the cost of addressing them with mitigating actions.[25]

Today, 56 percent[26] of the world's population lives in urban areas. *Unsustainable urban water and wastewater management* is a serious threat to water security in most developing countries. There will be no water security unless the provisioning services of *freshwater ecosystems are maintained and managed sustainably.*

ACHIEVING A POVERTY- AND RIGHTS BASED WATER SECURITY

We need to ensure that there is not too little, nor too much and not too polluted waters while ensuring equal access[27]. To do this we need to consider the trade-offs between different and interrelated outcomes in water resource systems and water services[28] and focus on three different outcomes:

- **Resource sustainability:** water is governed, managed and conserved to ensure quality and availability are maintained, considering the impacts of climate variability and extremes on surface water, wetlands and groundwater systems.
- **Inclusive services:** different human-centered users (people, industry, agriculture/ forestry/fishery, energy, transport, recreation, etc.) are able to access safe, reliable, sufficient and affordable water, and to dispose of wastewater safely.
- **Sustainable growth:** changing water needs and threats, linked to job creation, productivity and standards of living, are managed as countries develop

So, achieving water security means an acceptable level of water services for all users and acceptable water-related risks. Water security risks are experienced differently, varying based on the individual, group and place. Hence, it is important to explicitly recognizing inequalities based on gender, ethnicity, and wealth that identifies how benefits and risks are distributed. Water security risks are managed at different scales through multiple processes that determine which risks are addressed and for whom. Understanding these processes is critical to ensuring water security inequalities can be addressed.

13 Isaacman & Musemwa 2021
14 Asian Development Bank 2020
15 United Nations Environment Programme. 2016
16 United Nations, DESA 2023
17 Kuzma et al. 2023
18 WWAP UN-Water 2018
19 WWAP UN-Water 2018
20 Vörösmarty et al. 2010
21 Paudel et al. 2021
22 IPCC 2022
23 Watts et al. 2018
24 Li et al. 2023
25 CDP 2020
26 United Nations Population Division 2018
27 OECD 2022
28 REACH 2020

Improving water security will decrease **poor people's** vulnerability and improve their health, productivity and physical safety and increase their resilience to other forms of vulnerability. **Women's** challenges and contributions to water security remain undervalued in the policy discourse and rising water insecurity and the consequent politicization of water resources, exacerbated by climate change and demand surge, both will have a disproportionate impact on women. More than a decade has passed since the United Nations explicitly recognized access to water (and sanitation) as a **human right**[29] and water resources are now also protected under the human right to a healthy environment. Increasing pressures on water resources, and higher water insecurity, are already contributing to **conflict and migration** in many parts of the world[30], solutions exist but must be tailored to the specific context.[31] Water security is also a key condition for successful adaptation to **climate change** as access to secure water sources can mitigate impacts of droughts, provide alternative food sources and provide safe WASH services during heat waves.

LIST OF REFERENCES AND RESOURCES

ADB (2020). *Asian Water Development Outlook 2020 - Advancing Water Security Across Asia And The Pacific.* Manila, Philippines

CDP 2020. CDP Global Water Report 2020. *A Wave of Change: The Role of Companies in Building a Water-Secure World;* CDP Worldwide: London, UK. https://www.cdp.net/en/research/global-reports/global-water-report-2020.

Gain, Animesh K , Carlo Giupponi and Yoshihide Wada (2016). *Measuring global water security towards sustainable development goals.* Environ. Res. Lett. 11 124015

Grey and Sadoff (2007). *Sink or Swim? Water security for growth and development.* Water Policy 9:545–571

Giupponi, C., Gain, A.K. (2017). *Integrated water resources management (IWRM) for climate change adaptation. Reg Environ Change* 17:1865–1867

IPCC 2022. *Sixt assessment report; Impacts, Adaptation and Vulnerability.* Cambridge University Press, Cambridge, UK and New York, NY, USA,

Isaacman & Musemwa (2021). *Water Security in Africa in the Age of Global Climate Change.* Daedalus (2021) 150 (4): 7–26.

Jepson, et. al. (2017). *Advancing human capabilities for water security: A relational approach.* Water Security.

Kuzma, Saccoccia and Chertok (2023). 25 *Countries, Housing One-quarter of the Population, Face Extremely High Water Stress.* World Resources Institute. https://www.wri.org/insights/highest-water-stressed-countries.

Li, J. et al. (2023). *Climate change impacts on wastewater infrastructure: A systematic review and typological adaptation strategy,* Water Research 242:120828. https://doi.org/10.1016/j.watres.2023.120282.

Mao, F., Miller, J.D., Young, S.L. et al. (2022). *Inequality of household water security follows a Development Kuznets Curve.* Nature Communications 13, 4525.

Marcal, Antizar-Ladislao and Hofman (2021). Addressing Water Security: An Overview. Sustainability 13(13702). https://doi.org/10.3390/su132413702.

Mekonnen, M. and Hoekstra, A. (2016). *Four billion people facing severe water scarcity.* Science Advances,

Octavianti, T. (2020). *Rethinking water security: How does flooding fit into the concept?* Environmental Science and Policy 106: 145-156. https://doi.org/10.1016/j.envsci.2020.01.010.

Octavianti and Staddon (2021). *A review of 80 assessment tools measuring water security.* WIREs Water 1-24. https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wat2.1516.

OECD (2022), *Financing a Water Secure Future,* OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/a2ecb261-en.

Oluwasanya, G., Perera, D., Qadir, M., Smakhtin, V., (2022). *Water Security in Africa: A Preliminary Assessment,* Issue 13. United Nations University Institute for Water, Environment and Health, Hamilton, Canada

Paudel et. al. (2021). *Nexus between Water Security Framework and Public Health: A Comprehensive Scientific Review. Water,* 13(10), 1365

REACH (2020). *REACH Global Strategy 2020-2024,* University of Oxford, Oxford, UK.

29 "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". United Nations General Assembly resolution 64/292 in 2010.
30 WRI 2018
31 WRI 2020

Sida (2022). *Human Rights Based Approach and Water.* Technical note. Stockholm, Sweden

UNESCO (2019). *Water Security and the Sustainable Development Goals.* Global Water Security Issues (GWSI) Series, UNESCO Publishing, Paris, France

United Nations, DESA. *Ensure availability and sustainable management of water and sanitation for all* https://sdgs.un.org/goals/goal6, (accessed 2022-04-03)

United Nations Population Division (2018). *World Urbanization Prospects: 2018 Revision.*

United Nations Environment Programme (2016). *A Snapshot of the World's Water Quality: Towards a Global Assessment.* Nairobi. Kenya.

UN-INWEH (2017) – *"Without Water, Nothing is Secure"* Policy brief, city, country

UN WATER (2013) – *Water Security and the Global Water Agenda,* Analytical brief, Geneve

Vörösmarty et. al. (2010). *Global threats to human water security and river biodiversity.* Nature 467: 555-561

WWAP UN-Water (2018). *The United Nations World Water Development Report 2018: Nature-Based Solutions for Water.* Paris, UNESCO.

Watts et. al. (2018). *The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come.* Lancet, 392:10163, 2479-2514,

World Bank, 2022. *Water Matters: Resilient, Inclusive and Green Growth through Water Security in Latin America.* Washington, DC: World Bank. http://hdl.handle.net/10986/37214.

World Resources Institute (2018). *Water, Security, And Conflict.* Issue Brief, Washington D.C. USA

World Resources Institute (2020). *Ending Conflicts over Water: Solutions to Water and Security Challenges.* Washington D.C. USA

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