

Climate change and the human rights to water and sanitation

**Special Thematic Report 3:
A rights-based approach to
adaptation, mitigation,
finance, and cooperation**

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Introduction

The impacts of climate change on access to water and sanitation vary worldwide, but there are many common elements, among which is the exacerbation of inequality under the effects of climate change. Regions where geographical and hydrological conditions complicate access to water and sanitation, such as arid regions, will be the most impacted by climate change. Populations living in situations of vulnerability, such as those in areas with overexploited or polluted rivers and aquifers or poorly maintained or non-existent basic services, including water and sanitation services and facilities, are also more likely to experience more severe impacts from climate change. Another issue that generally applies to climate change is that its impacts on access to water and sanitation around the world can be significantly limited through the adoption of appropriate adaptation measures and strategies. The devastating socioeconomic impacts of changes in the water cycle call for urgent adaptation strategies in order to increase the resilience of aquatic ecosystems to extreme events and to increase social resilience, in accordance with the human rights to safe drinking water and sanitation.

The current report is one of three special thematic reports issued by the Special Rapporteur on the human rights to safe drinking water and sanitation. It serves as an intermittent report presented by the Special Rapporteur between his report to the 48th session of the Human Rights Council in September 2021 focused on his plans and vision for the mandate (A/HRC/48/50) and his next report to the 51st session of the Human Rights Council in September 2022. The first special thematic report outlines how climate change will impact the human rights to safe drinking water and sanitation, and describes the main trends in those impacts by region. The second special thematic report explores the impacts of climate change on the human rights to water and sanitation of specific groups in situations of vulnerability. The third and present report outlines a human rights approach to four major topics within the sphere of climate action: adaptation, mitigation, finance, and cooperation.

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The hydrological transition

Water is the primary vector through which the socio-economic impacts of climate change are, and will be, felt. Water has been increasingly recognized over the past decade as a central element of climate change adaptation. The Intergovernmental Panel on Climate Change (IPCC) states with very high confidence that the most effective actions to reduce vulnerability in the short-term are to implement “basic public health measures such as the provision of clean water and sanitation [...] and alleviate poverty”.

As such, climate change adaptation should occur through a ‘hydrological transition’ that strengthens social and environmental resilience. The hydrological transition must address the water, sanitation and hygiene sphere holistically, including eliminating inequalities in access to water and sanitation and associated vulnerabilities. It should also address restoring the good status of aquatic ecosystems and rigorous hydrological, territorial and urban planning, as well as identifying, preventing and minimising the main risks of desertification, drought and flooding arising from climate change and the impacts of rising sea levels.

The hydrological transition speaks to the need to reintegrate the human rights to safe drinking water and sanitation into many areas of climate action, and of water and sanitation provision. These areas are discussed under four main areas of conversation in climate action:

- A. Adaptation**
- B. Mitigation**
- C. Finance**
- D. Cooperation**



Adaptation

Adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. From the perspective of the human rights to safe drinking water and sanitation, climate change adaptation includes building resilience of water infrastructures, improving water management and governance and lastly, building resilience of groups and population in vulnerable situations in order to minimize the risk and harm of climate change impacts.

Building resilience of water and sanitation infrastructure



Water infrastructure must be adapted in two ways: it must be more robust and capable of withstanding both extreme droughts and flood events, and it must be more flexible, adaptable to changing circumstances, availability of water and local needs. It is often a matter of introducing 'additional' technical components or designs to address the specific risks arising from climate change. However, traditional strategies tend to rely on 'hard' and large infrastructure (such as dams, dykes, and inter-basins transfers of water) that are increasingly questioned. This type of infrastructure has high operational and maintenance costs, long lifecycles, and low flexibility. Often, these large infrastructures are impacted by the very events that they are built to address – such as droughts, floods, or more gradual impacts of climate change.

An important alternative to 'hard' infrastructural solutions to the impacts of climate change on water and sanitation systems is recovering the good condition and functionality of aquatic ecosystems. It is especially important to recover the ecosystems that can provide buffers against the impacts of climate change. Implementing nature-based solutions does not imply the need to abandon traditional infrastructure, but rather combining it with integrated nature-based solutions, which are usually more cost effective, less vulnerable to climate change, and provide better service and protection over its lifetime.

Ecosystem and protection against impacts of climate change

Aquifers are 'water lungs' of the planet and they will become increasingly important as sources to rely on long-term, as periods of drought become longer and more frequent;

Wetlands are surface stores, flood regulators and natural macro-purifying plants that regenerate water quality;

Riverside ecosystems soften floods and reduce their destructive energy

Management strategies

- Reserving enough water in the aquifers for periods of drought
- Reducing pumping in non-drought period
- Developing recharge strategies during wet periods

- Restoring wetlands and their biodiversity
- Limiting the degradation of wetlands, which can lead to greenhouse gas emissions

- Expanding zone of river expansion, in particular upstream from settlements

Enhancing water management and governance



Despite the relatively large amount of attention that infrastructure receives in adaptation measures, in many cases, the key is not in the robustness or flexibility of the infrastructures but rather, it is found in safeguarding the availability of resources and the sustainability of the ecosystems. As an example, two serious threats to the human rights to safe drinking water and sanitation are the overexploitation of aquifers and the prioritization of over-allocation of water rights over the sustainable availability of flows in ecosystems. Both of these problems have been created by unsustainable management approaches and will undoubtedly be exacerbated by climate change.

It is important that adaptation measures take into account current and future water demand in each basin and even between countries, where transboundary basins or aquifers are involved, to ensure that activities are viable and do not undermine the provision of water for drinking, hygiene, and sanitation, especially for vulnerable populations. Moreover, sustainable adaptation strategies in the field of water management should include:

- Basing water planning and management on both existing surface and underground water resources, and the expected availability of water under plausible scenarios of climate change. It is essential to contemplate a diversification of surface and underground water sources, as well as a prioritization of safe drinking water;
- Promoting water tariff systems that guarantee access to safe drinking water and sanitation services for everyone, including those who are not capable to pay, with rates that encourage efficient use and minimize the water footprint on ecosystems - for example, systems with increasing rates for consumption blocks; and
- Balancing the use and allocation of surface water and groundwater according to the level of rainfall. During periods of high precipitation, the use of surface water should be favoured, and infiltration to aquifers should be encouraged to maintain or restore the level of groundwater reserves while preserving their quality. Thus, during periods of drought, the use of groundwater may be intensified, ensuring in any case an order of priority in the different uses, so that in no case is there a risk to the fulfilment of the human rights to drinking water and sanitation. It is and will be essential to avoid overpumping and to prevent their pollution, especially by protecting their recharge areas.

Building resilience of people in vulnerable situations



Most people without access to safe drinking water are not living in waterless (arid) environments. Rather, they are people living in poverty who lack access to drinking water for their basic needs while the available drinking water is served to those who can afford it or they are people living next to polluted rivers, lakes or aquifers, which are their source of drinking water. The fundamental key to reducing the risks and impact of climate change on drinking water lies in recovering the good functioning of aquatic ecosystems and addressing the socio-economic inequalities that exacerbate risks for groups in situations of vulnerability.

Mitigation

Although climate change adaptation is central to safeguard the human rights to safe drinking water and sanitation, the 'hydrological transition' as advocated by the Special Rapporteur, also shines a light on the human rights impacts of climate mitigation strategies. Some low-carbon energy generation methods, such as negative emission biofuels or dams, are being suggested as 'green' solutions. These methods can have, however, massive impacts on human rights generally, and the human rights to safe drinking water and sanitation in particular. In order to find 'green' solutions without compromising human rights, the human rights to safe drinking water and sanitation must be reintegrated into conversations about climate mitigation.

The carbon-impact of water and sanitation



The hydrological transition addresses the need to adapt safe drinking water and sanitation services and management to a changing climate while respecting natural hydrology and ecology as well as human rights. It also draws attention to safe drinking water and sanitation services and facilities through the lens of mitigation, in order to recentre the human rights to safe drinking water and sanitation in conversations around reducing greenhouse gas emissions and limiting the extent of climate change.

Safe drinking water and sanitation services, and in particular wastewater sanitation systems, can generate significant greenhouse-gas emissions. The combined emissions of water supply and sanitation services (electricity consumption and breakdown processes) are expected to grow as populations grow. It is therefore crucial to design wastewater remediation strategies and models that limit the growth of emissions from the sanitation sector. In regions where groundwater becomes depleted or unreliable, alternative sources of freshwater may need to be found. In order to become drinkable and safe, these sources may have larger energy needs than traditional sources. One such source is desalinated seawater. Although reverse osmosis technologies have reduced the energy cost of desalination, while conventional water treatment requires 0.2–0.4 kWh m³, desalination needs between 3.5 and 4.5 kWh m³ to produce drinking water - this can augment greenhouse gas emissions from the water sector. While alternative methods for providing safe drinking water will become increasingly important with the impacts of climate change, must go hand in hand with sustainable adaptation processes.

The hydrological transition reinforces social and environmental resilience through nature-based solutions and sustainable water and sanitation services and offers us a way to limit emissions. For example, energy recovery from wastewater systems could provide over 55 per cent of the electricity required for municipal wastewater treatment by 2040, demonstrating the dual benefits of reducing waste-related emissions and producing renewable energy. As another example, wetlands accommodate the largest carbon stocks among terrestrial ecosystems, storing twice as much carbon as forests. Taking into account that wetlands also reduce risks derived from floods and droughts, purify drinking water, and foster healthy biodiversity, their restoration and conservation is of critical importance in both adaptation and mitigation strategies in order to protect the human rights to safe drinking water and sanitation.

The human rights costs of false 'green' choices



Taking advantage of the justified alarm generated by climate change, some economic sectors have been promoting certain renewable energies and energy strategies as 'green', ignoring and hiding the serious impacts on human rights and the environment that they generate. Bioenergy with Carbon Capture and Storage and large hydroelectric dams are examples in this regard, insofar as they offer renewable energies that do not generate greenhouse gases, but also present threats to the human rights to safe drinking water and sanitation. It is crucial to integrate human rights into plans for climate change mitigation. Mitigation measures to address climate change must be equitable, must ensure that human rights are protected, and must avoid generating new challenges or exacerbating existing ones for populations in vulnerable situations.

Bioenergy with Carbon Capture and Storage (BECCS)

First, Bioenergy with Carbon Capture and Storage (BECCS) is a method of obtaining fuels that can be used for electricity and heat generation and transport from biomass capturing and storing carbon and then closing the cycle when the fuel is used. Its massive use could make a significant contribution to reducing emissions and keeping global warming to below 2°C. However, at the large-scale required, biomass production is likely to have an extremely large water consumption. Studies project that BECCS could entail water demands of the same magnitude as those of all current agricultural water withdrawals, translating into nearly one-quarter of global annual runoff. Most notably, the water demands of BECCS are predicted to increase the number of people experiencing water stress from 2.28 billion people currently to 4.58 billion. This increase in populations experiencing water stress larger increase than that predicted as a result of climate change, which is to 4.15 billion people.

BECCS operations might also degrade the quality of water bodies, with implications for safe drinking water.

While these impacts do not negate the 'green' potential of BECCS, they do speak to the need to understand the 'blue' impacts of strategies and technologies being considered in the effort to mitigate climate change. In situations of large-scale projects such as the cultivation of biomass for BECCS, the human rights to safe drinking water of the populations living in situations of most vulnerability can be threatened. It is therefore crucial to establish clear priorities for water uses, and to safeguard human rights against the potential impacts of climate mitigation strategies.

Dams

Dams are an important global source of energy with little to no emissions. However, despite being labelled as a 'green' source of energy, they have widespread impacts on human rights. In November 2000, the World Commission on Dams presented the findings of its landmark report stating that dams have made an important and significant contribution to human development, but often with heavy, contradictory socio-economic and environmental impacts. According to that report, between 40 and 80 million people, whose homes were flooded, were forcibly displaced, and more than 470 million had their livelihoods severely affected downstream. These populations mostly fell into extreme poverty and saw their human rights violated, including in many cases their rights to safe drinking water and sanitation. The former Special Rapporteur on the human rights to safe drinking water and sanitation, Léo Heller, outlined the impacts of megaprojects on human rights throughout their lifecycle. He identified the threats to the human rights to safe drinking water and sanitation from the start of construction of megaprojects such as, to their management, including occasional disasters as a result of their degradation.

Finance

Climate finance and water and sanitation



The centrality of the hydrological transition in climate change adaptation strategies highlights the need for financing to strengthen more resilient safe drinking water and sanitation systems. Finance that aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability and maintaining and increasing the resilience of human and ecological systems to negative climate change impacts will become increasingly crucial in adapting the impacts of climate change on the human rights to safe drinking water and sanitation.

When taking both mitigation and adaptation into account, the water sector received only 3 per cent of climate funding since 2011. Sanitation has been further side-lined in climate funding, often being treated as a sidenote within safe drinking water and sanitation projects. One study estimates that sanitation received only 3 per cent of water supply and sanitation funding.

Beyond not reaching the quantity needed to adapt water and sanitation systems to climate change, climate finance also fails to address the range of climate impacts on the human rights to water and sanitation in two main ways. Firstly, climate finance is generally earmarked for specific projects, requiring a level of research and planning whose cost is often unaffordable for groups in vulnerable situations, who are most in need. Secondly, climate finance also tends to favour projects that focus on building new “climate proof” infrastructure, or updating existing infrastructure, to solve specific local problems, rather than nature-based, ecological solutions.

Avoiding the commercialization of water



The lack of political will to assume the hydrological transition, as a democratic challenge and from a human rights-based approach encourages false solutions based on the commodification and financialization of water, as ways of allegedly better managing water scarcity. However, the truth is that they increase the vulnerability of the most impoverished and aggravate the unsustainability of the aquatic ecosystems, which are the two key factors in understanding the global water crisis.

To guarantee the human rights to safe drinking water and sanitation, especially those rights of the most impoverished people, communities, and sectors, water cannot be considered as a commodity. It is about developing participatory adaptation strategies with a gender perspective, based on the recovery of the good state of our aquatic ecosystems and on hydrological, territorial, and urban planning that prioritize the protection and fulfilment of human rights at stake. Funding these strategies and protecting them against the volatility and vulnerability of the markets, is part of the human rights obligation of States: as noted by the former Special Rapporteur, Léo Heller, allocating and spending budget that takes into account the entire life-cycle of safe drinking water and sanitation is part of the obligation of States to progressively realize the human rights to safe drinking water and sanitation – including budgeting for how these costs may change in the future through the impacts of climate change.

Cooperation - Collaboration and Participation

In climate adaptation strategy, it is essential to ensure that actions taken by one group do not create risks for other groups. For example, if the inhabitants of one bank build a dike to prevent floodwaters from flooding their lands, they will cause the floodwaters to flood the lands on the other bank more heavily. In the face of rising incidence of flooding, a shared strategy will be necessary for the collaboration of all the riverine populations, on one side and the other, upstream and downstream, to soften floodwaters and minimize flood risks for all.



Ensuring effective local participation in the design, development, and management of safe drinking water and sanitation services and facilitates is essential to achieve adaptation processes that effectively guarantee the human rights to safe drinking water and sanitation in the face of the risks arising from climate change. Participation is particularly important where socio-economic inequalities and issues of marginalisation are ignored in the management of safe drinking water and sanitation services so that these issues of discrimination are not reinforced by adaptation plans. Designing solutions for resilient safe drinking water and sanitation services depends to a large extent on matching them to the characteristics of the territory's aquatic ecosystems, and no one knows the territory better than its inhabitants. Examples of participatory approaches that protect the human rights to safe drinking water and sanitation in the face of climate change include:

- Taking into account the local knowledge, values and cultural cues of communities should govern participation in water and sanitation services, to ensure the acceptability of those services;
- Encouraging local participation in the design and development of water and sanitation services, as well as respect for municipal and community institutions, to ensure the necessary local and community responsibility in the management and maintenance of these services;
- Including the participation of groups with specific needs in designing adaptation solutions. For example, women's participation is essential in ensuring that their specific (often neglected) menstrual health needs are taken into account, and in their empowerment in the design and development of safe drinking water and sanitation projects as those who often bear the responsibility for fetching safe drinking water in many impoverished communities;
- Ensuring the participation of marginalized groups or population living in vulnerable locations, including the neighborhoods of peri-urban areas and informal settlements in large cities;
- Creating policies to plan for the impacts of climate change that include measures to address the disproportionate impact on groups in situations of vulnerability.

While local participation is essential to protecting the human rights to safe drinking water and sanitation against climate change, the State is the primary duty-bearer. The scale of the impacts of climate change requires action beyond the capacity of purely local management. Ultimately, the obligation to guarantee the human rights to safe drinking water and sanitation for all, without discrimination of any kind, rests with the State.



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