**Special thematic report on climate change and the human rights to water and sanitation by the Special Rapporteur on the human rights to safe drinking water and sanitation (March 2022)**

**Part 3: A rights-based approach to adaptation, mitigation, finance, and cooperation**

# Introduction

1. 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 will be the most impacted by climate change.[[1]](#footnote-1) Populations living in situations of poverty and vulnerability with poorly maintained or non-existent water and sanitation services and facilities, are also more likely to experience more severe climate change impacts; particularly those in areas with overexploited or polluted rivers and aquifers. On the other hand, climate change, with its devastating socio-economic impacts, has a multiplier effect on poverty and vulnerability (as explained in Part 2 of the Special Thematic Report). In view of this, it is urgent to promote adaptation strategies, strengthening the resilience of aquatic ecosystems and social resilience to extreme events, and building robust and adequate water and sanitation services to minimise the vulnerability of the population. The key to minimising the impacts of climate change and ensuring the human rights to safe drinking water and sanitation, especially among those living in poverty and marginalisation, is to develop appropriate adaptation strategies.[[2]](#footnote-2)
2. 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](https://ap.ohchr.org/Documents/dpage_e.aspx?si=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](https://www.ohchr.org/Documents/Issues/Water/Climate/climate-change-1.docx) 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](https://www.ohchr.org/Documents/Issues/Water/Climate/climate-change-2.docx) explores the impacts of climate change on the human rights to water and sanitation of specific groups in situations of vulnerability.[[3]](#footnote-3) 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.

# The hydrological transition

1. Water is the primary vector through which the socio-economic impacts of climate change are, and will be, felt. Ensuring access to safe drinking water and sanitation for all 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’.[[4]](#footnote-4) Adaptation to climate change must involve a *hydrological transition* that addresses the challenge of guaranteeing drinking water, sanitation and hygiene for all from a holistic viewpoint, taking on board both the elimination of inequalities and the recovery of the good state of aquatic ecosystems. A *hydrological transition* that promotes rigorous water, territorial and urban planning based on the precautionary principle in order to identify, prevent and minimise the risks of desertification, drought and floods resulting from climate change, as well as the impacts of rising sea levels.

## Adaptation

1. Adaptation strategies aim to reduce the risks and damages of climate change and minimise the vulnerability of the population, strengthening social resilience through participatory hydrological, territorial and urban planning based on human rights-based approaches, improving environmental resilience by restoring the good state of aquatic ecosystems, and adapting infrastructure to foreseeable impacts.

### Strengthening social resilience

1. Minimising society's vulnerability to the risks of climate change means first and foremost strengthening prevention and social organisation in the face of these risks. In other words, the aim is to provide the population with clear information on the risks to be prevented, as well as to plan and organise society's life in such a way as to minimise the impacts, based on the active participation of society. To this end, it is essential to develop good participatory water, territorial and urban planning, based on social participation and the primacy of guaranteeing human rights, especially for those living in situations of poverty and vulnerability.
2. Two of the main problems that aggravate the vulnerability of the population to climate change are the overexploitation of aquifers and the over-allocation of water rights over the sustainable availability of flows in ecosystems.[[5]](#footnote-5) Logically, if in normal years we pump more water from aquifers than the average infiltration and if access to water is increased more than the average available flow in rivers, in drought years not only do productive uses collapse, but competitive dynamics open up that put pressure on water supply services in urban areas and their tariffs, putting at risk the human rights to drinking water and sanitation of the people in most vulnerable situations. Climate change is likely to exacerbate this vulnerability, as the average river flows will be reduced and the risk of drought will increase. Therefore, it is necessary to plan a lower use of water in productive activities to adapt future demands in response to the lower availability of flows expected in the scenarios imposed by climate change. We need integrated groundwater and surface water planning based on sound information, not only on current water availability, but also on the availability we can expect in a future where climate change will impose lower river flows and reduced infiltration into aquifers.[[6]](#footnote-6) It is necessary to ensure that current and future economic activities are viable and do not undermine the provision of drinking water, hygiene and sanitation, especially for vulnerable populations.[[7]](#footnote-7)
3. Integrated management of surface water and groundwater is necessary. During periods of normal or high rainfall, the use of surface water should be encouraged, favoring infiltration into aquifers and preserving their recharge zones, in order to have quality groundwater reserves available during drought cycles.[[8]](#footnote-8)
4. In view of the expected lower availability of average flows in the future and the increasing risks of shortages in drought cycles, it is essential to prioritise drinking water supply over other uses and to diversify sources of supply, so that in no case is there a risk to the fulfilment of the human rights to drinking water and sanitation.
5. The affordability of drinking water and sanitation must be ensured even in circumstances of scarcity, by prohibiting service cuts for those with payment difficulties and promoting water pricing systems with tariffs that encourage efficient use and minimise the water footprint on ecosystems - for example, with increasing tariffs per block of consumption.
6. Adequate territorial and urban planning can greatly reduce flood risks by preventing the construction of housing, economic activities and services in flood-prone areas and by providing decent housing in safe areas for the most impoverished families.
7. Ensuring integrated risk planning and management, early warning systems and contingency plans involving communities will reduce the exposure of urban and rural populations to the risk of floods and droughts.
8. To make rural communities more resilient to climate change, it is necessary to strengthen basic services such as drinking water and sanitation, diversify livelihood options to minimize vulnerability to droughts and floods, have access to credit, secure land tenure, and expand crop insurance programs.[[9]](#footnote-9)
9. In local decision-making processes, information on the risks arising from climate change (droughts, floods...), with the available data, must be accessible and understandable to all.[[10]](#footnote-10) The active participation of women must be guaranteed and the knowledge that the communities have of their territories must be taken into account, especially in the face of water scarcity during drought cycles.[[11]](#footnote-11)
10. To the extent that adaptation strategies aim to minimize social vulnerability, it is essential that all measures pay specific attention to sectors, families and people who live in situations of greater vulnerability, guaranteeing their human rights to drinking water and sanitation in emergency plans for drought or flooding. As highlighted in Part 2 of the Special Thematic Report, existing inequalities, particularly regarding water and sanitation services, are exacerbated by climate change. Therefore, adaptation strategies must prioritize combating these inequalities.

### Improving environmental resilience

1. Most of the people without access to safe drinking water are impoverished people who live next to polluted rivers, lakes or aquifers, from which they are supplied. The fundamental key to reducing the risks and impact of climate change for them lies in restoring the proper functioning of aquatic ecosystems and in combating the socioeconomic inequalities.
2. To restore the health and functionality of aquatic ecosystems is to restore the basic natural engineering on which the water cycle on islands and continents, and in particular our water supply, functions. It is vital to understand that ecosystems can greatly buffer the impacts of extreme events, exacerbated by climate change, if they are in good condition.
3. Strengthening the resilience of aquatic ecosystems is especially critical in terms of the human rights to safe drinking water and sanitation of the most impoverished, as they are more directly dependent on these ecosystems for their water supply, while often living in environments that are more vulnerable to extreme weather events.[[12]](#footnote-12)
4. It is particularly important to restore the health and functionality of the most inertial ecosystems of the water cycle on islands and continents: aquifers, wetlands and riparian ecosystems.
5. Preserving and protecting aquifers is a key part of adaptation strategies. Aquifers store and regulate the world's largest freshwater reserves; they are the unseen part of the "iceberg" that underpins the water cycle. Aquifers are the "water lungs" of islands and continents and are less affected by climate change than surface waters. They can and should therefore be managed as strategic reserves to manage droughts, which will become more intense, longer and more frequent.
6. Integrated surface and groundwater management should allow sufficient water to be reserved in normal years in aquifers for periods of drought. This requires avoiding overexploitation of groundwater, reducing pumping in normal or rainy years, and even developing recharge strategies in these years [[13]](#footnote-13).
7. It is also vital to conserve and restore wetlands, as reservoirs of surface flows that buffer floods due to their high flow absorption capacity. In addition, wetlands are natural macro-purifiers that regenerate the quality of surface flows and sinks for greenhouse gases.[[14]](#footnote-14)
8. Riverside ecosystems can soften floods and reduce their destructive energy, based on the provision of spaces for controlled river expansion in extraordinary floods, with adequate compensation and good land management[[15]](#footnote-15).
9. Avoiding pollution of rivers and aquifers, especially with toxic spills or diffuse pollution and promoting nature-based solutions are often more flexible, resilient, cost-effective, less vulnerable to climate change, and provide better service and protection over its lifetime; but above all they are the cheapest options that can be affordable for those 2 billion impoverished people who today do not have guaranteed access to safe drinking water.

### Adapting infrastructure

1. From the traditional approaches of civil engineering, water planning and management throughout the 20th century was dominated by the paradigm of "domination of nature" and the development of large hydraulic infrastructures. Today, the new paradigm of sustainability calls for profound changes that emphasise the restoration of ecosystems and their functionality, while new models of participatory governance need to be developed under human rights-based approaches.
2. Traditional "hard" strategies, based on large dams and inter-basin water transfers, although reframed as adaptation strategies, are highly contested, as they often put at risk the human rights of communities living in vulnerable situations and the sustainability of aquatic ecosystems, as well as ignoring the principle of participatory governance. On the other hand, these infrastructures not only have high investment, operation and maintenance costs, lack of modularity and little flexibility, but also low effectiveness and efficiency in the face of droughts, floods and the progressive reduction of average flows imposed by climate change. For example, large inter-basin transfers, beyond the environmental and social impacts they usually produce, are inefficient in the face of drought cycles, to the extent that droughts, being regional and not local, affect not only the receiving areas but also to the ceding basins, causing these transfers to collapse when they are most needed.[[16]](#footnote-16)
3. However, and although the inertia of the past still weighs, magnifying the need for new large infrastructures, it is important to adapt and improve existing water and sanitation infrastructures and develop new infrastructures that facilitate adaptation to climate threats. In fact, the construction, adaptation and improvement of infrastructure appears as a priority for adaptation actions in more than 68% of the total of the National Determined Contributions (commitment of the countries under the Paris Agreement of the United Nations Framework Convention on climate change).[[17]](#footnote-17)
4. Water infrastructure must adapt in two ways: it must be more robust and able to withstand extreme droughts and floods, and it must be more flexible, modular and adaptable to changing circumstances, water availability and local needs. This is often about introducing 'additional' technical components or designs to address specific risks from climate change. For example, pit latrines can be built elevated or floating, among other options, to resist flooding and reduce pollution in the event of a collapse.[[18]](#footnote-18)
5. Modular and decentralized technologies, such as reverse osmosis, powered by renewable energies, such as solar and wind, allow the development of modular, flexible and more sustainable strategies and options for the purification, regeneration and even reuse of water and wastewater, as well as better adaptation to the growing need to protect drinking water supplies from drought.[[19]](#footnote-19)
6. Combining traditional infrastructure with nature-based solutions often makes the most sense in adaptation strategies. We have an example in the new strategies to manage river floods. Traditional strategies throughout the 20th century were based on lateral dikes that narrowed the riverbeds, often dragged and rectified (for the benefit of navigation). All this led to the fact that, in the 1990s, the floods of the Mississippi and the Rhine in particular, saw the kinetic energy of their flood points multiplied producing true humanitarian and economic disasters at the end of the basins. Today, strategies are promoted based on setting back these dikes, giving the river more room to expand, recovering forests and riparian ecosystems, and placing gates in the dikes that allow a gentle flooding of wide spaces, when extraordinary floods arrive, after agreeing to indemnify the owners of these lands. This makes it possible to defend sensitive and densely populated areas downstream, softening the floods and reducing their destructive energy, effectively and at a lower cost.

## Mitigation

1. Although the clearest link between climate change and the human rights to water and sanitation is adaptation to a changing climate, it is important to look at water and sanitation services through the lens of mitigation, in order to reduce greenhouse gas emissions and to limit the extent of climate change.[[20]](#footnote-20)

### The carbon-impact of water and sanitation

1. Drinking water and sanitation services, and in particular wastewater management and sanitation systems, can generate significant greenhouse gas emissions, both directly through the decomposition of excreta discharged into the environment or during treatment processes (e.g. nitrous oxide, methane, etc.), and indirectly through the energy required in wastewater supply and treatment systems. In fact, it is estimated that sanitation treatment plants account for 3% of global electricity consumption.[[21]](#footnote-21) Combined emissions from water supply and sanitation services (electricity consumption and decomposition processes) are expected to grow as population, life expectancy and water consumption increase. Domestic water demand is expected to increase significantly over the period 2010–2050 - 300% in Africa and Asia; 200% in Central and South America … -.[[22]](#footnote-22) The aim is to reduce emissions from the sanitation sector. In New York, for example, a law is in force, promoted by the so-called ‘80 x 50 initiative’, which aims to reduce greenhouse gas emissions by 80 per cent by 2050. The initiative applies to the 14 wastewater treatment plants, which plan to reduce emissions by 35 per cent by 2030 and by almost 80 per cent by 2050.[[23]](#footnote-23)
2. As climate change impacts on water and sanitation services, energy demand and emissions in the sector grow. With climate change, droughts are becoming longer and more frequent, requiring more water to be pumped from aquifers, transporting flows from more distant sources or using water that requires special purification processes, such as desalination of brackish or seawater, which requires much more energy. Although reverse osmosis technologies have reduced the energy cost of desalination, while conventional water treatment requires between 0.2-0.4 kWh/m3, desalination requires between 3.5 and 4.5 kWh/m3, which can increase greenhouse gas emissions from the water sector.[[24]](#footnote-24)
3. However, the hydrological transition promotes nature-based solutions and water and sanitation management strategies that can limit and reduce emissions. By prioritising the restoration and conservation of aquatic ecosystems and preserving the quality of their flows, less energy will be needed to supply drinking water. 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.[[25]](#footnote-25) The use of energy recovery technologies in wastewater treatment, obtaining biogas, can provide more than 55 per cent of the electricity needed to treat wastewater by 2040, offering the dual benefit of reducing emissions and producing renewable energy.[[26]](#footnote-26) By using wind and solar energy for purification, reclamation, reuse and desalination processes, emissions from the water and sanitation sectors can also be reduced.

### False ‘green’ choices

1. Taking advantage of the justified alarm generated by climate change, some economic sectors have been promoting certain renewable energies and as ‘green’ energies, ignoring and hiding the serious impacts on human rights and the environment that they generate. Bioenergy with Carbon Capture and Storage (BECCS) and large hydroelectric dams are examples in this regard, insofar as they offer renewable energies that do not generate greenhouse gases.
2. 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.[[27]](#footnote-27) Its massive use could make a significant contribution to reducing emissions and keeping global warming to below 2°C.[[28]](#footnote-28) 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.[[29]](#footnote-29) From this strategy, the water demands of BECCS are predicted to increase the number of people experiencing water stress from 2.2 billion people currently to 4.5 billion.[[30]](#footnote-30) This increase is even higher than the projected increase of 4.15 billion people due to climate change.[[31]](#footnote-31) BECCS operations might also degrade the quality of water bodies, with implications for safe drinking water. [[32]](#footnote-32) While these impacts do not negate the "green" potential of BECCS, it is crucial to set clear priorities for water uses, and to safeguard human rights against the possible impacts of climate mitigation strategies such as this one.
3. Dams are an important source of energy globally, with low emissions. However, despite being labelled by the hydropower lobby as a "green" energy source, they have wide-ranging impacts on human rights and the sustainability of river ecosystems. In November 2000, the World Commission on Dams presented the findings of its landmark report in which, while recognising that dams have made an important contribution to human development, they have generated devastating social and environmental impacts. According to the 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.[[33]](#footnote-33) 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, described the human rights impacts of megaprojects throughout their life cycle. He identified threats to the human rights to safe drinking water and sanitation from the beginning of the construction of megaprojects through to their management, including occasional disasters as a result of their degradation.[[34]](#footnote-34)
4. Despite the evidence of these socio-economic and environmental impacts and the possibility of developing other less impactful options, the hydropower industry is promoting a new wave of large hydropower dams.[[35]](#footnote-35) The Special Rapporteur on the human rights to safe drinking water and sanitation, along with other Special Rapporteurs, has recently insisted that large hydroelectric dams do not produce green energy, as they generate enormous social impacts on the affected populations, as well as serious irreversible impacts on river and freshwater aquatic ecosystems, whose sustainability is essential precisely to strengthen environmental resilience as a key to climate change adaptation strategies.[[36]](#footnote-36) On the other hand, the Special Rapporteur on the right to development, Saad Alfarargi, has noted that currently, neither the Kyoto Protocol nor the Paris Agreement – the two primary global mechanisms through which climate change is being addressed - provide a judicial mechanism for persons claiming to have their rights violated by projects aimed at reducing carbon emissions.[[37]](#footnote-37) 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.

## FINANCE

### Climate finance and water and sanitation

1. Meeting Sustainable Development Goal (SDG) 6 by developing climate change adaptation and mitigation strategies logically requires financing. The World Bank estimated, before the COVID-19 pandemic, that investment would need to triple.[[38]](#footnote-38) Of what is known as 'climate finance', the water sector has only received 3% since 2011.[[39]](#footnote-39) But even within that sector, sanitation has been left even further behind, with only 3% of funding for drinking water and sanitation projects.[[40]](#footnote-40)
2. With SDG 6 not on track at the global level, the argument of the "financing gap", due to the lack of public funds, reappears to justify the need for massive private financing, as was the case in 2008. Today, after the tragic consequences of the "austerity strategies" implemented in the wake of the 2008 financial crisis (i.e. worsening poverty and inequality), the strategies on the table are fortunately very different. What was anathema in 2008 is now the key to overcoming the current crisis: the availability of significant public funds in the most developed countries and in financial institutions such as the World Bank, to relaunch the economy in what is characterised as the *Green New Deal*. On the other hand, the pandemic is driving a widespread consensus on the need to strengthen public health systems as a collective, not-for-profit effort, with the aim of protecting the health of all, *leaving no one behind*. In this context, it is important to remember that drinking water and sanitation services are the cornerstone of public health and deserve to be integrated into this consensus and approach. Prioritising the financing of necessary investments in water, sanitation and hygiene services, both to adapt to climate change and to strengthen public health systems, must be understood as a democratic challenge. A multi-year public investment plan, with specific attention to local institutions, should address the financing gap in water, sanitation and hygiene services and infrastructure to achieve SDG 6.
3. In addition to insufficient funding to adapt water and sanitation systems to climate change, the Special Rapporteur sees a need to refocus climate finance. First, climate finance is often targeted to specific projects, requiring a level of research and planning whose cost is often unaffordable for vulnerable groups, who are most in need.[[41]](#footnote-41) Secondly, climate finance tends to focus on building new infrastructure, or upgrading existing infrastructure, to the exclusion of funding for green nature-based solutions that address the root causes of key problems.[[42]](#footnote-42) For example, restoring an aquifer, wetland or river to good condition is often not only the most cost-effective option for adapting to climate change, but also promotes the realisation of the human rights to water and sanitation for those living in the most vulnerable situations and in extreme poverty.

### Avoiding the commercialization of water

1. 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 the growing water scarcity caused by climate change. 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.[[43]](#footnote-43)
2. 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 and manage it from the logic of the market or even from the speculative logic that prevails in financial markets. 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 society against the perversions of market and speculative logic is part of the human rights obligations of states. As noted by the former Special Rapporteur, Léo Heller, the allocation of a budget that takes into account the entire life cycle of drinking water and sanitation services is part of States' obligation to progressively realise the human rights to safe drinking water and sanitation, including the prevention and provision of funds to prevent future impacts of climate change.[[44]](#footnote-44)

## D. COOPERATION - COLLABORATION AND PARTICIPATION

1. In climate adaptation strategy, it is essential to ensure that actions taken in favour of 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, this will cause the river to flood the other bank more strongly. During the 2011 catastrophic flood of Central Thailand, a fifteen kilometres long ring of dikes and sandbags built in order to keep central Bangkok dry, raised the water level outside the protected zone, flooding impoverished rural areas and contaminating their drinking water supplies.[[45]](#footnote-45) This example shows that 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.
2. Water and territory are essential factors in the life and livelihoods of any city, town or community. Ensuring effective local participation in the design, development, and management of safe drinking water and sanitation services 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.[[46]](#footnote-46) Effective participation of the most impoverished or marginalised is essential to ensure that problems of discrimination are not reinforced by adaptation plans.[[47]](#footnote-47) 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;
* Promoting climate change adaptation strategies that include measures to address the disproportionate impact on groups in situations of vulnerability. This includes carrying out climate risk assessments and compiling data on the impacts of climate change on safe drinking water and sanitation services of those groups. It also includes ensuring adequate investment to guarantee their effective access to safe drinking water and sanitation services and to strengthen resilience of these groups.

1. 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. Therefore, there is an increasing need to integrate local participation into broader territorial scales such as the river basin. Water quality monitoring or the prevention of extreme events resulting from climate change, among other issues, often require planning, oversight, knowledge of available technologies, technical and financial support, capacity building and training as part of a community and local empowerment. In any case, 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.
2. Throughout this report, the Special Rapporteur highlighted the need to promote climate change adaptation strategies based on strengthening social and environmental resilience and adapting infrastructures to deal with the risks of climate change. The report explained the possibility of contributing to mitigation strategies from an adequate management of water and sanitation services but avoiding developing false "green" options. Further, the report reflected on the financing challenges of accelerating the pace to meet SDG 6 by 2030. On all these fronts, it is essential to develop participatory strategies, insofar as facing the risks and impacts of climate change from a human rights-based approach it is a true democratic challenge.

1. For an overview of the impacts of climate change on access to safe drinking water and sanitation around the world, please see the first Special Thematic Report in the series. [↑](#footnote-ref-1)
2. [A/HRC/10/61](https://undocs.org/en/A/HRC/10/61), para. 30 [↑](#footnote-ref-2)
3. See also, friendly versions of the [first special thematic report](https://www.ohchr.org/Documents/Issues/Water/Climate/climate-change-1-friendlyversion.pdf) and [second special thematic report](https://www.ohchr.org/Documents/Issues/Water/Climate/climate-change-2-friendlyversion.pdf). [↑](#footnote-ref-3)
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5. A/76/159, para. 33 [↑](#footnote-ref-5)
6. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 35 [↑](#footnote-ref-6)
7. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 34 [↑](#footnote-ref-7)
8. IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, page 237 [↑](#footnote-ref-8)
9. The employment impact of climate change adaptation. Input Document for the G20 Climate Sustainability Working Group , International Labour Office – Geneva, ILO, 2018, page 12 [↑](#footnote-ref-9)
10. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 89 [↑](#footnote-ref-10)
11. Vivekanandan, J., and Nair, S., 2009, Climate Change and Water: Examining the Interlinkages- Troubled Waters: Climate Change, Hydropolitics and Transboundary Resources, page 5 [↑](#footnote-ref-11)
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13. UNICEF, Thirsting for a future: Water and Children in a changing climate, March 2017, page 8 [↑](#footnote-ref-13)
14. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 25 [↑](#footnote-ref-14)
15. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 34 [↑](#footnote-ref-15)
16. Murgatroyd Anna, Hall Jim W., 2020, The Resilience of Inter-basin Transfers to Severe Droughts With Changing Spatial Characteristics, Frontiers in Environmental Science, 8, page 258 [↑](#footnote-ref-16)
17. The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. See more at: https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs [↑](#footnote-ref-17)
18. S. Dickin et al., Sustainable sanitation and gaps in global climate policy and Financing, npj Clean Water (2020) 24, page 1 [↑](#footnote-ref-18)
19. UNESCO, UN-Water, 2020: United Nations World Water Development Report 2020: Water and Climate Change, Paris, UNESCO, page 174 [↑](#footnote-ref-19)
20. Rogelj, J. et al. Scenarios towards limiting global mean temperature increase below 1.5 °. Nat. Clim. Change 8, 325 (2018) [↑](#footnote-ref-20)
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22. Boretti, A., Rosa, L. Reassessing the projections of the World Water Development Report. *npj Clean Water* **2,**15 (2019), page 2 [↑](#footnote-ref-22)
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