

Water Management key to tackling climate change

Resilient water management is crucial to achieving the objectives of the UNFCCC's 2015 Paris Climate Agreement. It is encouraging that so many of the Nationally Determined Contributions from the parties to the agreement explicitly include water but much more needs to be done. This policy brief puts forth recommendations to enhance the objectives set out to implement the Paris agreement.

Putting water on the climate agenda

Water can play a key role in the planning and implementation of the Paris Agreement if integrated early enough in the process. However, greater coordination of hydro-climate work streams is needed at all levels to achieve the emissions reduction targets and climate adaptation objectives of the Paris Agreement, as well as resilient water management. With increased climate variability, this could further endanger availability of water, in quantity and quality, and put populations even more at risk. To ensure that actions taken are complimentary and not contradictory, water must be explicitly acknowledged and integrated into efforts to combat climate change and adapt to its adverse effects.

This policy brief walks through several of the Paris Agreement's key Articles and offers suggestions as to where and how water might be explicitly integrated into achieving many of the Agreement's core objectives. While it is by no means a comprehensive list, our aim is to systematically highlight key areas where water knowledge could become an important ally in achieving the goals of the Agreement, assisting and enhancing the ability of Parties to meet their national targets and contribute to the work of the UNFCCC Subsidiary Bodies.

Article 4 – Nationally Determined Contributions for adaptation and mitigation

Nationally Determined Contributions (NDC) comprise all the actions a country intends to take to meet its Greenhouse Gas (GHG) reduction goals under the Agreement. Since 2015, many countries have drafted their preliminary NDCs and here we see some of the greatest opportunities for water knowledge and management to be utilized. Successful implementation of these plans will require strengthened coordination between sectors.

Given that the impacts of global climate change are felt most directly through changes in the hydrologic system, increasing adaptive capacity and reducing vulnerability to climate change often necessitates altering and/or improving how freshwater is managed and distributed. These activities can result in co-benefits for mitigation that can then be applied to emissions reduction targets under the NDCs. For example, improving stormwater management enhances watershed health, creating a more resilient ecosystem and reducing the likelihood and severity of flooding, while at the same time lowering carbon emissions from treating contaminated water.

Many NDC mitigation plans focus on investments in the energy and transportation sectors – improving or replacing inefficient infrastructure, developing carbon capture and storage, transitioning towards renewables, and implementing policy and governance reforms. The forestry sector is also given a key role, with plans for afforestation, reforestation and improved forestry management. All of these measures have important freshwater implications. Nearly all energy generation systems are water-intensive and forest/soil management is heavily water-dependent. Because of these interlinkages, there is a risk for deep disruption and increased vulnerability if these activities are managed separately. Close coordination is needed to ensure that mitigation actions are both climate smart and water-resilient. At a moment when the NDCs are being reviewed and must be strengthened to keep the global rise in temperature below a 2-degrees Celsius increase from pre-industrial times, prioritizing climate resilient water management policies and implementation plans is crucial.

For example, the NDC Partnership could provide support to countries in developing implementation plans of the water components of their NDCs. The existing NDC toolbox navigator system should be enhanced with more water knowledge sources in order to support the assessment of climate resilient water utilities, improve stormwater management, increase water use efficiency, or planning carbon neutral wastewater treatment systems. This would be of great benefit to planners and policy makers engaged in the NDC planning process.

Article 5 – Conserve and enhance GHG sinks

In addition to reducing the sources of carbon emissions, the Paris Agreement targets the maintenance and improvement of carbon storage facilities, also known as carbon sinks. Major natural carbon sinks include oceans, grasslands, forests and forested wetlands such as mangroves and peatlands. Forests and wetlands also play a central role in the hydrologic cycle, filtering, storing and regulating both surface and groundwater flows. Given the inextricable link between these natural systems, they must be managed in concert.

Major efforts to protect existing forests and wetlands are under way, with annual net global deforestation rates cut by half since 1990, according to the FAO.¹ However, roughly 3.3 million hectares per year are still lost, with major implications not only for carbon storage but also for water quantity and quality. This is particularly true for peatlands, waterlogged soils capable of holding more carbon per acre than any other terrestrial sink and which contain twice as much carbon as the world's forests.² According to a recent report, avoiding the draining and conversion of peatlands alone, which are lost at a rate of approximately 780,000 hectares globally each year, could store upwards of 678 million tonnes of carbon emissions equivalent per year – equal to removing 145 million cars from the streets.³

Draining these important carbon sinks would also have major implications for water and soil quality, increasing flood and fire risk for neighbouring communities and reducing the availability of clean water, productive land and sustainable fisheries. Managing peatlands for both carbon sequestration and water conservation produces important co-benefits and can make a significant contribution to reducing global emissions. Water scientists and policymakers are working to better understand, protect and restore these important water regulation systems and their work could be of great use to countries looking to meet their national carbon reduction commitments and improve their resilience to climate change.

A collaborative effort between FAO, IUCN, IUFRO and SIWI is advocating for greater recognition of the importance of sustainable management of the water-forest nexus and for its integration into policy, practice and research to achieve the SDGs related to food- and water security, biodiversity and climate change. The Source-to-Sea (S2S) platform, hosted by SIWI, is another multi-stakeholder initiative to exchange and generate knowledge and support joint action for improved management of land, water, coastal and marine linkages.

1 <http://www.fao.org/forest-resources-assessment/en/>

2 <https://www.wetlands.org/wetlands/what-are-wetlands/>

3 <http://www.pnas.org/content/114/44/11645.abstract/>

Article 7 – Increasing adaptive capacity and resilience

Adapting to a climate-changed world necessitates increasing the capacity of individuals and populations to mitigate, absorb, and recover from shocks and stressors in ways that reduce chronic vulnerability. All countries are vulnerable to the impacts of climate change, which are and will be felt most profoundly through changes to the water cycle. Increasing severity and frequency of floods, drought, tropical cyclones, and receding coastlines are just a few of the threats we face from increasing temperatures. Resilient and secure communities and ecosystems are only possible if water is taken into account from the outset. Therefore, systematically integrating water issues into national adaptation strategies is essential.

National Adaptation Plans (NAPs) and Nationally Appropriate Mitigation Actions (NAMAs) should build on existing integrated water resources management knowledge and experience. Bottom-up approaches to water management can be modified and used to build adaptive capacity from the community level upward. Countries engaging in climate adaptation actions, such as building climate resilient infrastructure or investing in sustainable agricultural production methods, should explicitly acknowledge the cross-sectoral character of their work and ensure that these activities do not increase vulnerability to either water scarcity or flooding.

Because building adaptive capacity is an ongoing, iterative process, flexible adaptation pathways should take water into account at every step, acknowledging that the challenges faced are likely to evolve over time and require adjustment. Adaptive solutions that are appropriate for today may in fact increase long-term vulnerability, so the formulation and prioritization of no-regret options will be key.

Article 8 – Reducing the risks of loss and damage

There is extensive existing water knowledge related to reducing the risk of loss and damage from both extreme weather as well as slow onset events that could be of great use to climate actors. Stronger, more frequent storms already impact coastal communities worldwide and much work is being done to improve the adaptive capacity of these regions, including mangrove planting, seawall reinforcement, coastal floodplain re-connection, early-warning system creation, and integrated coastal planning. Elsewhere, longer, more frequent droughts are exacerbating water scarcity, decreasing agricultural production and increasing fire risk for communities that are actively working to reduce their risk by adapting their agricultural and silvicultural practices to ensure their watersheds are more resilient and able to withstand longer dry periods. Green infrastructure (nature based solutions such as forests and wetlands) and grey infrastructure (such as constructed dams and treatment plants) need to be planned hand in hand in order to secure resilient cities and human settlements, thereby reducing the risks due to floods and droughts.

When it comes to decision making in the context of climate change mitigation and adaptation measures, everybody needs to have a voice. It is especially important to include marginalized groups, for example children, indigenous populations, minorities and women. This is a question of climate justice – the people most affected by effects of climate change are seldom themselves causing major emissions. Yet, at the same time they can be strong agents of change. Local communities can build resilience and reduce chronic vulnerability to disasters, particularly in an era of increasing climate uncertainty, by mainstreaming of adap-



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tive water management strategies. Bridging the Sendai Framework for Disaster Risk Reduction with the UNFCCC's Paris Agreement through resilient water management is key to reducing loss and damage.⁴

Article 9 – Financial assistance for mitigation and adaptation

Climate finance for adaptation continues to grow but is still far below what is needed, and persistent inequalities in the targeting of climate finance for adaptation continue. In 2014, 18 per cent of all public climate finance (US\$27 billion) was targeted for climate change adaptation, but to implement post-2020 activities in the least developed countries (LDCs) has been estimated to cost over US\$93 billion each year⁵. Currently, less than a third of all climate finance reaches the LDCs. Effective targeting and use of funding at the local level has proved challenging in many countries, though innovations exist and are increasing.

The challenges of development, poverty eradication and sustainability are intricately interwoven with those of climate change mitigation and adaptation. Treating development and climate as separate entities for action, as is currently the case in many countries and globally, comes at a very high cost. Climate finance should rather be designed in order to leverage and intensify the climate aspects of the SDG agenda. In the water and sanitation subsector, climate finance must focus on the climate actions that are likely to be underemphasized in the SDG framework and on highly climate-vulnerable areas, such as coastlines and arid areas that will require more robust development action. In many of the LDCs, these areas coincide with very low levels

of water and sanitation coverage. Strategic use of development and climate finance can help to sustainably address twin development and adaptation deficits.

Article 10 – Developing and transferring technology

Ensuring that Parties are aware of, have access to, and possess the institutional and human capacity to harness appropriate technology, knowledge, and institutions will be key to achieving many of the ambitious country-level targets currently being set through the NDC process. According to the UNFCCC's Climate Technology Centre & Network (CTNC), as of May 2016, over 100 Parties to the Paris Agreement have stated that they will require international support for technology development and transfer in order to successfully implement their NDCs.⁶

The employment of new water technologies to support sustainable, climate-resilient water management has been ongoing for some time and there are many lessons learned that could be of great use to those developing and sharing new technologies for climate change mitigation and adaptation. For example, because water supply and sanitation are intrinsically interlinked with many other sectors, such as energy and food production, urban planning and circular economy, technologies should be deployed with site-specific considerations taken into account. A lack of consideration of local conditions could lead to a lack of effectiveness or maladaptation. Building a small hydropower dam for sustainable electricity production may make sense in one region but could have unintended negative impacts on food security or water quality in other regions. Traditional knowledge could support and contribute to these innovations.

⁴ Mastering Disaster in a Changing Climate: Adaptive Water Management for Disaster Risk Reduction” (2018), policy brief by AGWA and SIWI.

⁵ <https://washmatters.wateraid.org/sites/g/files/jkxooof256/files/Increasing%20climate%20finance%20policy%20brief%20Feb%202017.pdf>

⁶ <https://www.ctc-n.org/news/unfccc-conference-technology-transfer-insights-technology-mechanism>

Article 11 – Capacity-building for developing country Parties

In the realm of capacity-building, there are many existing water organizations and networks dedicated to knowledge sharing and training that could be utilized by Parties seeking to improve their ability to design and implement locally-appropriate, inclusive climate change adaptation and mitigation programmes.

SIWI is a leading water institute, focusing on water governance and capacity building. It is well-known for its research, knowledge generation and applied science, which helps to develop policy recommendations and support the implementation of programmes. In addition, SIWI uses its trusted convening power to facilitate multi-stakeholder dialogues, most evident its annual event, the World Water Week.

The Alliance for Global Water Adaptation (AGWA), co-chaired by SIWI and the World Bank, is a network of regional and global development banks, government agencies and ministries, diverse non-governmental organizations, academics and the private sector focused on sustainable water resource management. The work of the network covers several areas related to climate change adaptation, such as science, policy, economics, engineering, and more. AGWA is focused on how to support experts, decision-makers and institutions in the water community to work more effectively.

The Global Alliances for Water and Climate (GAFWAC) was formed under the framework of the Lima-Paris Action Agenda (LPAA), now called the Global Climate Action Agenda (GCAA). It is structured around four alliances of Non-state actors: the “Paris Pact” Alliance on water and Climate adaptation in the basins of rivers, lakes and aquifers; the Business Alliance for Water and Climate change (BAFWAC); the Alliance of Megacities for Water and Climate Change and the Global Clean Water Desalination Alliance. The objective of the Alliances is to ensure common projects and initiatives are developed to improve synergies and cross-sectorial integration of the management of water and climate change issues, also across key actors.



Article 2 – Overall Objective of the Agreement: A Global Response to Climate Change

This Agreement:

aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

- (a) Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;*
- (b) Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and*
- (c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.*

About this publication

This publication, prepared by AWGA and SIWI, is a contribution to the discussions and activities at the Conference of Parties 24 (CoP), 3–12 of December 2018, Katowice, Poland.

This policy brief has been authored by Maggie White, Senior Manager, International Policies SIWI and AGWA co-chair, Ingrid Timboe, Policy Officer AGWA, Kristina Johansson, Programme Officer SIWI.