

Chapter 8

Regional perspectives

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8.1 Sub-Saharan Africa

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Of the 771 million people still lacking even a basic drinking water service in 2020, half lived in Sub-Saharan Africa (WHO/UNICEF, 2021). There is a widening gap in water supply between urban and rural dwellers (Adams et al., 2019; Grasham et al., 2019; Niva et al., 2019) where governments have not been able to expand the necessary infrastructure to meet growing demand.

Developing water infrastructure, harnessing ground water resources, addressing climate change effects and investing in science and technology under an enabling political and institutional environment are key areas needed to drive sustainable water security. Given the multifaceted nature and the magnitude of water challenges in the region, strategic collaboration among stakeholder groups is deemed crucial and a necessity for reaching solutions. However, even though some efforts have been made recently to mitigate this problem, the coordination, communication and exchange of the generally limited data and information available to African water stakeholders has been very weak due to the lack of appropriate strategies and platforms to establish a fruitful dialogue between researchers, decision-makers and community members (see Chapter 10).

This chapter presents a few cases of strategic partnerships on water development in Sub-Saharan Africa, ranging from community-based to regional and international levels.

8.1.1 Community–public partnerships

Community–public partnerships (CPPs) offer win–win arrangements that enable private operators, utilities and communities to derive benefits through mutual understanding, shared responsibilities, and exchange of knowledge and experiences (Adams et al., 2019). CPPs are usually established between a water utility and an elected group within a community. Adams et al. (2019) examined the role of CPPs for water supply in Ghana, Malawi, Tanzania and Zambia. In Malawi, a CPP between water boards and community-elected water user associations (WUAs) in informal settlements, facilitated by local non-governmental organizations (NGOs), community leaders and city councils, led to significant improvements in water supply (Adams and Zulu, 2015; Adams et al., 2019). In Tanzania, the CPP between community-based organizations (CBO) and public utilities in Dar es Salaam enabled the construction and maintenance of secondary pipes which permitted water connections to households (Adams et al., 2019; Dill, 2010).

CPPs have also been linked to the resolution of water-related conflicts. In Ghana, a partnership between the Ghana Water Company, private operators and community water boards enabled a successful mediation of water tariff conflicts by showcasing broader communal benefits (Galaa and Bukari, 2014). In Zambia, the CPP in the city of Ndola showed how a partnership between informal water supply systems and the formal sector was critical in ensuring safe water quality (Liddle et al., 2016).

8.1.2 Regional and international water development partnerships

Alliance for Water Stewardship Africa

The need to hold businesses and water users accountable and ensure adoption of sustainability practices for the management of water resources has inspired water stewardship worldwide. In 2011, the International Water Stewardship Programme (IWaSP) was initiated to foster collaboration among different water actors. Inspired by IWaSP, the Alliance for Water Stewardship (AWS) was born as a global collaboration membership comprising businesses, NGOs and the public sector. AWS members contribute to the sustainability of local water resources through their adoption and promotion of the AWS Standard, a universal framework that recognizes and rewards good water stewards through third-party certification. AWS Africa is the regional partner of AWS, driving and

guiding implementation of the AWS Standard across the continent. In 2018, 26 regional stakeholders from eight countries joined to agree on a strategy to guide and champion the AWS Standard in Africa (AWS Africa, n.d.).

In Kenya, AWS Standards were tested at flower and vegetable farms and a coffee processing enterprise to examine their suitability in delivering better water management in the challenging context of an African river basin (Hepworth et al., 2011). The study, carried out in the Lake Naivasha basin, showed that application of AWS Standards improved water use efficiency and quality, and resulted in long-term investments and management commitments to improving basin governance by WUAs through research and partnership projects (Hepworth et al., 2011; Isundwa and Mourad, 2019).

As Isundwa and Mourad (2019) have noted, there are several other African examples of successful water partnerships under the AWS. A stewardship partnership resulted in secured groundwater supply for residents and businesses in Lusaka (IWaSP, n.d.a). In Uganda, more than 500 hectares of wetland areas were reportedly restored through a partnership between companies and local industries operating in the Ruwizi River catchment area (IWaSP, n.d.b). In Tanzania, a stewardship partnership comprising development partners resulted in successful restoration of the Mlalakua River and safeguarded it from pollution (IWaSP, n.d.c).

Transboundary water partnerships

Cooperation is crucial for ensuring water security in the region's many transboundary basins and aquifers.

In the Stampriet Transboundary Aquifer shared by Botswana, Namibia and South Africa, a joint assessment of the water system required the harmonization of data across the countries. In partnership with UNESCO's Intergovernmental Hydrological Programme (IHP) and the International Groundwater Resources Assessment Centre (IGRAC), the project has generated more than 40 thematic maps, which have been uploaded to the project's Information Management System.⁴⁶ The coordination mechanism supports science-based decision-making on water allocation and sound management at the basin level.

Cooperation in International Waters in Africa (CIWA), managed by the World Bank, invests in water infrastructure development and offers technical support and analyses to foster a better understanding of transboundary water issues. It provides governments, river basin organizations (RBOs) and other stakeholders with the sound evidence required to make informed decisions. Since 2011, the CIWA partnership has supported riparian governments in Sub-Saharan Africa by addressing constraints to cooperative management and development of transboundary waters in order to advance sustainable, inclusive and climate-resilient growth. CIWA's activities are cross-sectoral, involving climate resilience, biodiversity conservation, data initiatives, energy, agriculture, social issues, the environment, as well as Gender and Social Inclusion (GESI), and Fragility, Conflict, and Violence (FCV). The partnership works to protect people and property from water-related shocks and use the valuable resource sustainably. CIWA has strengthened cooperative and sustainable management and development in the Niger River basin and is seeking to unlock growth opportunities through transboundary cooperation in the Zambezi River basin (World Bank, 2022).

W12+ Programs

W12+ Programs is a partnership-based initiative jointly run by the Institute for Ecological Civilization (EcoCiv) and a registered charity based in South Africa (SOS NPO⁴⁷), born out of the crisis experienced by Cape Town as it approached Day Zero (See Box 7.2). W12+'s mandate is to connect, catalyse and incubate water solutions, particularly in urban contexts

⁴⁶ For more information, please see: www.un-igrac.org/case-study/stampriet-aquifer.

⁴⁷ For more information, please see: <https://soscpt.org/water-delivery/>.

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facing the dual crisis of climate change and rapid urbanization. W12+ Programs addresses the obstacles to water security through a two-pronged approach: supporting local leaders who are working to solve their own communities' water security challenges via hubs; and connecting these leaders or decision-makers to global resources and knowledge via the Blueprint's network and other W12+ events such as the 'W12+ Drive-In'.

W12+ has three African 'hub' locations: in Wau (South Sudan) with Water for South Sudan (WfSS); in Minya (Egypt) with Life from Water; and in Johannesburg (South Africa) with the National Business Initiative. Via a participatory process, these hubs each identified key priority interventions to transition towards a water-secure future. W12+ then provided a supportive, capacity development partnership to design, implement and evaluate these interventions, ultimately sharing them widely with the W12+ network broadly to prompt global adaptation and uptake, scaling the impact of each W12+ Hub. The W12+ Blueprint currently houses over 35 case studies representing adaptable and replicable water solutions from over 30 countries globally. W12+ also organizes informational and networking events for local leaders, activists, policy-makers and government leaders, including W12+ Drive Ins and W12+ Congresses.

Continental Africa Water Investment Programme

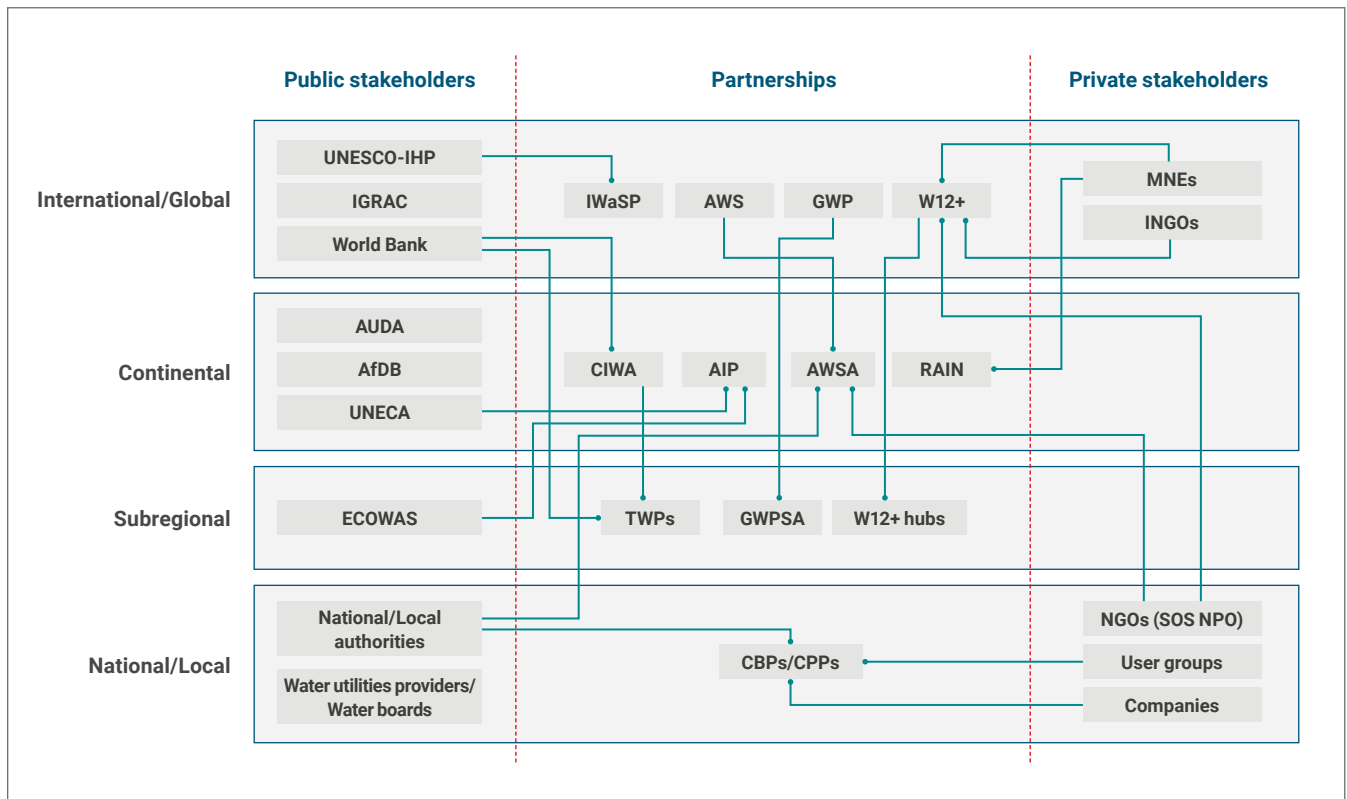
The Continental Africa Water Investment Programme (AIP), part of the second phase of the Programme for Infrastructure Development in Africa – Priority Action Plan (PIDA – PAP 2) of the African Union Development Agency's New Partnership for Africa's Development (AUDA-NEPAD), is an emerging partnership between regional and global agencies such as AUDA-NEPAD, the African Development Bank (AfDB) and the United Nations Economic Commission for Africa (UNECA). AIP supports a collective 'call for action' for meeting the 2025 Africa Water Vision of Water Security by addressing investment gaps and supporting water infrastructure projects. The new agenda targets five pilot countries (Benin, Cameroon, Tunisia, Uganda and Zambia) and five transboundary basins: the North-West Sahara aquifer system, the Volta River basin, the Lake Chad basin, the Kagera/Lake Victoria basin and the Zambezi River basin. In August 2018, AUDA-NEPAD, the AfDB, the African Ministers' Council on Water (AMCOW), the Infrastructure Consortium for Africa, and the Global Water Partnership (GWP) signed a joint communiqué to make investment in water security and sustainable sanitation a key goal for AIP (AUDA-NEPAD/AfDB/AMCOW/ICA/GWP, n.d.). The Economic Community of West African States (ECOWAS), a political and economic union of 15 countries in West Africa adopted AIP to accelerate regional cooperation on transboundary water investments. While the partnership aligns with the targets of the 17th Sustainable Development Goal (SDG 17 – in particular 17.17) and encourages and promotes public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships data, monitoring and accountability, success depends on how participatory these partnerships emerge (Nagabhatla et al., 2021).

8.1.3 Conclusions

Figure 8.1, below, provides a schematic representation of the complex landscape of water partnerships in Africa.

There are currently numerous activities at all levels that require coordination to optimize efforts and resources. The value of CPPs is worth examining further, and CPPs should potentially be scaled up. Several subregional, regional and continental partnerships could be strengthened. A knowledge management tool and a campaign to avoid duplication and ensure complementarity are required. At the continental level, the role of such coordination is being taken up by AMCOW (Box 8.1). Development partners and other stakeholders should consider reinforcing existing structures, rather than developing new ones. It is only then that the growing complexity of partnerships involved in Africa's water governance can be fully addressed.

Figure 8.1 Complex landscape of water partnerships in Africa



Note: Public stakeholders: IHP (Intergovernmental Hydrological Programme), IGRAC (International Groundwater Resources Assessment Centre), AUDA (African Union Development Agency), AfDB (African Development Bank), UNECA (United Nations Economic Commission for Africa), ECOWAS (Economic Community of West African States); partnerships: IWaSP (International Water Stewardship Programme), AWS (Alliance for Water Stewardship), GWP (Global Water Partnership), CIWA (Cooperation in International Waters in Africa), AIP (Continental Africa Water Investment Programme), AWSA (African Water and Sanitation Academy), RAIN (Replenish Africa Initiative), TWPs (Transboundary Water Partnerships), GWPSA (Global Water Partnership Southern Africa), CBPs (community-based partnerships), CPPs (community–public partnerships); private stakeholders: MNEs (multinational enterprises), INGOs (International Non-Governmental Organizations), NGOs (Non-Governmental Organizations).

Source: Own elaboration.

8.2 Europe and North America

The case studies below illustrate partnerships and cooperation initiatives that are frequent in the Europe and North American region. The *Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters* (Aarhus Convention – UNECE, 1998) and the *Convention on the Protection and Use of Transboundary Watercourses and International Lakes* (Water Convention – UNECE, 1992) stress the need for cooperation and involvement of stakeholders, as do several relevant Directives of the European Union (EU). These instruments have facilitated the development of various types of partnerships in the region and are also contributing to stakeholder participation outside the region.

While stakeholder involvement is an objective that has been proactively pursued and, to a large degree, successfully achieved in the outlined case studies, it remains a common challenge in water management, governance and cooperation across the region.

8.2.1 Cooperation in the Drin basin

The transboundary Drin River basin includes two rivers (Drin and Buna/Bojana) and three lakes (Prespa, Ohrid and Skadar/Shkoder). Four State Parties to the Water Convention - Albania, Greece, Montenegro, North Macedonia - and Kosovo (within the framework of the United Nations Security Council Resolution 1244, dated 1999), share the basin. It provides water resources for drinking, energy, fishing, agriculture, biodiversity, tourism and industry.

Box 8.1 AMCOW Pan-African Groundwater Programme: Advancing groundwater for water security and socio-economic transformation in Africa

The African Ministers' Council on Water (AMCOW) identified groundwater as a priority intervention area in its Strategic Plan 2018–2030, launching the Pan-African Groundwater Program (APAGroP) in Kampala in February 2020. Through APAGroP, AMCOW has engaged groundwater networks and institutions such as the German Federal Institute for Geosciences and Natural Resources (BGR), the British Geological Survey (BGS), the International Water Management institute (IWMI) and UNESCO's Intergovernmental Hydrological Programme (IHP), working across three main thematic pillars (see Table).



Source: Adapted from Tijani (n.d.).

Arising from this collaboration, several joint activities were accomplished, including the development of a groundwater country support tool (the Namibia case study), a groundwater financing framework (the Uganda pilot study) and the development of the Pan-Africa Water Quality Programme in collaboration with the IWMI.

With the support of GWP Mediterranean (GWP-Med) and the Water Convention Secretariat of the United Nations Economic Commission for Europe (UNECE), multi-stakeholder consultations at the national and basin level led to the signing by riparians of a *Memorandum of Understanding (MoU) for the Management of the Extended Transboundary Drin Basin*⁴⁸ in 2011. The MoU established an institutional framework for cooperation: the Meeting of the Parties, a Drin Core Group and three Expert Working Groups. Objectives of the MoU include increased accessibility to comprehensive data and adequate information, minimization of flooding, pollution control, and reduction of damage from hydro-morphological changes (UNECE, 2022).

⁴⁸ The full text can be found here: https://unece.org/DAM/oes/MOU/MOU_Drin_Strategic_Shared_vision_Final.pdf.

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American region**

With the support of the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and GWP-Med, joint activities under the MoU included a transboundary diagnostic analysis that provides the basis for collaborative work. Outcomes included:

- Consensus among riparians on key transboundary concerns and drivers of change, including climate change and variability, reached through joint fact-finding;
- Commitment of riparians and donors to sustain joint cooperation mechanisms and to undertake priority reforms and investments; and
- Benefits demonstrated in the field by environmentally sound approaches and technologies new to the region (such as River Basin Management Plans, wastewater treatment technologies, approaches to decrease nutrient loads, and establishment and testing of transboundary monitoring).

The process has included a high level of stakeholder involvement, including regular stakeholder meetings at the national and basin levels. Implementation of a joint Strategic Action Plan, approved by the riparians in 2020, has been supported by the GEF and the Adaptation Fund and through national investments. A nexus assessment focusing on hydropower and floods, and on sustainable biomass and forest management contributes to the involvement of important sectors in the management of the basin (UNECE, 2022). The learning workshop *Gender equality for sustainable development in the Drin basin* (2020), held in the framework of the project 'Promoting the Sustainable Management of Natural Resources in Southeastern Europe, through the use of the nexus approach' by the Austrian Development Agency (ADA), GWP and UNECE, discussed gender-related challenges and opportunities relevant to the water–food–energy–ecosystem approach in the Drin basin, enhancing the understanding of the basic concepts of gender equality among stakeholders.

8.2.2 National Policy Dialogues of the EU Water Initiative

Since 2006, UNECE and its Water Convention Secretariat, jointly with the Organisation for Economic Co-operation and Development (OECD) and in close cooperation with national authorities, has been implementing National Policy Dialogues (NPDs) in countries of Eastern Europe, the Caucasus and Central Asia under the EU Water Initiative (EUWI), funded mainly by the European Union. The International Office for Water (IOW) and the Environment Agency Austria have also been involved in this work since 2016. NPDs have strengthened water governance and integrated water resources management (IWRM) in line with the provisions of the Water Convention, its Protocol on Water and Health, and EU Directives. It is a specific feature of the NPDs that they are involving a broader base of stakeholders, such as representatives of civil society, academia and the private sector, than is usually the case in national water policy discussions. Capacity-building on modern water management principles has been an important aspect of the NPDs (UNECE, 2022).

Outcomes of such support in Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine in 2016–2021 (European Union, 2021; UNECE, 2022) included:

- Five transboundary basins (of the Dniester, Kura, Khrami-Debeda, Neman and Western Dvina Rivers) progressed with development of joint legal frameworks;
- Hundreds of knowledge products such as technical reports, databases, maps and web services were delivered and nine water laboratories modernized, including with the delivery of 400 units of state-of-the-art equipment items for water monitoring and analysis;
- Forty-four surveys were carried out in rivers, ground- and coastal waters, covering over 1,000 sites;

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A water-smart society leads to a more resilient water sector, with water security and safety as essential goals

- Water information systems in the six countries were modernized to provide transparent data on the status and use of water resources; and
- Around 30 million people are benefiting from 11 new or revised River Basin Management Plans and water monitoring practices that are closer to EU standards.

Outcomes of support in Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan included:

- A multi-stakeholder water–food–energy–ecosystems nexus dialogue in the Syr Darya basin in 2013–2015;
- Progress with strategic planning, such as a water sector reform strategy in Tajikistan for 2016–2025 involving the uptake of the basin management principle, and water safety indicators in Kyrgyzstan;
- Modernized legislation in Turkmenistan, such as a new water code, adopted in 2016 with IWRM elements, and accession by that country to the Water Convention; and
- Capacity-building and research on the state of the Kigach, Ural/Zhayik, Bolshoy and Malyi Rivers shared by Kazakhstan and the Russian Federation, and development of an action plan in 2015–2018.

8.2.3 Water-oriented living labs for a water-smart society

Water Europe has been established to promote water-related innovation, research and development in the region. It is a multi-stakeholder association with over 250 members, representing the whole diversity of water-related innovation. All Water Europe activities and positions are guided by its Water Vision (2017) and the ambition to achieve a water-smart society (Water Europe, n.d.).

A water-smart society leads to a more resilient water sector, with water security and safety as essential goals. It responds to the need for major societal changes in response to climate change and demographic trends.

Water Europe has developed the model of Water-Oriented Living Labs (WOLLS) to promote the co-creation, validation and deployment of innovations to achieve a water-smart society. Experts among Water Europe’s members form Vision Leadership Teams – Water Smart Industry, Water Smart City and Water Smart Rural – providing guidance.

WOLLS work on the integration of technologies with new business and governance models, and on innovative policies to address the pressing water and water-related challenges in full compliance with SDGs 6 and 17 (Water Europe, n.d.).

Water Europe selected 105 WOLLS in its 2019 *Atlas of Water-Oriented Living Labs* (Water Europe, 2019), expanding the networks of existing WOLLS, supporting the creation of new WOLLS, and exploring funding opportunities by leading the WOLLS pillar of the EU co-funded partnership Water4All. An annual action plan for the Network of WOLLS establishes priorities for the urban, rural and industrial water-related environments.

8.2.4 The International Joint Commission

The International Joint Commission (IJC) between Canada and the United States of America (USA) has a long history and demonstrates good practices for successful water cooperation and for the establishment of partnerships not only across borders but also within countries and between sectors, administrative levels and other stakeholders.

The IJC was created by the Boundary Waters Treaty of 1909 for the purpose of settling and preventing transboundary water disputes between Canada and the USA. The IJC's activities commence when governments issue a Directive. The IJC works independently to study issues and makes recommendations back to governments. Once recommendations are accepted, the IJC assumes a monitoring and reporting function.

The IJC's rich history of resolving water apportionment and flood management issues is linked to a strong engagement with involved communities. Public outreach and engagement are foundational components of the IJC's activities. Article XII of the 1909 Boundary Waters Treaty states that "... in any proceeding, or inquiry, or matter within its jurisdiction under this treaty, all parties interested therein shall be given convenient opportunity to be heard..." (The Boundary Waters Treaty, 1909).

Providing all interested parties with convenient opportunities to be heard is prominently included in all IJC activities and is the core principle for its communications programme.

As detailed in its Rules of Procedure (IJC, n.d.), the IJC fulfils this obligation by holding public hearings before issuing an Order or submitting final reports to the governments. For hearings to be meaningful, the IJC must also inform the public about the matters it is considering.

For the past 40 years, the IJC has also taken a proactive approach by involving stakeholders as members of its boards and advisory groups. More recently, the IJC has endeavoured to involve members of indigenous communities in its work.

One of the recent experiences is the concept of 'adaptive management' used by the watershed (basin) boards to monitor and review international water regulation plans across the transboundary waters. Adaptive management enables the IJC's boards to respond quickly to changing conditions. This is particularly important in view of the changing climate. In the watershed boards, a broad range of stakeholders are represented.

In 2022, the IJC has undertaken the 50th anniversary review of the 1972 Great Lakes Water Quality Agreement. The *Great Lakes Horizon* project identifies factors that could impact the Great Lakes (which hold 20% of the world's freshwater resources – US EPA, n.d.) ecologically, economically, socially and culturally over the next 30+ years, and provides suggestions regarding potential improvements of the Agreement.

Another key initiative implemented in support of SDG 6 is the *Great Lakes Manure Management Framework*. The 2019 Great Lakes Water Quality Board's report on manure management included research from a very diverse group of stakeholders from agriculture, nutrient research and water treatment organizations (IJC, 2019). Partnerships, including with regional governmental agencies and institutions, are key to establishing an implementation plan.

8.2.5 Equitable access to water and sanitation in Armenia

In its efforts to improve access to water and sanitation, in 2015–2016, Armenia undertook a self-assessment of equitable access to water and sanitation, using the Equitable Access Score-Card (UNECE/WHO Regional Office for Europe, 2019). This innovative analytical tool, based on the *Protocol on Water and Health* (UNECE/WHO Regional Office for Europe, 1999), helps governments and other stakeholders to establish a baseline measure of equity in access to water and sanitation, identify policy gaps and priority areas for actions, agree on further actions, and evaluate progress through a process of self-assessment (UNECE/WHO Regional Office for Europe, 2013).

The self-assessment exercise was carried out by the NGO Armenian Women for Health and Healthy Environment under the coordination of the State Committee of Water Economy under the Ministry of Agriculture.⁴⁹ The exercise brought together the Ministry of Health, the Ministry of Territorial Administration and Infrastructure, the Public Services Regulatory Commission, the Ministry of Nature Protection, the Ministry of Education and Science, and the Ministry of Labour and Social Affairs of Armenia. The Office of the Human Rights Defender of Armenia was a partner in the exercise. Stakeholders from the private sector, universities and civil society also participated, providing inputs.

The exercise identified the challenge of guaranteeing water supply for almost 579 rural communities that were neither connected to the centralized water supply system nor serviced by water companies. Obtaining water supply was found to be particularly problematic for schools. Information on access to water and sanitation by vulnerable and marginalized groups was scarcely available or lacking from official sources. It became evident that the existing legal framework lacked definition of the term ‘vulnerable and marginalized groups’, and there were no public policies to sufficiently help improve access for these various groups (UNECE/WHO Regional Office for Europe, 2019).

The self-assessment process led to strong interministerial collaboration in addressing these issues. An Action Plan on Equitable Access to Water and Sanitation for the period 2018–2020 identified priority measures to reduce geographical disparities and provide access to water and sanitation for vulnerable and marginalized groups. The self-assessment also triggered a legislative reform to include a definition of vulnerable and marginalized groups in the Water Code.

The self-assessment exercise strengthened the governance framework for guaranteeing human rights to water and sanitation in Armenia by capitalizing on new data and information gathered through the use of the Equitable Access Score-Card (UNECE/WHO Regional Office for Europe, 2013). Through 2012–2020, the Equitable Access Score-Card has been applied at the national, subnational or municipal level in 12 countries of the UNECE region, enhancing knowledge of the situation of equitable access to water and sanitation through self-assessments and awareness-raising and fostering the adoption of measures to further ensure equitable access.

8.3 Latin America and the Caribbean

This section describes several different types of partnerships and forms of cooperation related to water management in Latin America and the Caribbean. It covers examples found at different scales (i.e. local, national, and transboundary basins) as well as other cross-sectoral productive experiences. These partnerships are mainly water-based or closely connected to water-dependent sectors, such as agriculture. The evidence points to limited engagement outside the water-based domain, such as water initiatives linked to social justice, gender, education or job creation, or even other environment-related aspects, such as biodiversity.

8.3.1 Water-related partnerships and other coordination efforts

Local level

The most common water-related partnerships at the local level in Latin America and the Caribbean are established for overseeing drinking water supply and sanitation services, particularly in rural areas. Agricultural producer groups (such as WUAs; see Section 2.2) for the management of irrigation water are also widespread, given the relevance of this activity in the region. One common trait of these associations is that they usually operate independently of urban area regulators with varying levels of involvement from national-level authorities.

⁴⁹ Currently the Water Committee is under the Ministry of Territorial Administration and Infrastructure.

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There are several different types of partnerships and forms of cooperation related to water management in Latin America and the Caribbean

Rural drinking water and sanitation

In Latin America and the Caribbean, rural drinking water and sanitation services are generally led by community organizations, such as administrative boards or water vigilance committees. An estimated 80,000 of these associations were active in the region's rural and peri-urban areas in 2011 (AVINA, 2011). Most of these organizations are responsible for the operation and maintenance of services, which depend on the collection of fees. However, these associations tend to have weak management capacities, mainly due to the lack of funding, insufficiently trained technicians, poor or insufficient infrastructure, and/or the difficulty of agreeing on rates or fees with the local population. Faced with these issues, the promotion of new management models based on efficiency, enhanced technical assistance and appropriate subsidies are generally required to improve and expand overall service for rural and peri-urban populations (Mejía Betancourt et al., 2016).

Another challenge is related to the regulation of said partnerships, which varies significantly across countries in the region. For example, the drinking water and sanitation management boards in Ecuador need to have a legal status and must affiliate their staff to social security. These demands induce community organizations to avoid legalization and therefore tend to remain informal (Foro de los Recursos Hídricos, 2013). Similar situations are found in rural areas of the Plurinational State of Bolivia and Peru. In Chile, the Rural Water Systems are managed, maintained and operated by local committees or cooperatives, which benefit from infrastructure, advice and assistance provided by the state. For the operation of the service, a license must be issued, while tariffs should guarantee the sustainability of the system (Gobierno de Chile, 2015).

Agricultural associations – Irrigation boards

Irrigation boards or committees are found all across the region. Frequently, they operate independently and are privately funded. However, there are some interesting examples of coordination and state involvement. In Jamaica, the WUA organizes private farmers into a cohesive self-governing unit, which manages an irrigation system. Farmers are members and shareholders and are responsible for governing the organizations through democratic processes (Government of Jamaica, 2015). In Peru, legal support from the state for the collective management of irrigation water has played a fundamental role in strengthening collective action for water management across different basins (MINAGRI, 2015; Muñoz Portugal, 2020).

Regionally, the participation of women in local irrigation boards has been low. This is partly explained by the low ratio of women's land ownership, while land ownership is in many cases a precondition for legally participating in irrigation boards, although there are other prevailing sociocultural constrictions as well (Saravia Matus et al., 2022).

National and transboundary basin levels

National level

Basin management organizations have a long history in the region. Organizations and systems vary in structure, continuity, stakeholders or functions, even within the same country. However, most of these associations focus on data-monitoring, research, coordination of actions, regulation, planning, financing, and development and administration, among other aspects, and often face similar challenges related to technical capacity, governance structures and, particularly, funding (GWP/INBO, 2009).

The launch of the National Basin Plan of the Plurinational State of Bolivia led to the creation of basin management organizations. These organizations serve as interlocutors with the executing entities of investment projects, and as the intercommunal entities for the management of the natural resources of the micro-basins. They are established based on existing social organization structures (unions, brands, irrigation organizations, etc.).

The sustained operation of these organizations requires the support of the Municipal Autonomous Government and other local authorities, in addition to the legitimacy granted by the recognition of the social or indigenous organizations that are water users.

In Brazil, there are River Basin Committees whose primary functions are to approve water resources management plans, to set the price and charge for use, and to serve as intermediaries in the event of conflicts between users. These committees are comprised of representatives of the federal, state and municipal governments, water users and civil society. In this case, having associated support organizations or funds to carry out their activities is key to the committees' effectiveness. Thus, efforts to create effective coordination between committees is crucial as many are still unable to fulfil their mission (Formiga, 2014). Likewise, in Mexico, the decentralization of water resources management from the national to the basin level includes the participation of federal, state and municipal government, together with representative water users and sectoral organizations (CONAGUA, 2014).

In Panama, the River Basin Committees are organized by the Ministry of the Environment. These committees promote coordination and cooperation between the public sector, private organizations and civil society on water issues, and coordinate the preparation and implementation of the Environmental Territorial Planning Plan for the hydrographic basin and the Management, Development, Protection and Watershed Conservation Plan. Basin Committees were established for 84.6% of the national territory during the 2015–2019 period, thus highlighting the political support given to this type of partnership (Gobierno de Panamá, 2020).

As in the local-level analysis, gender disparities can be identified among the decision-makers at the national level. In the case of Peru, one 2020 study identified 20 key roles in water management, of which 19 were for less than 35% performed by women. At the national management level (National Water and Sanitation Superintendency), only 29% of managers were women. At the regional and basin level, only 17% of basin presidencies were held by women, while in the case of Irrigation Water Users Board presidencies only 6% were women (Carrillo Montenegro and Remy Simatovic, 2020).

However, the current gender gap in governance and decision-making in the water sector has been recognized by policy-makers across Latin America and the Caribbean, and in fact, of all gender-related water policies established over the past 20 years, 58% address gender equality in governance and participation in the sector (Saravia Matus et al., 2022).

Water funds can be defined as multi-stakeholder partnerships that design financial and governance mechanisms to address water insecurity and act collectively through nature-based solutions (NBS) in support of sustainable river basin management (see Box 3.1 and Chapter 12). In Latin America and the Caribbean, there are 26 water funds in 9 countries⁵⁰ and 14 more are being created (Box 8.2) (Alianza Latinoamericana de Fondos de Agua, n.d.).

Transboundary level

In Latin America, only 4 of the 22 countries (Argentina, Brazil, Ecuador and Paraguay) have arrangements for at least 90% of the surface of their transboundary basins. Furthermore, in ten countries, the area of the transboundary river and lake basins covered by operational arrangements does not reach 10%. There are however, several encouraging examples (UNECE/UNESCO, 2021).

⁵⁰ In Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Mexico and Peru.

Box 8.2 Santiago Maipo Water Fund

To address water security challenges in the Maipo River basin, particularly the growing water deficit (mega-drought), the Santiago Maipo Water Fund brings together multiple water users to find collective solutions. The objective of this partnership is to implement projects aligned with six strategic lines of action: (i) source water protection, (ii) water use efficiency, (iii) information management, (iv) risk management, (v) awareness and communication, and (vi) territorial planning. For instance, the water fund has launched a demonstration project based on restoration and reforestation for the protection of natural habitats, such as high Andean wetlands and key riparian areas in the Maipo River basin. A pioneering initiative for environmental monitoring of wetlands has also been launched. The fund has the support of the Metropolitan Regional Government and forms part of the Resilience Strategy of the city of Santiago.

Source: Fondo de Agua Santiago-Maipo (n.d.).

One particular case is the Binational Commission for the Integrated Management of Water Resources of Transboundary Hydrographic Basins between Peru and Ecuador, created in 2017 as an intergovernmental organization to promote exchange and cooperation between representatives of the two countries. Its objective is to consolidate bilateral coordination, cooperation and participation, with an ecosystemic and sustainable vision, for the most appropriate use and management of water resources in the nine basins shared between both nations. It has a Binational Technical Secretariat that technically and politically oversees the Commission and the Committees of the nine transboundary basins. For their part, the Committees are responsible for executing the development plans for each basin. Some of the functions of the Binational Commission are to agree on the framework of policies and strategies to promote IWRM, establish mechanisms for the implementation of national IWRM strategies, approve basin plans, analyse the technical-economic proposals of the committees, propose dialogue mechanisms, propose climate change adaptation and mitigation measures as well as early warning systems for extreme events, and establish financing mechanisms (Ecuador and Peru, 2017).

Despite delays in the implementation of the Commission due to political instability in both countries' governments and the health emergency related to the COVID-19 pandemic, Presidential meetings have been arranged to agree and implement IWRM plans for all transboundary basins (starting with Zarumilla, Catamayo – Chira and Puyango – Tumbes), as well as other technical studies (GWP, 2021). However, according to GWP (2021), the Regulation for the Binational Commission may face some key challenges in the near future, such as the need to improve information exchange, adopt water quality protocols, mobilize additional resources and implement conflict resolution mechanisms.

Other coordination efforts

There are additional instances of inter-institutional coordination where public, private and community actors work together with the aim of improving water management. At the national level, one example is the Inter-Institutional and Sectoral Commission for Water, Sanitation and Hygiene (COMISASH) of Nicaragua. This involves public- and private-sector entities, academia, community and national networks, and national as well as international NGOs.

One of the most relevant examples in the region is the case of the Water Cabinet in the Dominican Republic. Created as an advisory council to increase efficiency and agility in decision-making, it coordinates state water policy, previously dispersed in institutions such as the National Institute of Hydraulic Resources, the National Institute of Potable Waters and Sewers, the Ministry of Environment and Natural Resources, the Dominican Hydroelectric Generation Company, and the Santo Domingo Water and Sewerage Corporation, with their local versions in each region (Gobierno de la República Dominicana, 2021a; 2021b). One of the main advantages of this Cabinet is that it is held within the Ministry of Economy, Planning and Development, and holds regular meetings with the president of the country, thus providing key evidence for decisions on water management that directly affect economic output, public health and the quality of the environment in the country. The Water Cabinet recognizes the triple dimension of water as a human right, an economic resource and a natural resource, and outlined the need of a public investment programme of more than US\$8.5 billion through 2030 (equivalent to 7% of the Gross Domestic Product (GDP) in 2022) (UNECLAC, 2022). Moreover, it also intends to achieve a National Water Pact that will allow for the preservation and availability of water in the future (World Bank, 2021). In other words, the high-level political endorsement is recognized here as an essential element to foster a water management transition involving different stakeholders.

At the transnational level, different intergovernmental initiatives pursue the implementation of good practices and cooperation. One example is the Caribbean Water & Sewerage Association Inc. (CAWASA), an organization of public and private water services providers. In Latin American countries, the Association of Water and Sanitation Regulators (ADERASA) aims to draw common lessons and formulate best practices, particularly to address efficiency and regulatory challenges. The Caribbean WaterNet focuses on improving the development of functional capacities for IWRM and resilience to disaster risks. Similarly, the Central American Integration System (SICA) is established as a space for cooperation around the consensual use of water resources. They have proposed the Regional Strategy for the Integrated Management of Water Resources and its respective Plan for the Integrated Management of Water Resources as regional instruments for harmonization in water management.⁵¹ Likewise, the Andean Community (consisting of the Plurinational State of Bolivia, Colombia, Ecuador and Peru) has also adopted a strategy for comprehensive management of water resources, seeking synergies with governmental and non-governmental actors such as academia, indigenous peoples, local communities and organized civil society, among others (Comunidad Andina, 2020). Despite these efforts, it is necessary to highlight that Latin America and the Caribbean has the lowest regional score in adopting integrated water management (37%), ultimately indicating that efforts in this respect still need to increase (UNEP, 2021).

8.3.2 Conclusions

Although there are valuable examples of water-based partnerships in Latin America and the Caribbean, their performance remains challenged by limited technical capacity and funding. Based on the examination of these, it is possible to conclude that basin-level management is of central importance to both public and private stakeholders. However, the level of adoption of IWRM remains rather low in the region. In this respect, high-level political support for water-related partnership initiatives is identified as a key enabler.

At the local level, most water-related organizations remain sectorial in their focus, either aimed at rural drinking water and sanitation supply, or at agricultural irrigation purposes, which is also a reflection of low levels of IWRM. Both types of organizations still need to be framed within basin-level management, and there is often no evidence of this connection. Although basin organizations have been evolving over time to empower social participation and communal agreements, the available examples of partnerships and other forms of cooperation indicate that there is still a void regarding those that connect water to other closely linked issues, such as education.

8.4 Asia and the Pacific

Water resources management has significantly contributed to the increasing economic and social welfare of the region over the last decade, through the provision of basic water and sanitation hygiene (WASH) services, and improved food production, industrial development, and ecosystem-based services. However, Asia and the Pacific remains far from being on track to meet the targets of SDG 6.

Several of the region's major river basins are experiencing high to critical levels of water stress, including the Krishna and Ziya River basins (Figure 8.2). Compounded by the effects of climate change, these stress levels are reported to be increasing (UN-Water/UNESCAP, 2022). Competition among the agriculture, industry, energy, and drinking water sectors will intensify as demands rise due to rapid urbanization and population growth (among others), exercising even greater pressure on water resources (FAO, 2021).

⁵¹ For more information, please see: www.sica.int/

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Women, who are primarily responsible for water collection in local communities, often have limited participation in water management due to traditional norms and practices, such as power imbalances and sociocultural factors

Inequity in terms of water access remains an issue. Households with low education that also belong to the bottom 40% in wealth distribution face higher restrictions in access to basic sanitation (UNESCAP, 2018). Women and vulnerable groups suffer more from limited access to water and sanitation (Brighton, n.d.; UNESCAP, 2018). Furthermore, women, who are primarily responsible for water collection in local communities, often have limited participation in water management due to traditional norms and practices, such as power imbalances and sociocultural factors (Thai and Guevara, 2019).

Other critical regional challenges include inadequate sanitation services, pollution – both very closely related (WWAP, 2017) – as well as shortcomings in transboundary cooperation.

Enhancing governance and policy coherence, including through cooperation, partnerships and multi-stakeholder engagement at all levels, has been identified as a key priority for achieving progress on sustainable water management across Asia and the Pacific (UN-Water/UNESCAP, 2022).

8.4.1 Partnerships in Asia and the Pacific

In Asia and the Pacific, multi-stakeholder partnerships and cooperation at all scales are critical for supporting a more sustainable approach to water management, including through greater policy coherence – spanning across the climate, disaster risk reduction, agriculture, energy, urban and rural development, environment, health and finance sectors – and enhanced water governance at local, national and regional (especially transboundary) levels.

Intra-sectoral partnerships

At the local level, WUAs can support effective water management strategies (see Section 2.2). In Cambodia, Nepal and the Philippines, WUAs have helped mobilize investments from development agencies such as the International Fund for Agricultural Development (IFAD), specifically receiving technical and financial support on projects involving irrigation canals, drainage structures and water conservation systems (IWMI, 2011).

Multi-stakeholder partnerships sharing a common objective in the water sector also exist, involving local communities, national ministries and NGOs. Community participation was the important factor to ensure sustainability of water projects in the Solomon Islands (Alexander et al., 2012), on Apo Island in the Philippines (Hind et al., 2010) and in the Songkhram River basin in Thailand (Piman and Ghimire, 2022).

Public–private partnerships (PPPs) have been set up for infrastructure projects supporting water distribution, treatment and transmission (ADB, 2022), benefiting 67.5 million people in Asia and the Pacific in 2013 (Jensen, 2017). There has been an increase in PPPs for water services in China, Singapore and South Korea since 2000, but some have experienced a lack of sustainability when financial viability is not ensured (see Section 13.4). This happens when there is limited fiscal commitment from both private and government sectors and tariff risks are high. Sustainability is also jeopardized when projects have not been incorporated in a national water plan (ADB, 2022).

Evidence suggest that women’s participation in the assessment and implementation of PPPs is increasing (Almeida et al., 2020), and that women’s involvement in decision-making leads to their economic empowerment (Indarti et al., 2019).

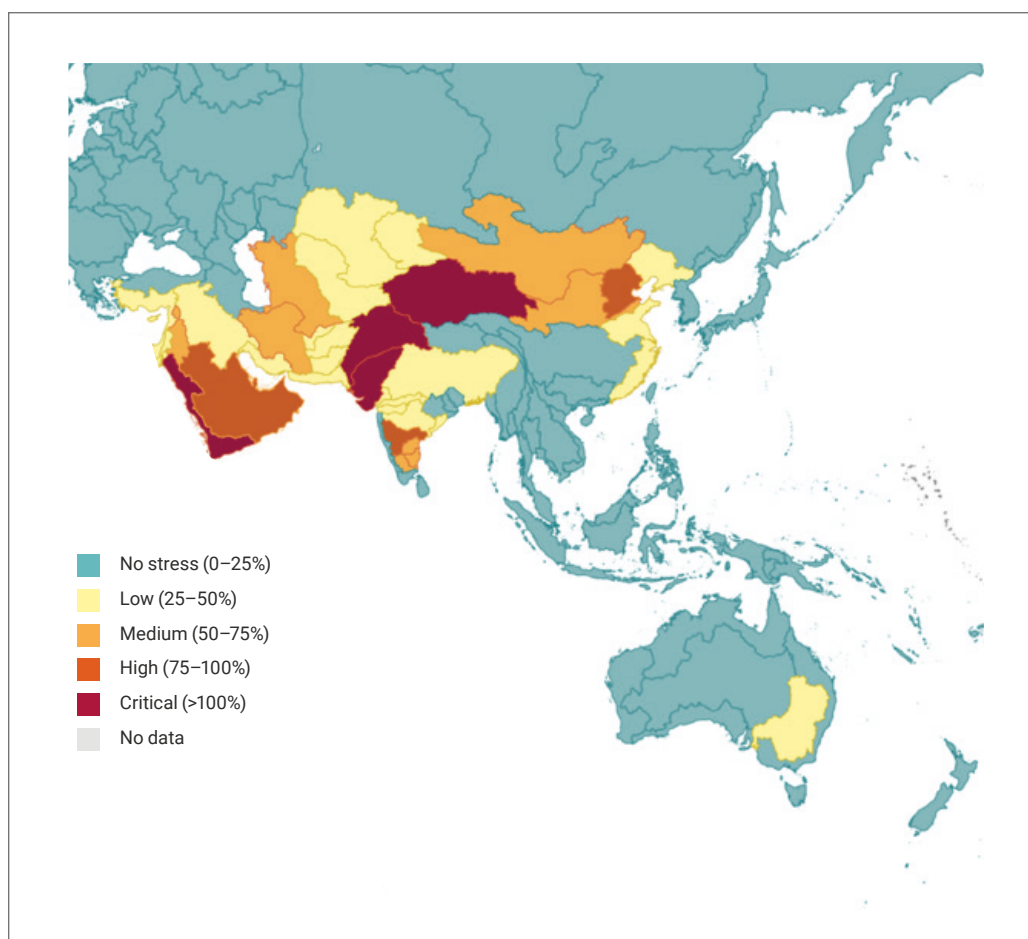
Cooperation and partnerships between countries sharing transboundary water resources are also critical for Asia and the Pacific. For example, the Mekong River Commission (MRC) was established in 1995 as a result of the *Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin*. The MRC collects water-related data and

Figure 8.2

Water stress levels in major river basins in Asia and the Pacific, 2018

Note: "The water stress is calculated as the ratio between (a) the amount of freshwater resources consumed in the three economic sectors (Agriculture, Service and Industry) and (b) the total renewable freshwater resources after deducting the amount of water needed to support existing environmental services, also indicated as environmental flows." (AQUASTAT, 2022).

Source: AQUASTAT (n.d.a).



information, increases stakeholder awareness, and supports cooperation among its Member States through consultations and the adoption of water management strategies, including on flood management and mitigation, as well as water use monitoring (MRC, n.d.).

Cross-sectoral partnerships

Asia and the Pacific records generally high levels of IWRM implementation (GWP/UNEP-DHI, 2021), which attest to a focus on both water and land management for social and economic development.

The Network of Asian River Basin Organizations (NARBO) serves as a platform for fostering regional cooperation in water governance, using IWRM. Since 2004, NARBO has contributed significantly through advocacy, awareness-raising, information exchange, capacity development and active participation in water-related conferences (ADB/ADBI/CRBOM/Japan Water Agency, 2015).

Cross-sectoral cooperation can also be effective in watershed governance. In China, the River Chief System (RCS) is a horizontal cooperation mechanism between different ministries from the municipal offices, the Environment Protection Agency, the Finance Bureau and the Water Conservancy Bureau, among others. The RCS has been implemented in 31 provinces since 2018, where visible improvements in surface water quality and the overall ecological condition of watersheds have been reported (Wang, et al., 2021).

Extra-sectoral partnerships

As water is a cross-cutting issue, partnerships and cooperation are key to integrated approaches to water management spanning across key sectors.

Integrated solutions, such as water–energy–food nexus approach, can help identify interlinkages and orient priorities in managing and allocating water for its multiple uses (Mitra et al., 2020), assessing co-benefits, neutrality and trade-offs (Rasul and Neupane, 2021). The GWP supports countries and regional organizations in developing and implementing nexus-integrated plans on cross-sectoral projects (GWP, 2020).

The water–energy–food nexus is also critical in a transboundary context. One partnership addressing this issue is the transboundary water cooperation arrangement established by the Mahakali Treaty (Pancheshwar Multipurpose Project) between India and Nepal, which aims to achieve water and energy security for both parties (Shrestha and Ghale, 2016; MoJS, n.d.). Although the Pancheshwar Multipurpose Project is long delayed, several beneficial impacts have been highlighted in terms of irrigation and flood control, and lessening energy shortages (Kunwar, 2014).

In Tuvalu, where water resources are affected by recurring storms and droughts related to El Niño-Southern Oscillation (ENSO) cycles, the government formulated the Sustainable and Integrated Water and Sanitation Policy (2012–2021),⁵² addressing the sustainable management of water resources as well as integrated policies on climate change and disaster risks. This resulted in a more comprehensive approach addressing the gaps between the policy outcome individually achieved by different government agencies (Gheuens et al., 2019).

The Small Island Developing States Accelerated Modality of Action (SAMOA Pathway) Pathway focuses on interlinkages among sustainable energy, natural resource management and green economy commitments to provide holistic adaptation measures, which includes water and ocean-based approaches (Commonwealth Foundation, 2015).

8.4.2 Conclusions

In Asia and the Pacific, multi-stakeholder partnerships and cooperation at all scales are critical for supporting sustainable water management and integrated approaches related to water, including at the transboundary level.

It is critical to strengthen existing partnerships and networks, to enhance existing platforms for better stakeholder engagement at all levels, and to ensure that all relevant stakeholders are included in water governance. Further developing governance approaches at subnational and national levels, engaging all parts of government, would support the mainstreaming and financing of water management required to achieve SDG 6, and lead to progress across other water-dependent sectors.

8.5 The Arab region

Characterized by its arid to semi-arid climate, the Arab region suffers from surface water scarcity. Over 392 million people in the region live with less than 1,000 m³ of renewable freshwater per capita per year (AQUASTAT, n.d.b; UNDESA, 2019). This and other rising challenges, such as climate change, high dependency on transboundary water resources and high usage of water resources by the agricultural sector, require successful cooperation and partnership initiatives, in order to collectively progress towards the sustainable management

⁵² Please see here for the original document: <https://reliefweb.int/report/tuvalu/sustainable-and-integrated-water-and-sanitation-policy-2012-2021>.

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Most Arab states largely rely on rivers and/or aquifers that are shared with neighbouring countries (within and outside the region) for their water supply

of water resources and an improved water security in the region. This section explores some of the partnerships and cooperation modalities in the region, from regional to transboundary to cross-sectoral.

8.5.1 Ministerial-level cooperation

In June 2008, the General Secretariat of the League of Arab States approved the proposal to establish the Arab Ministerial Water Council (AMWC). This institution aims to develop cooperation and coordinate efforts among Arab states (League of Arab States, n.d.). In 2011, the AMWC adopted the *Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010–2030* (AMWC, 2012). This document is a framework for programmes and activities in all areas of water resources, especially the following: IWRM, development and preservation of water resources in quantity and quality, water demand management, support to coordination and cooperation in shared basins, and protecting Arab rights to water in transboundary water resources and in occupied territories. The strategy has been updated in 2022 to reflect current progress and emerging issues relevant to water security in the region.

In addition to consolidating regional efforts and collaboration on water security, the strategy action plan has helped to advance:

- Inclusion of water security in national development strategies and in policies related to economy and climate change;
- Setting of priorities for supporting water security on the national level through collaboratively working with regional organizations and neighbouring countries;
- Regional cooperation in research and data-sharing; and
- Investments under regional cooperation for advancing water security through technological innovations.

The AMWC further coordinates efforts on other regional water priorities, such as transboundary water cooperation. The United Nations Economic and Social Commission for Western Asia (UNESCWA), as mandated by the AMWC, drafted the guidance principles for Arab cooperation in the management of transboundary water resources and presented them at an intergovernmental meeting organized by UNESCWA and the League of Arab States in 2017. The guidelines have been under discussion since then, but their adoption has yet to be formally approved. Several challenges have hindered the process, including the difficulty of holding physical meetings due to COVID-19 and, most importantly, the political sensitivity tied to current developments on major transboundary surface water basins in the region. However, these guidelines constitute an institutional mechanism for dialogue and agreements on transboundary water issues as well as an opportunity to develop capacities of many state actors.

8.5.2 Transboundary water cooperation in the Arab region

Most Arab states largely rely on rivers and/or aquifers that are shared with neighbouring countries (within and outside the region) for their water supply. In fact, 15 out of the 22 Arab states are riparian to a shared surface water basin, and all Arab states, except the Comoros, are riparian to a shared aquifer. This makes cooperation on transboundary water resources essential for the region's water security. Despite certain inter-state tensions between some neighbouring countries, several examples of cooperation modalities do exist in the region, including transboundary aquifers. The Nubian Sandstone Aquifer System (NSAS), the Northwestern Sahara Aquifer System (NWSAS) and the Orontes River basin are among those where such cooperation arrangements are in place.

For the NSAS, a Joint Authority formed by Egypt and Libya was launched in 1991 and was later joined by Sudan and Chad. This Joint Authority aims at serving the social and economic development of NSAS countries by studying, protecting and planning the uses of NSAS water resources (NSAS-JA, n.d.). The gathering and sharing of data often form a critical challenge in transboundary settings (see Section 10.3). To overcome this challenge, the four riparian countries of the NSAS have signed two agreements that have advanced data-sharing, monitoring and modelling. Cooperation in the NWSAS is fostered through a consultation mechanism facilitated by the Sahara and Sahel Observatory in the form of a steering committee constituted of representatives from water authorities of each riparian country. This consultation mechanism offers cooperation on data exchanges, research, and management and monitoring of water resources. However, it does not legally restrict any of the riparian countries from abstracting groundwater. The NWSAS cooperation mechanism was initiated with the support and funding of the international community, resulting in a mechanism prototype for other aquifers in the Arab region.

Formal cooperation on the Orontes River basin between Lebanon and the Syrian Arab Republic started in 1972 when the two riparian States signed a bilateral agreement concerning water use. It was further developed in 1991 through the *Fraternity, Cooperation and Coordination Treaty* (Syrian Lebanese Higher Council, 1991), establishing the formal basis for cooperation between the two countries in the domain of water and other sectors. The treaty led to the establishment of a Lebanese–Syrian Joint Committee for Shared Water in addition to several agreements that were signed thereafter to enhance cooperation between the riparian countries. This cooperation has improved the management of the transboundary water resources through river infrastructure development and shared allocation between countries (UNESCWA/BGR, 2013).

These transboundary cooperation arrangements have led to improved water management through iterative trust-building processes among riparian countries that started with targeted data-sharing, information-gathering and scientific research and then developed into more robust cooperation modalities.

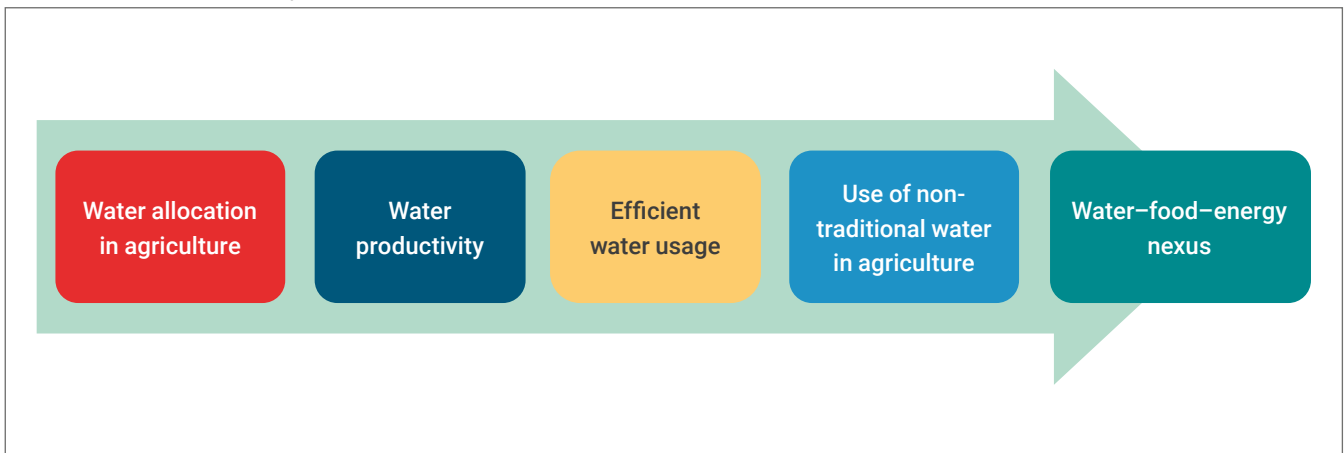
8.5.3 Cross-sectoral cooperation

The High-Level Joint Committee for Water and Agriculture

After several years of working towards coordination between the water and agricultural sectors, the First Joint Meeting of Arab Ministers of Agriculture and Water was convened under the auspices of the League of Arab States with the support of UNESCWA and the Food and Agriculture Organization of the United Nations (FAO) in 2019 (UNESCWA, 2019). The meeting resulted in the adoption of the terms of reference for the Joint Ministerial Committee and its Joint Secretariat, comprised of the Arab Organization for Agricultural Development (AOAD) and AMWC. This ministerial meeting was concluded with a call for the effective integration of water and food security issues into the national sustainable development strategies and the adoption of the Cairo Declaration urging governments and partners to reinforce regional coordination and to harmonize policies across both sectors to face the impacts of climate change and water scarcity.

The High-Level Joint Committee for Water and Agriculture strives to achieve greater institutional coordination between the agriculture and water sectors, particularly to improve intergovernmental coordination to support policy coordination and coherence for optimizing water use in the agriculture sector and for food production, both at the national and regional levels. So far, the High-Level Joint Committee for Water and Agriculture has set five priority areas of work (Figure 8.3).

Figure 8.3 The five priority areas of work of the High-Level Joint Committee for Water and Agriculture



Source: Authors.

The achievements of this cross-sectoral cooperation include drafting an action plan for the implementation of the Cairo Declaration, adopting a regional guideline for water allocation in the agriculture sector and issuing a scoping paper on the use of non-conventional water resources. Work is in progress to pilot the water use allocation guidelines in several Arab states.

8.5.4 Regional networks and initiatives

Several regional partnerships and cooperation initiatives have been initiated in the region in response to water priorities such as implementing IWRM and finding solutions to deal with the consequences of water scarcity or climate change. These initiatives have succeeded in bringing together partners and building synergies to address regional challenges and priorities of the water sector.

RICCAR

The Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR) is the outcome of the first Arab Ministerial Declaration on Climate Change (2007), which recognized the potential impacts that climate change may have on development in the Arab region (UNESCWA, n.d.a). RICCAR is implemented through an inter-agency collaborative partnership involving 11 partner organizations,⁵³ including UNESCWA. Commitment and support for the initiative have been further articulated by Arab states through follow-up resolutions adopted by AMWC, the Arab Permanent Committee for Meteorology (APCM) and the Council of Arab Ministers Responsible for the Environment (CAMRE). The regional initiative aims to assess the impacts of climate change on freshwater resources in the Arab region and to examine

⁵³ RICCAR is implemented through an inter-agency collaborative partnership involving 11 partner organizations, namely UNESCWA, the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD), FAO, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the League of Arab States Secretariat, the Swedish Meteorological and Hydrological Institute (SMHI), the United Nations Educational, Scientific and Cultural Organization (UNESCO) Cairo Office, the United Nations Environment Programme (UNEP), the United Nations Office for Disaster Risk Reduction (UNISDR), the United Nations University Institute for Water, Environment and Health (UNU-INWEH), and the World Meteorological Organization (WMO). In addition to the resources provided by the partner agencies, funding is provided by the Swedish International Development Cooperation Agency (Sida) and the German Federal Ministry for Economic Cooperation and Development (BMZ), which financially support RICCAR through the Adaptation to Climate Change in the Water Sector in the Middle East and North Africa Region (ACCWaM) project (UNESCWA et al., 2017).

their implications for socio-economic and environmental vulnerabilities, based on regional specificities (UNESCWA et al., 2017). In 2017, it has launched the first Arab domain climate modelling ensembles, which in turn are used to assess the impact of climate change on subdomains and transboundary resources in the Arab region.

Specific outcomes of RICCAR in relation to regional cooperation include (RICCAR, n.d.):

- Establishing an Arab knowledge hub on climate and water;
- Creating a common platform for assessing, addressing and identifying regional climate change challenges;
- Providing a common and comparable scientific understanding of climate change impacts and associated vulnerabilities across the Arab region;
- Increasing the capacity of Arab water ministries and meteorological institutions to engage in climate prediction and climate change projection; and
- Informing policy dialogue, negotiations and exchange among Arab decision-makers.

WSI

The FAO Water Scarcity Regional Initiative (WSI) was established in 2013 as a ‘partnership platform’ for strengthening coordination and collaboration among institutional partners (FAO, 2013). Partners⁵⁴ signed a ‘Partnership Pledge’ expressing their strong interest and willingness to work together to support the implementation of relevant collaborative strategies, in the context of the Arab Water Security Strategy and the Arab Strategy for Sustainable Agricultural Development (2005–2025). The primary focus areas of the initiative include: (i) adopting global standards for water accounting systems; (ii) expanding the knowledge base for irrigation efficiency and water productivity; (iii) improving groundwater governance; (iv) using non-conventional water resources; (v) adapting to climate change; (vi) managing drought; and (vii) implementing scenario analysis, including the water–energy–food nexus approach, to identify safe operational boundaries for water.

Specific outputs of WSI collaborative initiative include:

- Coordinated planning and implementation of joint activities between regional partners;
- Better understanding of, and responding to, countries’ priority areas/needs;
- Contribution to updating and enhancing the scope of ongoing and future regional strategies in water, food and climate change; and
- Supporting member countries in issuing policies and identifying sustainable practices in agriculture to boost productivity, improve food security and better manage water resources.

⁵⁴ Arab Centre for the Studies of Arid Zones and Drylands (ACSAD), Arab Organization for Agricultural Development (AOAD), Arab Water Council (AWC), Centre for Environment and Development for the Arab Region and Europe (CEDARE), Desert Research Center (DRC), ESCWA, FAO, German Agency for International Cooperation (GIZ), International Centre for Agricultural Research in Dry Areas (ICARDA), International Centre for Biosaline Agriculture (ICBA), International Fund for Agricultural Development (IFAD), International Water Management Institute (IWMI), League of Arab States (LAS), National Water Research Center (NWRC) Egypt, UNESCO, World Bank and World Food Programme (WFP).

AWARENET

The Arab Integrated Water Resources Management Network (AWARENET) is an independent regional network of training and research institutes, NGOs, government institutions, civil society and experts in the field of water, engaged in the elaboration and delivery of capacity development programmes and resource materials on IWRM policies and practices for the Arab region. Part of the International Capacity Development Network for Sustainable Water Management's (Cap-Net UNDP) global network of networks, AWARENET was established in March 2002 with support from UNESCWA and a number of regional and international organizations, and is currently hosted by UNESCWA. It aims to spread knowledge through sharing experiences and information during workshops and trainings. AWARENET currently includes more than 680 members from the Arab region – of which at least 30% are women – and has worked on capacity development through structured training on several topics, including IWRM, innovative technologies and climate change assessments (AWARENET, n.d.).

Outcomes of AWARENET (UNESCWA, n.d.b) include:

- Raising regional understanding and awareness about water-related challenges in the Arab region;
- Offering capacity-building activities;
- Initiating regional forums and discussion groups; and
- Creating professional opportunities.

8.5.5 Conclusions

The Arab region is a water-scarce region facing many challenges exacerbated by climate change impacts, high dependency on transboundary water resources, low irrigation efficiency in the agricultural sector, and conflict, among others. This more than ever necessitates national and regional cooperation and partnerships to collectively meet the region's growing water needs.

Several cooperation and partnership arrangements have already been initiated in the Arab region despite the financial and political barriers that might hinder collaboration. These arrangements have demonstrated the importance of collaborative efforts, trust-building processes and data exchange for better water management. Such cooperation arrangements and partnerships are a starting point and a prototype for replication across Arab countries. However, given the immense challenges, more partnerships and increased collaboration are needed to accelerate the level of achievement of the water-related goals, especially to secure additional financing, advance innovation and share information.

References

- Adams, E. A. and Zulu, L. C. 2015. Participants or customers in water governance? Community-public partnerships for peri-urban water supply. *Geoforum*, Vol. 65, pp. 112–124. doi.org/10.1016/j.geoforum.2015.07.017.
- Adams, E. A., Sambu, D. and Smiley, S. L. 2019. Urban water supply in Sub-Saharan Africa: Historical and emerging policies and institutional arrangements. *International Journal of Water Resources Development*, Vol. 35, No. 2, pp. 240–263. doi.org/10.1080/07900627.2017.1423282.
- ADB (Asian Development Bank). 2022. *A Governance Approach to Urban Water Public-Private Partnerships: Case Studies and Lessons from Asia and the Pacific*. Manila, ADB. www.adb.org/publications/governance-approach-urban-water-ppps.
- ADB/ADBI/CRBOM/Japan Water Agency (Asian Development Bank/Asian Development Bank Institute/Center for River Basin Organizations and Management/Japan Water Agency). 2015. *NARBO: A Decade of Achievements (2004–2014) – Promoting Integrated Water Resources Management and Improving Water Governance*. Mandaluyong City, Philippines, Asian Development Bank. www.adb.org/sites/default/files/publication/161909/adbi-narbo-decade-achievements-2004-2014.pdf.
- Alexander, T., Manele, B., Schwarz, A.M., Topo, S. and Liliqeto, W. 2012. *Principles for Best Practice for Community Resource Management in Solomon Islands*. Jakarta, Coral Triangle Support Partnership. https://digitalarchive.worldfishcenter.org/bitstream/handle/20.500.12348/988/3027.pdf?sequence=1&isAllowed=y.
- Alianza Latinoamericana de Fondos de Agua. n.d. La Alianza Latinoamericana de Fondos de Agua website. www.fondosdeagua.org/es/.
- Almeida, R., Cassang, A., Lin, D. and Abe, M. 2020. *Public-Private Partnership System and Sustainable Development in Asia and the Pacific*. ESCAP MPFD Working Papers WP/20/07. www.unescap.org/sites/default/files/publications/WP_20_07_PPP%20Network_final_web.pdf.
- AMWC (Arab Ministerial Water Council). 2012. *Arab Strategy for Water Security in the Arab Region to Meet the Challenges and Future Needs for Sustainable Development 2010–2030*. Cairo, AMWC. www.unescwa.org/sites/default/files/event/materials/arab_strategy_for_water_security-english_translation-2012_0.pdf.
- AQUASTAT. 2022. *Level of Water Stress by Major River Basin Calculated on the Water Consumption*. FAO. https://data.apps.fao.org/catalog/dataset/b1a616c0-6b73-4625-a413-237e4677c469.
- _____. n.d.a. *Aquastat – FAO Aquamaps. Level of Water Stress by Major River Basin Calculated on the Water Consumption*. https://data.apps.fao.org/aquamaps/?share=f-88fbb746-f95b-4b86-9806-9b12eb7d5eea. (Accessed on 29 November, 2022)
- _____. n.d.b. *Aquastat: FAO's Global Information System on Water and Agriculture*. Rome, Food and Agriculture Organization of the United Nations (FAO) www.fao.org/aquastat/statistics/query/index.html. (Accessed on 29 November, 2022)
- AUDA-NEPAD/AfDB/AMCOW/ICA/GWP (African Union Development Agency – New Partnership for Africa's Development/African Development Bank/African Ministers' Council on Water/Infrastructure Consortium for Africa/Global Water Partnership). n.d. *AIP Continental Africa Water Investment Programme*. www.gwp.org/globalassets/documents/gwpsa/aip-brochure.pdf.
- AVINA. 2011. *Annual Report 2011: Leadership for Sustainable Development in Latin America*. Fundación Avina. www.avina.net/wp-content/uploads/2019/03/2011-eng.pdf.
- AWARENET (Arab Integrated Water Resources Management Network). n.d. *Introduction: Who we are*. AWARENET website. https://awarenet.info/index.php/introduction/.
- AWS Africa (Alliance for Water Stewardship) Africa. n.d. *About AWS Africa*. AWS Africa website. https://a4ws-africa.org/about?.
- Brighton, V. n.d. *The Impact of Water Scarcity on Rural Groups in the Asia-Pacific Region*. Aid and International Development Forum. www.aidforum.org/docs/Water_Scarcity_Report_Rev.pdf.
- Carrillo Montenegro, P. and Remy Simatovic, M. I. 2020. *Brechas de género en la gestión del agua y la infraestructura natural* [Gender gaps in water management and natural infrastructure]. Lima. https://pefssp.org/wp-content/uploads/2020/08/Brechas-de-G%C3%A9nero-y-Gesti%C3%B3n-del-Agua-en-la-Infraestructura-Natural.pdf (In Spanish.)
- Commonwealth Foundation. 2015. *The SAMOA Pathway: Recommendations from Commonwealth Civil Society*. Commonwealth Foundation. https://commonwealthfoundation.com/wp-content/uploads/2015/08/Commonwealth-Insights_SAMOA-Pathway.pdf.
- Comunidad Andina. 2020. *Carta Ambiental Andina* [Andean Letter on the Environment]. Press release, 1st December 2020. www.comunidadandina.org/notas-de-prensa/carta-ambiental-andina/. (In Spanish.)
- CONAGUA (Comisión Nacional del Agua). 2014. *Ley de Aguas Nacionales y su Reglamento* [National Water Law and its Regulations]. Coyoacán, Mexico www.conagua.gob.mx/conagua07/publicaciones/publicaciones/sgaa-37-12.pdf. (In Spanish.)
- Dill, B. 2010. Public–public partnerships in urban water provision: The case of Dar es Salaam. *Journal of International Development*, Vol. 22, No. 5, pp. 611–624. doi.org/10.1002/jid.1601.
- Ecuador and Peru. 2017. *Acuerdo que establece la Comisión Binacional para la Gestión Integrada de los Recursos Hídricos de las Cuencas Hidrográficas Transfronterizas entre la República del Ecuador y la República del Perú* [Agreement that establishes the Binational Commission for the Integrated Management of the Water Resources of the Transboundary Hydrographic Basins between Ecuador and Peru]. www.asambleanacional.gob.ec/es/system/files/rd_328210moreno_328210_467234-ecuador-peru-28-05-2018_0.pdf. (In Spanish.)
- European Union. 2021. *The European Union Water Initiative Plus – Supports the Transition to Healthy Waters in Eastern Partnership Countries*. EUWI+ EU Water Initiative for Eastern Partnership. www.euwipluseast.eu/en/component/content/article/447-all-activities/activites-global-project-2/news-global-project/887-euwi-top-ten-success-stories?Itemid=397.
- FAO (Food and Agriculture Organization of the United Nations). 2013. *The Regional Initiative on Water Scarcity in the Near East: A Collaborative Strategy and Partnership to Address the Water-Food Security Nexus*. FAO. www.fao.org/documents/card/en/c/067764a8-bba7-4b2c-b617-25edf13e4a47/.
- _____. 2021. *Water Scarcity Program (WSP) for Asia-Pacific*. Bangkok, FAO. www.fao.org/publications/card/en/c/CB4417EN/.
- Fondo de Agua Santiago-Maipo. n.d. *Santiago-Maipo Water Fund*. www.fondosdeagua.org/content/dam/tnc/nature/en/documents/latin-america/SantiagoMaipoWaterFund.pdf.
- Formiga, R. 2014. *Water Resources Management in Brazil: Challenges and New Perspectives*. Brazil Water Learning Series. 24 April–03 June 2014. World Bank. https://www.worldbank.org/content/dam/Worldbank/Feature%20Story/SDN/Water/events/Rosa_Formiga_Johnson_Presentacion_Ingles-3.pdf.
- Foro de los Recursos Hídricos. 2013. *La gestión comunitaria del agua para consumo humano y el saneamiento en Ecuador. Diagnóstico y propuesta*. [Community management of water for human consumption and sanitation in Ecuador. Diagnosis and proposal.] Quito, Foro de los Recursos Hídricos. www.camaren.org/documents/lagestioncomunitaria.pdf. (In Spanish.)

- Galaa, S. Z. and Bukari, F. I. M. 2014. Water tariff conflict resolution through indigenous participation in tri-water sector partnerships: Dalun cluster communities in northern Ghana. *Development in Practice*, Vol. 24, No. 5–6, pp. 722–734. doi.org/10.1080/09614524.2014.940852.
- Gheuens, J., Nagabhatla, N. and Perera, E. D. P. 2019. Disaster-risk, water security challenges and strategies in Small Island Developing States (SIDS). *Water*, Vol. 11, No. 4, Article 637. doi.org/10.3390/w11040637.
- Gobierno de Chile. 2015. *Resumen Ejecutivo Evaluación Programas Gubernamentales (EPG): Programa Infraestructura Hidráulica de Agua Potable Rural (APR)*. [Executive Summary of the Evaluation of Government Programmes: Rural Drinking Water Hydraulic Infrastructure Programme]. www.dipres.gob.cl/597/articles-141243_r_ejecutivo_institucional.pdf. (In Spanish.)
- Gobierno de la República Dominicana. 2021a. *Informe Nacional Voluntario 2021. Crecimiento con equidad y respeto al medioambiente* [Voluntary national review 2021: Growth with equity and respect for the environment]. https://mepyd.gob.do/publicaciones/informe-nacional-voluntario-2021-crecimiento-con-equidad-y-respeto-al-medioambiente. (In Spanish.)
- _____. 2021b. *Diálogo de las reformas 2021. Reformas del sector agua. Propuesta Institucional* [Dialogue of the reforms 2021: Water sector reforms. Institutional Proposal]. Gabinete del Sector Agua. https://ces.gob.do/dialogo_reformas/01%20agua/Agua.%20Propuesta%20Institucional%20V0.pdf. (In Spanish.)
- Gobierno de Panamá. 2020. *Libre de pobreza y desigualdad – La sexta Frontera. Informe Nacional Voluntario de los ODS* [Free from poverty and inequality – The sixth frontier. Voluntary national review of progress towards the SDGs]. www.gabinetesocial.gob.pa/wp-content/uploads/2020/10/PanamaLibredePobrezayDesigualdad.pdf. (In Spanish.)
- Government of Jamaica. 2015. *Water Sector Policy*. www.rwsl.gov.jm/wp-content/uploads/2021/05/Water-Sector-Policy-.pdf.
- Grasham, C. F., Korzenevica, M. and Charles, K. J. 2019. On considering climate resilience in urban water security: A review of the vulnerability of the urban poor in sub-Saharan Africa. *Wiley Interdisciplinary Reviews (WIREs): Water*, Vol. 6, No. 3, Article e1344. doi.org/10.1002/wat2.1344.
- GWP (Global Water Partnership). 2020. *Nexus: Water, Food, Energy, and Ecosystems (WFEE)*. GWP website. www.gwp.org/en/we-act/themesprogrammes/Nexus-Water-Food-Energy-Ecosystems/.
- _____. 2021. *Transboundary Freshwater Security Governance Train: Interactive Online Session: River Basin Organisations and the Implementation of Legal Commitments*. 16 March 2021. www.gwp.org/contentassets/092e5da4a6b0454ab98526442b143961/mooc-event-16-march-ppts.pdf.
- GWP/INBO (Global Water Partnership/International Network of Basin Organizations). 2009. *Manual para la Gestión Integrada de Recursos Hídricos en Cuencas* [Manual for the integrated management of water resources in basins]. GWP/INBO. www.rioc.org/IMG/pdf/RIOC_GWP_Manual_para_la_gestion_integrada.pdf. (In Spanish.)
- GWP/UNEP-DHI (Global Water Partnership/United Nations Environment Programme DHI Centre on Water and Environment). 2021. *Progress on Integrated Water Resources Management (IWRM) in the Asia-Pacific Region 2021: Learning Exchange on Monitoring and Implementation towards SDG 6.5.1*. www.gwp.org/contentassets/895105e56f3c4feaa33a6361ae44f7ac/web-version-new-cover_final-report-sdg-6.5.1-progress-asia-2021.pdf.
- Hepworth, N., Agol, D., Von Wiren-Lehr, S. and O’Grady, K. 2011. *Alliance for Water Stewardship Kenya Case Study – Exploring the Value of Water Stewardship Standards in Africa*. Technical Report. Alliance for Water Stewardship/Marks and Spencer/GIZ/BMZ.
- Hind, E. J., Hiponia, M. C. and Gray, T. 2010. From community-based to centralised national management—A wrong turning for the governance of the marine protected area in Apo Island, Philippines? *Marine Policy*, Vol. 34, No. 1, pp. 54–62. doi.org/10.1016/J.MARPOL.2009.04.011.
- IJC (International Joint Commission). 2019. *Oversight of Animals Feeding Operations for Manure Management in the Great Lakes Basin*. A report submitted to the International Joint Commission by the Great Lakes Water Quality Board. www.ijc.org/sites/default/files/2020-01/WQB_ManureManagementReport_2019.pdf.
- _____. n.d. *Rules of Procedure*. IJC website. https://ijc.org/en/who/mission/principles/rules-of-procedure.
- Indarti, N., Rostiani, R., Megaw, T. and Willetts, J. 2019. Women’s involvement in economic opportunities in water, sanitation and hygiene (WASH) in Indonesia: Examining personal experiences and potential for empowerment. *Development Studies Research*, Vol. 6, No. 1, pp. 76–91. doi.org/10.1080/21665095.2019.1604149.
- Isundwa, K. F. and Mourad, K. A. 2019. The potential for water stewardship partnership in Kenya. *Arabian Journal of Geosciences*, Vol. 12, No. 12, pp. 1–21. doi.org/10.1007/s12517-019-4506-x.
- IWaSP (International Water Stewardship Programme). n.d.a. *Prepare Phase Success Story – Zambia*. https://ceowatermandate.org/wraf/wp-content/uploads/sites/22/2017/10/IWaSP_PPrepare_Zambia_Lusaka_03.08.2017.pdf.
- _____. n.d.b. *Act Phase Success Story – River Rwizi, Uganda*. http://ceowatermandate.org/wraf/wp-content/uploads/sites/15/2017/07/IWaSP_ACT_Uganda-River-Rwizi_17.05.2017.pdf.
- _____. n.d.c. *Mlalakua River Restoration Project (MRRP)*. https://ceowatermandate.org/natural-resources-risk-action-framework/resource/mlalakua-river-restoration-project-mrrp/.
- IWMI (International Water Management Institute). 2011. *Water User’s Associations in the Context of Small Holder Agriculture: A Systematic Review of IFAD Funded Water User Association in Asia*. Submitted to International Fund for Agricultural Development (IFAD) by International Water Management Institute (IWMI). www.un.org/waterforlifedecade/water_cooperation_2013/pdf/wuas_and_small_holder_agriculture.pdf.
- Jensen, O. 2017. Public–private partnerships for water in Asia: A review of two decades of experience. *International Journal of Water Resources Development*, Vol. 33, No. 1, pp. 4–30. doi.org/10.1080/07900627.2015.1121136.
- Kunwar, M. B. 2014. Rationale of Pancheshwar Multipurpose Project for reduction of energy crisis and mitigating the impacts of Mahakali flood and subsequent economic development of Nepal and India. *Hydro Nepal: Journal of Water, Energy and Environment*, Vol. 14, pp. 16–20. doi.org/10.3126/hn.v14i0.11247.
- League of Arab States. n.d. *النظام الأساسي للمجلس الوزاري العربي للمياه* [Organization of the Arab Ministerial Water Council]. www.lasportal.org/ar/councils/ministerialcouncil/Pages/MCouncilAbout.aspx?RID=10. (Accessed in April 2022) (In Arabic.)
- Liddle, E. S., Mager, S. M. and Nel, E. L. 2016. The importance of community-based informal water supply systems in the developing world and the need for formal sector support. *The Geographical Journal*, Vol. 182, No. 1, pp. 85–96. doi.org/10.1111/geoj.12117.
- Mejía Betancourt, A., Castillo, O., Vera, R. and Arroyo, V. 2016. *Agua potable y saneamiento en la nueva ruralidad de América Latina* [Drinking water and sanitation in the new rurality of Latin America]. Development Bank of Latin America (CAF). https://scioteca.caf.com/handle/123456789/918. (In Spanish.)
- MINAGRI (Ministerio de Agricultura y Riego). 2015. *Reglamento de la Ley Núm. 30157, Ley de las Organizaciones de Usuarios de Agua* [Regulation of Law Nr. 30157, Law on Water User Organizations]. Decreto Supremo N° 005-2015-MINAGRI Perú. https://sinia.minam.gob.pe/normas/decreto-supremo-que-aprueba-reglamento-ley-ndeg-30157-ley-las. (In Spanish.)
- Mitra, B. K., Sharma, D., Kuyama, T., Pham, B. N., Islam, G. M. T. and Thao, P. T. M. 2020. Water–energy–food nexus perspective: Pathway for Sustainable Development Goals (SDGs) to country action in India. *APN Science Bulletin*, Vol. 10, No. 1, pp. 34–40. doi.org/10.30852/sb.2020.1067.

- MoJS (Ministry of Jal Shakti). n.d. *India-Nepal Cooperation*. Department of Water Resources, River Development and Ganga Rejuvenation website. <http://jalshakti-dowr.gov.in/international-cooperation/bilateral-cooperation-with-neighbouring-countries/india-nepal-cooperation>.
- MRC (Mekong River Commission). n.d. *Mekong River Commission*. MRC website. www.mrcmekong.org/about/mrc/.
- Muñoz Portugal, I. 2020. Acción y gestión colectiva del agua en los valles de Moche y Virú en la costa peruana [Collective action and water management in the Moche and Virú valleys on the Peruvian coast]. *Problemas del Desarrollo, Revista Latinoamericana de Economía* (Mexico), Vol. 51, No. 200, pp. 77–101. doi.org/10.22201/iiiec.20078951e.2020.200.68186. (In Spanish.)
- Nagabhatla, N., Cassidy-Neumiller, M., Francine, N. N. and Maatta, N. 2021. Water, conflicts and migration and the role of regional diplomacy: Lake Chad, Congo Basin, and the Mbororo pastoralist. *Environmental Science and Policy*, Vol. 122, pp. 35–48. doi.org/10.1016/j.envsci.2021.03.019.
- Niva, V., Taka, M. and Varis, O. (2019). Rural-urban migration and the growth of informal settlements: A socio-ecological system conceptualization with insights through a “water lens”. *Sustainability*, Vol. 11, No. 12, Article 3487. doi.org/10.3390/su11123487.
- NSAS-JA (Nubian Sandstone Aquifer System-Joint Authority). n.d. الهيئة المشتركة لدراسة وتنمية خزان الحجر الرملي النوبي [Nubian Sandstone Aquifer System-Joint Authority]. www.nsasja.org/found_ar.php. (In Arabic.) (Accessed on 2 December 2022).
- Piman, T. and Ghimire, U. 2022. Community-based ecosystem management for wetlands resilience in Thailand’s Songkhram River Basin. SEI (Stockholm Environment Institute) website. www.sei.org/featured/community-ecosystem-wetland-resilience-thailand-songkhram/.
- Rasul, G. and Neupane, N. 2021. Improving policy coordination across the water, energy, and food, sectors in South Asia: A framework. *Frontiers in Sustainable Food Systems*, Vol. 5, Article 602475. doi.org/10.3389/fsufs.2021.602475.
- RICCAR (Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region). n.d. RICCAR website. <https://riccar.org/>.
- Saravia Matus, S., Gil, M., Sarmanto, N., Blanco, E., Llavona, A. and Naranjo, L. 2022. *Brechas, Desafíos y Oportunidades de Agua y Género en América Latina y el Caribe* [Gaps, challenges and opportunities in water and gender in Latin America and the Caribbean]. Serie Recursos Naturales y Desarrollo. United Nations Economic Commission for Latin America and the Caribbean (UNECLAC). <https://repositorio.cepal.org/handle/11362/48605>.
- Shrestha, A. and Ghale, R. 2016. *Transboundary Water Governance in the Hindi Kush Himalaya Region – Beyond the Dialectics of Conflict and Cooperation*. Himalayan Adaptation, Water and Resilience (HI-AWARE) Working Papers No. 7. Kathmandu, International Centre for Integrated Mountain Development (ICIMOD). <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/57517/IDL-57517.pdf>.
- Syrian Lebanese Higher Council, 1991. *الجمهورية العربية السورية والجمهورية اللبنانية معاهدة الأخوة والتعاون والتنسيق بين* [Fraternity, Cooperation and Coordination Treaty between the Republic of Lebanon and the Syrian Arab Republic]. www.syrleb.org/SD08/msf/1507751751_.pdf.
- Tijani, M. N. n.d. *AMCOW Pan-African Groundwater Program (APAGroP): AMCOW Agenda for Sustainable Management of Groundwater Resources and Trans-boundary Aquifers in Africa*. GGRETA Online Course on Groundwater Management in Africa Lake and River Basin Organizations.
- Thai, N. V. and Guevara, J. R. 2019. Women and water management: A policy assessment—A case study in An Giang Province, Mekong delta, Vietnam. *Asia-Pacific Journal of Rural Development*, Vol. 29, No. 1, pp. 77–97. doi.org/10.1177/1018529119860949.
- The Boundary Waters Treaty of 1909. 1909. *The Boundary Waters Treaty of 1909*. International Joint Commission (IJC). www.ijc.org/sites/default/files/2018-07/Boundary%20Water-ENGFR.pdf.
- UNDESA (United Nations Department of Economic and Social Affairs). 2019. *World Population Prospects 2019*. New York, United Nations. <https://population.un.org/wpp/>.
- UNECE (United Nations Economic Commission for Europe). 1992. *Convention on the Protection and Use of Transboundary Watercourses and International Lakes*. Helsinki, 17 March 1992, UNECE. unece.org/environment-policy/water/about-the-convention/introduction.
- _____. 1998. *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters*. Aarhus, Denmark, 25 June 1998. <https://unece.org/environment-policy/public-participation/aarhus-convention/text>.
- _____. 2022. *The Water Convention: 30 Years of Impact and Achievements on the Ground*. Geneva, UNECE. <https://unece.org/environment-policy/publications/water-convention-30-years-impact-and-achievements-ground>.
- UNECE/UNESCO (United Nations Economic Commission for Europe/United Nations Educational, Scientific and Cultural Organization). 2021. *Progress on Transboundary Water Cooperation – Global Status of SDG Indicator 6.5.2 and Acceleration Needs*. Paris, United Nations/UNESCO. www.unwater.org/publications/progress-transboundary-water-cooperation-2021-update.
- UNECE/WHO Regional Office for Europe (United Nations Economic Commission for Europe/World Health Organization Regional Office for Europe). 1999. *Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes*. London, 17 June 1999. <https://unece.org/environment-policy/water/protocol-on-water-and-health/about-the-protocol/introduction>.
- _____. 2013. *The Equitable Access Score-Card: Supporting Policy Processes to Achieve the Human Right to Water and Sanitation*. Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Geneva, UNECE. <https://unece.org/environment-policy/publications/equitable-access-score-card-supporting-policy-processes-achieve>.
- _____. 2019. *The Human Rights to Water and Sanitation in Practice: Findings and Lessons Learned from the Work on Equitable Access to Water and Sanitation under the Protocol on Water and Health in the Pan-European Region*. Geneva, UNECE. <https://unece.org/environment-policy/publications/human-rights-water-and-sanitation-practice-findings-and-lessons>.
- UNECLAC (United Nations Economic Commission for Latin America and the Caribbean). 2022. *Report on the Latin American and Caribbean Regional Process to Accelerate the Achievement of SDG 6 – Regional Inputs for the Mid-Term Review of the International Decade for Action, “Water for Sustainable Development 2018-2028” and the United Nations Water Conference 2023*. UNECLAC. www.cepal.org/sites/default/files/events/files/report_on_the_latin_american_and_caribbean_regional_process_to_accelerate_the_achievement_of_sdg_6.pdf.
- UNEP (United Nations Environment Programme). 2021. *Progress on Integrated Water Resources Management: Tracking SDG 6 Series – Global Indicator 6.5.1 Updates and Acceleration Needs*. Nairobi, UNEP. www.unwater.org/publications/progress-integrated-water-resources-management-2021-update.
- UNESCAP (Economic and Social Commission for Asia and the Pacific). 2018. *Inequality of Opportunity in Asia and the Pacific: Water and Sanitation*. Social Development Policy Papers No. 2018-05. Bangkok, UNESCAP. www.unescap.org/sites/default/files/Water_Sanitation_report_20181122.pdf.
- UNESCWA (United Nations Economic and Social Commission for Western Asia). 2019. *Arab Agriculture and Water Ministers Agree to Join Hands against Impacts of Climate Change, Land Degradation and Water Scarcity*. Press release, Beirut–Cairo, 4 April 2019. www.unescwa.org/news/arab-agriculture-and-water-ministers-agree-join-hands-against-impacts-climate-change-land#:~:text=%EF%BB%BFBeirut%2DCairo%2C%204%20April,regional%20coordination%20mechanisms%20and%20harmonize.
- _____. n.d.a. *Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR)*. UNESCWA website. <https://archive.unescwa.org/climate-change-water-resources-arab-region-riccar>.

- _____. n.d.b. *AWARENET Arab Integrated Water Resources Management Network*. UNESCWA website. www.unescwa.org/awarenet.
- UNESCWA/BGR (United Nations Economic and Social Commission for Western Asia/Bundesanstalt für Geowissenschaften und Rohstoffe). 2013. *Inventory of Shared Water Resources in Western Asia*. Beirut, United Nations. waterinventory.org.
- UNESCWA (United Nations Economic and Social Commission for Western Asia) et al. 2017. *Arab Climate Change Assessment Report – Executive Summary*. Beirut, UNESCWA. https://riccar.org/sites/default/files/2018-07/RICCAR-Executive%20Summary-online_1.pdf.
- United Nations Security Council. 1999. *Resolution 1244 (1999) Adopted by the Security Council at its 4011th Meeting, on 10 June 1999*. S/RES/1244 (1999). <https://digitallibrary.un.org/record/274488>.
- UN-Water/UNESCAP (Economic and Social Commission for Asia and the Pacific). 2022. *Mid-Term Review of the UN Water Action Decade: Input from the Asia Pacific Consultation*. Report Summary. www.unescap.org/sites/default/d8files/event-documents/UNWaterActionDecade%20AP%20consultation_0.pdf.
- US EPA (United States Environmental Protection Agency). n.d. *Facts and Figures about the Great Lakes*. US EPA website. www.epa.gov/greatlakes/facts-and-figures-about-great-lakes.
- Wang, B., Wan, J. and Zhu, Y. 2021. River chief system: An institutional analysis to address watershed governance in China. *Water Policy*, Vol. 23, No. 6, pp. 1435–1444. doi.org/10.2166/wp.2021.113.
- Water Europe. 2019. *Atlas of the EU Water Oriented Living Labs*. Brussels, Water Europe. <https://watereurope.eu/wp-content/uploads/2019/07/Atlas-of-the-EU-Water-Oriented-Living-Labs.pdf>.
- _____. n.d. *Water-Oriented Living Labs*. Water Europe website. <https://watereurope.eu/water-oriented-living-labs/>.
- WHO/UNICEF (World Health Organization/United Nations Children’s Fund). 2021. *Progress on Household Drinking Water, Sanitation and Hygiene 2000–2020: Five Years into the SDGs*. Geneva, WHO/UNICEF. www.who.int/publications/i/item/9789240030848. Licence: CC BY-NC-SA 3.0 IGO.
- World Bank. 2021. *The Dream of Having your Own and Constant Water*. Feature Story, 30 August 2021. World Bank website. www.worldbank.org/en/news/feature/2021/08/26/el-sueno-de-tener-agua-propia-y-constante.
- _____. 2022. *Cooperation in International Waters in Africa (CIWA)*. World Bank website. www.worldbank.org/en/programs/cooperation-in-international-waters-in-africa.
- WWAP (UNESCO World Water Assessment Programme). 2017. *The United Nations World Water Development Report 2017. Wastewater: The Untapped Resource*. Paris, United Nations Educational, Scientific and Cultural Organization (UNESCO). <https://unesdoc.unesco.org/ark:/48223/pf0000247153>.