

How water resources management can support climate-resilient development in Guatemala



ABOUT THIS BRIEF

Water is a ‘climate connector’ – impacts of climate change on water will flow through all sectors of the economy and across national borders. This brief explains why integrated approaches to water management are essential for climate-resilient development, how Guatemala has laid a solid foundation in that sense, and what needs to change if Guatemala is to meet its commitments under the Paris Agreement and achieve the Sustainable Development Goals (SDGs).

SDG target 6.5, on integrated water resources management (IWRM), can make that climate connection. This brief looks at all four dimensions of IWRM, namely the enabling environment, institutions and participation, management instruments, and financing.

RECOMMENDATIONS

Key stakeholder(s)	Recommendation
Ministry of Environment and Natural Resources (MARN)	<p>With the establishment of a Vice-Ministry of Water in MARN in February 2021, a new institutional mechanism exists to coordinate multisectoral efforts towards integrated water resource management (IWRM) at national, sub-national, and regional levels.</p> <ol style="list-style-type: none"> The incoming Vice-Minister and staff of the new Vice-Ministry of Water should champion the passing of the National Water Law, which is pending approval, to formalise IWRM in Guatemala, as well as the Water Policy. The Vice-Ministry will need to ensure the political feasibility of the law and convey to other stakeholders its applicability to water-relevant climate action and enhanced resilience.
Secretariat of Planning and Programming of the Presidency (SEGEPLAN)	SEGEPLAN is the Ministry that has the responsibility of coordinating the implementation of the Sustainable Development Goals (SDGs) in Guatemala, as well as overseeing the implementation of the National Development Plan.
MARN	<ol style="list-style-type: none"> Include SEGEPLAN as a strategic actor in all water-related climate actions proposed at the policy level to support coordination between climate adaptation, the SDGs, and national planning processes.

RECOMMENDATIONS CONTINUED...

Key stakeholder(s)	Recommendation
The National Institute for Seismology, Vulcanology, Meteorology and Hydrology (INSIVUMEH)	<p>A functional hydrometeorological station network is required to collect continuous high-quality climate data. Many hydrometeorological stations have been abandoned due to insufficient funding from the national government. Other stations, while continuing to function, need increased resources for their improved operation and maintenance. Lastly, the network needs to be expanded to ensure that there are as few data gaps as possible.</p> <p>3 Guatemala's network of hydrometeorological stations needs to be systematically assessed, with a focus on prioritising which abandoned stations should be rehabilitated; which stations need improved support for operation and maintenance; and where the network needs to be expanded. INSIVUMEH can lead this, but to do so will require a significant increase in the budget, including investment from non-traditional stakeholders, and strengthened technical capacities.</p>
INSIVUMEH, with support of other Guatemalan institutes (e.g. IARNA)	<p>Quantification of water's contribution to climate resilience in Guatemala is limited by gaps in monitoring infrastructure, knowledge management, and technical capacity at the institutional level. As a result, opportunities to build resilience via managing water are limited.</p> <p>4 Targeted analytical research should be undertaken alongside the use of relevant decision-making tools as means to reduce the economic, social, and environmental impacts of water-related climate risks. INSIVUMEH could lead these efforts, with support and input from other centres of expertise, such as the Institute of Agriculture, Natural Resources and Environment (IARNA) at Rafael Landivar University.</p>
MARN Ministry of Foreign Affairs Water Basin Authorities	<p>Guatemala shares many of its main water sources with its neighbours, making transboundary water resource management a crucial component of water-related climate preparedness. However, arrangements for managing Guatemala's transboundary basins remain scarce.</p> <p>5 Use the lessons learned from the Trifinio transboundary planning processes (with El Salvador and Honduras) on how to generate information regarding transboundary basins to help the future development of equivalent plans and strategies with Guatemala's neighbours for its other shared water sources and incorporate climate change impacts wherever possible.</p>
MARN National Council on Climate Change	<p>The lack of a coherent IWRM financing strategy means that the government scatters limited resources to meet the population's immediate water-related needs in an uncoordinated manner. The resources are primarily used to cover administrative and operational expenses, and drinking water and sanitation, while neglecting IWRM approaches that could yield wider benefits such as lowered disaster risk, ecosystem sustainability, and climate resilience.</p>

RECOMMENDATIONS CONTINUED...

Key stakeholder(s)

Recommendation

- 6 Develop an IWRM financing strategy and ensure coherence with the previously mentioned National Water Law and Water Policy. The financing strategy should leverage non-budgetary resources, including international climate funds, and potential blended financial instruments. The Water Fund for the Metropolitan Region of Guatemala City (FUNCAGUA), and other existing coordination mechanisms, offers a promising example of public-private cooperation to enhance water security in Guatemala.

THE CHALLENGE

Water-related hazards in Guatemala already affect economic growth and worsen the country's high poverty levels. Climate change threatens to exacerbate these hazards, making Guatemala one of the countries predicted to be hardest hit by the impacts of climate change.



Average temperatures in Guatemala are projected to increase by between 2.5°C and 4.1°C by 2050. Average rainfall in Guatemala is projected to reduce by between 9.5% and 12.4% by 2050, but with increased frequency and intensity of extreme rainfall events.^{13, 28}



Under the **Global Climate Risk Index**, Guatemala ranked as the 9th most affected country and one of the most vulnerable to natural disasters for the period 1996–2015.¹⁷



Increasing temperatures and more variable rainfall will worsen water and food insecurity, with increased crop loss and failure and increased food prices.²⁸



One third of Guatemalans depend on degraded natural resources and land with low productivity for their livelihoods, which suffer from over-exploitation of water resources, deforestation, and slash-and-burn agricultural practices.



Guatemala has high levels of poverty and wealth inequality with an overall poverty level of 59%, a rural poverty level of 70%, and a Gini Index of 48.3% (where the wealthiest 20% of the population accounted for over 50% of the country's income share and the poorest 20% accounted for less than 5% of the income).^{9, 29}



Inefficient usage and distribution of water resources exacerbates inequality in access to safe drinking water and sanitation services, increasing the vulnerability of Guatemala's poorer populations to climate hazards such as droughts and flooding.

Under climate change, water availability is projected to decrease by between 5% and 30% by 2050, more intensely so in areas located in the dry corridor, including in areas bordering El Salvador, Honduras, and Mexico.^{13, 28}



The number of Guatemalan migrants stopped at the US border significantly increased during the El Niño-related drought conditions in the Central American Dry Corridor from 2014. Climate-related threats could force more poor, rural families to migrate out of the region.²³



Reduced water availability already affects the energy sector. The 2009 and 2010 heavy droughts associated with El Niño disrupted the functioning of hydropower dams, causing a 34% reduction in hydroelectric generation. Disruption of hydropower causes significant economic impacts in the face of rising energy demand.¹³



In the period between 2010 and 2016, an estimated 2 million people were injured by floods (1.6 million in 2011 and 400,000 in 2015).

- Floods are especially harmful in areas with poor or non-existent urban planning and regions with significant land use changes.
- Flooding also damages crops, reducing agricultural output and food security.
- A 2014 estimate of the economic impact of droughts and floods in Guatemala in the previous decade (2004–2014) was more than US\$1.3 billion.⁹
- According to official statistics from the Government of Guatemala, the hurricanes Eta and Iota caused the equivalent of US\$780 million in loss and damage.³²

The interconnected nature of the water-related climate challenges in Guatemala

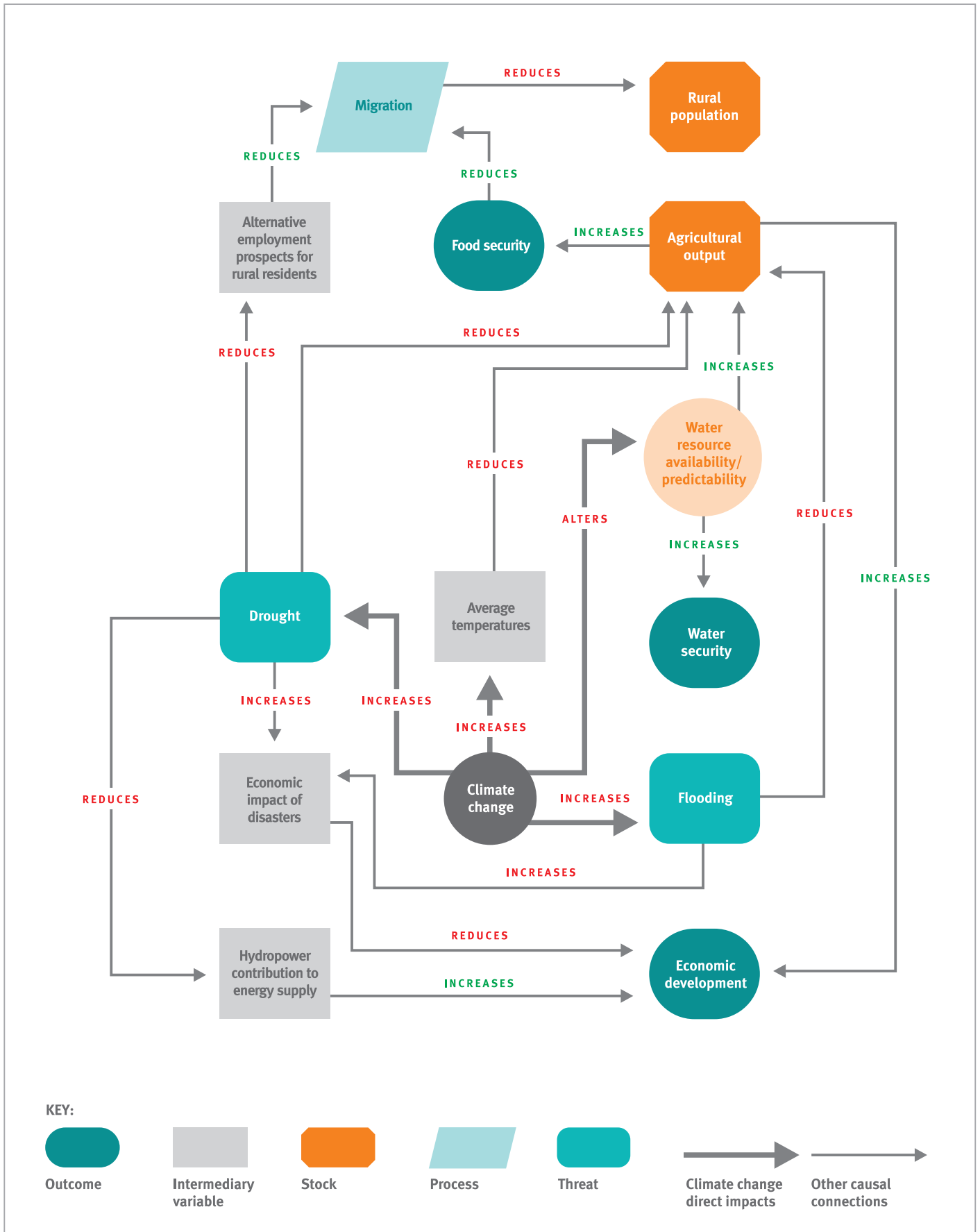
As with the water–energy–food nexus, climate resilience and sustainable development are interconnected. The diagram below maps the relationships between some of the key climate challenges that Guatemala faces, showing why coordinated, integrated, and cross-sectoral responses are required to adapt to the impacts of climate change.

At the centre of the diagram is water resource availability/predictability, which is impacted by climate change (as shown by the words written on the arrows between the variables). The complex relationship between climate change and water availability/predictability is not shown here for reasons of space. The word ‘alters’ is used to describe the fact that climate change can affect water resources via multiple vectors, including via changes in temperature and precipitation, and impact on availability in multiple ways, including via seasonality, changing frequency and intensity of rainfall events, and fluctuating water quality, which affects the increase or decrease in average water availability.

To illustrate the accurate reading of this diagram, two causal chains are described:

- **Causal chain 1:** Climate change impacts agricultural output via multiple vectors. In Guatemala, increasing average temperatures, driven by climate change, are expected to reduce the agricultural output. Decreasing water resource availability/predictability is also expected to negatively impact agricultural output, with negative impacts on both food security and economic development. Decreasing food security drives an increase in migration away from rural areas and out of Guatemala, which will reduce the rural population and increase urban population.
- **Causal chain 2:** Climate change is also increasing the frequency and severity of droughts. Ongoing drought has multiple effects for rural economies, reducing alternative employment prospects for rural residents who have traditionally been smallholder farmers. The fewer the alternative employment prospects, the greater the migration, resulting in the further depopulation of rural areas. Increasing drought also increases the overall economic impact of disasters on Guatemala, which reduces economic development.

THE INTERCONNECTED NATURE OF WATER-RELATED CLIMATE CHALLENGES IN GUATEMALA



ENABLING ENVIRONMENT

What do key policy statements say about integration of water, climate, and other Sustainable Development Goal agendas?

There is overall recognition of the need for IWRM across different sectors to address current climate hazards and future climate risks. However, there is no unified policy to define the pathway. This is exacerbated by the lack of a National Water Law, which is awaiting approval, and a national IWRM plan. The draft National Water Policy, however, does offer a framework to address these issues. Some municipalities, such as those that are part of the Association of Municipalities of the Naranjo River Basin (MANCUERNA), have had better success in addressing IWRM through basin management, but lack national level strategic guidance.

Guatemala's **National Development Plan 2032** recognises that addressing the threat of climate change is crucial for reaching the SDGs, and it includes climate adaptation and mitigation actions. In addition, it proposes the implementation of measures related to sustainable water resource management to achieve social, economic, and environmental objectives, and territorial planning for the sustainable use of natural resources and agricultural production (see **Recommendation 2**).

In terms of climate strategy, Guatemala's **Nationally Determined Contribution (NDC)**, finalised in 2021, recognises water-related climate change impacts and identifies IWRM as one of the priority actions to strengthen adaptation to climate change.³¹ An **Adaptation Plan** exists as part of the **National Climate Change Action Plan (2016)**. This identifies IWRM as a key pillar, with action goals including control of water quality and quantity in river basins, protection of climate vulnerable areas/basins, and establishment of operative instruments in a National Water Law. The **National Policy for Disaster Risk Reduction (2016)** also mentions water resource management to support climate change adaptation; however, implementation is inhibited by gaps elsewhere in the enabling environment, for example weaknesses in the supporting legal framework for flood and drought risk management, especially around water, land, and related resources.¹

POLICY STATEMENTS

SECTOR	KEY POLICY STATEMENTS (INCLUDING LAWS, STRATEGIES, AND PLANS)
Cross-sectoral	<ul style="list-style-type: none"> ■ National Development Plan 2032
Climate change	<ul style="list-style-type: none"> ■ National Adaptation Plan (2017) ■ National Climate Action Plan (2016) ■ Nationally Determined Contribution (2021) ■ Climate Finance Readiness Action Plan
Water	<ul style="list-style-type: none"> ■ (Draft) National Water Policy (2020)
Transboundary	<ul style="list-style-type: none"> ■ General Framework for Guatemala's Foreign Policy (2012–2016) ■ State Policy on International Watercourses (2012) ■ Trifinio-El Salvador-Guatemala-Honduras Local Transboundary 'Shared Waters' Public Policy (2013)
Agriculture	<ul style="list-style-type: none"> ■ Irrigation Development Framework 2013–2023
Energy	<ul style="list-style-type: none"> ■ Energy Policy 2013–2027
Disaster Risk Reduction	<ul style="list-style-type: none"> ■ National Policy for Disaster risk reduction (2016)

On SDG 2, the **Irrigation Development Framework 2013–2023** promotes the modernisation of irrigation systems and aims to improve both irrigation efficiency and sustainability for increased food production. This includes the promotion of modern technologies in water use, incentives to use water efficiently, and development of water regulation and infrastructure for water collection and storage. Goals are intended to benefit 50,000 climate vulnerable families in drought-prone areas. Regarding climate change, following the National Adaptation Plan (NAP), the NAP-Agriculture Programme contributes to its implementation with particular focus on (i) agriculture, livestock, and food security, and (ii) IWRM.

With respect to SDG 7, the **Energy Policy 2013–2027** recognises the need to reduce vulnerability to climate change and promotes proper management of natural resources and the development and use of renewable energy sources. It identifies opportunities in the untapped 85% of potential 6,000 MW of hydropower.

Policy, law, and strategy for water resources have significant gaps in terms of climate change, which prevents IWRM from providing a credible basis for meeting the challenges of climate change. The draft of the **Water Policy**, which is under revision by the Ministry of Environment and the Ministry of Planning:

- recognises IWRM as key to reduce the risks of water-related hazards from climate change
- aims to provide a unified institutional and policy framework
- proposes establishing several new water management instruments (including a registry for water resource users)

A National **Water Law** would then formalise these policy proposals and provide the legislative framework for more integrated regulation, management, and implementation, which could support climate change adaptation (see **Recommendation 1**).⁹

Other important aspects of water management that the National Water Law needs to account for include **groundwater abstraction** and **establishing mechanisms to allocate water** between different users (especially when drought events occur). It is important to note that efforts to produce a National Water Law have been ongoing for many years but have failed to garner sufficient political support to be approved (see **Recommendation 1**). Even if the law is passed, it could not be solely relied on to fix all issues of implementation. With the support of the **Global Water Partnership (GWP)** through the ‘SDG 6 IWRM Support Programme’, the Guatemalan government has developed the document **Strategic Actions** to improve the degree of IWRM implementation in the coming years. Other existing laws that regulate different aspects of water administration need to be further enforced, especially considering the increasing threat of climate change.^{3, 11, 12, 14, 15}

Besides the risk of climate-induced migration, **regional-scale risks** arise from the impacts of climate change on transboundary river basins and aquifers, which connect Guatemala with its neighbours Belize, Honduras, El Salvador, and Mexico (see text box). The **General Framework for Guatemala’s Foreign Policy (2012–2016)** defines the principles and guidelines that serve as a basis for establishing future bilateral treaty negotiations for water resource use with Guatemala’s neighbours. A **State Policy on International Watercourses** was approved in 2012, which established general guidelines for the management of international watercourses and the associated negotiation processes.¹⁰

Despite the above mechanisms, arrangements for managing Guatemala’s transboundary basins remain scarce (see **Recommendation 5**). One exception is the Trifinio area, named after the zone where the countries of Guatemala, Honduras, and El Salvador meet, which contains the Rio Lempa (Upper Lempa River). A treaty supporting the execution of the ‘Plan Trifinio’ was signed in 1997 and was approved by all three states by 1999. A more recent policy further supported transboundary management (**El Salvador-Guatemala-Honduras Local Transboundary ‘Shared Waters’ Public Policy [2013]**) prepared by Plan Trifinio. The lessons learned from the Plan Trifinio could be used to develop equivalent plans and strategies for other shared water sources (see **Recommendation 5**), with the incorporation of climate change impacts being an important and necessary addition.^{10, 11}

The importance of transboundary water management in Guatemala:

- Guatemala shares **25** of its **35** main water sources with its Central and North American neighbours (Mexico, Belize, El Salvador, and Honduras).
- **16** out of the **18** transboundary aquifers in Central America have significant portions of their recharge areas in Guatemalan territory.
- **44.7%** of the Trifinio area (shared between Guatemala, Honduras and El Salvador) is in Guatemala, where it is spread across 15 municipalities.

INSTITUTIONS

Are Guatemala's institutions ready to manage the impacts of climate change on water resources and on other water-related sectors in an integrated way?

A national-level, multisectoral decision-making platform for climate change comprising representatives of different sectors, including water, exists in the form of the National Council on Climate Change (CNCC). However, water-related efforts and responsibilities, including those to address climate change, are scattered across different institutions with different mandates and no central coordinating entity. Leading institutions at the local level, such as the councils, committees, and Water Basin Authorities, lack strategic guidance, funding, and the capacity to implement the few available IWRM plans and to ensure participation of affected communities.

Climate change:

The **Ministry of Environment and Natural Resources (MARN)** leads the implementation of the National Climate Change Programme via a Vice-Ministry on Climate Change. MARN has established the **CNCC**, a national consultation entity involving representatives of government, as well as multiple external stakeholders including indigenous groups, farmworkers' organisations, municipalities, non-governmental organisations, and academia. The CNCC meets every six months to coordinate the country's progress in addressing climate change mitigation and adaptation and is also responsible for oversight of the **National Fund for Climate Change**.⁹

Institutional mechanisms to support disaster risk reduction:

- National Coordination for Disaster Reduction (CONRED) works on risk assessments and coordination of risk management measures.
- Municipalities, Community Development Councils (COCODEs), and other local governments work on prevention, response, and recovery of disasters.
- Other actors, such as fire departments and environmental NGOs, contribute to response actions and raising awareness.

MARN is also the focal point for the **Global Environment Facility (GEF)** and the **Green Climate Fund (GCF)** multilateral mechanisms. There are also several mechanisms for coordination of disaster risk reduction activities.⁸

Water management:

There has historically been a lack of mechanisms for intersectoral coordination on water within the national government, meaning that there was no designated entity in charge of IWRM that could potentially:

- set a national vision
- coordinate government entities' activities related to water
- mediate conflict

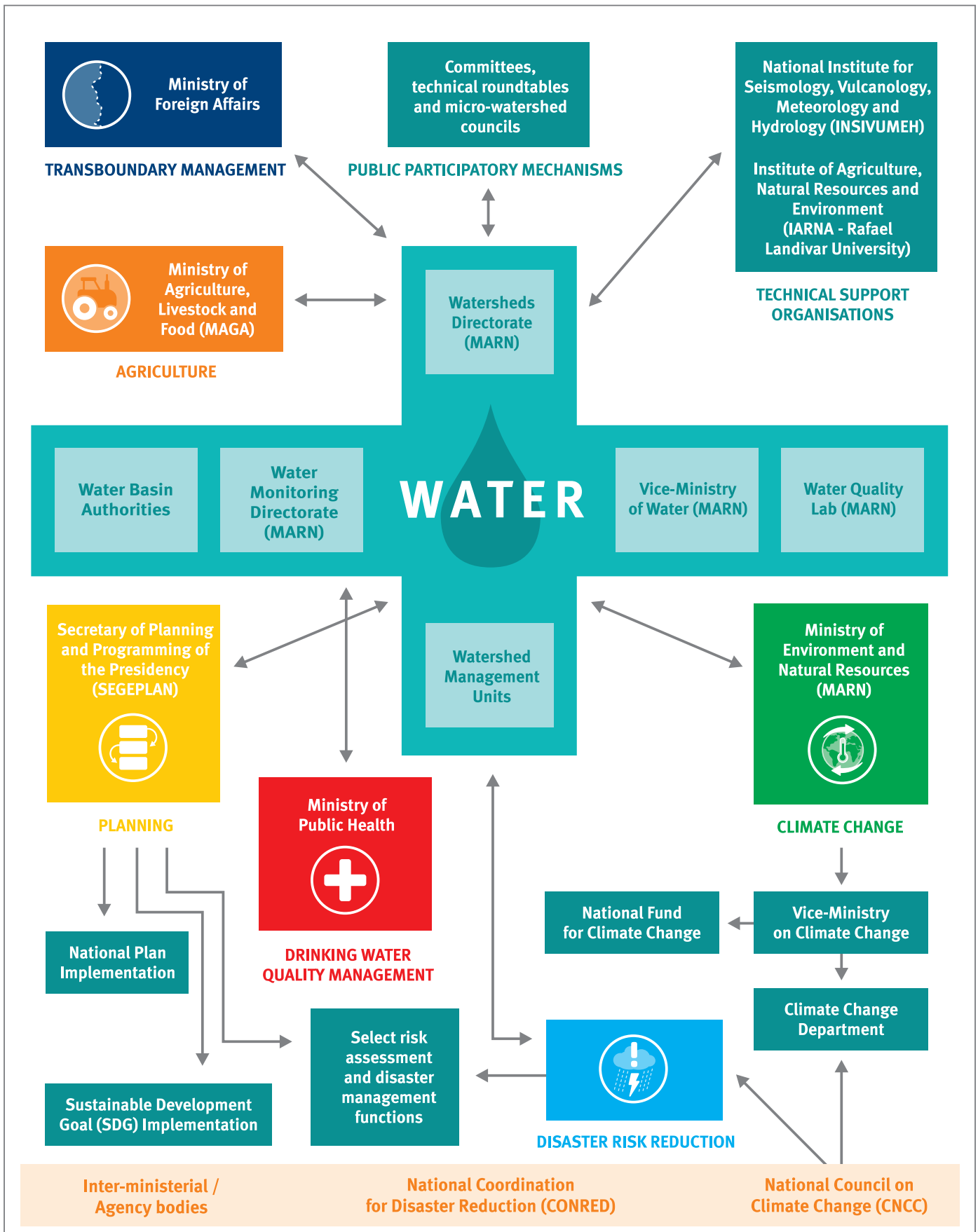
This gap is particularly concerning given that the need for these roles is likely to increase with climate change. In February 2021, a **Vice-Ministry of Water** was established under MARN, which has the potential to fill this gap. Another key function that the Vice-Ministry of Water could play is to create the conditions that could lead to the passing of a National Water Law (see **Recommendation 1**).⁷

Multiple government bodies are involved in other aspects of water management, including:

- **The National Institute of Forests (INAB)**
- **The Ministry of Agriculture, Livestock and Food (MAGA)**
- **The Ministry of Energy and Mines (MEM)**

INAB, MAGA, and MEM have 'Special Watershed Management Units' that deal with floods and droughts in particular, including by providing technical assistance and supplies, and they have overlapping responsibilities. The **municipalities** and the **Ministry of Public Health** have formal responsibilities in drinking water and sanitation services provision and oversight, respectively. The **National Institute for Seismology, Vulcanology, Meteorology and Hydrology (INSIVUMEH)** provides technical support in the form of hydrological and meteorological data (see **Recommendations 3 and 4**). Other organisations provide additional support, including the Institute of Agriculture, Natural Resources and Environment (**IARNA**) at Rafael Landivar University, which produced the 2015 'National Hydrological and Water Balance', which was used in the National Development Plan (2032). Oversight of the National Development Plan lies with the **Secretariat of Planning and Programming of the Presidency (SEGEPLAN)**, which also oversees

GUATEMALA'S INSTITUTIONS RELATED TO WATER AND CLIMATE CHANGE



the implementation of the SDGs in Guatemala in addition to performing select risk assessment and disaster management functions (see diagram and **Recommendation 2**).⁹

Four **Water Basin Authorities** have been established for some of Guatemala's major lake and river systems. These have limited capacities for implementing IWRM and the lack of a National Water Law has made them institutionally weak and susceptible to political influence. A special decree approved in 2021 mandates the establishment of Basin Technical Tables, with the purpose of coordinating actions between relevant stakeholders for the protection and management of basins at national level. In addition, private actors in the energy and agriculture sectors consult with the government on IWRM and provide guidance; however, this often reflects their own interests. Guatemala also has structures to facilitate public participation and localised forms of governance for natural resource management, including community-based water committees, basin technical boards, and micro-watershed councils. However, they lack strategic guidance for any IWRM implementation efforts. The **Ministry of Public Health** oversees drinking water quality, as well as the protection, conservation, and rational use of drinking water sources.^{26, 10, 9}

At the **transboundary level**, there are Boundary Commissions of Water between Guatemala and Mexico, and between Guatemala and Honduras, coordinated by

Guatemalan basins with Water Basin Authorities:

1. Lake Atitlán Basin
2. Lake Izabal and Río Dulce basins
3. Lake Petén Itzá Basin
4. Amatitlán Lake Basin.

the Ministries of Foreign Affairs. As noted above, the lack of arrangements for managing Guatemala's transboundary basins needs to be addressed (see **Recommendation 5**).

Meanwhile the energy sector, including the hydropower sector, is privatised but under the authority of the **Ministry of Energy and Mines (MEM)** and regulated by the **National Electricity Commission (CNEE)**, which is responsible for creating and enforcing energy regulations, and the **Wholesale Market Authority (AMM)**. Courts have found that consultations with indigenous peoples are often not carried out during planning of new hydropower plants. These communities are often highly climate vulnerable and living below the poverty line. Overall, this is due to the lack of national regulation for implementing the international Indigenous and Tribal Peoples Convention, which has led to the delay or suspension of hydropower investments.^{3, 19}

MANAGEMENT INSTRUMENTS

Are management decisions on water and other Sustainable Development Goal issues being guided by evidence of climate change?

The low availability, reliability, and quality of data on river levels and flows, water quality, and aquifers limits the generation of useable scientific information on climate change's impacts on water. Gaps in institutional capacity for water resources management, including for implementing existing management instruments like basin-level IWRM plans, limit the actual use of available information.

The provision of reliable evidence on water to support climate action is, firstly, limited by gaps in monitoring infrastructure, knowledge management, and technical capacity at the institutional level. INSIVUMEH manages the hydrometeorological networks, collecting hydrological and meteorological data, and conducts mapping and modelling using the data (see **Recommendation 4**). However, operation of the 68 hydrological stations is irregular and variable due to budgetary constraints, especially for operation and maintenance, leading to negative impacts on data quality. The Climate Change

Department (within the Vice-Ministry on Climate Change) also has a network of stations along the Pacific coast. Additional data from the National Electrification Institute (INDE), responsible for hydropower development, is restricted to rivers with hydroelectric potential and the upper part of watersheds. Meteorological stations are too dispersed, which affects the robustness of data, and the stations often only collect temperature and rainfall data (see **Recommendation 3**).¹¹

When it comes to the *use* of evidence, the ‘Special Watershed Management Units’ embedded in INAB, MAGA, and MARN, reportedly access and use the data from INSIVUMEH, but the ministries’ overlapping functions lead to duplication of efforts. INSIVUMEH’s technical capacity, for example to conduct flood mapping and modelling to understand flood behaviour of flood-prone rivers, is also reported to be low.^{16, 11}

Instruments and plans to guide decision-making on water- and, potentially, climate-related information do exist. There are **basin authorities** for four lakes/river basins; however, institutional and financial capacities to both implement plans and integrate climate change risks are low. In addition, there are no aquifer management plans or instruments in Guatemala, despite groundwater being the main source of supply in some areas, including Guatemala City. However, a compensation scheme for financing water management actions and a draft law for a Watershed Management Authority have been developed for the Xayá and Pixcayá sub-basins, which provide

around one third of Guatemala City’s water supply. Success factors, which provide a basis for learning and upscaling, include a bottom-up participatory approach and the integration of different stakeholder interests, as well as availability of sufficient and appropriate technical water and climate data to understand climate risks.^{7, 9}

Other initiatives of note include the **Research Agenda for Climate Change** developed by the Guatemalan System of Climate Change Sciences (SGCCC). This recognised the need to strengthen the National Climate Change Information System (which is within MARN’s Unit of Environmental Information), and capacities to characterise, quantify, and assess (i) the natural wealth of the country and its dynamics; (ii) the climate change impacts and effects; and (iii) the intersecting risks and opportunities of climate change to the environment, the economy, and society. At the regional level, technical dialogues of the **Conference of Ibero-American Water Directors** (CODIA) involving 22 countries in Latin America and Europe have enabled IWRM experience sharing and the development of technical instruments around the theme of ‘Planning for the implementation and monitoring of SDG 6 and measures for adaptation to climate change’. As well as the regional analysis prepared in 2021 by GWP, the Central American Commission for Environment and Development (CCAD), and the United Nations Environment Programme (UNEP) on the level of implementation of IWRM, which proposes regional strategies to overcome the challenges, including improved coordination between the water and climate agendas (see **Recommendation 5**).^{13, 5}

FINANCES

How ready is Guatemala to finance water-related climate action?

Guatemala, despite technical and financial support from international institutions, has accessed little international climate finance dedicated to IWRM, or water more generally. Barriers, which the water community needs to tackle with others, include challenges in gaining accreditation with the multilateral climate funds, such as the GCF, low national and local government capacity for executing investments, and the systemic challenge of corruption. Other water-specific challenges include the lack of a National Water Law, financial strategy, or a single coordinating entity for IWRM to provide a clear national direction and an investment pipeline.

The NDC update in 2021 included specific objectives for IWRM and the establishment of early warning systems in its adaptation targets. Although these actions will contribute to the leverage of financial resources in the future, the cost of inaction is clear, with losses from hydrological and climatological events alone totalling US\$285 million from 2013 to 2018¹⁸ and around US\$780 million during the recent hurricanes Eta and Iota in 2021.⁽³²⁾

International financial flows for climate change from 2010 to 2015 amounted to US\$338.38 million, but of this only 1.4% was allocated to the water sector. Guatemala has been preparing to scale up its access to international climate finance via the **multilateral climate funds**. Within this, the most prominent water project with a strong climate change dimension is ‘Building livelihood resilience to climate change in the upper basins of Guatemala’s highlands’, approved in 2018 and implemented by the International Union for Conservation of Nature (IUCN) and MARN. However, Guatemala’s overall access to international climate funds remains constrained by the country’s lack of an accredited Direct Access Entity to the GCF. While MARN is the current National Designated Authority (NDA), all four of the currently approved GCF projects are led by international accredited agencies based outside of Guatemala, such as the IUCN.⁶

The **National Fund for Climate Change**, overseen by the National Council for Climate Change, will manage national and international funding with the aim of allocating 80% of funds for adaptation and 20% for mitigation initiatives from 2018 onwards. However, it is still not known what the water priorities are within the fund. Other more localised initiatives include the Water Fund for the Metropolitan Region of Guatemala City (FUNCAGUA), which, although only in its infancy, is a promising example of a public–private cooperation and governance scheme to enhance water security for Guatemala City.

Regarding domestic finance, little **national government budget** appears to be allocated to support the implementation of IWRM. Stakeholders agree there is not enough to finance water resource management although the financing gap is not known, precisely. For **decentralised budgets**, in theory, the inclusive and participatory budgeting processes through Municipal Development Councils (COMUDEs) provides a platform to influence their allocation, but there are no criteria or mechanisms to prioritise IWRM.^{11,7}

Corruption is also a significant issue in Guatemala, and is a systemic problem that affects all aspects of governance, including the management of climate financing. Guatemala scored in the lowest quintile (20%) on Transparency International’s 2020 Corruption Perception Index (CPI), ranking 149 out of 179 countries. The country declined in the CPI rankings between 2012 and 2020, dropping 8 points, demonstrating that the public perception is that corruption is getting worse,

rather than improving. Another Transparency International report, the *2019 Global Corruption Barometer: Latin America and The Caribbean*, reported on representative polls that showed that 90% of Guatemalans think that corruption is a big problem and have ‘little to no trust’ in key institutions (including government, the courts, and the police). A water-related example of this is that the ex-Vice President was jailed for embezzlement of funds for the decontamination of Amatitlán Lake.³⁰ From the climate financing perspective, the perception of corruption is likely to inhibit Guatemala’s ability to access multilateral and bilateral climate finance.^{25,24,20,4}

In addition to the broader challenges of readiness to access multilateral climate funds and corruption, as mentioned above, there are other **specific barriers in the water sector** to attracting and utilising both international and domestic funding. These are not specific to climate-related expenditure, but they do inhibit water sector investments from playing a full role in tackling climate change.

Firstly, stakeholders recognise the urgent need and opportunity to develop a financing strategy for IWRM. This gap – along with the lack of a legal framework, institutional coordinating entity, and budgetary information structure for the water sector – means the government focuses its limited resources to meet the population’s water-related needs, mainly covering administrative and operational expenses, and drinking water and sanitation, while other aspects of IWRM are neglected. A financing strategy and National Water Law could also help to leverage additional finance (see **Recommendation 6**). Agriculture insurance in Guatemala provides a precedent: the agriculture insurance market in 2013 blossomed from the development of an **integrated disaster risk financing and insurance strategy** by the Ministry of Finance, with technical assistance designed to reduce Guatemala’s fiscal vulnerability to natural disasters.⁸

Secondly, revenues from fees, rates, or specific taxes and charges to water users are insignificant at the country or even the municipal level, meaning there is little or no cost recovery to take the burden off taxpayers or foreign aid. Previous attempts to increase water tariffs have met with protests and they generally end up not being enacted.¹¹

Thirdly, and very much related to the previous point, municipal capacity to efficiently use the scarce budgetary resources for their water resources management functions is low. This is also related to a wider problem reflecting slow progress in fiscal decentralisation: the budget allocated to municipalities to carry out all their activities, including payroll, infrastructure development, and social programmes, equates to less than 1% of the national GDP.¹¹

REFERENCES

- 1 Guinea Barrientos, H.E. and Swain, A. (2015) Linking Flood Management to Integrated Water Resource Management in Guatemala: A Critical Review. *International Journal of Water Governance*, **4**: 53–74.
- 2 Bou Nassar, J.A., Malard, J.J., Adamowski J.F., Ramírez, M., Medema, W. and Tuy, H. (2020) Multi-Level Storylines for Participatory Sociohydrological Modelling – Involving Marginalized Communities in Tz’olöj Ya, Mayan Guatemala. *Hydrology and Earth System Sciences*. Available at: <https://doi.org/10.5194/hess-2020-437>
- 3 Briz, R., Volpicella, K. and Gramajo, J.P. (2020) Environmental law and practice in Guatemala: overview. Available at: [https://uk.practicallaw.thomsonreuters.com/w-013-2794?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/w-013-2794?transitionType=Default&contextData=(sc.Default)&firstPage=true)
- 4 Chêne, M. (2014) *Corruption Risks and Mitigating Approaches in Climate Finance*. U4 Expert Answer by Transparency International, for the U4 Anti-Corruption Resource Centre. 21 January 2014. [Spanish]. Available at: <https://www.u4.no/publications/corruption-risks-and-mitigating-approaches-in-climate-finance>
- 5 CODIA website – of *Conferencia de Directores Iberoamericanos de Aguas*. Available at: <https://codia.info/>
- 6 Coyoy, E. and Torselli, C. (2016) *Guatemala: informe de financiamiento nacional e internacional para cambio climático*. Available at: <https://doi.org/10.13140/RG.2.1.1202.5205>
- 7 DHI IWRM Portal, SDG6.5 Questionnaire results – “Guatemala” – Accessed 19th October 2019. Available at: <http://iwrmdataportal.unepdhi.org/>
- 8 Global Facility for Disaster Risk Reduction (GFDRR) (2011) *Vulnerability, Risk Reduction, and Adaptation to Climate Change: Guatemala*. Climate Risk and Adaptation Country Profile (April 2011). Available at: <https://www.gfdr.org/en/publication/climate-risk-and-adaptation-country-profile-guatemala>
- 9 Green Climate Fund (GCF) Funding Proposal (2018) *FP087: Building livelihood resilience to climate change in the upper basins of Guatemala’s highlands*. Proposal by the International Union for Conservation of Nature (IUCN) November 2018. Available at: <https://www.greenclimate.fund/project/fp087>
- 10 Global Water Partnership (GWP) (2016) *Integrated Water Resources Management in Central America: The Over-Riding Challenge of Managing Transboundary Waters*. Available at: https://www.gwp.org/globalassets/global/toolbox/publications/technical-focus-papers/tfp_central_america.pdf
- 11 Global Water Partnership. SDG 6.5 Workshop summary note. Available at: https://www.unwater.org/sites/default/files/app/uploads/2018/11/SDG6_Indicator_Report_651_Progress-on-Integrated-Water-Resources-Management_ENGLISH_2018.pdf
- 12 Government of Guatemala (1996) *General law of electricity*. [Spanish]. Available at: <http://www.mem.gob.gt/wp-content/uploads/2012/05/Reglamento-de-LGE.pdf>
- 13 Government of Guatemala (2016) *National Communications*. Submission by the Government of Guatemala to the UNFCCC.
- 14 Government of Guatemala, National Coordination for Disaster Reduction (CONRED). Available at: <https://conred.gob.gt/>
- 15 Government of Guatemala Ministry of Energy and Mines (2001) *Mining law and its regulation Guatemala*. Available at: https://www.mem.gob.gt/wp-content/uploads/2015/06/2._Mining_Law_and_its_Regulation.pdf
- 16 Guinea Barrientos, H.E. and Swain, A. (2014) Linking Flood Management to Integrated Water Resource Management in Guatemala: A Critical Review. *International Journal of Water Governance*, **4**: 53–74.
- 17 Kreft, S., Eckstein, D. and Melchior, I. (2017) *Global Climate Risk Index 2017: Who Suffers Most From Extreme Weather Events? Weather-Related Loss Events in 2015 and 1996 to 2015*. Germanwatch. Available at: <https://www.germanwatch.org/en/cri>
- 18 NatCatService – 2018 values in US\$. Available at: <https://www.munichre.com/en/solutions/for-industry-clients/natcatservice.html>
- 19 Ortega, R.P. and Briz, R. (2020) *Electricity regulation in Guatemala: overview*. Available at: [https://uk.practicallaw.thomsonreuters.com/w-009-9340?transitionType=Default&contextData=\(sc.Default\)](https://uk.practicallaw.thomsonreuters.com/w-009-9340?transitionType=Default&contextData=(sc.Default))
- 20 Pring, C. and Vrush, J. (2019) *Global Corruption Barometer (Latin America & The Caribbean) 2019: Citizens’ Views and Experiences of Corruption*. Transparency International.
- 21 Sadoff, C. and Muller, M. (2009) *Water Management, Water Security and Climate Change Adaptation: Early Impacts and Essential Responses*. Global Water Partnership TEC Background Paper No. 14.
- 22 Singh, C., Bazaz, A., Ley, D., Ford, J. and Revi, A. (2020) Assessing the Feasibility of Climate Change Adaptation Options in the Water Sector: Examples from Rural and Urban Landscapes. *Water Security*, **11**(November): 100071.

²³ Steffens, G. (2018) Changing climate forces desperate Guatemalans to migrate. *National Geographic*. Published online 23 October 2018. Accessed 15 August 2019. Available at: <https://www.nationalgeographic.com/environment/2018/10/drought-climate-change-force-guatemalans-migrate-to-us/>

²⁴ Transparency International (2020) *Corruption Perception Index 2019*. Available at: https://images.transparencycdn.org/images/2019_CPI_Report_EN_200331_141425.pdf

²⁵ Transparency International (2021) *Corruption Perception Index 2020*. Available at: www.transparency.org/cpi

²⁶ Royal Dutch Embassy San Jose (2016) Guatemala: An Assessment of Business Development Opportunities in the Water Sector.

²⁷ UNESCO IHP (2016) *Governance of Groundwater Resources in Transboundary Aquifers (GGRETA) Project: Main Achievements and Key Findings*. Report prepared by the International Hydrological Programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO IHP), Paris, France. Available at: <https://www.un-igrac.org/case-study/trifinio-aquifer>

²⁸ USAID (2017) *Climate risk profile: Guatemala*. Adaptation Thought Leadership and Assessments (ATLAS), funded by United States Agency for International Development (USAID). Available at: <https://www.climate-links.org/resources/climate-change-risk-profile-guatemala>.

²⁹ World Bank (2020) World Bank Data (online interface) for Guatemala. Accessed 20 December 2020. Available at: <https://data.worldbank.org/indicator/SI.POV.GINI?locations=GT>

³⁰ BBC News (2018) Guatemala ex-VP Roxana Baldetti jailed in “Magic Water” scandal. 10 October. Available at: <https://www.bbc.com/news/world-latin-america-45806524>

³¹ Gobierno de Guatemala (2022) *Contribución nacionalmente determinada Guatemala 2021*. [Spanish]. Available at: <https://unfccc.int/sites/default/files/NDC/2022-06/Contribuci%C3%B3n%20Nacionalmente%20Determinada%20Guatemala.pdf>

³² CEPAL (2021) Evaluación de los efectos e impactos de las depresiones tropicales Eta y Iota en Guatemala. [Spanish]. Available at: <https://www.cepal.org/es/publicaciones/46681-evaluacion-efectos-impactos-depresiones-tropicales-eta-iota-guatemala>

ABOUT THIS PUBLICATION

This Country Brief is one of a series of 15 publications that explores how integrated water resources management at a country level contributes to climate resilience and sustainable development, as well as meeting the commitments under the Paris Agreement and achieving the Sustainable Development Goals (SDGs).

The full synthesis report, *The Untold Story of Water in Climate Adaptation. Part II. 15 Countries Speak*, of the work undertaken in all 15 countries is available at www.gwp.org.

1	Bangladesh	9	Jordan
2	Cameroon	10	Kazakhstan
3	Chile	11	Kenya
4	China	12	Mauritania
5	Ghana	13	North Macedonia
6	Grenada	14	Tunisia
7	Guatemala	15	Ukraine
8	Indonesia		