

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



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 Cameroon has laid a solid foundation in that sense, and what needs to change if Cameroon 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 Water and Energy (MINEE)	Water needs to play a stronger role as an enabler of climate-resilient development in Cameroon, but important strategic frameworks are still being finalised and/or operationalised.
Ministry of the Environment, Nature Protection and Sustainable Development (MINEPDED)	<ol style="list-style-type: none"> The strategic framework for IWRM – including PANGIRE, the new water policy, and a revised water law – should be finalised, and fully operationalised, with climate change (and its implications) incorporated into these water mechanisms. This would increase Cameroon’s climate resilience.
MINEPDED and the National Climate Change Observatory (ONACC)	Ensuring that synergies between climate change, development and water-related outcomes are spotted early and are maximised requires cross-sectoral coordination and broad stakeholder inclusivity.
MINEE Other sectoral ministries	<ol style="list-style-type: none"> Flexible coordination platforms for climate and water, which incorporate an array of stakeholder interests, should be invested in to enable information sharing, enhanced participation in decision-making, and coordination amongst diverse interests. Existing platforms, such as ONACC, should be used for these purposes before new platforms are developed.

RECOMMENDATIONS CONTINUED...

Key stakeholder(s)	Recommendation
<p>Directorate of Civil Protection</p> <p>MINEE</p> <p>MINEPDED</p>	<p>Although there is a central coordinating agency for disaster risk reduction (DRR) – namely, the Directorate of Civil Protection – comprehensive DRR policies and plans for Cameroon are missing.</p> <p>3 Guidelines that have been developed should be built on to mainstream climate change and DRR into development planning, with the goal of creating a coherent and comprehensive policy framework for DRR in Cameroon.</p>
<p>Ministry of Transport (MINTRANSPORT)</p> <p>National Meteorology Directorate (DMN)</p> <p>ONACC</p> <p>MINEE</p> <p>Ministry of Scientific Research and Innovation (MINRESI)</p> <p>International partners</p>	<p>Better water-related data and observation systems are needed to guide climate resilience and water resources management planning.</p> <p>4 Cameroon should implement its plans to improve observation, information management and early warning systems, including by addressing degraded hydrological monitoring capacity.</p>
<p>MINEE</p> <p>MINEPDED</p> <p>Electricity Development Corporation</p>	<p>The impacts of climate change on water resource availability and reliability could threaten the viability of existing and proposed hydropower stations.</p> <p>5 MINEE should advocate for an understanding of hydropower and energy generation within the context of the climate–water–energy nexus, including analysing how changes in water resource availability and reliability could threaten hydropower in operational terms (for example, climate-proofing design criteria or location).</p>
<p>MINEPDED</p> <p>Ministry of Economy, Planning and Regional Development</p> <p>Sectoral ministries including the Ministry of Agriculture and Rural Development, MINEE, MINRESI and MINTRANSPORT</p> <p>International partners</p>	<p>Access to climate-specific funds is low and the scale, coherence, and impact of climate-related investment in the water sector is limited.</p> <p>6 The draft National Climate Change Adaptation Investment Plan (PNIACC) should be built on to improve the overall investment strategy, and a coherent pipeline of fundable projects (which could form part of preparations for the future Nationally Determined Contribution (NDC) cycles) should be developed.</p> <p>7 Key bottlenecks in attracting climate finance should be tackled by improving intersectoral coordination and skills in proposal development and funding pipeline management.</p> <p>8 Tracking of climate finance from all sources should be improved to support the implementation of the National Adaptation Plan to Climate Change (NAPCC) and enable the government to monitor and coordinate climate finance in support of different development objectives.</p>

THE CHALLENGE

Cameroon's economy and its population are highly susceptible to climate variability, climate change, and extreme events, all of which threaten its ability to develop as an emerging country.



Between 1990 and 2014, the Cameroonian Emergency Events Database recorded that floods accounted for 77% of all natural hazards (followed by drought and landslides).

In 2012, Cameroon was hit by its worst flood in 60 years, which resulted in more than 3,000 people being hospitalised and more than 60,000 displaced; public services were disrupted throughout the affected north and far-northern regions of Cameroon, with extensive damage to property and infrastructure.

Coastal areas, especially around the economic capital and largest city Douala, are particularly vulnerable to the combined effects of flooding and sea-level rise.



Infrastructure is recognised to be central to economic growth in Cameroon, but is highly vulnerable to floods, landslides, and erosion exacerbated by climate change.

Hydrological variability (affecting rainfall, runoff, and yield) is predicted under most climate change simulation models to continue to grow, with heavier precipitation alternating with a dry season of six to seven months and sporadic but significant droughts and floods.

Other direct impacts of variable rainfall and drought include lower soil fertility, destruction of crops, and the spread of water-related diseases (e.g. cholera) among the farming population.



Agriculture is central to Cameroon's economy. It provides around 16% of the country's GDP and accounts for about 75% of its annual water use, with more than 60% of the labour force either formally or informally employed in the agricultural sector. The majority of the informal agricultural labour force lives below the national poverty line.

The combination of reduced and more variable rainfall and an increased risk of floods and drought threatens the agricultural sector's contribution to economic growth and employment, and jeopardises ongoing efforts to reduce poverty.



Cameroon has the second greatest hydropower potential in Africa (after the Democratic Republic of Congo), but only about 5% of this hydropower potential is currently harnessed.

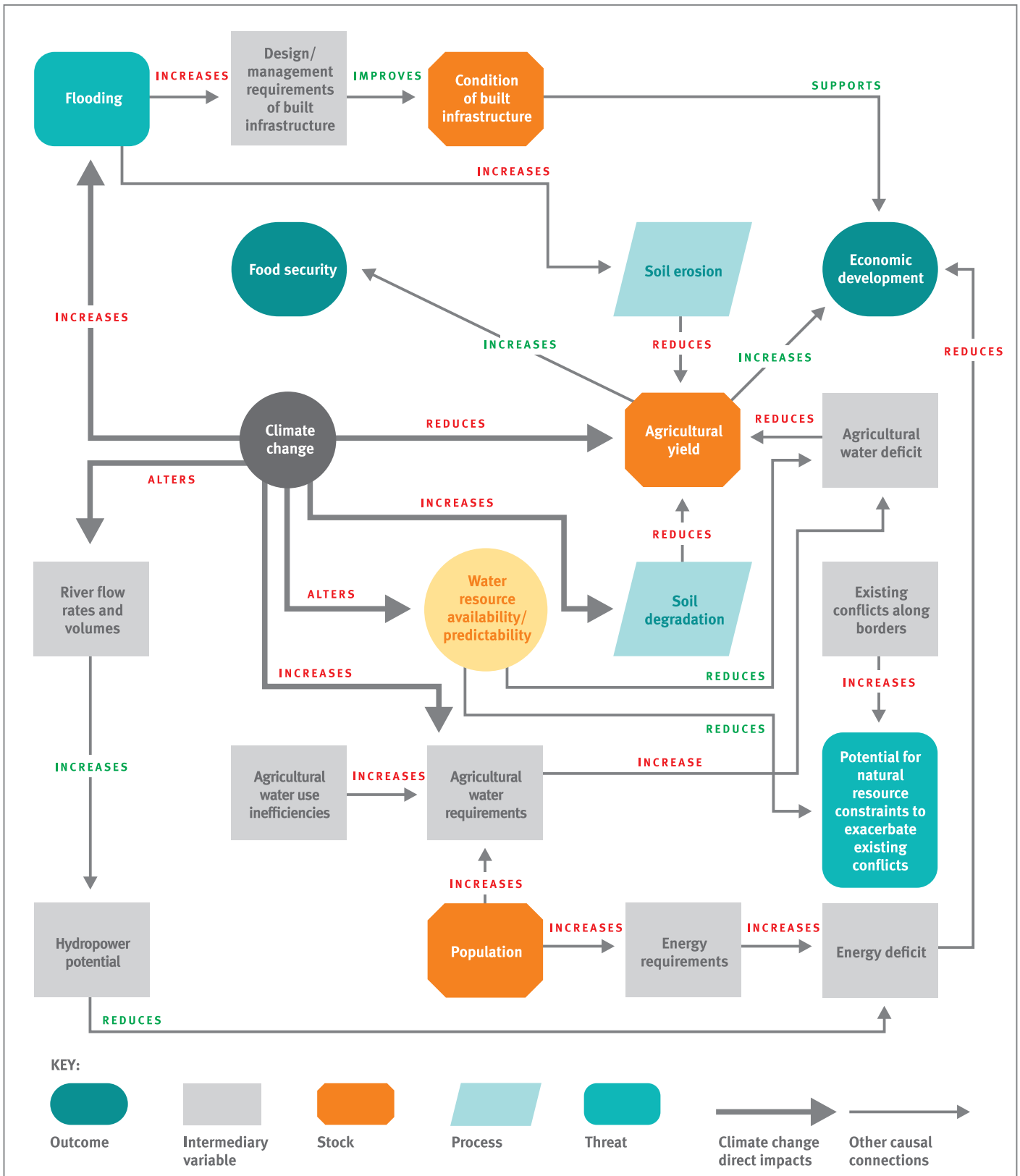
Increased hydrological variability will likely decrease the reliability of river flow, decreasing the assurance of supply to the existing hydropower stations and threatening the viability of the many new hydropower projects in the pipeline.



Climate change will intersect with multiple existing challenges, including growing demands for water driven by growth in agricultural and domestic needs and the worsening conflict and refugee crisis in the Lake Chad Basin and along the Nigerian border.

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 Cameroon faces, showing why coordinated, integrated, and cross-sectoral responses are required to adapt to the impacts of climate change.

THE INTERCONNECTED NATURE OF WATER-RELATED CLIMATE CHALLENGES IN CAMEROON



The interconnected nature of these challenges

As with the water–energy–food nexus, climate resilience and sustainable development are interconnected. The diagram maps the relationships between some of the key climate challenges facing Cameroon, 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.

In order to facilitate the accurate reading of this diagram, the following description will describe two causal chains. The relationship between water resource availability/predictability and agricultural water deficit is inverse: an increase in water availability/

predictability will generally reduce the agricultural water deficit (defined as the gap between the demand for agricultural water, expressed in the diagram as agricultural water requirements, and the water available for agriculture). The impacts of climate change in Cameroon are expected to mostly alter water resource availability/predictability in negative ways, which will then increase the agricultural water deficit. An increasing deficit will reduce the agricultural yield, with associated decrease in both food security and economic development.

Climate change is also increasing flooding in Cameroon, which is increasing the design/management requirements of built infrastructure. An increase in these requirements should improve the condition of built infrastructure, supporting economic development. Flooding also increases soil erosion, which reduces agricultural yield, which further reduces food security and negatively impacts upon economic development. The remainder of the diagram can be read in the same way.

ENABLING ENVIRONMENT

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

WATER RESOURCES MANAGEMENT IN CAMEROON

Cameroon has progressed in developing key strategies for climate change action in general, and adaptation in particular, setting out a clear role for water resources management. The contribution of water resources management to climate change adaptation is also clear in the country’s agriculture sector strategies, though less clearly stated in strategic infrastructure strategies (such as the roads strategy). In summary, the policy, strategic and legislative framework for water has many gaps – key documents are in most cases under preparation but await finalisation and/or review.

Cross-sectoral policy

The long-term development plan, Vision 2035 recognises climate change and water-related hazards, including drought, rainfall extremes and desertification, as major threats to the economy. While the Growth and Employment Strategy barely mentions climate change, addressing climate change impacts is set to be a major focus of the 2020–2027 Strategy. Industrial development in the country is laid out until 2050 in the Industrialisation Master Plan, which has three pillars (food, energy, and digital industries) and a key focus on infrastructure. High-level recognitions of the interconnections between industrial development and environmental protection are detailed in the National Development Strategy (NDS) 2020–2030. The section on the transformation of the economy in the NDS includes a component on ‘environment and nature protection’ for the purposes of controlling the impact of Cameroon’s industrialisation on the environment and for guarding against the visible consequences of climate change.

Climate strategy

Cameroon’s 2015 NDC includes a dedicated sectoral water programme, with water additionally mentioned in the programmes for agriculture and industry and in the cross-cutting programme on hydro-meteorological data. The National Adaptation Plan (PNACC) provides further detail on the adaptation projects and programmes mentioned in the NDC. A draft national climate change adaptation investment action plan (PNIACC) has been developed to support the PNACC but needs further detail in order to turn costings into a pipeline of fundable investments (see **Recommendations 6 and 7**).

Water strategy and policy

Cameroon’s water strategy and policy landscape is in a similar position: there has been a good start in terms of plans but many difficulties in moving to implementation. The PNACC includes a measure to integrate climate change into the *Plan d’Action National de Gestion Intégrée des Ressources en Eau* (PANGIRE) – the national IWRM action plan – and a baseline study on climate change has been completed. The formal adoption and implementation of key water plans and strategies is where many obstacles lie: both PANGIRE and the National Water Policy are awaiting adoption and an important law governing the country’s water regime (Law 98/005) is currently under revision (see **Recommendation 1**).

POLICY STATEMENTS

SECTOR	KEY POLICY STATEMENTS (INCLUDING LAWS, STRATEGIES, AND PLANS)
Cross-sectoral	<ul style="list-style-type: none"> ■ Vision 2035 (2009) ■ Growth and Employment Strategy (2010–2020) ■ Industrialisation Master Plan ■ National Development Strategy (2020–2030)
Climate change	<ul style="list-style-type: none"> ■ National Adaptation Plan ■ Draft National Climate Change Adaptation Investment Action Plan ■ Nationally Determined Contribution (2020)
Water	<ul style="list-style-type: none"> ■ Baseline study of water sector in Cameroon ■ National Water Policy ■ Water Law 98/005
Agriculture	<ul style="list-style-type: none"> ■ Rural Development Strategy ■ National Agricultural Investment Plan (2014–2020)
Energy	<ul style="list-style-type: none"> ■ Energy Sector Development Plan 2030

With regard to transboundary issues, Cameroon's national development strategies recognise that water acts as a 'climate connector' to its neighbours, via climate change impacts on shared rivers, lakes, and aquifers. Transboundary water and climate change initiatives are also identified as a priority for Phase II (2020–2027) of Vision 2035, as part of the axis 'Intensify the fight against climate change'. Cameroon is also initiating steps to sign the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

The enabling environment for disaster risk reduction (DRR) is constrained by a lack of comprehensive DRR policies and plans at both national and sub-national scales. National guidelines have been developed to mainstream climate change and disaster risk management into development planning, but these guidelines remain ineffective in the absence of established regulatory frameworks (see **Recommendation 3**).

Agriculture and rural development

Agriculture and rural development strategies in Cameroon go beyond acknowledging climate change as a challenge: they also identify improved water management as part of the needed response. The National Agriculture Investment Plan (PNIA, 2014–2020) includes "the protection of rivers and watersheds" as part of its sub-objective on sustainable natural resource use; the PNIA also states that climate change will be mainstreamed. Participatory water management through basin agencies is also mentioned as a climate change adaptation response within the overarching Rural Development Strategy. In support of these initiatives, the Prime Minister of Cameroon's speech on the 2019 Fiscal Year Programme promised a focus on water management to mitigate the effects of climate change in agriculture. Agricultural water conservation and water demand management is a form of climate change adaptation that could be deployed to upgrade the country's traditional irrigation systems (which is particularly required in the dryer Sudano-Saharan northern region of Cameroon).

INSTITUTIONS

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

INSTITUTIONAL INTEGRATION IN CAMEROON

Coordination and cooperation exist among institutions responsible for climate change and water, and other areas including agriculture, if not the major infrastructure sectors such as roads. But it is still too often on an ad hoc basis and mostly only at a technical level. Cross-sectoral platforms for integrated management of climate change challenges exist but are not functioning well. On the plus side, there is widespread recognition of the importance of integrated water resources management for managing the challenges of climate change, and Cameroon is actively engaging with its neighbours to tackle water-related climate risks in transboundary lake and river basins.

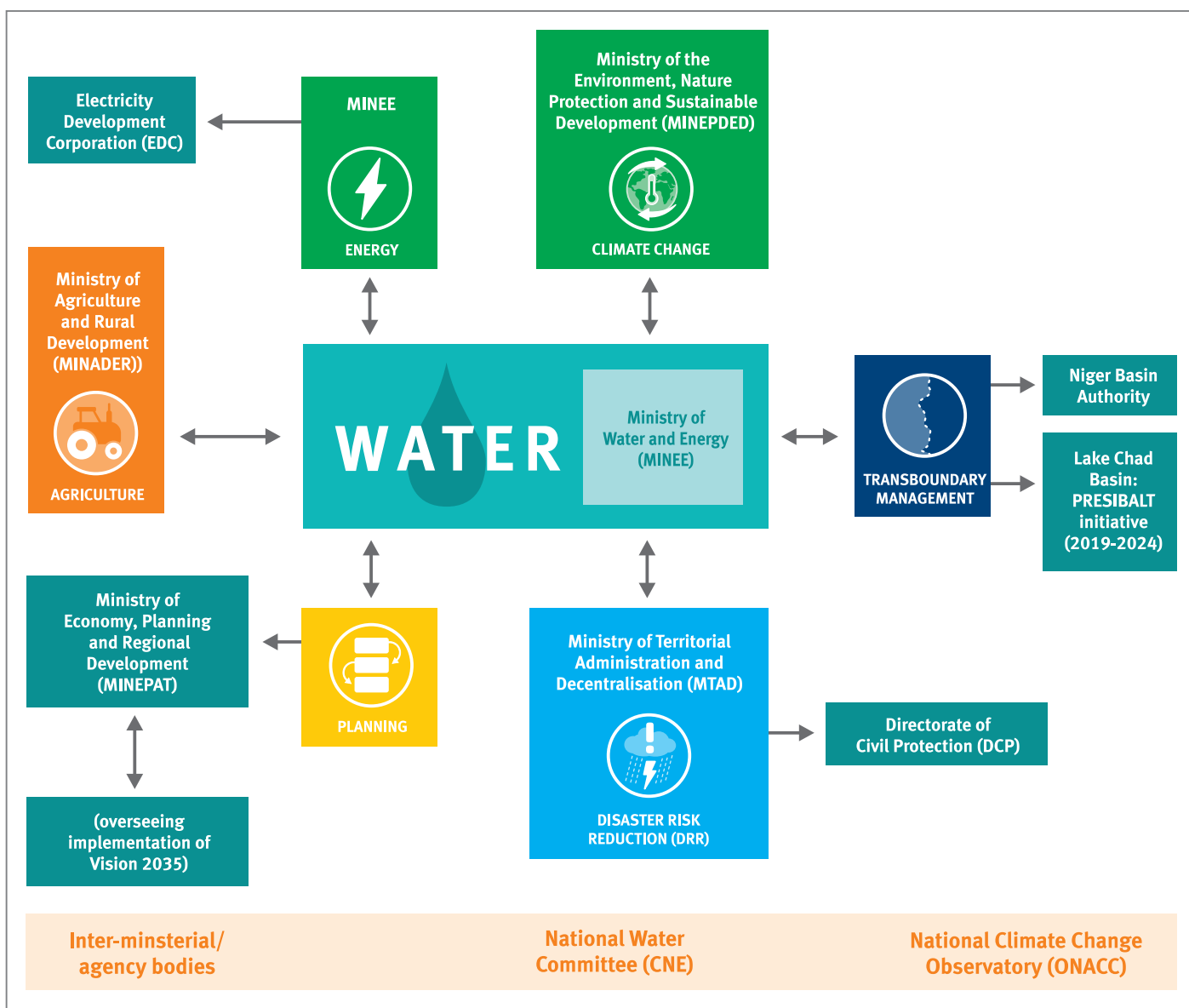
Intersectoral coordination on climate and water

The Ministry of the Environment, Nature Protection and Sustainable Development (MINEPDED) is responsible for coordinating the NAPCC and annual evaluation to 2020, and works with other ministries to try to mainstream climate change – including the Ministry of Water and Energy (MINEE) and the Ministry of Agriculture and Rural Development (MINADER) (see the institutional diagram below). Cameroon has also set up a National Climate Change Observatory (ONACC) to monitor and evaluate climate change impacts and responses, as well as sensitise actors at different levels; but it needs support to strengthen its financial and institutional capacity (see

Recommendation 2). The Steering Council of ONACC plays a coordinating role on climate change issues across government, but there are reportedly weaknesses in the implementation of the coordination function; for example, while MINEE and MINADER are included, other key ministries for infrastructure management, such as the Ministry of Public Works are not. Intersectoral coordination and cooperation on other cross-cutting issues is also challenging.

A National Water Committee (CNE) has been established, but it has only met once and little information about it is publicly available. Research suggests that communication, decision-making, and coordination of DRR activities are also limited (see **Recommendation 3**).

CAMEROON'S INSTITUTIONS



Collaboration with neighbours on transboundary climate and water issues

In relation to transboundary water resources, Cameroon participates in the major resilience initiative PRESIBALT in the Lake Chad Basin (active between 2019 and 2024), and is participating in a new US\$205 million climate change adaptation programme in the Niger River Basin, in partnership with the Niger Basin Authority and eight neighbouring countries.

Underlying barriers and enablers at the institutional level

In addition to closing gaps in structures and increasing capacity to ensure coordination and cooperation across different institutions, a wider challenge is the fact that climate change mitigation has historically dominated government attention, particularly reducing emissions from deforestation. Adaptation, where water plays a more central role, has only recently begun to receive political attention. However, things are starting to move in the right direction, at least on recognising the interlinked vulnerability of agriculture and water resources. Stakeholders inside and outside government recognise that water resources and agriculture are both highly vulnerable to climate change, and see IWRM as an important part of the policy response.

New approaches for Cameroon, such as the climate–land–water–energy nexus, are being used to engage across government, with the support of regional bodies (see **Recommendation 6**). Much of the liaising between responsible ministries happens at a technical level between individuals or is focused on a particular plan, but has yet to be institutionalised.

In terms of the climate–energy–water nexus, Cameroon is at an institutional advantage given that the MINEE includes both water and energy within the same ministry. This is particularly relevant given the proportion of Cameroon’s electricity that is generated from hydropower. The Electricity Development Corporation is an important institution for hydropower, given that it is in charge of the construction and the development of all hydroelectric projects in Cameroon, in addition to playing a strategic role in the overall development of the electricity sector (see **Recommendation 5**).

In addition to the aforementioned coordination platforms (ONACC and CNE), the Ministry of Economy, Planning and Regional Development (MINEPAT) in Cameroon also plays a key role overseeing implementation of the Vision 2035 national strategy. Over the course of the 2020 Voluntary National Review of the Sustainable Development Goals, Cameroon recognised that a national multi-stakeholder monitoring body is required as an accountability platform for the implementation of the SDGs. MINEPAT is responsible for coordinating implementation of the SDG Agenda 2030 in Cameroon.

MANAGEMENT INSTRUMENTS

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

INFORMATION MANAGEMENT

The Government of Cameroon recognises key challenges in collecting data on water and climate change and turning this into useable information, and is directing resources to improve this. Water-related climate information is used for some decision-making, including around specific plans and themes such as energy security, but does not happen routinely. However, the management instruments that could support evidence-based decision-making, such as functioning early warning systems and river basin management plans, appear to be lacking or do not incorporate climate change considerations sufficiently.

Collecting climate and water data

Cameroon's first cross-cutting project in the PNACC aims to put in place systems for observation, information management and alerting for climate risks, with measures including:

- rehabilitating and expanding meteorological and hydrological monitoring networks
- initiating a weather and hydrological forecasting system adapted to the needs of groups including farmers, pastoralists, and hauliers
- developing early warning systems (stakeholders responsible for disaster management concede that early warning systems in Cameroon are weak to non-existent – see **Recommendation 4**).

Related measures also feature under a dedicated sectoral programme on water and sanitation. However, Cameroon's 2019 Voluntary National Review on the SDGs noted that collection and availability of quantitative data on climate change and other environmental matters remains a key barrier to climate change adaptation. Technical infrastructure for data collection has long been inadequate. In 2011, only three meteorological stations out of a total of 58 were found to be functioning; a further 20 were subsequently installed with the support of Japan. Hydrological data collection, for example on river flow, has been limited since the late 1980s, and is now largely confined to one river, the Sanaga, due to its importance for energy generation. There is a similar gap in human resource capacity: trained hydrologists to process and interpret data are in short supply.

Processing data into information and communicating it

There are, however, efforts to process and communicate the data that is available, as useful information. ONACC is reportedly collecting and analysing climate change data and developing tools for climate projections, in line with its responsibilities and a reorganisation in early 2019 (see **Recommendation 2**). Specific examples of ONACC outputs given in interviews include provision of the agricultural calendar and a newsletter on climate change. It is also evident that climate-related information has been assembled and used for the production of major plans and strategies – most notably the PNACC, in a successful collaboration between responsible institutions including the National Meteorology Directorate (DMN).

Using climate and water information in management instruments

Routine usage of hydro-meteorological and climatological data by different sectors is reportedly low: DMN reports developing tailored products for sectors including agriculture (SDG2) but in no sectors does DMN perceive climate services to be guiding policy decisions or investment plans. Within the water sector, routine use of the relevant data in water management instruments is also low: a basin management plan exists for the Sanaga, but this is shaped by Cameroon's dependence on the river for hydropower and energy security – as are the low-flow management plans developed by MINEE. MINEE plans to set up a water information system, but progress is reportedly slow. At the transboundary level, Cameroon participates in projects on the Chad, Niger, and Congo River Basins, which include components related to strengthening climate and/or water information and early warning systems at regional and country levels.

Underlying barriers and enablers at the level of management instruments and information

The underlying barriers to more evidence-informed decision-making appear to be related to institutional fragmentation and gaps in political commitment. Institutional fragmentation seems to emerge given that MINTRANSPORT, MINEPDED, MINEE, MINADER and the Ministry of Scientific Research and Innovation (MINRESI) all have responsibility for some aspect of climate data, but harmonisation and coordination are limited (see **Recommendation 2**). Gaps in political commitment seem to be the cause of limited use of data for evidence-based decision-making or even for routine use of decision-making tools and frameworks around climate change and water – even though data collection and use in the context of water-related climate change issues has been part of flagship programmes such as the PNACC and politically important issues such as hydropower for energy security. On the plus side, there are signs that this may be changing; for example, the 2018–2020 medium-term expenditure framework for MINTRANSPORT budgeted around US\$16.5 million for the development and rehabilitation of meteorological and climatological monitoring networks and information systems, and a further US\$1 million for the related training of staff.

FINANCES

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

CLIMATE FINANCE POLICY FRAMEWORK

Recent spending suggests that water resources management, and water in general, are attracting a sizeable share of climate-related development assistance, often with co-financing from government. Some of this spending is plausibly enhancing climate resilience in sectors such as agriculture, but there is limited detailed tracking of climate finance at the country level. To increase access to climate-specific funds, and to improve the scale, coherence, and impact of climate-related investment in water-related institutional solutions as well as water-related infrastructure, a number of key bottlenecks need to be tackled, including limited intersectoral coordination; a lack of skills in proposal and pipeline development; and limited awareness and tracking of the different flows and sources of finance available.

Strategic direction for adaptation finance

The PNIACC that accompanies the PNACC National Adaptation Plan sets out four priority programmes at a total cost of around US\$117 million. While this does not match the scale of ambition in the PNACC (nor the very significant cost of institutional development and infrastructure required for climate change adaptation), it does provide a first framework to set the vision and some of the detail needed to organise and attract finance. However, further funding and work is needed to convert the document into detailed and fundable project proposals (see **Recommendations 6 and 7**). In the absence of such a programmatic pipeline for adaptation investments, funding has tended to be received for isolated and unconnected projects, rather than following a coherent strategy (showing the importance of the required enabling environment and institutions – see **Recommendation 1** – and improved tracking of climate finance – see **Recommendation 8**).

The Cameroonian government has identified the improved use of international climate financial instruments as a priority, with a focus on the Green Climate Fund (GCF). The GCF provided Cameroon with a small readiness support

grant to provide assistance to a national-level accredited entity (the national designated authority, or NDA) for managing GCF funding. National contact points are listed online for the GCF, the Global Environment Facility, and the Adaptation Fund (which as of October 2020 are all from the MINEPDED ministry). Other contributors to water and adaptation projects in Cameroon include multilateral development banks (e.g. the World Bank, the African Development Bank, and the Islamic Development Bank), bilateral donor agencies (e.g. Japan and France), and UN agencies (particularly UNDP and UNICEF).

SELECT WATER PROJECTS

Project	Funder	Value
Flood mitigation in Yaoundé	Global Environment Facility (GEF)	US\$4 million
Transboundary management of the Niger Basin	Green Climate Fund, GEF + others	US\$210 million

Underlying barriers and enablers at the level of finance

Most of the identified barriers apply to finance for climate change projects generally, and by implication those relating to water. Although a promising development, the draft PNIACC is yet to be operationalised into a portfolio of fundable project proposals. The PNIACC also identifies certain barriers to accessing climate finance, including:

- a need for multi-sectoral coordination, given climate change projects will involve several ministries and departments
- gaps in technical skills for proposal and pipeline development
- limited awareness of international and regional financing sources available (see **Recommendations 6 and 7**).

Other identified needs include an improved system for tracking climate finance (see **Recommendation 8**).

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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.

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