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Water Heritage for the Future

Challenges and Opportunities In the Face of Climate Change

Corazon L. Abansi, Ph.D.

Executive Summary

In the Cordillera, water is deeply woven into the region's cultural heritage. However, climate change-induced scarcity and pollution are worsened by competing usage demands and complex transboundary disputes. Despite a range of national water laws, local efforts remain fragmented, highlighting the urgent need for an institutional framework that manages water as both a vital economic resource and an irreplaceable ecological and cultural asset.

This policy brief advocates for a revitalized watershed management approach tailored to the Philippines, particularly the Cordillera. By operationalizing a collaborative governance framework, this model addresses inter-jurisdictional challenges and upstream–downstream conflicts. Strengthening the Watershed Management Councils to navigate diverse policy landscapes is proposed. By scaling existing successful prototypes, watershed governance can be transformed into a holistic system that prioritizes ecological integrity, social equity, and cultural continuity.

Introduction

Water is not only an essential element of life but also a carrier of human history, religion, values, identity, and concerns about ecology as well as environmental sustainability. In Genesis 2:10-14, four heavenly rivers irrigate the world, thereby spreading and supporting life. Water becomes an idea, an icon, a metaphor and a concrete reminder of our vital interrelationships with other humans and with the natural world (Euzen and Morehouse 2011; Haghe 2011; Morehouse 2011). Whether in the form of streams or rivers, water flows in a meandering fashion providing the matrix of ecosystems.

In the rugged spine of Northern Luzon lies the Cordillera Administrative Region (CAR), often hailed as the "Watershed Cradle of the Philippines." Its mountainous terrain gives rise to a vast network of rivers—lifelines that nourish ecosystems, sustain livelihoods, and shape the cultural identity of its people. The region is home to 13 major river systems, including the Chico, Abra, Ibulao, Agno, and Amburayan rivers. Originating from the highlands, these rivers flow toward the lowlands, feeding significant water bodies such as the Magat and Cagayan rivers. They serve multiple functions such as supporting irrigation and hydropower generation, and sustaining a diverse range of freshwater species. Beyond their physical landscape, the rivers of CAR represent more than just natural features; they are economic resources, ecological lifelines, and cultural landmarks.

Water is deeply intertwined with heritage in the Cordillera. This connection is seen in the traditional water management of the terraces, the spiritual significance of natural water sources, and the cultural practices and rituals that have developed around both water and the land it sustains. Natural water forms like rivers and waterfalls are often considered sacred and are part of the spiritual landscape for the indigenous communities. Waters have historically guided settlement patterns, agricultural practices, industry, and spiritual traditions.

Using Polanyi's concept of embeddedness, Abansi et al. (2016) show that water access and exchange are deeply embedded in the community's socio-cultural spaces. Likewise, embeddedness determines the value and availability of water and recognizes the importance of a broader range of values, ones that extend beyond traditional economic calculations (Dayo et al. 2018). Many authors argued that such values of water must be equitably represented in policy and governance proceedings (Austin and Drye 2011; Garrido and Ingram 2011; Jackson, 2006; Whitely, Ingram, and Perry 2008). This is especially becoming important as scarcity affects people, while pollution threatens the quality and availability of water. Climate change is a serious risk multiplier that increases the strain already put on water resources. As climate change accelerates, this heritage faces unprecedented threats.

Recognizing water as both a shared resource and heritage invites a more holistic approach to policy that values ecological integrity, social equity, and cultural continuity. We are faced with the issue of how to achieve the right balance between managing water as an economic and social good (Gleick et al. 2002; Linton 2010; Feitelson 2012). Understanding the challenges and impacts, implementing targeted strategies, and intentionally leveraging water heritage can strengthen community preparedness in a changing climate.

This policy brief brings water heritage forward to the future by looking at challenges and opportunities amid accelerating climate change. It outlines strategies to protect water as both a resource essential to survival and a heritage asset that must be preserved for future generations. Specifically, it aims to:

1. Analyze the interconnected challenges faced by water systems of CAR;
2. Examine existing policies addressing water resources; and
3. Lay down the policy goals for the management of water-related heritage sites and resources and propose policy recommendations and strategies in using water heritage as a tool for promoting climate resilience

The data used in this study came from the series of meetings consisting of the following:

- Municipal Local Government Unit (MLGU) consultation meetings on heritage policies (four consultation meetings);
- Community Group Discussions (CGD) on issues and gaps in policy, development of policy actions aimed at refining existing policies, and improvement of the implementation of heritage programs (two CGDs, one in the municipality of Mountain Province and one in the Municipality in Benguet); and
- A public forum that engaged government agencies, private sector, civil society organizations, and the academic community in a systematic discussion of state policies affecting heritage in the Cordillera, and outlook for heritage policies. Assessment and identification of policy gaps, and proposed actions were among the important outputs of the public forum.

Challenges Faced by Water as a Heritage in the Cordillera

There are many interconnected challenges associated with water in CAR such as depletion and scarcity, pollution and quality degradation, transboundary issues, as well as multiple use conflicts and fragmented water governance. While these issues and challenges are recognized and documented in earlier studies (Rola et al. 2015), the local government unit (LGU) consultations, community discussions and public forum confirmed that transboundary issues and multiple use conflicts are dominant challenges whose resolutions are hindered by limitations in water governance. There are competing demands from agriculture (irrigation projects), hydropower development, urban supply, industry (mining pressures), tourism, contested infrastructure investments, conservation, and cultural practices. These tensions are exacerbated by transboundary governance challenges across LGUs, ancestral domains, national agencies, and private interests. Fragmented management regimes, sectoral silos, and power asymmetries among stakeholders exacerbate conflicts and threaten long-term sustainability of water heritage resources.

Box 1 and Box 2 show the highlights of the discussion from the three conversations conducted, using the cases of the Chico and Agno rivers, two water-based natural heritage assets in CAR.

Box 1. Multiple-use conflicts and transboundary issues in the Chico river watershed

The Chico river originates in Mount Data flowing through the Mountain Province, Kalinga and Cagayan provinces. The 233-kilometer river stands not only as a physical landmark but also as a symbol of the rich heritage and enduring spirit of the people of the Cordillera, it represents a landmark struggle for indigenous rights in the Philippines.

The Chico river along Bontoc once provided drinking water to communities and support laundry activities of women. But the continuous dumping of wastes along the river and the mining activities in barangays such as Mainit and Pidnilisan result in serious pollution, especially from the mine tailings. Every mining area has tailing dams which eventually affect the river.

The pollution resulting from mining and household activities along the Chico river led to the erosion of cultural and ecological heritage. The population of endemic water creatures such as fish (gadew), crabs and other species have diminished significantly over the years which if not addressed can lead to biodiversity loss. The loss of biodiversity also erodes cultural practices tied to these ecosystems, from farming traditions to ceremonial uses of water.

Source: CSC 2025

Policy Landscape

This section discusses the response to the issues and challenges related to water at the national and local levels.

National Policies

In the Philippine context, heritage conservation is guided by Republic Act No. 10066 or the National Cultural Heritage Act of 2009, which mandates the protection, preservation, and conservation of cultural properties, including historic sites and traditional cultural landscapes. The law recognizes the importance of safeguarding both tangible and intangible heritage and directs local government units to maintain cultural heritage inventories and formulate conservation plans. The Act also emphasizes community involvement, requiring consultation with stakeholders in the management of heritage sites. This law is particularly relevant to water as a natural heritage but may not be enough given the nature of water as an economic resource and a cultural good. While the legislation provides a framework for protection, its implementation often confronts the same challenges noted in global water heritage discourse, including tensions between preservation and the adaptive practices necessary for sustaining this living natural heritage.

Box 2. Multiple-use conflicts and transboundary issues in the Agno river watershed

The Agno river, the third largest in Luzon and sixth longest in the Philippines, originates from Mount Data in Benguet and flows through towns like Buguias, Kabayan, Bokod, and Itogon, all in Benguet before moving into Pangasinan. It supports the culture of the indigenous Ibaloi, Kankanaey, and Kalanguya. It also provides water for local agriculture and feeds the dams of Ambuclao and Binga for hydropower generation.

Aside from power generation, the Agno River is used for fishing, small-scale gold panning, and agriculture. The river is known to face environmental challenges, including the accumulation of sediments and pollution from mining activities. Because it spans political boundaries, emerging issues and challenges also include the sharing of benefits from various activities along this water body, especially the economic incentives from hydropower generation.

Source: CSC 2025

Water as a policy area in the Philippines exhibits multi-layered complexity and fragmentation. Multiple institutions with hierarchical areas of coverage, varying mandates (regulatory and customary) and sectoral representations inhabit its universe (Malayang 2004). Participants include state agencies and non-state actors (non-governmental organizations or NGOs and

civil society), but their ability to influence outcomes is highly uneven. The power of each actor (i.e. their ability to influence outcomes) is in turn determined by their mandate, resources and public recognition of their legitimacy. There are 30 agencies (national and local government units) managing the water resources of the Philippines (Paragas 2012). Their regulatory mandates cover water quality and quantity, as well as water resources and water services. Major national laws pertaining to water and the year these were enacted are given in Table 1.

Table 1. National laws on water

Law	Title	Description	Date
Presidential Decree No. 1067	Water Code	Instituting a Water Code, thereby revising and consolidating the laws governing the ownership, appropriation, utilization, exploitation, development, conservation and protection of water resources	1976
Presidential Decree No. 198	Provincial Water Utilities Act	Declaring a national policy favoring local operation and control of water systems; authorizing the formation of local water districts and providing for the government and administration of such districts; chartering a national administration to facilitate improvement of local water utilities; granting said administration such powers as are necessary to optimize public service from water utility operations	1973
Presidential Decree No. 522	Sanitation Requirements for Travel Establishments	Requiring sanitation in the operation of establishments and facilities for the protection and convenience of the traveling public	1974
Republic Act No. 7586	National Integrated Protected Area System Act	Providing for the establishment and management of national integrated protected areas system, defining its scope and coverage, and for other purposes	1992
Republic Act No. 8041	National Water Crisis Act	Addressing the national water crisis and for other purposes	1995
Republic Act No. 8371	Indigenous People's Rights Act	Recognizing, protecting and promoting the rights of indigenous cultural communities and indigenous peoples, creating a national commission on indigenous peoples, establishing implementing mechanisms, appropriating funds therefor	1997
Republic Act No. 9275	Clean Water Act	Providing comprehensive water quality management	2004

Source: Hall, et al 2015

Cognizant of the importance of water as an economic good and a heritage resource, and the rising awareness on water-related issues and challenges they face, LGUs adopted policies guided by the Local Government Code and the various national laws described in Table 1.

Local Policies

Municipalities have enacted ordinances that address water-related issues, including access, quality, pollution, and the economic incentives associated with water use. Table 2 shows some of the water-related ordinances enacted by the municipalities of Bokod, Buguias and Sagada, shared during the LGU consultations.

Although there are various national policies to improve environmental conditions, the Philippines suffers from fragmentation of local efforts to manage its watersheds (CUI 2016). It is obvious from Table 2 that existing governance efforts are confined to individual territorial jurisdictions. The fragmented water management approaches demonstrated here and frequently seen in many communities do not create an integrated manner that addresses critical water issues. Consequently, when transboundary water issues and competing uses emerge, the institutional framework available may not be robust enough to facilitate a collaborative, coordinated, and adaptive governance response. Conventional top-down or sector-specific management approaches have proven insufficient to manage these complexities. This results in more pronounced climate change vulnerability of communities (Sanford et al. 2011).

Table 2. Municipal Ordinances on Water

Municipality	Municipal Ordinance			
	Number	Year	Title	Description
Bokod	13	2018	Resort Safety Ordinance of Bokod, Benguet	Ensuring health and safety in resorts, public swimming pools, water parks, wading pools, spas
	14	2019	Amending a previous regulation (municipal ordinance no. 11, series of 2018)	Revenue sharing from tourism fees collected at mountain and mossy forest destinations within Bokod, Benguet
	09	2021	Establishing the Bokod Inter-agency Watershed and Forest Protection Task Force	Harmonizing the overlapping powers and functions of various agencies to strengthen the protection and enforcement of environmental laws
	03	2024	Management and Regulation of Water Systems	Ensuring water supply and quality; designating a municipal water system supervisor and constituting the municipal water system management board
	16	2024	Prohibiting and Penalizing the Improper Disposal of Waste into the Municipality's Waterways	Recognizing that improper disposal leads to pollution and all wastes eventually go and accumulate in the Ambuklao reservoir
Buguias	38	2018	Providing Measures to Protect the Bodies of Water within the Municipality of Buguias	Protecting aquatic species, prohibiting the dumping of wastes

	38	2018	Safe, Clean and Potable Water Ordinance	Establishing measures to ensure safe, clean, and potable water
Sagada	03	2025	Prohibiting the Use of Electric or Fueled Water Pump in Siphoning the Water Spring or any Outlet or Passage	Protecting and safeguarding all identified water springs from siphoning

Adaptive-Collaborative Governance: A Framework for Policy

The preceding analysis of existing policy landscape shows a mismatched legal framework, institutional fragmentation, uneven power relations, and limited mechanisms for cooperation across borders. Our policy goal is to build a robust and inclusive water governance system based on an adaptive and collaborative governance framework. Collaborative governance refers to decision-making processes and institutional arrangements in which public authorities, local communities, indigenous peoples, civil society, and private actors jointly engage in planning, implementation, and monitoring.

This approach is guided by the principles of sustainability, equity and human rights, cultural and ecological stewardship along with participatory governance. Collaborative governance, therefore, is applicable to water heritage resources because it:

- Reflects the shared and interconnected nature of water systems;
- Enables legitimacy through participation and consent;
- Integrates scientific, local, and traditional knowledge; and
- Supports trust-building in politically sensitive transboundary contexts

Moreover, such approach is particularly suited to the Cordillera where indigenous governance systems already operate on principles of consensus, reciprocity, and collective stewardship and where water systems cross barangay, municipal, provincial, and regional boundaries. This proposed collaborative governance approach will:

- Balance diverse and competing water uses;
- Respect cultural heritage and indigenous knowledge systems;
- Strengthen transboundary cooperation; and
- Enhance long-term sustainability and conflict resilience

Ostrom's (2010) findings that institutional rules must be tailored to fit a specific social-ecological setting support this framework. Alignment is also evident with one of the medium-term recommendations for climate change adaptation which requires holistic approaches in managing watersheds through collaborative governance (Sanford et al. 2011). Koebelle et al. (2023) emphasized equity beyond engagement in collaborative governance.

The framework by Emerson et al. (2011) on transboundary governance systems is an example that may be used to analyze the collaborative governance of the water systems in the Cordillera. The framework defines collaborative governance as the processes and structures of public policy decision-making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or public, private and civic spheres to carry out a public purpose that could not otherwise be accomplished.

Policy Option: Using the Watershed Management Councils as Platform for Collaborative Governance

Understanding the Watershed Management Approach

The Philippines has considered water governance based on watershed boundaries (or catchments) as an effective way to integrate the social, political, and environmental systems they encompass. Water is managed using natural-hydrological, rather than political borders to better align environmental, social, and economic systems. This approach covers all land draining into a common body of water, enabling integrated management of upstream and downstream impacts. The national government enacted Department Administrative Order (DAO) 2005-23. This department order calls for the adoption and implementation of the collaborative approach to watershed management. Watershed as an ecosystem and as a basic planning and management unit shall be developed in a holistic, scientific, rights-based, technology-based community-based and collaborative manner. The objectives of DAO 2005-23 are:

- To ensure the sustainable use of watershed resources;
- To encourage meaningful and active participation of stakeholders within the watershed; and
- To ultimately establish a sustainable and multisectoral institution capable of addressing natural resources issues in the watershed.

Administrative Order 2005-23 was a dramatic change from a more centralized, singular policy-focused and rights-based regime to a policy area that has expanded to include watershed, pollution and health concerns. The change, however, did not necessarily produce coherence as inter-agency linkages are weak (Hall et al. 2015). This is also evident in the argument raised by Contreras (2004) and in the earlier work of Francisco and Rola (2004) on four case studies of watershed management. The case studies have shown that that the implementation of watershed management requires some level of financial capital, a community or group of communities with good enough level of intellectual and social capitals, and where the legal and institutional framework to support the watershed approach is present.

Revisiting the Creation of Watershed Management Councils

More than 16 years after DAO 2005-23 was implemented, Department Administrative Order No. 2021-41 was enacted on 23 December 2021, providing guidelines in the creation of watershed management councils (WMCs). In attempting to streamline the management of watersheds, this multi-agency, inter-LGU, and multi-sectoral consortium brings together relevant public authorities working on environmental protection, water, irrigation, economic planning, agriculture, public works, and indigenous concerns from the provincial to the regional level. Watershed management councils serve crucial roles as oversight and advisory bodies regarding their respective watersheds.

The key functions of WMCs are:

- Integrated Watershed Management
  - Develop plans to manage water resources, protect watersheds, and ensure sustainability.
- Conflict Resolution
  - Address conflicts regarding water use and allocation between municipalities or sectors.
- Policy Implementation
  - Implement national directives, such as the Clean Water Act at the local level.

At the provincial level, water management is largely facilitated through WMCs. Provincial environmental offices collaborate with national agencies to manage resources across municipal boundaries. WMCs act as multi-sectoral bodies aimed at sustainable resource management and often chaired or co-chaired by the Provincial Governor.

Box 3. Objectives of DAO 2021-41

- To standardize and provide guidance on the institutionalization of existing and creation of new Watershed Management Councils and ensure that it adheres to the participatory, collaborative, multi-sectoral and inter-disciplinary principle of watershed management, in accordance with existing laws, rules and regulations.
- To strengthen and develop the collaboration between and among the various government agencies, Local Government Units (LGUs), and other concerned stakeholders in the management of the watershed.
- To improve the technical and operational capacity of the DENR, LGU, and other stakeholders involved in the Watershed Management Council.

Conflict resolution among municipalities can be resolved at the level of the province. This is a positive response to the claim of Rola et al. (2015), that the legal framework of the Philippines layers responsibility over water at the national and local agencies but mechanism to effect subsidiarity and decentralization are not fully articulated. It also supported the Philippine commitment in the International Symposium on Water and Cultural Heritage in Tokyo in 2020, to give importance to multi-disciplinary dialogues in harnessing water-related heritage. Since 2021, WMCs have been organized in various provinces, including those in the Cordillera region.

Recommended Policy Action: Strengthening the Watershed Management Councils

More than half of Philippine watersheds are unprotected, despite the vital role they play in supporting water supplies, ecosystems and mitigation against climate change (Fabro 2023). The current watershed policy and governance framework does not adequately respond to the realities and needs of the people and the environment. While the Philippines is ahead of most of its neighbors in recognizing the importance of watersheds, too many legal instruments and the lack of coordination and enforcement lead to inadequate protection in practice (LRC 2023).

While the WMCs are not robust enough to respond to varying watershed policy landscapes, there are successful ones which can serve as prototypes of how we can transform the way we manage our watersheds. These are the Batangas Environmental Protection Council (Case 1), Bukidnon Watershed Protection and Development Council (Case 2) and the Davao Watershed Code and WMC (Case 3), among others.

Case 1. Batangas Environmental Protection Council

Source: https://www.pemsea.org/resources/news/batangas-convenes-environment-protection-council

The Batangas Environmental Protection Council (BEPC) is a multi-sectoral body established by the Provincial Government through Sangguniang Panlalawigan Resolution No. 276, Series of 1996, to manage environmental concerns in Batangas Province. Chaired by the Governor, it coordinates stakeholders, enforces policies, and manages the water resources. It is an important forum through which stakeholders could together address multiple use conflicts, sharing of benefits and other environmental concerns. Industry (large refineries and medium enterprises) is an active participant sharing their collective voices through the Batangas Coastal Resources Management Foundation.

In the same year (1996), the Provincial Government Environment and Natural Resources Office (PG-ENRO) was created and serves as the office to initiate activities, coordinate events and recommend action to higher authorities for approval.

The Governor regularly convenes the Council. Conflicts of varying nature such as navigational paths, safety of small fishing vessels, ecological and tourism fees, waste management (solid and industrial), oil spill and pollution issues are resolved by the Council. Funds came from regular appropriation, contribution of members and external donors such as the UNDP-IMO Program for the Environmental Management of the Seas of East Asia (PEMSEA). A Batangas Bay Demonstration Project (BBDP) was initiated by PEMSEA which later expanded to include Balayan Bay and Tayabas Bay in the same province. Lessons from BBDP were replicated in the Philippines and other countries in East Asia.

Case 2. Bukidnon Watershed Protection and Development Council (BWPDC)

Source: https://essc.org.ph/content/sustainable-watershed-management-as-a-response-to-land-and-water-problems-bukidnon/

The Bukidnon Watershed Protection and Development Council (BWPDC) was created in 1995 through Memorandum Order No. 270 by President Fidel Ramos. The objective was to protect and preserve the remaining forest in the Bukidnon watersheds and to rehabilitate open areas within the headwaters of the watershed.

Chaired by the Governor, it serves as the highest body for watershed management in the province. The BWPDC is a good illustration of a local government initiative to manage its natural resources and to protect environmentally critical areas within the province. The local government actively involved itself in the management of the watershed areas, considering their significance in ensuring water supply, not only for the province but also for other areas.

The Council is tapping external funding to complement internally generated funds and attain financial sustainability.

Case 3. Davao City Watershed Code

Source: https://idisphil.org/wp-content/uploads/2014/12/DC-Watershed-Code-IRR-final.pdf

The Watershed Protection, Conservation and Management Ordinance of Davao City, also known as the Watershed Code was passed through Ordinance No. 0310-07 in 2007. This local legislation aims to protect and sustain Davao City's eight major watersheds through a ridge-to-reef approach. It designates conservation areas, agro-forestry areas, and other watershed areas based on a terrain analysis study made by the Regional Mines and Geosciences Bureau (MGB) and Davao's City Planning and Development Office.

The Watershed Code is enforced by the Watershed Management Council to manage water resources and resolve multiple use conflicts. For example, in 2021, the DENR office in Davao issued a Private Land Timber Permit within the Mounts Makabol-Alikoson Conservation Area (MMACA), which is classified as an environmentally critical area under the Watershed Code. A resolution was passed by the Davao WMC earlier that year denying the application for tree cutting. The DENR-Davao eventually suspended tree-cutting activities while it conferred with the City Government on the boundary of the protected conservation areas declared under the Watershed Code.

Conclusion and Recommendation

Water is deeply intertwined with heritage in the Cordillera. However, challenges such as scarcity and pollution threaten the availability and quality of water. Climate change is a serious risk multiplier that increases the strain on water resources and as it accelerates, this heritage faces unprecedented threats.

The consultations with the LGUs, CGDs, and the public forum confirmed that water scarcity and pollution in the face of climate change are aggravated by multiple use conflicts and transboundary issues. There are various national water laws and policies, but fragmentation of local efforts is a serious concern. Therefore, we need an institutional framework that facilitates a coordinated, adaptive and collaborative governance of water as an economic resource and as a cultural and ecological heritage.

This policy brief proposes to revisit the watershed management approach adopted by the Philippines. This approach operationalizes a collaborative water governance framework and is suited to the Cordillera context in addressing multiple-use conflicts and upstream–downstream and inter-jurisdictional governance challenges. Specifically, we propose the strengthening of the watershed management councils in responding to varying watershed policy landscapes. The few successful ones in the country can serve as prototypes in transforming the way we manage our watersheds, one that invites a more holistic approach to policy that values ecological integrity, social equity, and cultural continuity.

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UNIVERSITY OF THE PHILIPPINES
CENTER FOR INTEGRATIVE AND DEVELOPMENT STUDIES

Lower Ground Floor, Ang Bahay ng Alumni, Magsaysay Avenue
University of the Philippines Diliman, Quezon City 1101

cids.up.edu.ph

Telephone (02) 8981-8500 loc. 4266 to 4268
(02) 8426-0955

Email cids@up.edu.ph
cidspublications@up.edu.ph

Website cids.up.edu.ph