Transforming Watershed Governance

An Overview of Watershed Policies and Governance in the Philippines



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Legal Rights and Natural Resources Center - Kasama sa Kalikasan - Friends of the Earth Philippines



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Cover Photo: Watershed area in Sibuyan Island, Romblon. Photo by J. Dumaual / LRC

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Executive Summary

The state of our country's watersheds is characterized by pressures of crisis proportions such as land and water use conflicts, inaccessibility, eroding water quality, degrading ecosystems, and worsening climate vulnerabilities. Amidst these pressures, a significant percentage of our agriculturally and ecologically critical watersheds are not under protected status.

The current watershed policy and governance framework does not capture the realities and needs of our people and our environment. Backdoor provisions that still allow harmful activities within watersheds undermine policy protections.

Despite the potential of integrating indigenous peoples and local communities within the watershed governance structure, in practice they are instead excluded by preferential treatment for big businesses and other powerful economic and political interests.

Needless to say, the planning, financing, enforcement, and governance of our watersheds are technically unsound, biased towards big business and big government interests, and are low priority in the economic and political agenda.

Given this context, this discussion paper by the Legal Rights and Natural Resources Center (LRC) prescribes some policy and governance options that are envisioned to be transformative of how the government, businesses, and the general public understand, value, and take concrete action to protect our watersheds.



1. State of Watersheds

1.1. Watersheds

A watershed, also known as a basin or catchment, is "land bounded by a hydrological system within which communities of plants, animals and people are inextricably linked by a common stream flowing to another stream, river, lake, or another body of water and to the sea" (Salas, 2023). It is an ecological system composed of a land area bounded by ridges (watershed divide), where streams flow from the ridges (tributaries) to a common outlet which could be another water body, a river, a lake, or the sea. This system is known as a watershed continuum.

Watersheds are areas that are essential for the maintenance of water resources. They are important for regulating water supply, maintaining water quality, and providing habitat for various aquatic and terrestrial species. Watersheds also play a critical role in mitigating impacts of floods, droughts, and other extreme climate events, as they help store and release water slowly over time. These benefits are crucial for supporting social and ecological systems.

The Ecosystems Research and Development Bureau (ERDB) recognizes that the Philippines has 421 principal river basins covering 21 million hectares or 70% of the country's 30 million-hectare land area (ERDB, n.d.). These constitute the watersheds of the country. According to the Forest Management Bureau (FMB), 131 critical watersheds covering 14.2 million hectares or 47% of the total river basin area are listed as priority for supporting the country's irrigation needs (FMB, 2021). Table 1 below describes the various categories of watersheds in the Philippines.

Table 1. Different Categorizations of Watersheds	Qty.	Area (Hectares)
Principal River Basins	421	21,000,000.00
Priority Critical Watersheds Supporting the National Irrigation System	131	14,220,828.67
Priority Watersheds Assessed for their Vulnerabilities	174	6,771,146.04
National Integrated Protected Areas System and Presidential Proclamation-Protected Watersheds	115	2,657,454.33
Other Terrestrial Protected Areas (Natural Park; Natural Monument; National Park; Wildlife Sanctuary; Protected Landscape; Resource Reserve; Natural Biotic Area; Managed Resource Protected Area; Game Refuge and Bird Sanctuary; Wilderness Area; Mangrove Swamp Forest Reserve; and Other Categories)	174	3,813,469.40

gilan, Bukidnon, Photo by L. Dulce / LRC

Meanwhile, 174 watersheds covering 6.8 million hectares or 32% of the total river basin area were assessed as priority for being vulnerable to various ecological hazards, such as deforestation, biodiversity loss, siltation and erosion, floods and landslides, and water pollution, among others (ERDB, 2022).

Despite the importance of these watersheds, only 2.7 million hectares or 13% of our river basins are proclaimed or legislated as watersheds, granting them protected status and directives for rehabilitation (FMB, 2021). An additional 3.8 million hectares of terrestrial landscapes, or 18% of the basin areas, are legislated as protected areas for various other purposes (PhilCHM, n.d.-a).

This means that only about 6.5 million hectares or 22% of our total land area are protected, which is still under the targeted 30% benchmark which scientists say are necessary to help species and ecosystems recover from the various pressures affecting them. It further demonstrates that 9% of ecologically vulnerable watersheds and a staggering 55% of agriculture-critical watersheds are not under protected status.

Watersheds are composed of various water areas, such as rivers, lakes, wetlands, and marine waters. Government efforts in assessing them and categorizing them according to quality and use are continuing at present. Table 2 shows the different types of water areas as categorized by the Biodiversity Management Bureau (BMB) and Philippine Clearinghouse Mechanism (PhilCHM).

Table 2. Different Categorizations of Water Areas	Identified	Classified / Assessed
Water Bodies (Rivers, Lakes, Marine Waters)	1,019	791
Critical Wetlands (Lagoons, Lakes, Ponds, Marshes/Swamps, Peatlands, Water Storage Areas, Seagrasses, Mangroves, Estuaries, Mudflats, Cave Systems)	461	187

Sources: BMB (2022), PhilCHM (n.d.-b)

1.2 Forests

Forests are the heart of watersheds because they serve as the primary headwaters from which all water flows originate. In climate vulnerable areas such as the Philippines, forest covers play a great role in minimizing the effects of hydro-meteorological or water-related hazards. They also support local flora and fauna, and are the main livelihood sources for many indigenous and other upland communities in the country.

Official government data differ from independent monitoring of the Philippines' forest cover (FMB 2004, 2020). Data based on FMB's satellite imaging indicate that the country's forest cover increased by 57,994 hectares, from 7,168,400 hectares in 2003 to 7, 226,394 hectares in 2020. Meanwhile, data from the Global Forest Watch (GFW), an international forest monitoring system using the latest real-time satellite data, show that the Philippines had a net loss of 300,000 hectares of tree cover from 2000 to 2020 (GFW, n.d.). The current forest cover, at just 24% of the country's total land area, is far from the ideal 40-54% total forest cover of 12-16.2 million hectares (Cabico, 2018, Aguda, n.d.).

The degradation of Philippines forestlands is even more apparent when investigating data on closed canopy forest areas, which represent the country's dense forest cover (FMB 2004, 2020). From 2003 to 2020, the Philippines lost 339,699 hectares of closed forests. Aside from deforestation, some areas likely degraded into open forests.

Another indicator of forest degradation is the resultant biodiversity loss. This demonstrates the actual ecosystem health of forests rather than just their topographical characteristics. The International Union for Conservation of Nature (IUCN, n.d.) Red List of Threatened Species shows an increasing number of terrestrial species classified as vulnerable, endangered, and critically endangered from 2012 to 2022 (See Figure 1).



Figure 1. Number of vulnerable, endangered, and critically endangered species in the Philippines added to the IUCN Red List 2012-2022

A total of 1,279 terrestrial species in the Philippines have been added to the Red List from 2000 to 2022, or an average of 58 species per year. While the IUCN's expanding evaluation capacity over time influences the rate of species listing, one thing is certain: the number of endangered flora and fauna is increasing.

In 2019, for instance, the Visayan tarictic hornbill was classified as critically endangered, alongside the rufous-headed and the Sulu hornbills (Chavez, 2019). Hornbills are known as vital long-distance seed dispersers and are viewed as keystone species (Trail, 2007), or species whose disappearance will drastically affect the ecosystem.

Moreover, at least 35 of the priority watersheds assessed by ERDB (2022) for their vulnerabilities were identified to be facing risks of biodiversity loss, with at least nine reaching a high level of vulnerability.

Data from the GFW (n.d.) suggest that deforestation was driven mainly by commercial agricultural expansion, contributing an average of 88% of all tree cover loss from 2019 to 2021. Contrary to popular perception, this does not include shifting agriculture such as swidden farming, which accounts for a mere 4% of the total deforestation.

1.3 Water Supply

Having an abundant water supply from watersheds that adequately provide for the county's demand is directly related to maintaining low pressure on these watersheds. Data from the Philippine Statistics Authority (PSA, 2022a) show that from 2010 to 2021, water stress levels were within the low-level classification range of between 25-50% as a proportion of available freshwater sources (See Figure 2).

Philippine watersheds have consistently provided the country's annual total freshwater demand, with the country's estimated total renewable freshwater resources pegged at 479,000 million cubic meters (mcm) (PSA, 2022a). Based on 2021 data, this is sufficient for the population's total freshwater withdrawals at 89,000 mcm.

Source: IUCN (n.d.)



Figure 2. Water stress levels (2010-2021)

When we disaggregate the pressure on our water supplies per major economic sector, however, it becomes apparent that industries, which include mining and quarrying, construction, manufacturing, and power, have the biggest ecological footprint on our water supply (PSA, 2022a). Not only do industries comprise almost 70% of the total volume of water abstracted, or water diverted from its source, they also have the biggest amount of water diversion per capita (See Figure 3). Particularly, the power sector consumes the largest amount of abstracted water with 58.7% share. (PSA, 2022a)



Figure 3. Water abstraction trends per major economic sector

Source: PSA (2022a)

Source: PSA (2022a)



For instance, Magno's (2020) analysis of water use at the Didipio copper-gold mine in Nueva Vizcaya province revealed that much of the mine's ecological footprints are significant drivers of underground water depletion in the village, and that these activities pose a real threat to the community's access to potable water.

This disproportionate pressure on watersheds, which are not apparent at the national level of data aggregation, warrant particular attention especially from local public authorities since impacts are more significantly felt at the local level.

1.4 Water Quality

The siltation of watersheds due to the increasing loss of vegetation continues to be a problem. Comparing data from the Philippine Development Plan 2023-2028 crafted by National Economic Development Authority (NEDA, n.d.) and Medina (2019), there is an apparent 27% improvement in land degradation hotspots, from an estimated 2.6 million hectares of hotspots in 2018 to 1,910,478 hectares of hotspots in 2022. Despite this, at least 113 or 65% of the priority watersheds assessed by ERDB for vulnerabilities were found to be at risk of soil erosion, sedimentation, and siltation (ERDB, 2022).

Water quality indicators further demonstrate that soil erosion from heavily degraded lands is not improving. From 2019 to 2021, the percentage of water bodies monitored by the Environmental Management Bureau (EMB, n.d.) that have failed ambient water quality standards increased from 37 to 41% (see Figure 4).





Source: EMB (n.d.)

The EMB (n.d.) particularly observed that the percentage of water bodies that failed the quality standards for total suspended solids (TSS), which indicates sediment runoff, negligibly decreased from 24 to 22%. The percentage that failed the nitrate standards, which usually indicates excessive runoff of agricultural fertilizers, wastewater, and other pollutants with toxic contaminants, significantly increased from 0.6 to 14% during the same period.

Researchers such as Schoenholtz (2004) have surfaced that water from undisturbed forested watersheds is generally of the highest quality, particularly in terms of water potability, biodiversity habitation, and contact recreation.

Recognizing forests' crucial role in delivering high-quality water sources has been crucial for the establishment of forest reserves and the development of forest management practices meant to safeguard critical water sources.

1.5 Climate

The 6th Intergovernmental Panel on Climate Change's (IPCC) Assessment Report (AR6) has established that the world has been experiencing impacts from climate change since the 1950s. These impacts include more frequent and intense precipitation, hot extremes, tropical cyclones, and compound extreme events (IPCC, 2021).

The AR6 furthers that the precipitation variance related to the El Niño–Southern Oscillation (ENSO) mode of variability is very likely to increase. This means that there will be more extreme droughts during El Niño and more extreme rainfall during La Niña phases.

These climate impacts are expected to intensify the risks in a staggering 170 or 98% of the ERDB (2022) assessed priority watersheds that are vulnerable to floods and landslides. For instance, a study of potential hydrological impacts of climate change on 24 river basins in the Philippines found that there would be a general increase in river flows and variability, and consequently increased threats of flooding and erosion (Tolentino, et al., 2016).

Forests, to which watersheds are inextricably linked, are also carbon sinks, meaning forests can store large amounts of carbon. A 2017 study particularly relevant to tropical forests in the Philippines by Baccini and colleagues found that degradation of tropical forests could emit carbon into the atmosphere and increase even higher emissions. Alarmingly, the study results indicate that current carbon losses exceed gains on every continent. These losses are attributed to forest degradation, which is mostly due to human activities such as deforestation and illicit logging (Baccini, et. al, 2017).

This observation that tropical forests constitute a net carbon source highlights the significance of forests in stabilizing carbon dioxide levels in the climate. Further, stopping tropical forest degradation would not only preserve watersheds but also reduce carbon emissions.



1.6 People

Undeniably, watersheds are the arteries where the lifeblood of millions of Filipinos flow. The last available census data from 2000 showed that an estimated 24 million Filipinos, or a third of the population, live in upland areas (Espiritu et al., 2010).

Between 14 to 17 million indigenous peoples live in watershed areas, overlapping with 75% of the country's forest cover (LRC, 2022). Indigenous communities have indigenous knowledge systems and practices (IKSPs) that include effective watershed management systems, such as the Muyong land-zoning system of the Ifugao people in the Cordilleras (Torres, 2020) and the Sulagad agro-ecological practices of the Teduray and Lambangian people in Maguindanao (FoEI, 2022).

The ecological health of watersheds is also crucial in providing water to drink and ensuring proper sanitation. In a public briefing held in March 2023, the National Water Resources Board (NWRB) pronounced that about 11 million Filipino families still do not have access to clean water and continue to access water from unsafe sources such as deep wells, springs, rivers, lakes, and rainwater (Galvez, 2023). This is alarming, since clean water is indispensable for Filipinos' general health and well-being.

Watersheds are also crucial in creating jobs. A total of 11.7 million people are employed in the agriculture, forestry, and fisheries (AFF) sector (PSA, 2022b). These jobs are highly dependent on the ecological health of naturescapes for productivity. A further 8.3 million people work in industries heavily reliant on huge volumes of water for their successful operation.

Healthy watersheds also protect people from various risks such as water-borne diseases and hydrometeorological hazards such as typhoons, floods, and landslides. From 2010 to 2019, around 14 Filipinos died daily from water-borne diseases, such as typhoid and paratyphoid fever, acute bloody diarrhea, confirmed cholera, viral hepatitis, rotavirus, and leptospirosis (Ordinario, 2021). Various studies have shown how insufficient pollution control and poor land use planning (Das & Dorner, 2007; Ntajal et al., 2022) in either urban or rural watersheds are linked to the prevalence of water-borne diseases.

According to a study on disasters conducted by Harvard Humanitarian Initiative, over 75% of the entire population reported being affected by flooding (Bollettino et al., 2018). Further, at least 17 provinces in the country are included in the top 100 areas in the world that are most vulnerable to disasters driven by the climate crisis (Cabico, 2023).

As the state of watersheds pose far-reaching consequences to the lives of the Filipino people, it necessitates the Philippine government to craft and implement a comprehensive watershed policy framework that is responsive to the complexities of our physical and socio-political landscapes.

2. Policy Landscape

A tributary of Chico River flowing through Kalinga province. Photo by L. Dulce / LRC

2.1 Legal Definitions

Presidential Decree 705, also known as the Forestry Code of 1975, defines a watershed as "a land area drained by a stream or fixed body of water and its tributaries having a common outlet for surface run-off" (Section 3m). The Forestry Code also defines a critical watershed as "a drainage area of a river system supporting existing and proposed hydro-electric power and irrigation works needing immediate rehabilitation" (Section 3n).

Further, the Department of Environment and Natural Resources (DENR), through Department Administrative Order 2021-41, set forth the guidelines for the creation of Watershed Management Councils and defines the protective status granted to watersheds. Section 4.3 of DAO 2021-41 defines the sizes of small (10,000 hectares and less), medium (10,000 to 50,000 ha), or large-scale (above 50,000 ha) watersheds.

2.2 Legal Protection

Watersheds generally do not have an intrinsic protection status. Section 29 of the amended implementing rules and regulations (IRR) of PD 1067, or the 1976 Water Code of the Philippines, designates the National Water Resources Board (NWRB), the DENR, and other relevant government agencies "to undertake watershed conservation, protection and rehabilitation" to safeguard their hydrological integrity (NWRB, 2005).

Similarly, Section 37 of PD 705 directs the State to undertake "all measures" to "protect forest resources from destruction, impairment, and depletion". Section 18 allows the President to establish watersheds as forest reservations. This is further operationalized in DAO No. 2021-41 as Proclaimed Watershed Forest Reserves, for the purposes of protecting, maintaining, and improving the water yield, among others, of critical watersheds, national parks, and the like.

The National Integrated Protected Areas System (NIPAS) Act of 1992, or Republic Act 7586 meanwhile grants Congress the power to establish protected areas (PA), with watersheds as among the components covered by the system. The NIPAS, which was further expanded in 2018 through the Expanded NIPAS (E-NIPAS) Act or Republic Act 11038, details the prohibited acts within a PA, with due recognition and exemption of acts of subsistence by indigenous peoples.

As with the Forestry Code, the E-NIPAS Act through Section 24 also allows special uses within the PA outside of the strict protection zones and strict nature reserves, provided that the activity shall not be detrimental to ecosystem functions, biodiversity, and cultural practices and traditions within the area.

Meanwhile, Section 5 of Republic Act 9275, or the Clean Water Act of 2004 allows for the designation of watersheds and other units of water as water quality management areas (WQMAs). These WQMAs will be subjected to maintenance and upkeep, water pollution control, and a compliance regime to be detailed in a Water Quality Management Area Action Plan. Section 27 emphasizes that watersheds do not need to be designated as a WQMA for prohibited acts enumerated in RA 9275 to be applicable, thus granting watersheds with an inherent protective status, albeit limited only to its water quality.

Further, Section 25 of Republic Act 9147, or the Wildlife Resources Conservation and Protection Act of 2001 also allows for the establishment of critical habitats, which "shall be protected, in coordination with the local government units and other concerned groups, from any form of exploitation or destruction which may be detrimental to the survival of the threatened species dependent therein." While not specifically referring to watersheds, watershed areas serve as habitats for threatened wildlife.

Table 3 summarizes salient prohibited activities applicable to watersheds based on the abovementioned policies.

Table 3. Protective Provisions for Watersheds

RA 9275 or the Clean Water Act

Sec 27 (a) Discharging, depositing or causing to be deposited material of any kind directly or indirectly into the water bodies or along the margins of any surface water, where the same shall be liable to be washed into such surface water, either by tide action or by storm, floods or otherwise, which could cause water pollution or impede natural flow in the water body;

Sec 27 (b) Discharging, injecting or allowing to seep into the soil or sub-soil any substance in any form that would pollute groundwater. In the case of geothermal projects, and subject to the approval of the DENR, regulated discharge for short-term activities (e.g., well testing, flushing, commissioning, venting) and deep re-injection of geothermal liquids may be allowed: Provided, that safety measures are adopted to prevent the contamination of the groundwater;

Sec 27 (c) Operating facilities that discharge regulated water pollutants without the valid required permits or after the permit was revoked for any violation of any condition therein;

Sec 27 (d) Disposal of potentially infectious medical waste into sea water by vessels unless the health or safety of individuals on board the vessel is threatened by a great and imminent peril;

Sec 27 (e) Unauthorized transport or dumping into sea waters of sewage sludge or solid waste as defined under Republic Act No. 9003;

Sec 27 (f) Transport, dumping or discharge of prohibited chemicals, substances or pollutants listed under Republic Act No. 6969;

Sec 27 (g) Operate facilities that discharge or allow to seep, willfully or through gross negligence, prohibited chemicals, substances or pollutants listed under Republic Act No. 6969, into water bodies or wherein the same shall be liable to be washed into such surface, ground, coastal, and marine water;

Sec 27 (h) Undertaking activities or development and expansion of projects, or operating wastewater/sewerage facilities in violation of Presidential Decree No. 1586 and its IRR;

Sec 27 (i) Discharging regulated water pollutants without the valid required discharge permit pursuant to this Act or after the permit was revoked or any violation of any condition therein; and,

Sec 27 (j) Directly using booster pumps in the distribution system or tampering with the water supply in such a way as to alter or impair the water quality.

PD 705 or the Revised Forestry Code

Sec 68. Cutting, gathering, and/or collecting timber or other products without license

Sec 69. Unlawful occupation or destruction of forest lands

Sec 70. Pasturing livestock

Sec 71. Illegal occupation of National Parks System and recreation areas, and vandalism therein

Sec 72. Destruction of wildlife resources, unless for the protection of life, health, safety and property, and the convenience of the people

Sec 73. Survey by unauthorized person

Sec 79. Sale of wood products unless compliant with grading rules and standards set by the government

RA 11038 or the Expanded National Integrated Protected Areas System Act

Sec 20 (a) Poaching, killing, destroying, disturbing of any wildlife including in private lands within the protected area;

Sec 20 (b) Hunting, taking, collecting, or possessing of any wildlife or by-products derived therefrom within the protected area without the necessary permit, authorization, or exemption: Provided, that the PASU as authorized by the PAMB shall issue a permit, authorization or exemption only for culling, scientific research, the exceptions provided under Section 27(a) of Republic Act No. 9147 (Wildlife Resources, Conservation and Protection Act) or harvests of nonprotected species in multiple-use zones by tenured migrants and IPs;

Sec 20 (c) Cutting, gathering, removing, or collecting timber within the protected area including private lands therein, without the necessary permit, authorization, certification of planted trees or exemption such as for culling exotic species; except, however, when such acts are done in accordance with the duly recognized practices of the IPs/JCCs for subsistence purposes;

Sec 20 (d) Possessing or transporting outside the protected area any timber, forest products, wildlife, or by-products, derived therefrom which are ascertained to have been taken from the protected area other than exotic species, the culling of which has been authorized under an appropriate permit;

Sec 20 (e) Using any fishing or harvesting gear and practices or any of their variations that destroys coral reefs, seagrass beds, and other marine life and their associated habitats or terrestrial habitat as may be determined by the DA or the DENR;

Sec 20 (f) Dumping, throwing, using, or causing to be dumped into or placed in the protected area of any toxic chemical, noxious or poisonous substance or nonbiodegradable material, untreated sewage or animal waste products or products whether in liquid, solid or gas state, including pesticides and other hazardous substances as defined under Republic Act No. 6969 detrimental to the protected area, or to the plants and animals or inhabitants therein;

Sec 20 (g) Operating any motorized conveyance within the protected area without permit from the PAMB, except when the use of such motorized conveyance is the only practical means of transportation of Ips/ICCs in accessing their ancestral domain/land;

Sec 20 (h) Altering, removing, destroying or defacing boundary marks and signs;

Sec 20 (i) Engaging in 'kaingin' or, in any manner, causing forest fires inside the protected area;

Sec 20 (j) Mutilating, defacing, destroying, excavating, vandalizing or, in any manner, damaging any natural formation, religious, spiritual, historical sites, artifacts and other objects of natural beauty, scenic value or other objects of interest to Ips/ICCs;

Sec 20 (k) Damaging and leaving roads and trails in damaged condition;

Sec 20 (I) Littering or depositing refuse or debris on the ground or in bodies of water;

Sec 20 (m) Possessing or using blasting caps or explosives anywhere within the protected area;

Sec 20 (n) Occupying or dwelling in any public land within the protected area without clearance from the PAMB;

Sec 20 (g) Operating any motorized conveyance within the protected area without permit from the PAMB, except when the use of such motorized conveyance is the only practical means of transportation of Ips/ICCs in accessing their ancestral domain/land;

Sec 20 (h) Altering, removing, destroying or defacing boundary marks and signs;

Sec 20 (i) Engaging in 'kaingin' or, in any manner, causing forest fires inside the protected area;

Sec 20 (j) Mutilating, defacing, destroying, excavating, vandalizing or, in any manner, damaging any natural formation, religious, spiritual, historical sites, artifacts and other objects of natural beauty, scenic value or other objects of interest to Ips/ICCs;

Sec 20 (k) Damaging and leaving roads and trails in damaged condition;

Sec 20 (I) Littering or depositing refuse or debris on the ground or in bodies of water;

Sec 20 (m) Possessing or using blasting caps or explosives anywhere within the protected area;

Sec 20 (n) Occupying or dwelling in any public land within the protected area without clearance from the PAMB;

Sec 20 (o) Constructing, erecting or maintaining any kind of structure, fence or enclosures, conducting any business enterprise within the protected area without prior clearance from the PAMB and permit from the DENR, or conducting these activities in a manner that is inconsistent with the management plan duly approved by the PAMB;

Sec 20 (p) Undertaking mineral exploration or extraction within the protected area;

Sec 20 (q) Engaging in commercial or large-scale quarrying within the protected area;

Sec 20 (r) Establishing or introducing exotic species, including GMOs or invasive alien species within the protected area;

Sec 20 (s) Conducting bioprospecting within the protected area without prior PAMB clearance in accordance with existing guidelines;

Sec 20 (t) Prospecting, hunting or otherwise locating hidden treasures within the protected area;

Sec 20 (u) Purchasing or selling, mortgaging or leasing lands or other portions of the protected area which are covered by any tenurial instrument; and

Sec 20 (v) Constructing any permanent structure within the forty (40)-meter easement from the high-water mark of any natural body of water or issuing a permit for such construction pursuant to Article 51 of Presidential Decree No. 1067: Provided, that construction f/or common usage wharves and shoreline protection shall be permitted by the PAMB only after thorough EIA.

RA 9147 or the Wildlife Resources Conservation and Protection Act Sec 27 (c) (i) dumping of waste products detrimental to wildlife; Sec 27 (c) (ii) squatting or otherwise occupying any portion of the critical habitat; Sec 27 (c) (iii) mineral exploration and/or extraction; Sec 27 (c) (iv) burning; Sec 27 (c) (v) logging; Sec 27 (c) (vi) quarrying Sources: PD 705 (1975), RA 9275 (2004), RA 9147 (2001), and RA 11038 (2018)

Other laws prohibit specific activities from declared watershed reserves. For instance, Section 19 (f) of the Mining Act of 1995 (Republic Act 7942) closes off from mining operations the following areas:

Old growth or virgin forests, proclaimed watershed forest reserves, wilderness areas, mangrove forests, mossy forests, national parks provincial/municipal forests, parks, greenbelts, game refuge and bird sanctuaries as defined by law and in areas expressly prohibited under the National Integrated Protected Areas System (NIPAS) under Republic Act No. 7586, Department Administrative Order No. 25, series of 1992 and other laws.

2.3 Local Government Protection

Local government units (LGUs) can potentially designate watersheds, thereby giving them protective status granted by the Forestry Code. This is being done by leveraging the regulatory powers granted by Sections 447 and 448 of the Local Government Code to (1) ensure and support, among other things, the preservation and enrichment of culture; (2) promote health and safety; and (3) enhance the right of the people to a balanced ecology—this is in fact a primary mandate of LGUs.

Through zoning ordinances based on their Comprehensive Land Use Plans (CLUP), LGUs can designate watershed areas within their territories as Protection Forest Zones. This can be done by applying regulations based on relevant provisions of the Forestry Code, E-NIPAS Act, Revised Public Land Act of 1937, and relevant presidential proclamations, among others (HLURB, 2014).

2.4 Permits

Aside from the aforementioned, limitations are applied on a case-by-case basis, depending on whether any activity affecting watersheds is within permitted standards and regulations. Project proponents must secure a range of permits in compliance with various relevant laws. These measures are essential for LGUs and other watershed managers to ensure the protection of their watersheds, as well as to guarantee responsible and sustainable use of their natural resources. Table 4 summarizes required permits that aim to safeguard Philippine watersheds.

Table 4. Permits to Regulate Watersheds				
Permits	Agency in Charge	Details		
Environmental Compliance Certificate (ECC) or Certificate of Exemption	Environmental Management Bureau (EMB)	Applicable to all projects		
Water Permit	National Water Resource Board (NWRB)	Applicable to all water-uses		

Forest Permits such as Special Land Use Permit (SLUP), Private Land Timber Permit, and Tree-Cutting Permits	Forest Management Bureau (FMB)	Applicable to projects within watershed's forest areas
Special use Agreement in Protected Areas (SAPA)	Department of Environment and Natural Resources (DENR)	Applicable to projects within NIPAS protected areas
Local Government Clearances such as Barangay, Municipal/City, and Provincial Resolutions	Barangay, Municipal, and Provincial Local Government Units (LGUs)	Applicable to all projects
Energy Permits such as Certificate of Endorsement and Certificate of Compliance	Department of Energy (DOE), Energy Regulatory Commission (ERC)	Applicable to hydro-electric and other power projects
Organizational Information Registrations such as SEC Registration, BIR Registration, and TIN	Securities and Exchanges Commission (SEC), Bureau of Internal Revenue (BIR), etc.	Applicable to all project proponents
Industry Clearances such as Board of Investments (BOI) Project Registration	Department of Trade and Industry (DTI)	Applicable to businesses
Land Development Permits such as Land Use Conversion and Locational Clearances	Department of Agrarian Reform (DAR), Department of Human Settlements and Urban Development (DHSUD)	Applicable to all land-uses

Sources: Rola et al. (2004), IPO-DOE (n.d.), DENR (n.d.), Section 14 of PD 1067, Section 25 of RA 11038, HLURB Resolution No. 980 s. 2019

2.5 Governance

Executive Order 22, s. 2023 established the Water Resources Management Office (WRMO) in the DENR, which integrates all water-related offices in the DENR. Section 4 of EO 22 mandates the creation of the Integrated Water Resources Master Plan, which shall be the comprehensive national policy for water resources management. The WRMO does not have a specific directive on watersheds, and the government has yet to come up with an IRR that would potentially provide more details.

Earlier in 2021, the National Economic Development Authority (NEDA, n.d.) came up with the Philippine Water Supply and Sanitation Master Plan (PWSSMP). The Plan proposes a PhP 1.07-trillion investment package over a 10-year period to fully achieve universal access to safe and sustainable water and sanitation to Filipinos by 2030. The PWSSMP, however, is clearly an infrastructure-oriented project, with only two out of its eight Key Reform Agenda items mentioning provisions on watersheds. These agenda pertain to balancing water supply and demand, and climate resiliency.

Likewise, its proposed investment program is exclusively for water infrastructure development. Only PhP 62.3 million or 0.06% of the total proposed investment package is allocated for 'nonphysical' investments on balancing water supply and demand and building climate resilience, as well as implementation and project management costs. There is no concrete allocation for tangible watershed protection, much less for the regeneration of watersheds.

The PWSSMP's strategy on watersheds is to formulate inter-agency, multi-stakeholder comanagement agreements aimed at protecting and rehabilitating watersheds. Simultaneously, it aims to develop new water service providers that use alternative water sources, in order to reduce supply and demand pressures from existing watersheds.

Watershed management councils (WMCs). The most recent attempt to streamline the management of watersheds is through the development of guidelines for the creation of WMCs, as called for in DAO 2021-41. 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. They are involved in planning, policy making, resource and development management, monitoring, enforcement, conflict resolution, and awareness raising, among others. They are tasked to coordinate with other existing watershed management bodies, specifically Protected Area Management Boards (PAMBs) and Water Quality Management Boards (WQMA).

As emphasized in DAO No. 2019-05, PAMB membership underscores horizontal government, which includes the Provincial Development Officer (PDO), a representative of the autonomous regional government (if applicable), and representatives of the barangay governments within the protected area.

Section 5 or RA 9275 meanwhile mandates WQMA governing boards to have a unique technical secretariat composed of experts on law, chemistry, hydrology or civil engineering, and geology or biology that will provide technical support to the board. Further, WMCs, PAMBs, and WQMA boards are mandated to enable the participation of indigenous peoples, people's organizations, and other civil society groups in their policymaking, planning, and management processes.

Integrated Watershed Management Plans (IWMPs). Each WMC is mandated to craft an Integrated Watershed Management Plan. This plan includes a comprehensive set of land and resource management strategies to guide and organize the sustainable development and management of a watershed's various ecosystems to harness the environmental, socio-cultural, and economic benefits (ERDB, 2011).

Further, WMCs are instructed to align their IWMPs with their respective Water Quality Framework and Management Area Action Plans and the Protected Area Management Plans.

In addition, LGUs are required by law to formulate 32 other plans that can potentially affect watershed management. The Department of Interior and Local Government (DILG, n.d.) is tasked to rationalize these into two omnibus plans, namely the Comprehensive Land Use Plan (CLUP), and the Comprehensive Development Plan (CDP).

An assessment of the government's rationalized planning framework showed that in terms of developing their ecological profiles, 94% of LGUs prioritized water and sanitation data for preparing their profiles, while environment data was likewise mentioned (Sicat et al., 2019). The study also found that less than half (42%) used Climate and Disaster Risk Assessment and Water Sector Plans as tools for developing priority programs, projects, and activities.

2.6 Financing

Sections 64 and 65 of the Forestry Code establishes the charges, fees, bonds, and other regulatory fees that the DENR can impose for the different kinds of utilization, exploitation, occupation, possession, or activity within forest lands. Meanwhile, Section 57 of the E-NIPAS Act created the Integrated Protected Areas Fund (IPAF) for the purposes of promoting the sustained financing of the system, sourcing funds from income generated from the operation and management of protected areas.

Sections 10 and 15 of the Clean Water Act, on the other hand, established two funding streams related to watershed management. The Area Water Quality Management Fund (AWQMF) was set up for the maintenance and upkeep of water bodies within a WQMA, sourcing funds from the

wastewater charge system of the law, as well as donations, endowments, and grants. The Environmental Guarantee Fund (EGF), meanwhile, requires program and project proponents operating within a watershed to allocate an amount set by the DENR for the maintenance and conservation of the watershed ecosystem.

A review of the 2023 General Appropriations Act (GAA) revealed that PhP 676.6 billion was allocated for watershed-relevant public funding, ranging from ecosystem protections to water regulations and sufficiency, to flood control (DBM, 2023). Table 6 lists the corresponding budget for items related to watershed management in the national government budget.

Knowing how exactly these funds will be spent and by which agencies would enable a better understanding and analysis of what watershed management expenditures are prioritized and whether these translate to effective manaaement of watersheds. However, the full disaggregation of these budgets is not readily available to the public.

The item on flood management, for instance, is indicated to be mainly from the Department of Public Works and Highways (DPWH), implying that the budget will likely emphasize 'gray' infrastructure projects instead of 'green' or ecosystem-based approaches.

Table 5. Watershed-relevant items in the 2023 GAA		
National Greening Program	P2.4-B	
Manila Bay Rehabilitation	Р1.7-В	
Protected Areas Development and Management	Р1.0-В	
Clean Water Regulations	P454-M	
Coastal and Marine Ecosystems	P246-M	
Climate Change Adaptation	P464.5-B	
Flood Management Program	P185.8-B	
National Disaster Risk Reduction and Management Fund	P20.5-B	
TOTAL	Р676.6-В	

Source: DBM (2023)

This highlights the government's understanding of watershed protection as infrastructure-oriented, rather than protective and rehabilitative as ought to be of effective watershed promotion projects.

The huge budget for climate change adaptation, of which PhP 357.3 billion is specifically earmarked for water sufficiency, does not indicate how much is downloaded. Likewise, it does not indicate which government agencies are implementing the different watershed management strategies. It is important to note the allocation disparity with the clearly defined appropriation for clean water regulations amounting to less than half a billion pesos of the DENR's budget.

In 2014, the UN Development Program's Biodiversity Finance Initiative (BIOFIN) estimated an 80% financing gap between the PhP 24-billion annual funding requirement of the Philippine Biodiversity Strategy and Action Plan (PBSAP) and the government's PhP 5-billion average annual budget spending for biodiversity (BIOFIN, n.d.). The PBSAP aims to ensure adequate protected area management and other relevant environmental conservation costs.

The total cost at a higher estimate for the entire 14-year PBSAP amounts to PhP 393.3 billion (BMB, 2016). A huge percentage (87%) of the PBSAP's budget can already be covered by the 2023 General Appropriations' water sufficiency budget alone, inflation rates considered. This suggests that while there are public funds that can be allocated for ridge-to-reef restoration and protection measures, these are not being spent on cost-effective programs.

2.7 Challenges

Watersheds face many tenuous conflicts. As discussed throughout this section, laws that grant them protective status, such as the Forestry Code and the NIPAS Act, also provide for permits and other means of still allowing development activities within watershed systems provided that these are in compliance with legal standards and regulations.



Watersheds receiving protective status have proven to be difficult in practice. It took 16 years for the NIPAS Act to be expanded by Congress to the E-NIPAS Act in 2018, to include an additional 94 landscapes and seascapes. Meanwhile, Presidential Proclamation No. 296 s. 2011, which declared the Marikina Watershed as a protected area, was the last statute protecting a watershed through executive powers.

Without adequate protection, watersheds can be used for land, water, and resource utilization activities that can have adverse consequences to their ecological integrity. These activities include mining agreements, agricultural venture agreements, dams and other infrastructure projects, and the like. Vested rights granted prior to protective designations are also not covered by prohibitions. In particular, development projects supported by bilateral or multilateral economic agreements that prioritize industries and other economic activities run the risk of negatively impacting watersheds and the communities supported by watersheds.

Some examples are the Belt and Road Initiative (BRI) of the Chinese government, which is an estimated US\$ 4-trillion loan and investment facility for infrastructure development (Silk Road Briefing, 2021) and the Dutch-Philippine Water Partnership covering technical cooperation on coastal management, water quality improvement, and urban delta planning (NWP, n.d.). Further, a recent supply chain analysis of nickel and other electronic vehicle metals demonstrates how increasing mining investments are feeding into human rights and environmental impacts, particularly loss of forest cover in Palawan, the country's last ecological frontier (BHRRC, 2023).

Similarly, the Manila Bay Sustainable Development Master Plan, an urban delta and coastal management plan based on the watershed contexts of across the entire bay co-developed by the Dutch government, has enabled the proliferation of dredging and reclamation projects. These activities have affected wetlands in the bay and the rights of coastal communities whose livelihoods are reliant on them (IUCN NL, 2021).

The seeming state of regulatory capture, meanwhile, is reflected in the current situation of our watersheds discussed in the previous sections. In the Yale Center for Environmental Law & Policy's 2022 Environmental Performance Index, the Philippines ranked 158th among 180 assessed countries. Specifically, it ranked 71st in terrestrial biome protection, 84th in tree cover loss, 102nd in water sanitation, 113th in water potability, and 126th in wastewater treatment (Wolf et al., 2022).

Moreover, in 2017, an industry-wide audit of mining projects by the DENR resulted in the cancellation of 75 mineral production sharing agreements after finding that these were situated in watersheds (Geronimo, 2017a). Likewise, the audit resulted in the suspension or closure of 23 operating mines after finding them in violation of various environmental and social regulations (Geronimo, 2017b).

It is also important to surface that watershed-relevant government offices and other relevant stakeholders have very little participation in Municipal Planning Teams (MPT), the basic planning unit of the LGU. For instance, only 18% of LGUs have the Housing and Land Use Regulatory Board (HLURB) as a member of their MPT, while only 11% have representatives from the National Commission on Indigenous Peoples (NCIP) on board.

The DENR itself, whose participation in local planning processes would better interface technical cooperation between LGUs and national government agencies in addressing environmental concerns, apparently does not even have significant representation. Moreover, only 5% of LGUs updated their CLUPs in a timely manner vis-à-vis their varying policy time frames, as prescribed by law. Similarly, only 36% had up-to-date CDPs, while only 30% had up-to-date Local Development Investment Programs (LDIPs) (Sicat et al., 2019).

Further, competing land claims with a regulatory regime skewed in favor of business-as-usual over environmentally critical projects create a volatile situation for social conflict. The spatial conflicts within ancestral domains of indigenous peoples are a telling example representing conflicts especially around upland forest areas where headwaters of watersheds are usually located. The State of Indigenous Peoples Address 2022 Report revealed that 49% of approved mining projects and a staggering 87% of timber or forest plantations conflict with Certificate of Ancestral Domain Titles (CADTs). These numbers thus suggest that these projects conflict with the impetus to preserve the remaining forest cover of the country (LRC, 2022).

This in turn has caused the intense militarization and human rights abuses against indigenous communities. A report submitted to the UN Expert Mechanism on the Rights of Indigenous People, revealed how 79% of indigenous territories with land and environment conflicts were further affected by militarization (LRC, 2023).

On the other hand, applying protections on watersheds without contextualizing indigenous knowledge systems and practices can also potentially displace indigenous peoples and other marginalized communities. The Forestry Code, for instance, has been used to criminalize Iraya Mangyans who cut a Dita tree for the construction of their community toilet, such as in the case of Sama et al. v. People of the Philippines (2021). The Supreme Court has, however, refined the interpretation of indigenous peoples' rights to forest resources and acquitted them in 2021.

2.8 Precedents

Over recent years, there has been some progress in the recognition and protection of watersheds in the various branches of government. These can be cited as precedents for watershed governance, and are described in this section.

Cancellation of Mining Agreements in Upper Marikina Watershed. A series of department orders from the DENR (Bautista, 2023) ordered the cancellation of quarrying permits of three companies overlapping with the sections of the Upper Marikina River Basin Protected Landscape (UMRBPL). The UMRBPL is a 26,126-hectare proclaimed as a protected area, by virtue of Presidential Proclamation No. 296, s. 2011. It.was eventually integrated in the E-NIPAS in 2018.

The companies Rapid City Realty and Development Corp., Quimson Limestone, Inc., and Quarry Rock Group, Inc., all holders of Mineral Production Sharing Agreements (MPSAs) covering a total of 1,343 hectares of the protected area, were found to have failed various administrative requirements in connection with activities within the protected area. These requirements included the submission of work programs, submission of environmental protection and enhancement programs, and establishment of rehabilitation and decommissioning funds, as required by law.

While the DENR's basis for cancelling quarrying permits did not cite the protected status of watersheds, the mining companies themselves recognized the protected status. Quimson Limestone Inc. responded to a show-cause order issued by the Region IV-A office of the Mines and Geosciences Bureau in 2021 regarding their impending MPSA cancellation, stating that they considered not renewing their contract as its expiration neared after their operating areas were declared by then DENR Secretary Roy Cimatu as part of Masungi Georeserve, a protected area.



Writ of Kalikasan on the Mt. Santo Tomas Forest Reserve. In a decision dated June 2022 (Aliping v. CA et al., 2022), the Supreme Court En Banc affirmed the granting of a writ of kalikasan, a legal remedy that provides protection for the right to a balanced and healthful ecology, covering the Mount Santo Tomas Forest Reserve (MSTFR), a 3,121-hectare forest reserve established in 1940 for forest protection, timber production, and aesthetic purposes.

The MSTFR has not been integrated into the NIPAS; as such, it does not expressly receive the highest level of protected status available under Philippine laws. Despite this, the SC denied the petition for review filed by former Baguio City Congressional Representative Nicasio Aliping Jr., who alongside other public officials and private individuals was served with the writ and a Temporary Environmental Protection Order (TEPO) in 2014 to stop them from engaging in earth moving activities in the area (Aning, 2014).

Petitioners, which included residents and clergy of Baguio City and Tuba Town in Benguet, and San Fabian Town in Pangasinan, sought to stop activities that led to the degradation of Mt. Sto. Tomas. These activities included illegal tree cutting and road construction, expansion of vegetable farms and residential areas, and illegal small-scale mining. Despite repeated appeals and motions for reconsideration, the CA and SC continued to affirm that cutting trees for the construction of two roads leading to Aliping's claimed property within the forest reserve resulted in forest degradation.

Davao City Watershed Code. The Davao City Council passed its Watershed Protection, Conservation, and Management Ordinance No. 0310-07 in 2007. Davao City's Watershed Code 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 sets prohibited acts according to the particular designation; schedules regular reviews and studies for updating the spatial coverage of the Code; establishes the operationalization of its watershed governance through a Watershed Management Council and other mechanisms; and implements various other regulations.

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. This was despite a resolution passed by the Davao WMC earlier that year denying the application for tree cutting (Colina, 2022). 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.

While these precedents are not yet standard for majority of watershed policy landscapes, they serve as prototypes of how we can transform the way we manage our watersheds.

5. Incinecaro Transformative Water

Governance

A young Kirentiken Manobo woman leads the documentation and propagation of native herbal plants in her ancestral domain in Pangantucan, Bukidhan, Photo by L. Dulce / LRC

The current watershed policy and governance framework are inadequate in comparison to their tremendous importance in the lives of Filipinos. Despite government assessments highlighting the importance of these watersheds for mitigating risks of depletion, pollution, and climate impacts, the proportion of watersheds with effective protection measures is disappointingly small. Moreover, at times, these protection measures can be superseded, thus undermining the intent of these measures.

Attempts to manage the various overlapping governance plans and structures of watersheds show the government's recognition of watershed integrity as critical to the welfare and well-being of Filipinos. Nevertheless, the direction of government projects and programs does not seem to support genuine ecological solutions and is exclusionary to marginalized communities.

As a result, watersheds in the Philippines are clearly in a state of crisis. This watershed crisis is marked with spatial conflicts that have resulted in the increasing inaccessibility of water supplies; eroding water quality; degrading integrity of ecosystems; and worsening vulnerability to water and climate-related disaster risks. In the Philippines and across the world, there is increasing recognition of the urgent need for a paradigm shift in watershed governance.

Thus, in 2023, more than 40 environmental justice advocates from civil society and academia around the world, including representatives of the Legal Rights and Natural Resources Center (LRC) and other Filipino groups, authored the Transformative Water Pact (TWP). The initiators describe the TWP as a living, breathing blueprint of principles and frameworks for action "developed in response to the continued exploitation of nature, neglect of human rights and the extreme power-imbalances that characterize contemporary water governance throughout the world" that provides "an alternative vision of water governance based on the tenets of environmental justice, equality, and care" (TWP, 2023, p.3). Establishing local TWPs at the national and subnational levels can address the various challenges besetting watershed management in the Philippines through its action frameworks, localized to the Philippine context.

This concluding section suggests policy and programmatic initiatives that can contribute to a more robust and transformative framework for watershed governance in the Philippines.

3.1 Responsive Public Institutions

Watershed Management Councils must be integrated with similar governance structures such as Water Quality Management Area Councils. These integrated mechanisms should then develop cohesive watershed management plans that immediately designate priority-assessed watersheds as watershed forest reserves and protection forest zones. Local government units and other offices within the WMC have existing mandates to provide these policy protections.

The planning and policy programming of WMCs must be anchored on a rights-based approach that empower indigenous, farmer, and other grassroots communities and their people's organizations with significant decision-making capabilities. Government agencies that are mandated to enable public participation, such as the Commission on Human Rights (CHR), NCIP, and the National Anti-Poverty Commission (NAPC), must be integrated into the structure of these Councils.

Additionally, local-level watershed plans must be mainstreamed both into local CLUPs and CDPs of LGUs, and with national-level plans such as the Philippine Development Plan and the Water Master Plan. These plans must be anchored on established scientific realities, and should thus be prioritizing agro-ecological development, ensuring accessible public services infrastructure, and rationalizing industrial development. Further, they must be harmonized with ancestral domains, small holder farms, and other grassroots politico-ecological systems situated within watersheds.

In terms of resource allocation, LGUs, national agencies, and other government bodies that have appropriate environmental protection and climate adaptation public funds must allocate resources and investment programs toward watershed interventions based on the imperatives of science and social justice.

Further, a special audit must be conducted on how the PhP 676-billion budget earmarked for climate-specific allocations in the 2003 General Appropriations Act was spent, and how it can best be rechanneled toward appropriate watershed interventions.

3.2 Knowledge Exchange and Development

Indigenous knowledge systems and practices (IKSP) and other traditional systems of watershed management must be utilized and supported technically and financially, especially within ancestral domains overlapping with watershed areas. Existing WMCs can serve as platforms where information about these IKSPs and other traditional systems can be exchanged among localities.

Research and development (R&D) institutions such as the DENR's ERDB and the Department of Science and Technology's (DOST's) various R&D institutes should be actively directed toward addressing the country's prevailing watershed problems. Focus should especially extend to interventions around indigenous and other local community watershed management systems.

A watershed-specific public information clearing house mechanism must be established, building on existing efforts by the Philippine Statistical Authority (PSA), ERDB, Biodiversity Management Bureau (BMB), and other relevant agencies. This mechanism can develop databases and profiles down to specific watershed levels, which will be helpful in providing up-to-date information necessary for policy and programmatic interventions, and for the general public.

3.3 Social Justice and Equity

Core regulatory agencies embedded in integrated WMCs, such as the EMB, the NWRB, and provincial LGUs, among others, must adopt a joint administrative order (or local codes, for LGUs) creating a mandatory human rights due diligence mechanism. This is an important tool that will guide the regulatory regimes of their watershed-relevant permitting powers such as the Environmental Compliance Certificate, Water Permit, Certificate Precondition on free, prior, and informed consent.

Likewise, regulatory compliance must be updated to the highest environmental and other human rights standards set by national laws, international treaties, and other guiding principles on human rights. These should include but not be limited to the CHR's National Inquiry on Climate Change Report recommendations, the UN Guiding Principles on Business and Human Rights, and the UN Declaration on the Rights of Indigenous Peoples.

3.4 Local Capacity

Part of public funds for watershed management must be allocated for the capacity building of local indigenous and other grassroots people's organizations, civil society organizations, cooperatives, and other community groups involved in watershed protection and management. Considering how local communities are most attuned with ground realities and most motivated to protect their lives and livelihoods inextricably linked to the integrity of watersheds, they are best positioned to contribute to and thus be represented in the Watershed Management Councils.

3.5 Ecological Integrity

To immediately stem the degradation of watersheds, moratorium on approving new or renewing existing agribusiness, mining, large dam, and other infrastructure projects identified as main drivers of water pressures should be imposed, until such time that a new local or national legislation on transformative watershed governance has been passed to rationalize the regulations covering watersheds.

The National Greening Program must be reconstituted into a 'rainforestation' program that emphasizes the restoration of the ecological functions of watershed forests, particularly its water storage and provisioning, erosion control, pollution and carbon sequestration, biodiversity conservation, and climate resilience, among others.

Clean alternatives to ecologically destructive development projects must also be identified and scaled up. Likewise, appropriate watershed rehabilitation solutions to improve water quality such as bioremediation, phytoremediation, and the like should be implemented, with particular emphasis on solutions that address the sources of pollution and degradation.

3.6 International Regulation

A review of international technical, financial, and other value flows toward industries and other programs or projects that adversely affect the ecological integrity of our watersheds, as outlined in the previous sections, is in order. These must be assessed based on local scientific realities, human rights due diligence, and public interest.

Finally, treaties that help address urgent crises such as climate change, biodiversity loss, and human rights abuse must be urgently ratified and implemented. Concretely, the Philippine government, along with environmental protection advocates must champion the operationalization of recent agreements such as the Kunming-Montreal Global Biodiversity Framework and the Sharm el-Sheikh Implementation Plan, which created funds for biodiversity restoration and climate loss and damage compensation.

These policy and governance options are envisioned to guide communities, advocates, and public officials in localizing best practices in transformative watershed governance to their respective local contexts. It is our hope that this publication creates a watershed moment for a renewed public interest in our watersheds, amid the complex challenges our people and our planet face.

References

Aguda R.B. (n.d.). Conservation, ulitilization, and management of forest genetic resources in the Philippines. https://www.fao.org/3/ac648e/ac648e09.htm#:~:text=The%20optimal%20area%20of%20forest,40%25%20of%20the%20land%20area

Aliping v. Court of Appeals et.al. (2022). G.R. No. 221823.

Aning, J. (2014, September 30). SC stops activities in Mt. Santo Tomas forest. Philippine Daily Inquirer. https://newsinfo.inquirer.net/641797/sc-stops-activities-in-mt-santo-tomas-forest

Baccini, A., Walker, W., Carvalho, L., Farina, M., Sulla-Menashe D. & R. A. Houghton. (2017). Tropical forests are a net carbon source based on aboveground measurements of gain and loss. Science, 358(6360), 230-234. https://doi.org/10.1126/science.aam5962

Bautista, J. (2023, February 10). Watershed defenders win vs quarrying. Philippine Daily Inquirer. https://newsinfo.inquirer.net/1727863/watershed-defenders-win-vs-quarrying

Bollettino, V., Alcayna, T., Enriquez, K., & Vinck, P. (2018). Perceptions of disaster resilience and preparedness in the Philippines. Harvard Humanitarian Initiative, June (1-31). https://disasterlink.give2asia.org/wp-content/uploads/2019/12/COP-CDRC.pdf

Business & Human Rights Resource Centre [BHRRC]. (2023). Powering electric vehicles: Human rights and environmental abuses in Southeast Asia's nickel supply chains.

Biodiversity Finance Initiative [BIOFIN]. (n.d.). Philippines: Invest in biodiversity, invest in our future. https://www.biofin.org/philippines

Biodiversity Management Bureau [BMB]. (2016). Philippine biodiversity strategy and action plan 2015-2018: Bridging resilience to Filipino communities.

Biodiversity Management Bureau [BMB]. (2022). Summary of assessed critical wetlands as of December 2021 [Data set]. ENR Compendium 2021. https://www.denr.gov.ph/index.php/e-library/enr-compendium-2021

Cabico, G.K. (2018, March 4). Recovering the Philippines' forest cover. Philippine Star. https://www.philstar.com/headlines/2018/03/04/1793446/recovering-philippines-forest-cover

Cabico, G.K. (2023, March 1). Philippine provinces among areas at most risk from climate change. Philippine Star. https://www.philstar.com/headlines/climate-and-environment/2023/03/01/2248552/philippine-provinces-amongareas-most-risk-climate-damage

Chavez, L. (2019, October 8). Philippines races to save its increasingly endangered hornbills. Mongabay. Retrieved from https://news.mongabay.com/2019/10/philippines-races-to-save-its-increasingly-endangered-hornbills/

City Government of Davao. (2007). Watershed protection, conservation and management ordinance of Davao City (Watershed Code). Davao City Council Ordinance No. 0310-07.

Clean Water Act of 2004, RA 9275. (Philippines). Sec 5.

Clean Water Act of 2004, RA 9275. (Philippines). Sec 10.

Clean Water Act of 2004, RA 9275. (Philippines). Sec 15.

Clean Water Act of 2004, RA 9275. (Philippines). Sec 27 a-j.

Colina, A., IV. (2022). DENR-Davao urged to review Watershed Code before issuing permit to cut trees. MindaNews. https://www.mindanews.com/top-stories/2022/03/denr-davao-urged-to-review-watershed-code-before-issuing-permit-to-cut-trees/

Das, Debalina and Dorner, Sarah M., "Waterborne Diseases: Linking Public Health and Watershed Data" (2007). 2007. Paper 54. http://opensiuc.lib.siu.edu/ucowrconfs_2007/54

Department of Budget Management [DBM]. (2023). 2023 People's enacted budget. https://www.dbm.gov.ph/images/pdffiles/2023-Peoples-Enacted-Budget.pdf

Department of Environment and Natural Resources (DENR). (2019). Implementing rules and regulations of the NIPAS Act, as amended by RA 11038 or the ENIPAS Act of 2019. Department Administrative Order 2019-05. https://www.officialgazette.gov.ph/downloads/2019/05may/20190530-IRR-RA-7586-RRD.pdf

Department of Environment and Natural Resources (DENR). (2021). Guidelines in the creation of watershed management councils. Department Administrative Order 2021-41. https://ncr.denr.gov.ph/images//dao-2021-41-guidelines-in-the-creation-of-watershed-management-_p25505.pdf

Department of Environment and Natural Resources (DENR). (2021). Guidelines in the creation of watershed management councils. Department Administrative Order 2021-41. Sec 4.3. https://ncr.denr.gov.ph/images//dao-2021-41-guidelines-in-the-creation-of-watershed-management-_p25505.pdf

Department of Environment and Natural Resources [DENR]. (n.d.). Forest management application forms. https://denr.gov.ph/index.php/home/40-invitation-to-bid/191-central-office-.html

Department of Interior and Local Government [DILG]. (n.d.). Local planning illustrative guide: Preparing and updating the comprehensive development plan (CDP).

Ecosystems Research and Development Bureau [ERDB]. (2015). A research compendium of rehabilitation strategies for damaged, critical & marginal watersheds. https://erdb.denr.gov.ph/wp-content/uploads/2015/06/watershed_compendium.pdf

Ecosystems Research and Development Bureau [ERDB]. (2011) Manual on vulnerability assessment of watersheds.

Ecosystems Research and Development Bureau [ERDB]. (2022). Table 2: Priority watersheds in the Philippines assessed for their vulnerability 2007-2021 [Data set]. ENR Compendium 2021. https://www.denr.gov.ph/index.php/e-library/enr-compendium-2021

Environmental Management Bureau [EMB]. (n.d.). Water quality monitoring database [Data set]. https://emb.gov.ph

Espiritu, N.O., Casin, M.C., & Camacho, S.C. (2010). Development pathways in the Philippine uplands: Impacts and influences on forest resource management and human well-being. Asian Journal of Agriculture and Development, 7(2), 27-47. https://ajad.searca.org/article?p=164

Expanded National Integrated Protected Areas System (E-NIPAS) Act of 2018, Republic 11038. (Philippines). Sec 20 a-v.

Expanded National Integrated Protected Areas System (E-NIPAS) Act of 2018, Republic 11038. (Philippines). Section 57.

Executive Order 22, s. 2023. (2023). Creating the Water Resources Management Office in the Department of Environment and Natural Resources.

Forest Management Bureau [FMB]. (2004). Philippine forestry statistics 2004. https://forestry.denr.gov.ph/index.php/statistics/philippines-forestry-statistics

Forest Management Bureau [FMB]. (2020). Philippine forestry statistics 2020. https://forestry.denr.gov.ph/index.php/statistics/philippines-forestry-statistics

Forest Management Bureau [FMB]. (2021). Philippine forestry statistics 2021. https://forestry.denr.gov.ph/index.php/statistics/philippines-forestry-statistics

Forestry Code of 1975, PD 705. (Philippines). Sec 3(m) & 3(n).

Forestry Code of 1975, PD 705. (Philippines). Sec 18.

Forestry Code of 1975, PD 705. (Philippines). Sec 37.

Forestry Code of 1975, PD 705. (Philippines). Sec 64-65.

Forestry Code of 1975, PD 705. (Philippines). Sec 68-73.

Forestry Code of 1975, PD 705. (Philippines). Sec 79.

Friends of the Earth International [FoEI]. (2022). Reviving indigenous agroecology in the Philippines: "Sulagad". https://www.foei.org/reviving-indigenous-agroecology-in-the-philippines-sulagad/

Galvez, D. (2023, March 20). 11 million Filipino families have no access to clean water – NWRB. Philippine Daily Inquirer. https://newsinfo.inquirer.net/1745469/11-million-filipino-families-have-no-access-to-clean-water-nwrb

Geronimo, J. (2017a). DENR orders cancellation of 75 MPSAs in watersheds. Rappler. https://www.rappler.com/nation/161419-denr-cancels-mpsa-watersheds/

Geronimo, J. (2017b). DENR announces closure of 23 mining operations. Rappler. https://www.rappler.com/nation/160270-denr-closes-mining-operations/

Global Forest Watch [GFW]. (n.d.). Components of net change in tree cover in Philippines [Data set]. https://gfw.global/3NaWHn7

House and Land Use Regulatory Board [HLURB]. (2014). CLUP guidebook: A guide to comprehensive land use plan preparation.

House and Land Use Regulatory Board [HLURB]. (2019). 2019 Revised rules of procedure of the Housing and Land Use Regulatory Board. HLURB Resolution No. 980 s. 2019.

Intergovernmental Panel on Climate Change [IPCC] (2021). Summary for policymakers. In Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the Intergovernmental Panel on Climate Change (V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou [Eds.]). Cambridge University Press (3–32). doi:10.1017/9781009157896.001

Investment Promotion Office – Department of Energy [IPO-DOE]. (n.d.). Registration procedures for energy projects.

International Union for Conservation of Nature [IUCN]. (n.d.). IUCN red list.https://www.iucnredlist.org/search? landRegions=PH&searchType=species

Legal Rights and Natural Resources Center [LRC]. (2022). State of indigenous peoples address 2022 report.

Legal Rights and Natural Resources Center [LRC]. (2023). Submission to the expert mechanism on the rights of indigenous peoples on the impact of militarization on the rights of indigenous peoples in the Philippines.

Local Government Code of 1991, RA 7160. (Philippines). Sec 447-448.

Magno, C. (2020). Water, transparency and mining concerns in the Philippines. Action for Economic Reforms. https://aer.ph/water-transparency-and-mining-concerns-in-the-philippines/

Medina, S. (2019, December 3). Soil erosion and agroforestry: The state of agriculture in the Philippines [Presentation slides]. Symposium in Meiji University, Tokyo, Japan. https://www.meiji.ac.jp/cip/researcher/6t5h7p00000ixpa5-att/material_2019f_kai.pdf

National Economic Development Authority [NEDA]. (n.d.). Philippine development plan 2023–2028. https://pdp.neda.gov.ph/philippine-development-plan-2023-2028/

National Integrated Protected Areas System Act of 1992, RA 7586. (Philippines).

National Water Resources Board (NWRB). (2005). Amended implementing rules and regulations, 1976 Water Code of the Philippines, PD 1067. Sec 29.

Ntajal, J., Höllermann, B., Falkenberg, T., Kistemann, T., & Evers, M. (2022). Water and health nexus—Land use dynamics, flooding, and water-borne diseases in the Odaw River Basin, Ghana. Water, 14(3), 461. https://doi.org/10.3390/w14030461

Netherlands Water Partnership [NWP]. (n.d.). Region: Philippines. https://www.netherlandswaterpartnership.com/regions/asia/philippines

Ordinario, C. (2021). PSA: 14 Pinoys die every day from water-borne diseases. BusinessMirror. https://businessmirror.com.ph/2021/10/04/psa-14-pinoys-die-everyday-from-water-borne-diseases/

Philippine Clearing House Mechanism [PhilCHM] (n.d.-a). 248 Protected Areas [Data set]. http://www.philchm.ph/padatabase/

Philippine Clearing House Mechanism [PhilCHM] (n.d.-b). Wetlands. http://www.philchm.ph/wetlands/

Philippine Mining Act of 1995, RA 7942. (Philippines). Sec 19f.

Philippine Statistics Authority [PSA]. (2022a). Statistical tables water accounts 2010 to 2021 [Data set]. https://psa.gov.ph/content/country%E2%80%99s-water-use-efficiency-increased-2020-2021

Philippine Statistics Authority [PSA]. (2022b). 2019 Annual survey of Philippine business and industry (ASPBI) – Economywide preliminary results [Data set]. https://psa.gov.ph/content/2019-annual-survey-philippine-business-and-industry-aspbi-economywide-preliminary-results

Presidential Proclamation 296, s. 2011. (2011). Declaring the Marikina Watershed Reservation situated in the City of Antipolo and in the Municipalities of Baras, Rodriguez, San Mateo and Tanay, all in the Province of Rizal as Protected Area pursuant to RA 7586 or the NIPAS Act of 1992 and shall be known as the Upper Marikina River Basin Protected Landscape.

Proclamation No. 581, s. 1940. (1940). Establishing as Santo Tomas Reserve for forest protection, timber production and aesthetic purposes a parcel of the public domain situated in the Municipal District of Tuba, Subprovince of Benguet, Mt. Province, Island of Luzon.

Rola, A., Francisco, H., & Liguton, J. (Eds). (2004). Winning the water war: Watersheds, water policies and water institutions. Philippine Institute for Development Studies (PIDS) and Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD).

Salas, J. (2023). Determining a watershed management unit. The Alternative Minerals Management Reader. [Unpublished manuscript]. SOS Yamang Bayan Network and the Legal Rights and Natural Resources Center.

Sama et al. vs People of the Philippines. (2021). G.R. No. 224469.

Schoenholtz, S.H. (2004). Impacts of forest management on water quality. In J. Burley (Ed.), Hydrology: Encyclopedia of Forest Sciences (pp. 377-387). Elsevier. doi.org/10.1016/B0-12-145160-7/00209-X.

Sicat, C.J., Mariano, M.A., Castillo, A.F., Adaro, C., & Maddawin, R. (2019). Assessment of the Philippine local government planning and budgeting framework. PIDS Discussion Paper No. 2019-18. Philippine Institute for Development Studies. https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps1918.pdf

Silk Road Briefing. (2021, September 16). China belt and road projects value now exceeds US\$4 trillion. Dezan Shira & Associates. https://www.silkroadbriefing.com/news/2020/11/25/china-belt-and-road-projects-value-now-exceeds-us4-trillion/

Tolentino P.L.M., Poortinga, A., Kanamaru, H., Keesstra, S., Maroulis, J., David, C.P., & Ritsema, C.J. (2016). Projected impact of climate change on hydrological regimes in the Philippines. PLOS ONE 11(10): e0163941. https://doi.org/10.1371/journal.pone.0163941

Trail, P.W. (2007). African hornbills: Keystone species threatened by habitat loss, hunting, and international trade. Ostrich, 78(3), 609-613. DOI: 10.2989/OSTRICH.2007.78.3.7.318

Transformative Water Pact [TWP]. (2023). The transformative water pact. Retrieved from https://transformativewaterpact.org/

Wildlife Resources Conservation and Protection Act of 2001, RA 9147. (Philippines). Sec 25.

Wildlife Resources Conservation and Protection Act of 2001, RA 9147. (Philippines). Sec 27 c(i-vi).

Wolf, M. J., Emerson, J. W., Esty, D. C., de Sherbinin, A., Wendling, Z. A., et al. (2022). 2022 Environmental performance index. Yale Center for Environmental Law & Policy. epi.yale.edu



