GG
Green Governance: Exploring Politics, Social Justice, and the Environment
GG 3(1): 1–21
ISSN 3062-8113

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Reclaiming sovereignty: Decolonizing wetland governance in Bangladesh for sustainable futures

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Received Date: January 14, 2026 Revised Date: February 24, 2026 Accepted Date: February 25, 2026

ABSTRACT

Background: Wetlands in Bangladesh, such as haors and beels, are living, dynamic landscapes that sustain biodiversity, livelihoods, and culture across generations. Yet, governance models rooted in colonial resource extraction and bureaucratic control persist, marginalizing these vital socio-ecological systems. Post-independence state-led development continues to prioritize technical solutions over community knowledge and ecological resilience. This has created a crisis in regions like the haors, where institutional incoherence meets acute ecological vulnerability. **Methods:** This study employs a qualitative interpretive design grounded in socio-ecological and historical perspectives to examine wetland governance in Bangladesh's haor region, drawing on extensive secondary sources and using iterative thematic analysis informed by a decolonial framework to explore power dynamics, community experiences, and postcolonial institutional legacies. **Findings:** Informed by decolonial theory, political ecology, and Indigenous knowledge, this paper argues for a radical paradigm shift. Through fieldwork and community narratives, it highlights the urgent need to move beyond centralized, reactive governance. Instead, it calls for institutional decolonization centering local leadership, plural knowledge systems, and justice in environmental decision-making. Securing the future of Bangladesh's wetlands demands not just technical innovation, but historical reckoning and epistemic justice, restoring governance to those whose lives are woven into these landscapes. **Conclusion:** Wetland governance in Bangladesh requires a decolonized, justice-oriented shift that centers community authority, participatory institutions, and the integration of local and scientific knowledge to ensure ecological resilience and social equity. **Novelty/Originality of this article:** This study applies a decolonial political ecology lens to wetland governance in Bangladesh, proposing a justice-oriented, community-centered model to replace centralized postcolonial control and strengthen socio-ecological resilience.

KEYWORDS: community governance; decolonial policy; environmental justice indigenous knowledge; social-ecological resilience; wetland sustainability.

1. Introduction

Provide Bangladesh is a high-density deltaic country formed by the interconnection of the Ganges, Brahmaputra, and Meghna river systems and has one of the most complex wetland ecologies in the world. The haor basins and the vast floodplains and beels spread across the national landscape are among the most dynamic and ecologically significant (Bangladesh Haor and Wetland Development Board [BHWDB], 2012). As hydrological buffers and biodiversity hotspots, and as key livelihood spaces for millions of people, these wetlands are at the heart of modern debates on environmental governance and climate

Cite This Article:
Salam, M. F., & Masrur, H. R. (2026). Reclaiming sovereignty: Decolonizing wetland governance in Bangladesh for sustainable futures. *Green Governance: Exploring Politics, Social Justice, and the Environment*, *3*(1), 1-21. https://doi.org/10.61511/gg.v3i1.2026.2890

resilience (Kafy et al., 2021). Besides being natural habitats, these wetlands are crucial social-ecological systems that govern water flows, recharge aquifers, store carbon, and sustain millions of livelihoods through farming, fishing, and transportation during the season. They are also highly spiritual and cultural, especially for rural and indigenous communities that have lived alongside these water bodies for generations.

Although wetlands in Bangladesh are vital for maintaining biodiversity and human life, they are increasingly threatened (Mukul et al., 2017). The ecological balance has been severely affected by industrial growth, uncontrolled development, pollution, encroachment on infrastructure, and the growing impacts of climate change. Unpredictable precipitation patterns, rising temperatures, and flooding are already changing wetland patterns and \displacing at-risk populations (Chowdhury & Moore, 2017).land revenue and consolidating state power (Gadgil & Guha, 1992; Mukerjee, 2020). This model marginalized indigenous management, disregarded ecological variation, and treated wetlands as wastelands or extractive frontiers. These colonial structures were not abolished after independence in 1971; instead, they were institutionalized in the postcolonial regime of planning and development. These issues of fragmented jurisdictions, overlapping mandates, and elite-driven agendas persist to this day, negatively impacting local knowledge and participation in the governance of wetlands. To illustrate this historical trajectory, Table 1 outlines the major policy shifts, administrative restructurings, and socio–ecological consequences that have shaped wetland governance from the colonial era to the present day, providing essential context for the structural challenges examined in this paper.

Table 1 Timeline of key colonial and postcolonial events impacting wetlands

Year	Event	Impact on Wetlands
1793	Permanent Settlement Act	Introduced fixed land revenue; encouraged land commodification; ignored community tenure systems.
1850s–1900s	Canal and embankment projects	Altered wetland hydrology; intensified flood control; marginalized traditional floodplain agriculture.
1947	Partition of British India	Legal-administrative structures retained by Pakistan (East Bengal); no shift in ecological governance.
1950	East Bengal State Acquisition and Tenancy Act	Abolished the zamindari system, but wetlands remained under indirect bureaucratic control.
1980s–1990s	Flood Action Plan (FAP)	Promoted structural engineering over local resilience; led to increased siltation and waterlogging.
2000s–present	Rise of co-management initiatives (e.g., CBFM, MACH)	Attempt to reclaim local authority; challenged the legacy of centralized, colonial governance.

(Ahmed, 2010; Sultana, 2019; Islam & Sato, 2012)

Over the last couple of years, researchers and practitioners have demanded a complete reimagining of environmental governance, one that is not so technocratic and instead embraces decolonial, community-based approaches (Suchet-Pearson et al., 2013; Temper et al., 2023; Liboiron, 2021). These methods aim to reinstate agency to the people who rely on wetlands, appreciate indigenous knowledge of ecology, and consider wetlands as culturally significant and politically controversial spaces (Escobar, 2018). Decolonizing of wetland governance is not a question of policy reform but of changing the power relations at the basis of resource control and environmental degradation.

This article unfolds in several interconnected sections. The first part is the introduction, covering the landscape of Bangladesh's wetlands and their socio-ecological value, and the second is a historical account of how colonial and postcolonial systems of governance have influenced the modern failures of institutions. A methodological section reports on a qualitative, field-oriented research that is based on community narratives, participatory

observations, and policy analysis. The theoretical framework is based on decolonial theory, political ecology, and Indigenous Ecological Knowledge, and aims to use wetland governance as an ecological and political process. The analytical centers examine structural and policy obstacles, present empirical case studies of sites such as Tanguar Haor and the haor wetlands of Sunamganj, and outline currents of resistance and innovation. The concluding chapters outline practical reform avenues, proposing a justice-focused, community-based approach to wetland management grounded in cultural resilience, legal recognition, and environmental justice. This study addresses three central questions: how do colonial and postcolonial institutional legacies structure contemporary wetland governance; in what ways are local ecological knowledge and community authority marginalized or reclaimed; what institutional reforms are required to operationalize decolonized, justice-centered governance.

1.1 Theoretical framework

This study integrates three intertwined perspectives: decolonial theory, political ecology, and indigenous knowledge systems to envision wetlands as arenas of ecological and political transformation. Decolonial scholars argue that the end of colonial rule did not dismantle deeply entrenched systems of knowledge and governance (Mignolo, 2011; Bhambra, 2021; Maldonado-Torres, 2020). In Bangladesh, wetland governance often retains administrative patterns rooted in extraction and control rather than community empowerment or environmental stewardship. This raises pivotal questions: Whose knowledge is prioritized? Who shapes environmental decision-making? A decolonial stance challenges technocratic, engineering-driven approaches and demands recognition of localized, relational epistemologies. Recent decolonial analyses reaffirm how such interventions perpetuate the exclusion and silencing of communities in wetland spaces.

Political ecology highlights how environmental challenges intertwine with power and political economy. Wetland infrastructure projects, such as embankments and flood control systems, often mask the marginalisation of rural and indigenous communities behind modernisation narratives. This framework compels us to interrogate who gains and who is placed at risk and to identify how governance failures and capitalist pressures reproduce environmental injustice.

Indigenous Ecological Knowledge (IEK) and Community-Based Natural Resource Management (CBNRM) exemplify how wetland communities have long governed water, fisheries, and floodplain agriculture through cultural norms, seasonal cycles, and spiritual ties (e.g., Berkes, 2008; Agrawal, 1995; Diver, 2017). These knowledge systems manifest adaptability and ecological sensitivity. A recent study on climate adaptation among the Munda Indigenous communities underscores how Indigenous perspectives not only enrich resilience but also challenge hegemonic adaptation paradigms, highlighting the importance of integrating Indigenous voices for justice and sustainability. Furthermore, community-led strategies have proven effective in mitigating flood risks rooted in deep local knowledge and participatory planning. By weaving together these theoretical strands, the framework rejects top-down technocratic fixes and instead promotes governance that is participatory, justice-oriented, and culturally embedded. Wetlands are not passive resources to be managed from above but living, dynamic systems co-maintained by the communities

2. Methods

2.1 Research design and epistemological orientation

This study employs a qualitative, interpretive research design grounded in socio-ecological systems thinking and historical institutional analysis. Wetland governance in Bangladesh is not reducible to administrative procedure or technical management; rather, it is shaped by layered histories of colonial restructuring, postcolonial bureaucratic continuity, ecological transformation, and everyday livelihood negotiation. Governance,

therefore, operates simultaneously across ecological, cultural, legal, and political registers. A qualitative approach was adopted to capture these relational dynamics, particularly the ways institutional arrangements intersect with lived experience and localized ecological knowledge.

A decolonial epistemological orientation informs the research. Rather than treating governance structures as neutral or technocratic, the study proceeds from the premise that knowledge production is embedded within relations of power. This orientation guided both data collection and interpretation, foregrounding questions such as whose knowledge is institutionalized, whose authority is recognized, and how historical administrative legacies continue to shape contemporary environmental decision-making. The methodological stance, therefore, integrates empirical inquiry with critical reflection on epistemic hierarchy and structural exclusion.

2.2 Study area and case selection

The method must be clear with description of the materials used in the study, the population and sample or key informant, research variables, data sources, the general procedures and techniques, the data collection technique, the analysis method, and data presentation. For research using experiments, the method should also include the design or the setup of the research. For article review, the author should also describe the theoretical components. For a qualitative method, the author may include the methods in data condensation (for example, coding system), data display (how the data is presented which allow for drawing conclusion), and conclusion drawing. For quantitative methods, the author may include the methods in sampling, data collection, and data analysis. The region also offers a clear historical trajectory linking colonial land revenue systems to contemporary leasing regimes and co-management initiatives. This continuity enables the study to trace institutional legacies across time rather than treating current governance arrangements as isolated policy phenomena.

2.3 Data sources and collection

The study draws on multiple sources of qualitative data, combining documentary analysis with field-based inquiry in order to triangulate institutional narratives and lived experience. First, an extensive review of documentary and archival materials was conducted. These included colonial-era land legislation, post-independence tenancy and land acquisition acts, fisheries leasing policies, flood management plans, reports from the Bangladesh haor and Wetland Development Board, NGO project documentation, and peer-reviewed academic literature on political ecology, environmental justice, and wetland governance. Particular attention was given to identifying continuities in administrative logic, jurisdictional overlaps, and the persistence of extractive or centralized governance rationalities.

Second, primary qualitative data were generated through semi-structured interviews, informal discussions, and participatory observation within selected wetland communities. Participants included small-scale fishers, farmers, women engaged in post-harvest and household-level wetland economies, local community leaders, and individuals with experience in governance committees or co-management initiatives. Purposive sampling was initially used to identify participants directly involved in wetland-dependent livelihoods or governance processes, followed by snowball sampling to ensure diversity across age, occupation, and gender.

Interviews explored perceptions of environmental change, experiences with leasing systems and state agencies, participation in governance institutions, and the role of Indigenous ecological knowledge in everyday resource management. Field observations documented seasonal livelihood practices, community interactions around water access, and informal governance negotiations. All interviews were conducted with informed consent, and anonymity was maintained where requested.

2.4 Analytical strategy

Data analysis followed a reflexive thematic approach characterized by iterative engagement rather than linear categorization. Initial open coding identified recurring themes, including institutional incoherence, elite capture, the marginalization of customary tenure, seasonal adaptation strategies, and gendered exclusion from decision-making spaces. These themes were subsequently refined through axial coding to examine interconnections between governance structures, ecological change, and social stratification.

The analytical process moved recursively between empirical materials and theoretical frameworks. Political ecology informed the examination of power relations and resource access; decolonial theory guided the interrogation of epistemic hierarchy and institutional continuity; and social-ecological systems thinking provided a lens for understanding the interdependence between ecological health and social wellbeing. This cyclical engagement allowed patterns to emerge inductively while situating findings within broader governance debates.

Importantly, empirical description and interpretive analysis are distinguished in presentation. Institutional arrangements, community narratives, and documented policy trends are first outlined descriptively before being examined through theoretical interpretation. This structure enhances analytical transparency and addresses concerns regarding normative overreach.

2.5 Triangulation and credibility

To enhance credibility and analytical robustness, the study employs methodological triangulation. Community narratives were cross-checked against policy documents and NGO reports; institutional claims were compared with field observations; and ecological decline trends were corroborated using secondary statistical and environmental data sources. This cross-referencing reduces reliance on any single perspective and strengthens interpretive validity. Rather than seeking positivist verification, the study aims for contextual credibility and interpretive coherence. Consistency across documentary evidence, interview accounts, and observed governance practices supports the reliability of key findings.

2.6 Researcher positionality and reflexivity

Given the political nature of governance research, reflexivity was central to the methodological approach. The researcher's engagement with environmental justice scholarship and decolonial thought inevitably shapes interpretive framing. Rather than asserting detached neutrality, the study acknowledges its normative orientation toward justice-centered governance while grounding conclusions in empirical evidence. Care was taken to avoid romanticizing local knowledge or presenting community perspectives as homogeneous. Internal differentiation within wetland communities particularly along lines of gender, economic status, and political influence was recognized as part of the governance landscape. This reflexive stance strengthens analytical balance and mitigates the risk of simplification.

2.7 Ethical considerations and limitations

Ethical considerations were integral to the research process. Participants were informed about the study's purpose, and voluntary participation was emphasized. Given the sensitivity of topics such as lease allocation, elite capture, and bureaucratic exclusion, confidentiality was preserved wherever necessary. Discussions involving politically sensitive issues were handled with discretion to prevent potential repercussions for participants.

Several limitations must be acknowledged. As a qualitative study centered on specific wetland regions, the findings are contextually grounded and not statistically generalizable across all wetlands in Bangladesh. Access to certain administrative records and lease documentation was limited, and elite actors involved in wetland leasing were less accessible for direct interview. Additionally, ecological indicators referenced in the study rely primarily on secondary data rather than independent biophysical measurements. Despite these constraints, integrating documentary analysis, field-based inquiry, and theoretical triangulation provides a robust foundation for understanding the structural dynamics of wetland governance.

3. Results and Discussion

3.1 Beyond reclamation: The colonial imprint On Bangladesh's wetland governance

To understand the contemporary challenges of wetland governance in Bangladesh, we must begin with the colonial foundations upon which the current system was built. British colonial administrators viewed nature, particularly wetlands, not as interconnected ecosystems but as underutilized spaces to be controlled, surveyed, and monetized. Wetlands, seen as "wastelands" in the colonial imagination, were targeted for transformation through engineering projects that prioritized agriculture, revenue extraction, and territorial order (Boyce, 1990; D'Souza, 2018; Mukerjee, 2020;).

3.1.1 Colonial interventions and displacement of community practices

The British regime introduced legal and institutional frameworks that centralized control over land and water. Policies like the Permanent Settlement Act, 1793 institutionalized landlordism, concentrating authority in the hands of state-sanctioned elites and eroding customary rights and collective stewardship systems (Banerjee & Iyer, 2005; Mukerjee, 2020). These developments sidelined traditional practices of rotational fishing, floodplain farming, and seasonal grazing, which had long maintained ecological balance. Colonial flood control efforts, such as embankments and drainage schemes, disrupted the hydrology of haor and beel ecosystems. While these projects were promoted as developmental milestones, they fragmented water flows, degraded habitats, and diminished the resilience of communities that depended on the cyclical rhythms of wetlands for sustenance.

3.2.2 Postcolonial continuities: Bureaucratic control and technocratic fixes

The independence of Bangladesh in 1971 marked a political rupture but not an administrative transformation. Rather than dismantling colonial-era structures, post-independence development planning often reinforced them. Large-scale projects under the Flood Action Plan (FAP) in the 1980s and 1990s replicated colonial logics relying heavily on engineering solutions and foreign consultants, while excluding local voices from the design and implementation process (Adnan, 1991Policies like the Khas Land Management Act, while ostensibly aimed at equitable distribution of resources, continued to treat wetlands as state assets to be allocated from above. This top-down approach perpetuated bureaucratic inefficiencies and ignored the plural, localized tenure systems that shaped wetland governance in practice.

3.3.3 From exploitation to marginalization

The two regimes of colonialism and post-colonialism, therefore, had a common pattern of wetland abuse; the view of the wetlands as exploitative frontiers. This has led not only to the ecological degradation, in the form of loss of fisheries, disruption of flood regimes, and loss of biodiversity, but also to the political marginalization of wetland communities. Their

expertise, power, and life experiences have been institutionally devalued in the policy-making processes, giving way to outside expertise and centralized control. This history contributes to one of the main arguments of this paper: that ecological restoration in Bangladesh is impossible without institutional decolonization. The reclamation of wetland futures demands a combination of technical ingenuity, historical reckoning, epistemic justice, and democratic stewardship grounded in place-based knowledge and relational stewardship.

3.2 Structural and policy barriers in recent wetland governance

Wetlands in Bangladesh are governed by structural constraints that continue to reinforce exclusion, fragmentation, and degradation. These issues are not just technical oversights; they are also imprinted in historical legacies, institutional inertia, and asymmetrical power relationships that determine who gets to be involved in decision-making and whose voices are routinely silenced.

3.2.1 Centralized governance and disconnected decision-making

A persistent feature of wetland governance in Bangladesh is the dominance of centralized, top-down institutions (Paprocki, 2018). Ministries and agencies based in Dhaka often exercise disproportionate control over resource planning and implementation, with limited understanding of local ecological conditions or socio-cultural contexts. Community consultation is often reduced to tokenism, while key decisions such as infrastructure projects, land leases, or conservation zoning are made without the meaningful participation of those most affected, Land, Environment, Fisheries) create a bureaucratic labyrinth that leads to turf wars, policy contradictions, and weak enforcement. In many wetland areas, local stakeholders are caught in a governance vacuum, unsure which institution is responsible or accountable for sustainable management.

3.2.2 Erosion of indigenous knowledge and customary systems

Modern governance frameworks continue to prioritize technocratic expertise over indigenous ecological knowledge, which has been developed over centuries of lived interaction with wetland environments. Traditional practices such as seasonal water sharing, community fishing regulations, or rotating crop cycles are rarely acknowledged in official policy or scientific assessments. This epistemic erasure undermines local adaptive capacity and alienates communities from stewardship roles they once held with pride and purpose (Escobar, 2018; Agrawal, 1995).

In addition, the pluralistic system of land rights found in wetland areas is not always recognized in the legal system, and access and use are negotiated based on social norms rather than title. The discrepancy between legal statutes and customary practice leaves communities in legal limbo and, in turn, susceptible to eviction, elite capture, and resource conflicts.

3.2.3 Environmental degradation and infrastructural overreach

Environmental degradation is also commonly seen as a symptom and a product of poor, disintegrated leadership. The uncontrolled construction of infrastructure, such as embankments, roads, and drainage canals, can break down wetlands in Bangladesh, alter natural hydrological processes, and accelerate siltation of rivers and beels. Commercial farming, intensive aquaculture, and sand mining are additional factors that add to the ecological pressure, which often occurs with implicit regulatory acceptance or institutional disregard. Climate change is exacerbating these threats by increasing the frequency of flash floods, prolonging dry periods, and altering seasonal patterns across the haor region. However, responses in governance remain largely reactive, focusing on disaster-based

rather than ecosystem-based governance or proactive resilience planning (Rahman & Gain, 2022).

3.2.4 Social exclusion and unequal access to resources

Social stratification and structural inequality are deeply embedded in the governance of wetlands in Bangladesh. Female representation, inclusive of indigenous people and small-scale fishers, is typically underrepresented in formalised decision-making centres and is subject to institutionalised impediments to access to land, water, and income. Patronage politics and elite capture are common in wetland lease systems, where politically connected individuals or urban entrepreneurs secure rights to fisheries and wetlands, displacing long-term users in the process. Even conservation programs with positive intent can contribute to exclusion without necessarily being intentionally harmful, as they do not incorporate social justice principles. For example, the status of a protected area may limit traditional livelihoods without providing viable alternatives, thereby straining conservation objectives and community survival.

3.3 Reclaiming authority: Decolonizing wetland governance in Bangladesh

Decolonizing wetland governance in Bangladesh is not just a symbolic endeavour; it is a structural change that demands a shift in power, knowledge, and institutional priorities. Re-taking control of wetland landscapes is about re-centering local communities, recognizing past injustices, and building governance systems that are culturally grounded, ecologically sound, and socially just.

3.3.1 Adaptive co-management: Embracing flexibility and collaboration

The Adaptive Co-Management (ACM) model is a promising solution that emphasizes learning-by-doing, flexibility, and collaboration across governance scales. ACM promotes the integration of local and scientific knowledge so that stakeholders can become adaptive to ecological feedback and social-political realities, from government agencies to community members (Armitage et al., 2009; Chaffin et al., 202;). ACM, in the context of Bangladesh's wetlands, provides a means of reinstating traditional practices within formal governance systems, fostering transparency and a sense of collective responsibility. It opposes rigid, command-and-control models. Instead, it establishes partnerships that can adapt to a variety of needs and are dynamic.

3.3.2 Environmental justice: Procedural inclusion and redistributive equity

Environmental Justice (EJ) principles offer an essential critical political and ethical underpinning of decolonisation. EJ demands both procedural justice, which involves decision-making that is inclusive and democratic, and distributive justice, which involves the fair sharing of environmental resources and benefits (Schlosberg, 2007). In the case of wetland governance, this implies breaking the elite monopoly over fisheries and land, providing women and indigenous people with a voice in policy-making, and instituting accountability structures at each level of environmental planning. Unless such ingrained inequities are addressed, even the most environmentally friendly interventions may end up recreating colonial patterns of marginalisation in the name of sustainability (Sikor & Newell, 2014; Temper et al., 2023).

3.3.3 Reclaiming plural knowledge and local institutions

A decolonial approach starts with the acknowledgement that there is no universal method of knowing or governing wetlands. It appreciates the various systems of knowledge to which community-based institutions have long held on to- systems with relationships

with the land and water, systems that are based on lived experience and developed in response to seasonal variations. In most Indigenous environments, stewardship is transmitted through oral traditions, practices, and traditional laws. They are not traditions that have been crystallized in a remote past; they are dynamic, changing structures that transform with circumstance, and provide communities with a means of dealing with change and preserving resilience (Latulippe & Klenk, 2020). Revitalizing these knowledge systems and enabling them to shape formal policy is crucial. This can be achieved through legal pluralism, participatory mapping, and mechanisms for integrating customary norms into local land-use planning and conservation efforts (Berkes, 2009; Agrawal, 1995).

3.3.4 Social-ecological systems (SES): Interdependence and resilience

Decolonization is not only about reclaiming power, but it is also about restoring relational thinking between humans and nature. The Social-Ecological Systems (SES) framework recognizes this interdependence and views sustainability as emerging from the co-evolution of ecosystems and societies (Ostrom, 2009). Applying SES to Bangladesh's wetlands means recognizing that ecological health cannot be separated from the social wellbeing of communities. Restoration must go hand in hand with livelihood security, cultural preservation, and participatory governance.

3.3.5 From technocracy to transformation

Decolonizing wetland governance is about more than changing institutions; it is about rethinking the values and assumptions that shape them. It means moving away from the idea of wetlands as extractive zones to be managed from afar, and instead recognizing them as living, shared landscapes, cared for and co-governed by the people who depend on them and understand them best. This kind of change will not happen overnight. It demands political courage, institutional openness, and a shift in cultural mindset (Todd, 2016; Schlosberg & Carruthers, 2010). However, it is a change worth striving for because without it, Bangladesh cannot hope to build a system of wetland governance that is not only ecologically sustainable, but also socially just and true to the histories and voices of the communities who have long called these waters home.

3.4 Case studies from Bangladesh: Challenges and possibilities for decolonized governance

The picture is mixed when it comes to experience across Bangladesh's various wetland areas, and success stories are intertwined with ongoing challenges. Collectively, these cases demonstrate what is possible when governance is informed by community leadership and cultural context, and also clarify the institutional blind spots that still constrain bigger change. They provide a warning and a sense of what might come from a dynamic, justice-based, and sensitive method to the pulses of local life.

3.4.1 Community-based fisheries management: Empowerment through local stewardship

Among the most conspicuous participatory wetland governance experiments is the Community-Based Fisheries Management (CBFM) program, initiated in the late 1990s. Applied to several floodplain regions, such as the Chalan Beel region and some of the haor basin, CBFM gave local fishing organizations control over decision-making. Such communities established access regulations, enforced fishing prohibitions during certain seasons, and actively participated in conserving water bodies. More importantly, the model combined community traditions of ecological knowledge with a sense of social responsibility. In most instances, the outcomes were practical: fish populations recovered, biodiversity increased, and household earnings were enhanced- providing an argument that local management, when aided, can provide ecological and social benefits.

CBFM also helped build local capacity through institution-building and leadership training, especially among women and marginalized fishers. These outcomes challenge the assumption that rural communities are too disorganized to manage common-pool resources and demonstrate the power of bottom-up governance when adequately supported by legal and financial frameworks (Sultana & Thompson, 2007). However, the long-term success of CBFM has been uneven. In many areas, projects faltered once donor support ended, revealing a lack of institutionalization in national policy. Furthermore, elite capture, where powerful individuals seize control of wetland leases, continues to undermine the program's equity goals (Sultana & Thompson, 2010).

3.4.2 Haor wetlands: Technocratic interventions and ecological fallout

The haor wetlands of northeastern Bangladesh have seen multiple large-scale interventions over the past decades. Projects like the Haor Flood Management and Livelihood Improvement Plan introduced embankments, polders, and sluice gates to protect crops from premature flooding. While these efforts may have short-term benefits for agriculture, they often disrupt the natural monsoon rhythms that sustain haor ecology (Gain & Schwab, 2012).

These disruptions have led to prolonged waterlogging, siltation, and the collapse of local fisheries, pushing wetland-dependent families into deeper economic precarity. Many of these interventions ignored or displaced community input, prioritizing engineering fixes over lived experience and ecological nuance. Women, in particular, reported exclusion from consultation processes, despite playing critical roles in wetland-based livelihoods.

However, amid these failures, local innovation has persisted. In parts of Sunamganj, communities have revived baira floating agriculture systems that adapt to fluctuating water levels. Similarly, informal water-sharing networks, based on reciprocal agreements and seasonal calendars, continue to manage access and resolve conflicts. These practices embody resilience thinking and offer culturally grounded models of adaptive governance.

3.4.3 Tanguar Haor: Lessons from participatory restoration

Tanguar Haor, an ecologically rich wetland and Ramsar site, has been at the center of both ecological degradation and pioneering restoration. Historically overexploited through commercial leasing, it saw a dramatic decline in fish populations and water quality. In response, the government, supported by IUCN and local NGOs, piloted a co-management system that transferred some decision-making power to local wetland users (IUCN, 2015). This initiative introduced community-based management committees, participatory planning, and training programs in sustainable fishing and disaster preparedness. While not free of challenges, the project demonstrated that co-governance structures, if well-resourced and genuinely inclusive, can begin to reverse environmental decline and restore community trust (IUCN, 2015). However, sustainability remains a concern. Without stronger legal protections, recognition of indigenous tenure rights, and consistent state support, such successes risk becoming isolated exceptions rather than scalable solutions.

3.5 Impact of colonial legacy on wetlands of Bangladesh

Wetland governance in Bangladesh is deeply rooted in colonial restructuring of land, water, and authority. Colonial rule did not simply introduce new administrative procedures; it transformed wetlands from dynamic commons into taxable and regulated property. Through revenue policies such as the Permanent Settlement, fluid floodplains were incorporated into fixed land-tenure systems, privileging landlords and marginalizing fishing and wetland-dependent communities.

As shown in Figure 1, colonial influence operated through four interconnected pathways: revenue extraction, property reclassification, hydraulic engineering, and institutional centralization. Mapping and cadastral surveys made wetlands legible to the

state but reduced their ecological complexity. Embankments and drainage projects disrupted hydrological flows and biodiversity. At the same time, indigenous management practices were sidelined in favor of centralized bureaucratic control. These colonial foundations continue to shape contemporary wetland governance. Patterns of resource inequality, ecological disruption, and administrative centralization reflect historically embedded structures rather than recent policy failures.

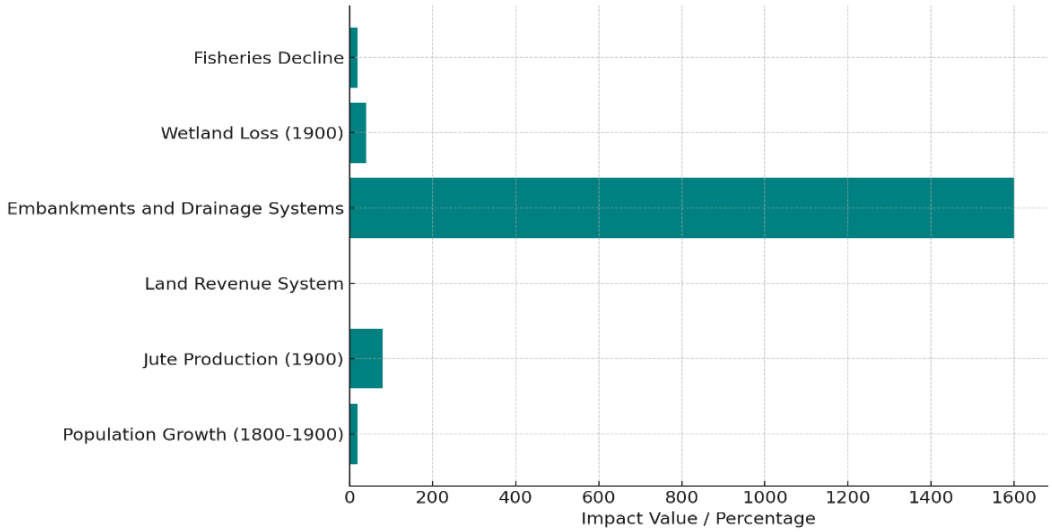

Fig. 1. Colonial impact on wetland management in Bangladesh (Rahman, 2021)

3.5.1 Colonial frameworks of extraction and control

During British rule (1757–1947), wetlands were systematically reclassified from ecologically rich and culturally embedded commons to state-managed zones of economic utility. Infrastructure such as embankments, irrigation canals, and railways was constructed not to benefit local communities, but to facilitate the extraction of agricultural surplus, particularly jute, rice, and indigo, for colonial markets (Boyce, 1990). Between 1850 and 1940, the jute-producing region of Eastern Bengal (now Bangladesh) saw a 300% increase in irrigated land, driven by colonial investments in flood control and canal systems. Much of this expansion occurred at the cost of wetland biodiversity and seasonal fisheries. The colonial state's disregard for the ecological logic of wetlands led to altered flood patterns, habitat loss, and increased vulnerability to climate shocks. Traditional systems such as community fishing cooperatives, floating agriculture, and oral knowledge of seasonal water cycles were branded "unscientific" and systematically marginalized.

3.5.2 Quantifying the legacy

The ecological footprint of development interventions and prolonged governance failures across Bangladesh's wetlands is not merely rhetorical; it is empirically demonstrable. Indicators of biodiversity loss, hydrological disruption, sedimentation, and declining fish stocks reveal a trajectory of cumulative ecological stress rather than isolated degradation events. These trends reflect the interaction of infrastructural expansion, unregulated extraction, weak enforcement, and policy fragmentation. As presented in Table 2, the data systematically document this environmental decline across key ecological parameters. The table does not simply list environmental changes; it evidences a pattern of structural transformation in wetland ecosystems, underscoring the widening gap between conservation commitments and on-the-ground outcomes.

Table 2. Environmental degradation trends in Bangladesh's wetland ecosystems

Issue	Description	Source
Wetland Loss	More than 50% of Bangladesh's natural wetlands have been lost or degraded since the 1950s.	Bangladesh Bureau of Statistics (2021)
Decline in Fisheries	Open-water fish production in the *haor* and beel regions declined by over 35% between 1999 and 2020 due to disrupted water cycles and mismanaged leasing systems.	Ahmed et al. (2010)
Biodiversity Impact	Over 20 wetland-dependent bird species have experienced population declines in the last two decades.	BirdLife International

(Bangladesh Bureau of Statisticsm, 2021)

3.5.3 Postcolonial policy reproduction

After independence in 1971, Bangladesh retained the colonial administrative mindset, favouring centralized control and engineering-based development strategies. Successive governments continued to treat wetlands as productive zones rather than ecological or cultural commons. This resulted in the proliferation of lease-based fisheries systems, the exclusion of indigenous groups from land rights, and the replication of outdated water control measures. Political independence notwithstanding, much of the legislation regulating the use of wetlands today is a continuation of British-era legislation, including acts on land acquisition and fisheries ordinances, and makes little acknowledgement of community rights or environmental constraints (Clement et al., 2019).

3.5.4 The legacy today: A dual crisis of ecology and equity

Colonial rule bequeathed is not a singular malady, but a twofold ailment, a crisis of ecological precariousness and a crisis of social exclusion. The wetlands are ironically abused but not conserved well. They are usually not involved in decisions that affect their fate, yet they are the very communities that depend on them as a source of food, income, and continuity of their culture. Central to this injustice is a profound disjuncture: state institutions, their rules, and priorities are out of step with the realities on the ground in local socio-ecological systems. Such a mismatch propagates environmental inequity in Bangladesh. It is not possible to address such deeply rooted legacies through minor policy changes. It requires an epistemic transformation, in which the state reimagines nature, development, and justice, with the knowledge of communities and the wellbeing of ecosystems at the centre of decision-making.

3.6 Pathways for decolonization: Toward just and sustainable wetland governance

Decolonizing the governance of wetlands in Bangladesh is more than just cosmetic. It necessitates addressing the structural, epistemic, and ecological legacies of a control-based rather than care-based system. It is not just about decentralizing concentrated power, but also about recognizing the variety of interpretations, interactions, and environmental management by wetland-dependent communities, most of which preserve both diversity and livelihoods. The ways forward, then, have to be multi-pronged: to move the governance of the Country beyond extractive, top-down models and towards participatory, equitable, and long-term, ecological health-based models. The objective is not merely to change the policy but to imagine a different way of governing the wetlands as a collective enterprise, jointly produced by the people who live in and make these landscapes with.

3.6.1 Legal reforms: Recognizing community rights and plural tenure systems

The lack of legal status of customary and collective tenure is one of the most contentious issues in the governance of wetlands today. This gap is most important in areas where

wetlands, going back as far as people can remember, have been the shared commons, the source of food to households, the sustenance of the trade, and the root of cultural life. However, the legal system is inclined to obscure key boundaries: it classifies wetlands as though they were agricultural land, and it does not differentiate much between formal deeds and the informal, but well-established, patterns of communal use and maintenance. A telling example is the East Bengal State Acquisition and Tenancy Act of 1950. Though its purported motive was to dissolve zamindari estates and give land to the tiller, it had left wetlands awkwardly straddling legal definitions. That ambiguity has served the interests of powerful players, who have been able to appropriate common waters in some cases with government sanction, in others through unspoken bureaucratic disregard. Societies that once relied on these destinations are currently locked out (Hall et al., 2011).

This needs more than an adjustment in the property law. It implies developing legal instruments grounded in the real-life experiences of wetland users. That may imply ensuring usufruct rights, protecting our fishing grounds from subdivision into leases, and incorporating local ecological knowledge into formal land-use planning. Unless the ways of doing things in everyday life are identified and conserved, any discussion of sustainability or inclusive governance is little more than lip service.

3.6.2 Measurable governance indicators for institutional reform

While normative commitments to justice-centered governance are essential, meaningful institutional transformation requires measurable and enforceable standards. Decolonizing wetland governance must therefore move beyond rhetorical inclusion toward clearly defined structural benchmarks that can be monitored over time.

First, wetland management committees should ensure at least 40 percent representation from local community members, including small-scale fishers, women, and Indigenous groups. Representation must extend beyond symbolic presence to voting authority and agenda-setting capacity. Such thresholds would institutionalize procedural justice rather than leaving participation contingent on administrative discretion.

Second, legal recognition of customary usufruct rights is critical. Communities that have historically relied on wetlands for fishing, seasonal agriculture, and water use should be granted secure, documented rights that protect them from arbitrary lease reallocation or elite capture. Embedding plural tenure recognition into statutory frameworks would reduce legal ambiguity and enhance incentives for ecological stewardship.

Third, transparency mechanisms must be strengthened by establishing a publicly accessible wetland lease registry. All lease allocations, durations, renewal conditions, and revenue flows should be digitally recorded and open to public scrutiny. Such transparency would mitigate patronage politics and reinforce accountability.

Finally, participatory ecological monitoring systems should be institutionalized. Local knowledge holders can be formally integrated into biodiversity monitoring, fisheries assessments, and seasonal water management planning. Community-led monitoring, supported by scientific collaboration, would enhance adaptive capacity and align governance with socio-ecological realities. Together, these measurable indicators shift reform from aspiration to operational governance change. They provide concrete pathways for translating environmental justice principles into institutional practice.

3.6.3 Institutional pluralism: Embedding local knowledge in governance

Decolonizing wetland governance goes beyond changing administrative control; it entails breaking state-consecrated monopolies on knowledge and establishing a substantial space for knowledge plurality. This means formally acknowledging and incorporating Indigenous Ecological Knowledge (IEK) into governance systems, not as an added input to the decision-making process but as an equal source of authority. Participatory Rural Appraisal (PRA), community mapping, and seasonal calendars are practical tools that offer tangible ways to incorporate local knowledge into planning. More importantly, community-

based management committees should be established as permanent bodies of governance, not as experiments or time-limited. This approach is backed by evidence from IUCN Bangladesh (2015). In pilot zones where water-sharing regimes were implemented with local knowledge at the forefront, wetland biodiversity and livelihoods increased by more than 30 percent. Such results support the idea that decolonization, in this respect, is not only a theoretical ideal but a practical way to more just and effective management of the environment (Tengö et al., 2017; Armitage et al., 2009).

3.6.4 Capacity building and political empowerment

Reclaiming authority over wetland resources is not just about securing legal rights; it is also about building the real-world capacity to exercise them. For many wetland-dependent communities, particularly women and indigenous groups, this remains a daunting challenge due to limited access to information, legal aid, and institutional support. Empowerment must go hand in hand with recognition. This means investing in leadership training for women and youth, equipping communities with conflict resolution and negotiation skills, and fostering ecological literacy alongside climate adaptation planning. Encouragingly, initiatives led by NGOs in Tanguar Haor have shown tangible results. Training in disaster preparedness and cooperative governance has significantly strengthened local resilience and enhanced community participation in policy dialogues (Islam & Sato, 2012). These efforts demonstrate that, with the right support, marginalized voices can not only be heard but also help shape more just and sustainable futures.

3.6.5 Ecosystem-based adaptation and climate justice

Climate change is not just an environmental crisis-it is an issue of justice. Communities that depend on wetlands are the ones that suffer the most from their effects, which tend to worsen existing inequalities. It is not enough to find technical, top-down solutions to this reality. A truly decolonised response would focus on developing ecosystem-based adaptation (EbA) strategies that combine scientific knowledge with local, experiential practices, such as floating agriculture, polyculture fish farming, or seasonal migration planning. These community-driven strategies need to be central to national adaptation plans and to long-term funding to support them. Even more crucial, local knowledge holders need to be consulted in the design of early warning systems; they can be particularly well-versed in ecological trends that may be beyond the reach of a remote observer (Reed, 2008; Bryant et al. 1997). According to data from the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), such participatory methods will lead to social acceptance rates 30-50 per cent higher than those from centrally determined models. The takeaway is obvious: resilience is long-term, and it starts with listening to, and investing in, the communities that are most immediately at risk.

3.6.6 Narrative and cultural reclamation

Decolonization is not only a matter of changing laws or reorganising institutions; it is also about taking back the stories that shape how places are seen and valued. In wetland governance, this involves reviving cultural narratives that regard these waterscapes not as vacant ground for exploitation, but as living, storied environments layered with memory, meaning, and identity. Folklore, oral histories, and place-based rituals deserve to be recorded, taught, and carried forward in conservation programs, so that the longstanding ties between communities and water are recognised and strengthened. Artistic expression, whether in the form of local theatre, song, poetry, or other creative work, can spark pride and renew intergenerational memories of care and stewardship (Coombes et al., 2014). Such a shift in narrative is far from decorative. It changes the very frame through which wetlands are understood, moving from the category of policy "problems" into that of shared places of belonging and renewal (Todd, 2016).

3.7 Sustainable futures for ecosystem management in Bangladesh

Sustaining the ecological integrity of Bangladesh's wetlands over the long term demands far more than a series of fragmented, project-based interventions (Datta, 2018). What is required is a coherent, durable commitment that moves beyond isolated initiatives toward systemic, institutional, and community-anchored transformation. What is really needed is a different way of thinking about these places, how they are governed, how their worth is measured, and how they can be sustained in the decades ahead. Any approach worth its name has to hold ecological protection and social justice together, not as separate goals but as parts of the same fabric. It also has to let scientific research and Indigenous knowledge meet on equal footing, each informing the other. Moreover, it means that local people cannot remain on the sidelines; they must share real responsibility for stewardship. In a country where the climate is changing faster than many communities can adapt, and where social and ecological inequalities still cut deep, management systems will have to be quick to adjust yet anchored in fairness. There is no other way forward.

3.7.1 Rethinking development: From technocracy to resilience

Historically, wetland management in Bangladesh has been dominated by excessive heavy infrastructure intervention, e.g., embankments, drainage canals, and flood control structures, designed to tame water rather than live with it. While these engineering projects have sometimes delivered short-term gains, they have also disrupted natural hydrological cycles, diminished biodiversity, and undermined the long-term socio-ecological resilience of wetland systems (Gain & Giupponi, 2014). A more sustainable and just model must pivot away from rigid, top-down designs and embrace nature-based solutions such as floodplain restoration and vegetative buffers that work with, rather than against, ecological processes. This shift also necessitates prioritising local knowledge and adaptability over universal solutions. A suitable example comes from Tanguar Haor, where community-led restoration efforts have successfully reintroduced native aquatic vegetation and revitalized fish-spawning grounds, thereby enhancing biodiversity and household incomes. Such experiences demonstrate the ability of participatory, ecologically attuned practices to chart a more resilient future for Bangladesh's wetlands.

3.7.2 Centering equity and environmental justice

Sustainability cannot be meaningfully pursued without addressing the deep-rooted injustices that shape who benefits from and who bears the burden of wetland governance. Existing institutional frameworks often reproduce historical patterns of exclusion, marginalizing women, indigenous groups, and small-scale resource users who are, paradoxically, among the most dependent on wetland ecosystems. To move toward truly sustainable management, governance must be reimagined through the lens of justice. This includes institutionalizing gender-sensitive frameworks, embedding environmental justice principles into all wetland policies, and implementing redistributive measures, such as secure tenure, equitable resource-sharing rights, and reinvesting revenues into local services. The urgency of such reforms is underscored by a 2021 policy review that found fewer than 20% of wetland management committees had active female participation, even though women are often the primary users and stewards of these ecosystems (Rahman & Gain, 2021). Bridging this justice gap is not optional; it is foundational to any sustainable future.

3.7.3 Investing in socio-ecological learning systems

One of the most effective kinds of adaptive management is when it accepts the learning process as an active, continual one, not only appreciating scientific information but also the life experiences and trial-and-error of local people. Villagers in wetland areas are likely to

witness seasonal changes and adjust their practices and even cultural rituals in response to ecological shifts, laying the foundation for long-term resilience. To provide this adaptive capacity, future policy should not rely on traditional monitoring systems. Communities must be supported to assume the lead in wetlands health surveillance and, in the long term, to fund action-research centers involving individuals with local knowledge, scientists, youth, and educators. In conjunction with this, the value of wetlands and the water ethics inherent in the Indigenous tradition should be integrated into national curricula and into media stories. Once these many and varied means of knowing and learning are recognised and are properly resourced, governance may become more responsive, more inclusive, and able to engage with the full complexity of wetland systems (Armitage et al., 2009; Berkes, 2017; Tengö et al., 2017).

3.7.4 Integrating climate policy and ecosystem governance

Bangladesh has been bearing more than an ecological resource; its wetlands form the first line of national defence against climate-related disasters. These systems not only help the Country become more resilient by absorbing excessive floodwaters, sequestering carbon, and maintaining livelihoods that are adaptive to the changing environmental landscape. However, no matter how many functions wetlands serve, they are too frequently pushed to the periphery of climate policy frameworks. It ignores their ecological services, and their management is seldom linked to the more fundamental governance reforms required in the long run to make them sustainable. Filling this gap would involve making wetlands the focus of National Adaptation Plans (NAPs) and redirecting climate finance toward restorative and adaptation projects driven by local people. It is also necessary to strengthen local governments and empower them to coordinate work on ecosystem-based adaptation (EbA) and disaster risk reduction (DRR). The economic benefits could be tremendous: the UNDP estimates suggest that the net benefits per dollar invested in EbA range from 4 to 7 dollars in disaster loss prevention and enhanced community resilience (UNDP, 2019). Thinking of wetlands as proactive agents of adaptation to climate change is thus not only a wise policy but also a condition for a fair and sustainable future (Reed, 2008; Coombes et al., 2014).

3.7.5 Building a multi-stakeholder vision

No individual group can map a course of action. Just and sustainable wetland governance will only emerge when communities, researchers, policymakers, non-government organizations, and international partners collaborate in a true partnership (Plummer & Baird, 2020). Moreover, it is not just consultation; it involves the practice of trust over time, the balancing of conflicting demands, and the establishment of common development purposes grounded in local realities and guided by notions of justice. Such a vision requires a rethinking of wetlands. They cannot be treated as marginal spaces to be controlled remotely; they are living, breathing organisms essential to Bangladesh's ecology, culture, and economic survival.

3.7.6 Institutional resistance and political constraints

Any serious effort to decolonize wetland governance in Bangladesh must confront the structural resistance embedded within existing institutions. Reform does not unfold in a neutral administrative space; it encounters entrenched bureaucratic inertia, where longstanding procedures, hierarchical decision-making cultures, and risk-averse administrative norms slow or dilute transformative change. Ministries and departments accustomed to centralized authority may resist decentralization not only for procedural reasons but also to preserve institutional control over revenue streams and regulatory discretion.

Political patronage networks further complicate reform efforts. Wetland leasing systems in particular are often embedded within local and national patron-client relations, where access to fisheries and water bodies becomes a source of political influence and economic accumulation. Elite capture in lease allocation undermines redistributive justice and marginalizes small-scale users, even in contexts where participatory frameworks formally exist. Without transparency and accountability mechanisms, reforms risk being co-opted rather than implemented.

International donor dependency introduces an additional layer of complexity. While externally funded co-management or restoration projects may initiate innovative governance experiments, their sustainability often remains contingent on project cycles rather than institutional integration. When donor funding recedes, community-based initiatives frequently struggle to secure state commitment or legal permanence. This dynamic can inadvertently reproduce technocratic project-based governance rather than structural transformation. Recognizing these institutional and political constraints strengthens the realism of reform proposals. Decolonization, therefore, must be understood not as a linear policy adjustment but as a negotiated process requiring administrative restructuring, political will, and sustained accountability.

4. Conclusions

In Bangladesh, wetlands are far more than ecological zones on a map. They are lived-in places where water and soil are braided together with memory, work, and cultural meaning. Generations have relied on these waters for food, mobility, and ritual life, and in doing so have shaped landscapes that are as much social as ecological. Today, however, these living systems are under strain. Climate change has begun to unsettle seasonal rhythms; unchecked industrial and infrastructural growth is narrowing waterways; and a deeper, often-overlooked influence still lingers: the governance mindset inherited from colonial administration. Over time, this centralised, technocratic approach has pushed aside community voices, diminished local ecological knowledge, and contributed to the gradual unravelling of wetland resilience.

If governance is to change, policy tweaks alone will not suffice. What is needed is a fundamental shift in how power is shared, how knowledge is valued, and how participation is made real rather than symbolic. This study draws on political ecology, decolonial thought, and socio-ecological systems perspectives to outline a justice-driven framework, one that places adaptability, inclusivity, and community authority at its core. Field evidence suggests that when local communities are trusted with decision-making rather than merely consulted, the restoration of wetlands and the improvement of human wellbeing tend to reinforce each other.

From this analysis emerge several practical steps: recognising customary rights in law, bringing indigenous knowledge into equal dialogue with scientific expertise, embedding participatory practices into institutions, and reshaping public narratives about wetlands. These are not technical adjustments; they are shifts in how wetlands are imagined not as resources to be extracted or territories to be controlled, but as shared spaces of care, belonging, and co-governance. The Country now finds itself at a turning point. The future of Bangladesh's wetlands will not be secured through infrastructure alone. It will depend on a commitment to justice, to open and sustained dialogue, and to democratic forms of stewardship. Seen in this light, decolonising wetland governance is not a peripheral concern. It is both an ecological necessity and a moral obligation, inseparable from the pursuit of a climate-resilient, equitable, and truly sovereign future.

Acknowledgement

The authors would like to express their sincere appreciation to the editorial team and anonymous reviewers for their constructive comments and suggestions, which have significantly improved the quality and clarity of this article.

Author Contribution
The authors confirm equal contribution regarding the study's conception, methodological design, analysis, and manuscript preparation. All authors have critically reviewed and approved the final version for submission.

Funding
This research did not receive funding from anywhere.

Ethical Review Board Statement
Not available.

Informed Consent Statement
Not available.

Data Availability Statement
Not available.

Conflicts of Interest
The authors declare no conflict of interest.

Declaration of Generative AI Use
During the preparation of this work, the author(s) used Grammarly to assist in improving grammar, clarity, and academic tone of the manuscript. After using this tool, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

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