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GOVERNANCE TRILEMMA ON THE "GREEN-BLUE ECONOMY" INTEGRATION IN GLOBAL ENVIRONMENTAL POLICY MAKING

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Abstract

This study examines the integration of land-based green and ocean-based blue economies, which remain separately governed despite shared relevance to the SDGs and Paris Agreement. Analyzing five national through a comparative case study method, it identifies four integration models, i.e (1) necessity-driven, (2) technocratically-driven, (3) opportunity-driven, and (4) fragmented. Those are shaped by local political-economic factors. A key finding is a governance trilemma, where mobilizing finance, controlling cross-boundary externalities, and ensuring procedural justice are rarely balanced. The article advances beyond normative calls for integration by specifying conditions for success or failure, and offers a diagnostic tool for policymakers. It concludes that effective green-blue integration demands context-sensitive architectures that jointly address finance, externalities, and justice as foundations for resilience and equity.

Keywords: green economy, blue economy, governance trilemma, environmental policy integration, comparative case study.

INTRODUCTION

The 2015 Paris Agreement and the 2030 Agenda for Sustainable Development codified a global consensus on the interwoven nature of climate change, biodiversity loss, and socio-economic inequality, compelling a fundamental rethinking of environmental governance beyond conventional sectoral boundaries. In response, two paradigms have emerged as central pillars of the sustainability transition: the green economy, focused on land-based low-carbon development and resource efficiency (Gupta et al., 2025), and the blue economy, emphasizing the sustainable utilization of ocean and coastal resources (Gupta et al., 2025). Both frameworks have gained considerable traction in international policy discourse, with the United Nations Environment Programme (United Nations Environment Programme, 2011) articulating the green economy as a pathway to poverty eradication through low-carbon, resource-efficient development, while the World Bank

and UNDESA (2017) have positioned the blue economy as an integrated approach to balancing economic activities with marine ecosystem sustainability. Their parallel incorporation into the Sustainable Development Goals (SDGs), particularly Goals 8, 12, 13, and 14, underscores their shared normative orientation toward sustainable development.

Yet despite this conceptual convergence, a growing body of evidence reveals that green and blue economic policies remain governed through distinct institutional architectures, sectoral mandates, and financing mechanisms, with limited cross-domain coordination (Benzaken et al., 2022; Schutter & Hicks, 2019). This institutional fragmentation is not merely an administrative inconvenience, yet it reflects a deeper failure to recognize the biophysical interconnectedness of terrestrial and marine systems. Scientific consensus increasingly demonstrates that land-use decisions generate transboundary impacts on coastal and marine ecosystems through nutrient runoff, sediment alteration, and pollution, while ocean-based activities simultaneously affect terrestrial climate stability through their role in carbon regulation and hydrological cycles (IPBES-IPCC, 2020; Rockström, 2016). The ocean, as the dominant regulator of the global climate system, renders any climate mitigation strategy incomplete without integrated terrestrial-marine adaptation pathways (Gattuso et al., 2018). Treating land and ocean governance in isolation thus represents not merely a policy oversight but a systemic vulnerability that undermines planetary resilience and increases the risk of crossing critical ecological boundaries (Rockström, 2016).

The scholarly literature on green-blue economic integration has grown considerably over the past decade, yet it remains characterized by several notable gaps. First, while numerous studies have examined the blue economy's potential contribution to GDP, livelihoods, and marine biodiversity conservation (Han et al., 2025; Ovchynnykova et al., 2024), and others have explored the green economy's role in climate mitigation and resource efficiency (Gupta et al., 2025), systematic analyses of the conditions under which these two paradigms can be effectively integrated remain scarce. A bibliometric review of the field reveals that "the link between blue and green

economies remains underexplored" and that "research on economic policy integration needs to be improved" (Kakisina & Meildiviri, 2025). Second, existing work has predominantly focused on normative arguments for integration rather than providing empirical explanations of how integration occurs, what factors enable or constrain it, and with what distributive consequences (Bennett et al., 2019a; Cisneros-Montemayor et al., 2019). Third, the political economy dimensions of integration, including the role of vested interests, institutional path dependencies, and power asymmetries between land-based and ocean-based stakeholders, remain undertheorized and underinvestigated (Satizábal et al., 2020; Sikhunyana & Mishi, 2023). Fourth, comparative analyses across diverse national contexts are limited; most studies focus on single-country cases or regional blocs, without systematically examining how variation in geopolitical position, economic structure, and institutional capacity shapes integration outcomes (Nagy & Nene, 2021). Finally, the justice implications of green-blue integration, particularly the extent to which land-based sustainability gains are achieved by externalizing costs onto coastal and small-island communities, have received insufficient analytical attention (Bennett et al., 2019a, 2021).

These gaps are consequential. Without a robust empirical understanding of the mechanisms, conditions, and trade-offs characterizing green-blue policy integration, policymakers lack the diagnostic tools to design effective interventions. The persistent separation of green and blue governance frameworks not only perpetuates policy incoherence but also risks generating perverse outcomes wherein progress toward one set of environmental goals actively undermines another, a dynamic that has been documented in the context of biofuel expansion driving marine eutrophication (De Castro et al., 2014; Ritu et al., 2023) and terrestrial afforestation projects compromising coastal sediment flows (IPBES-IPCC, 2020). Moreover, the absence of integrated governance frameworks that explicitly manage the land-sea interface results in a systematic failure to capitalize on synergistic opportunities thereby constraining the overall efficiency of global environmental governance.

This article addresses these gaps by posing three interrelated research questions: (1) What models of green-blue economic policy integration emerge across diverse national contexts, and what factors shape their variation? (2) What are the principal mechanisms through which integration is enabled or constrained, and how do these mechanisms interact with contextual political-economic conditions? (3) What are the justice implications of different integration pathways, and under what conditions can integration achieve simultaneously ecological effectiveness, economic viability, and social equity?

To answer these questions, this study employs a comparative case study design analyzing five countries: Seychelles, Bangladesh, China, Panama, and the Philippines. They were selected to represent a spectrum of geopolitical, economic, and ecological conditions, from small island developing states (SIDS) to major emerging economies and densely populated archipelagic nations. The analytical framework integrates three theoretical lenses: Green Political Economy, which assesses policies against criteria of social-ecological resilience, strong sustainability, and distributive justice (Dos Reis, 2015); Circular Bioeconomy, which emphasizes sustainable resource use, biodiversity protection, and stakeholder engagement (Stephenson & Damerell, 2022); and Integrated Ocean Management (IOM), which provides a governance framework for balancing ecological, economic, and social dimensions of ocean space (Winther et al., 2023). Through systematic document analysis of policy instruments and secondary data from peer-reviewed literature and international organization reports, the study identifies four distinct integration models – necessity-driven, technocratically-driven, opportunity-driven, and fragmented – and analyzes the conditions under which each emerges.

The article makes three principal contributions. First, it moves beyond normative advocacy for green-blue integration to provide an empirically grounded typology of integration models and their enabling conditions, offering scholars and practitioners a diagnostic framework for assessing integration readiness. Second, it identifies a governance trilemma – wherein efforts to mobilize finance, control cross-boundary externalities, and achieve

procedural justice are rarely balanced simultaneously – as a central explanatory mechanism for integration success or failure. Third, by foregrounding the justice dimensions of green-blue integration, the study challenges the technocratic assumption that policy coordination alone is sufficient, arguing instead that meaningful integration requires fundamentally addressing the political economy of resource allocation and the distribution of costs and benefits across terrestrial and marine constituencies.

The remainder of this article is organized as follows. Section 2 reviews the existing literature on green and blue economy governance, identifying key thematic contributions and persistent gaps. Section 3 elaborates the theoretical framework and develops the research argument. Section 4 describes the comparative case study methodology, including case selection, data sources, and analytical procedures. Section 5 presents the empirical findings through cross-national analysis and policy instrument evaluation. Section 6 discusses the implications of these findings for global environmental governance and identifies directions for future research. Section 7 concludes with policy recommendations and reflections on the study's limitations.

Literature Review

The scholarly discourse on green and blue economic governance has evolved along parallel trajectories, each generating distinct conceptual frameworks, empirical insights, and policy recommendations. Yet despite their shared normative commitment to sustainability, these literatures have largely developed in isolation, with limited cross-fertilization and insufficient critical engagement with their respective epistemological assumptions, methodological limitations, and empirical contradictions. This section undertakes a systematic and critical review of four interconnected streams of literature: (1) the green economy paradigm and its governance implications (Ellen MacArthur Foundation, 2021; Giroud, 2024; Gupta et al., 2025; IRENA, 2020; Salzman et al., 2018); (2) the blue economy concept and its policy applications (Bennett et al., 2019a; Benzaken et al., 2022; Costello et al., 2016; Ehler & Douvere, 2009; Han et al., 2025; Oceans Conference Record (IEEE), 2022; Suman, 1987; World Bank & & UNDESA, 2017; Wylie et al., 2016); (3)

the emerging scholarship on green-blue integration (Bennett et al., 2019a; IPBES-IPCC, 2020); and (4) the political economy and justice dimensions of environmental governance (Bennett et al., 2019a; Cisneros-Montemayor et al., 2019). Rather than merely summarizing existing studies, this review evaluates their contributions, identifies points of convergence and divergence, exposes persistent gaps, and synthesizes these insights to build an analytical framework for the present study.

The foregoing critical review reveals a fragmented scholarly landscape wherein four distinct literatures – green economy, blue economy, integration governance, and political economy/justice – operate largely in parallel, with limited cross-fertilization and insufficient critical engagement. Table 1 synthesizes the key contributions, limitations, and gaps identified across these streams.

Table 1. Synthesis of Literature Streams: Contributions, Limitations, and Gaps

Literature Stream	Key Contributions	Principal Limitations	Identified Gaps
Green Economy	Policy instruments; technical solutions; efficiency metrics	Terrestrial bias; reformist rather than transformative; techno-economic orientation	Land-sea interface; political economy dynamics; distributive justice
Blue Economy	Marine governance tools; case study insights; financing mechanisms	Conceptual ambiguity; particularistic case studies; limited comparative analysis	Political economy; power dynamics; cross-national patterns
Green-Blue Integration	Biophysical justification; governance frameworks; emerging case documentation	Normative orientation; prescriptive rather than explanatory; limited empirics	Conditions for integration; causal mechanisms; trade-offs and synergies
Political Economy & Justice	Distributional analysis; power critique; procedural justice focus	Limited engagement with green-blue literatures; case-specific	Application to integration governance; comparative justice analysis

Building on this synthesis, this study addresses four interconnected research needs. First, it provides systematic empirical analysis of green-blue policy integration across diverse national contexts, moving beyond normative advocacy to explanatory analysis. Second, it develops a comparative framework that enables identification of integration models, their enabling conditions, and causal mechanisms. Third, it integrates political economy and justice dimensions into the analysis, interrogating the distributional

consequences of different integration pathways. Fourth, it synthesizes insights across cases to generate generalizable knowledge that advances both theory and practice of integrated environmental governance.

Specifically, this study contributes to addressing the gaps identified in the literature by: (1) operationalizing a comparative case study design that systematically analyzes integration across five countries representing diverse geopolitical and ecological contexts; (2) developing an analytical framework that integrates Green Political Economy, Circular Bioeconomy, and Integrated Ocean Management to examine the multiple dimensions of integration; (3) identifying the "governance trilemma" (finance-externality-justice) as a central explanatory mechanism for integration success or failure; and (4) foregrounding the justice implications of integration pathways as a non-negotiable criterion for evaluation. This analytical framework, elaborated in the following section, provides the conceptual scaffolding for the empirical investigation that constitutes the core of this article.

Theoretical Framework and Research Argument

This study addresses the persistent gap between normative advocacy for green-blue economic integration and empirical understanding of its governance mechanisms by developing a synthesized theoretical framework that moves beyond parallel application of discrete theories toward an integrated analytical architecture. Rather than merely combining three established approaches: Green Political Economy (McGlinchey et al., 2017; Mukti, 2020), The Circular Bioeconomy (CBE) (Stephenson & Damerell, 2022), and Integrated Ocean Management (IOM) (Winther et al., 2023). These framework generates novel explanatory mechanisms through their systematic intersection.

Green Political Economy (GPE) provides the foundational normative and analytical orientation for this study. Developed as an extension of Green Theory within International Relations, GPE incorporates environmental variables as constitutive elements of global political analysis, challenging the anthropocentric and growth-oriented assumptions of mainstream political economy (Dos Reis, 2015). Meanwhile, the Circular Bioeconomy (CBE)

framework addresses the operational gap in GPE by providing analytical tools for understanding sustainable resource use, material flows, and stakeholder engagement (Stephenson & Damerell, 2022). It synthesizes two complementary approaches: the circular economy, which emphasizes closed-loop material flows, waste minimization, and resource productivity (Ellen MacArthur Foundation, 2021); and the bioeconomy, which focuses on the sustainable production and utilization of biological resources for food, energy, and materials (Stephenson & Damerell, 2022). Lastly, Integrated Ocean Management (IOM) provides the marine governance dimension essential for analyzing green-blue integration (Winther et al., 2023). It emerged from recognition that ocean governance is characterized by extreme fragmentation across sectors (fisheries, shipping, energy, tourism, conservation), jurisdictions (national, regional, international), and scales (local to global), resulting in policy incoherence, resource degradation, and conflict among users.

The central theoretical contribution of this study lies in synthesizing these three frameworks to generate a novel analytical mechanism: the governance trilemma of green-blue integration. This concept captures the inherent tension among three imperatives that are individually necessary but collectively difficult to achieve simultaneously in mobilizing adequate finance, controlling cross-boundary externalities, and achieving procedural and distributive justice altogether. The trilemma provides an explanatory framework for understanding why integration outcomes vary across contexts and why even well-designed policies often fail to achieve their objectives.

Based on the trilemma framework and the empirical literature reviewed in Section 2, this study proposes four ideal-typical integration models:

1. **Necessity-Driven Integration**, (exemplified by Seychelles and Bangladesh) where existential threats – debt distress, climate vulnerability – force integration, generating high attention to externality control (through necessity) and finance mobilization (through innovation), but where justice may be compromised due to capacity constraints and crisis-driven decision-making.

2. **Technocratically-Driven Integration** (exemplified by China) where strong state capacity enables strategic alignment of green and blue policies, achieving high finance mobilization and externality control, but where justice is systematically subordinated to technocratic objectives, generating distributive inequities and procedural deficits.

3. **Opportunity-Driven Integration** (exemplified by Panama) where specific economic opportunities – the Canal watershed, international conservation finance – generate functional integration in certain domains, but where broader governance remains fragmented, resulting in moderate progress on all dimensions without achieving full integration on any.

4. **Fragmented Integration** (exemplified by the Philippines) where policy framework exists for integration but implementation is systematically undermined by governance failures, resulting in low finance mobilization, persistent externalities, and weak justice outcomes despite progressive legislation.

These models are not mutually exclusive categories but heuristic devices for analyzing how different governance configurations manage the trilemma. The empirical analysis in Section 5 will examine whether and how these models manifest in the case countries and what patterns of trade-off management characterize each.

Building on the trilemma concept, this study operationalizes the theoretical framework through a set of analytical dimensions, indicators, and research questions (Table 2).

Table 2. Operational Framework: Analytical Dimensions and Indicators

Theoretical Dimension	Analytical Sub-Dimension	Empirical Indicators	Data Sources
Finance	Mobilization mechanisms	Existence and scale of dedicated financing; innovative instruments (debt swaps, bonds, carbon markets); funding sources (domestic, international, private)	Policy documents; international organization reports; secondary literature
	Conditionality & accountability	Stringency of conditionality; monitoring and reporting	Program evaluations; policy analysis

Theoretical Dimension	Analytical Sub-Dimension	Empirical Indicators	Data Sources
		requirements; stakeholder access to funds	
	Distribution of financial benefits	Who receives funding; mechanisms for local benefit-sharing; transparency of allocation	Case studies; audit reports
Externality Control	Cross-boundary mechanisms	Existence of mechanisms spanning land-sea boundary; legal/regulatory authority; enforcement capacity	Legal frameworks; institutional analysis
	Monitoring systems	Capacity to track trans-boundary impacts; data availability; scientific assessment	Technical reports; environmental monitoring data
	Internalization instruments	Whether externalities are priced or regulated; compensation mechanisms; liability frameworks	Policy instruments; regulatory analysis
Justice	Procedural justice	Stakeholder participation; transparency; access to information; mechanisms for appeal	Process evaluations; stakeholder interviews (secondary)
	Distributive justice	Equity of benefit distribution; compensation for costs; attention to vulnerable groups	Distributional analyses; social impact assessments
	Recognition justice	Recognition of diverse knowledge systems; respect for customary rights; cultural considerations	Anthropological studies; rights reports

This operational framework guides the empirical analysis by providing systematic criteria for assessing each case country's performance across the three trilemma dimensions. The comparative analysis will identify not only whether integration has occurred but how the trade-offs among finance, externality control, and justice have been managed, and with what consequences.

Based on the trilemma framework and the integration models proposed above, this study advances four research arguments: (1) Integration outcomes will vary systematically with contextual factors, with SIDS and climate-vulnerable LDCs exhibiting necessity-driven integration; emerging economies exhibiting technocratically-driven integration; resource-rich middle powers exhibiting opportunity-driven integration; and institutionally fragmented states exhibiting fragmented integration; (2) No integration model will achieve simultaneously high performance on all three trilemma dimensions; rather,

each model will exhibit a characteristic trade-off profile, with certain dimensions prioritized at the expense of others; (3) Justice performance will be systematically lower than finance and externality performance across all models, reflecting the persistent marginalization of equity considerations in environmental governance; (4) Institutional capacity –including bureaucratic coordination, regulatory enforcement, and stakeholder participation mechanisms– will mediate the relationship between integration model and trilemma outcomes, with stronger capacity enabling more balanced trade-off management.

Research Methods

This study adopts a qualitative comparative case study design positioned within an interpretivist-critical realist epistemological framework. This epistemological position is justified by the research questions, which seek to understand not merely whether green-blue integration occurs but how and why it occurs in diverse contexts, and under what conditions it succeeds or fails. The interpretivist dimension acknowledges that environmental governance is shaped by perceptions, values, institutional cultures, and political discourses that cannot be reduced to context-independent measurements, while the critical realist dimension enables identification of causal mechanisms – such as the governance trilemma – that explain why certain patterns of integration emerge across cases. The case study design is appropriate because the research questions ask “how” and “why” questions about contemporary governance phenomena, the phenomena are context-dependent and require attention to particularistic dynamics, and the comparative dimension facilitates identification of patterns while maintaining attention to each case’s unique characteristics.

Data collection relies on secondary data analysis drawing from four source categories. Category 1 comprises policy and legal documents including national strategies, laws, and regulations from each case country, accessed through government websites and international organization repositories. Category 2 includes international organization reports from UNEP, World Bank, UNDESA, IMF, OECD, IPCC, and IPBES that provide standardized,

cross-nationally comparable data. Category 3 consists of peer-reviewed academic literature identified through systematic searches of Web of Science, Scopus, and Google Scholar databases using search terms including “green economy,” “blue economy,” “policy integration,” and “governance” combined with each country name, limited to publications from 2000 onward. Category 4 encompasses grey literature including think tank reports, NGO assessments, and news media that provide contemporary context and stakeholder perspectives. Data collection followed a systematic, protocol-driven process including source inventory creation, screening against explicit inclusion criteria, full-text reading with extraction into a case-specific database, and iterative gap-filling through targeted searches.

The analytical procedures follow a systematic five-stage framework. Stage 1 constructs comprehensive within-case narratives for each country following a standardized structure covering national context, policy frameworks, integration mechanisms, financing arrangements, externality control, justice considerations, and implementation outcomes. Stage 2 applies thematic coding using a hybrid deductive-inductive approach, with deductive codes derived from the trilemma dimensions (finance, externality control, justice) and inductive codes capturing emergent themes including institutional fragmentation, political economy dynamics, and stakeholder mobilization patterns. Stage 3 conducts systematic cross-case comparison using the “most different systems” design, with each case scored qualitatively on performance across the three trilemma dimensions, followed by development of a typology of integration models (necessity-driven, technocratically-driven, opportunity-driven, fragmented) derived from the empirical cases. Stage 4 employs causal mechanism analysis drawing on critical realist principles to identify the processes and pathways through which contextual factors produce particular integration outcomes. Stage 5 synthesizes findings to refine the theoretical framework, validating the governance trilemma as an explanatory mechanism while specifying how it manifests across different governance contexts.

Case selection followed purposive, theoretically-informed sampling with four criteria: variation in geopolitical position and economic structure (SIDS, LDCs, emerging economies, middle-income maritime hubs), variation in ecological vulnerability and resource endowments, variation in governance capacity and institutional context, and crucially, variation in integration approach and intensity. The five cases selected: Seychelles, Bangladesh, China, Panama, and the Philippines. Those represent a "most different systems" design enabling identification of patterns that hold across diverse contexts. This selection strategy is not intended to produce a statistically representative sample but rather a theoretically meaningful set of cases that enable analytical generalization. The specific choice of five cases balances depth of within-case analysis with comparative breadth, permitting identification of patterns while maintaining attention to contextual particularities. Table 3 below summarizes the case characteristics against the selection criteria.

Table 3. Case selection matrix

Country	Geopolitical/ Economic Position	Ecological Profile	Governance Capacity	Integration Approach
Seychelles	SIDS, high debt, ocean-based economy	Exclusive economic zone, high marine biodiversity, climate vulnerability	Moderate capacity, democratic	Pioneering, blue-led, necessity-driven
Bangladesh	LDC, climate-vulnerable, deltaic	Deltaic, flood-prone, high climate sensitivity	Low-medium capacity, democratic	Adaptation-driven, functional integration
China	Emerging superpower, major polluter, maritime power	Continental, extensive coastline, marine resources	High capacity, authoritarian	Strategic, top-down, technocratic
Panama	Middle-income, maritime hub, isthmus	Isthmus, biodiversity-rich, maritime corridor	Medium capacity, democratic	Emerging, opportunity-driven
Philippines	Lower-middle-income, archipelagic, mega-diverse	Archipelago, mega-diverse, high coastal population	Low-medium capacity, democratic	Policy-rich, implementation-weak, fragmented

Data validity and trustworthiness are ensured through multiple strategies across four dimensions. Credibility is achieved through

triangulation (data source, methodological, and theory triangulation), pattern matching against theoretical predictions, and approximation of member checking through comparison with stakeholder perspectives documented in source literature. Dependability is ensured through systematic documentation of all analytical procedures, maintenance of a comprehensive case database with clear referencing, and explicit articulation of the decision trail. Confirmability is addressed through transparent acknowledgment of epistemological position, systematic protocol-driven procedures, grounding of all claims in documented evidence, inclusion of disconfirming evidence where identified, and use of multiple independent data sources. Transferability is achieved through rich detailed case narratives enabling reader assessment of contextual relevance, development of a theoretical framework applicable in other settings, identification of integration models serving as analytical heuristics, and explicit articulation of contextual conditions that shape outcomes. Ongoing reflexivity acknowledges the researcher's positionality in international political economy and environmental governance, with analytical judgments supported by documented evidence rather than assertion.

The study acknowledges six principal limitations. First, reliance on secondary data cannot capture informal governance practices or unrecorded implementation challenges that primary data collection would reveal. Second, the geographic scope of five cases cannot capture the full diversity of integration experiences globally, though the typology offers heuristics for analyzing other contexts. Third, the temporal scope focusing on the past 15 years may underemphasize longer-term historical dynamics and path dependencies. Fourth, the macro-level analytical emphasis may obscure micro-level dynamics and community-level experiences of integration policies. Fifth, the normative orientation toward justice may shape analytical judgments, though this is transparently acknowledged and grounded in documented evidence. Sixth, reliance on English-language sources may introduce linguistic bias, particularly for countries where significant documents are available only in national languages. Despite these limitations,

the methodological procedures ensure findings are grounded in documented evidence, derived through systematic analysis, and available for critical scrutiny and replication, while the limitations identified point toward productive directions for future research.

DISCUSSION

This section presents the empirical findings organized through a systematic comparative analytical structure designed to address the research questions and test the theoretical framework elaborated in Section 3. The presentation follows a three-tier architecture: first, individual case analysis using a standardized analytical template; second, systematic cross-case comparison to identify patterns, variations, and causal mechanisms; and third, theoretical discussion that synthesizes findings to refine the governance trilemma framework and advance understanding of green-blue policy integration. Each analytical claim is explicitly grounded in documented evidence from the sources described in Section 4, with interpretive judgments transparently linked to their empirical foundations. Table 4 reveals case-study over five different countries regarding their policies over the green and blue economies.

Table 4. Cross-National Analysis of Green-Blue Economy Policy Integration

No	Nation-State & Context	Green Economy Policy Thrust	Blue Economy Policy Thrust	Level of Integration & Key Synergies	Critical Disconnections & Challenges	Sources
1	**Seychelles** (SIDS, High Debt, Ocean-Based)	Limited scope	Pioneering & central	High (blue-led)	Scale & capacity	(Booth & Brooks, 2023; Jiang & Cao, 2024; Rambarran, 2018)
2	**Bangladesh** (Deltaic, LDC, High Climate Vulnerability)	Climate adaptation-focused	Livelihood-centric.	Medium (practically integrated by necessity)	Sectoral conflict	(Islam & Shamsuddoha, 2018, 2018; Mahadi et al., 2023; Rahman, 2022)
3	**China** (Emerging Economy, Major Polluter, Maritime Power)	Top-down & technological	Strategic & expansionist	Medium-high (technocratically integrated)	Justice & equity deficits	(Han et al., 2025; Mahadi et al., 2023)
4	**Panama** (Isthmus, Maritime Hub, High Biodiversity)	Forest-centric	Ocean logistics & conservation	Emerging (opportunity-driven)	Siloed economic models	(Spalding et al., 2015; Suman, 1987)
5	**The Philippines** (Archipelagic, Mega-Diverse, High Coastal Population)	Resource management & resilience	Community-based & threatened	Low to medium (politically fragmented	Severe policy-implementation gap	(Carlo V Vergel, 2017; Mendoza & Valenzuela, 2021; Putri & Raharyo, 2019; Sanchez-Escalona, 2023; Satizábal et al., 2020)

Individual Case Analysis

Seychelles demonstrates a pioneering, blue-led model of integration, where innovative ocean finance is strategically leveraged to advance a limited but targeted green economy agenda. As a small island developing state (SIDS) with a high debt burden and an ocean-based economy, Seychelles is the most evident in its use of landmark debt-for-nature swaps, which have generated substantial blue financing to implement an ambitious Marine Spatial Plan (MSP) protecting 30% of its exclusive economic zone. Crucially, this MSP acts as a de facto integration tool, governing sustainable fisheries, tourism, and blue carbon, while the revenue generated is explicitly used to fund cross-sectoral green goals, including the transition to renewable energy and terrestrial ecosystem restoration (Jiang & Cao, 2024). This reflects a national paradigm that recognizes the economy as fundamentally "blue." However, this promising model faces significant implementation challenges; the nation's limited technical capacity and the exorbitant cost of monitoring its vast maritime territory constrain the effectiveness of its grand designs, while the terrestrial green economy beyond the energy sector remains notably underdeveloped (Bennett et al., 2021). Therefore, while Seychelles offers a groundbreaking template for using blue finance to bridge the green-blue policy divide, its experience underscores that financial innovation, while necessary, is insufficient without concurrent investments in institutional capacity and a more holistic development of the land-based green economy to ensure truly sustainable and resilient outcomes.

While **Bangladesh** shows a context where the integration of green and blue economies is driven by existential need which results in a pragmatic, adaptation-focused model that remains prone to important internal policy contradictions. As a highly climate-prone, deltaic least developed country (LDC), its practical integration is most seen in the central role of mangrove afforestation and restoration (a green economy activity) as a primary, nature-based solution for coastal defense (a blue economy concern), which simultaneously protects lives, terrestrial agriculture, and aquaculture assets from storm surges. This synergy is part of a single national climate adaptation

framework that guides both green and blue policy tools toward the same goals of resilience (Islam & Shamsuddoha, 2018). On the other hand, direct conflicts between sectors constantly weaken this fragile cohesiveness. For example, promoting intense shrimp aquaculture (a vital blue economy livelihood) often causes soil and water salinization. This activity can harm arable land and makes climate-resilient agriculture (a green economy objective) less effective. Moreover, land-based industrial pollution, a failure of green industrial policy, keeps flowing into rivers and the Bay of Bengal, disrupting marine health and fisheries. Bangladesh shows that a shared vulnerability driver can help functional integration, but without stronger regulatory enforcement and planning across sectors to solve these internal conflicts, its development path could lead to a cycle where progress in one area makes another area less resilient.

While **China** presents a paradigm of top-down, technocratically efficient integration, where formidable state capacity strategically aligns green and blue economic policies to serve national energy security and geopolitical ambitions, yet this model is critically marred by significant socio-ecological justice deficits. As an emerging economic superpower, major polluter, and aspiring maritime power, China's approach is characterized by a centralized, engineering-oriented mindset that prioritizes large-scale infrastructure and technological solutions under the overarching doctrine of "Ecological Civilization." This is evidenced by the seamless incorporation of offshore wind development – a quintessential blue economy sector – into its national energy security strategy, the world's largest green energy portfolio. Similarly, massive coastal "greening" projects, involving the construction of "blue carbon" ecosystems like mangroves and seawalls, are deployed as integrated solutions for coastal erosion control and carbon sequestration (Liu, 2024; Wang et al., 2023). The state's powerful administrative machinery enables this high-level policy coordination, achieving a medium-high level of technocratic integration. However, this top-down implementation consistently generates severe social disconnections; large-scale coastal reclamation for development and stringent fishing bans imposed to restore marine stocks have led to the widespread

displacement of fishing and coastal communities, with limited consultation or adequate compensation (Geng et al., 2023; Wu et al., 2016). Therefore, China's experience underscores a critical lesson for global environmental policy: while state capacity is a powerful enabler of green-blue synergy, without robust participatory governance and a foundational commitment to procedural and distributive justice, such integration risks achieving ecological and economic targets at an unacceptable social cost, ultimately undermining the long-term legitimacy and sustainability of the transition.

Then, **Panama** exemplifies a nation where the potential for green-blue integration is geographically and economically inscribed, yet its realization remains emergent and constrained by deeply entrenched, siloed economic models. As a key maritime hub and a biodiversity-rich isthmus, the country's development is bifurcated between a forest-centric green economy and an ocean-focused blue economy, each driven by distinct global market opportunities rather than a unified national vision. The most promising integration is opportunity-driven, centering on the "Panama Canal Watershed" as a natural socio-ecological unit; here, forest conservation and reforestation that was funded through international carbon markets like REDD+ are explicitly recognized as vital for maintaining the hydrological regime and siltation control essential for the Canal's operations, a direct synergy between green policy and a core blue economic asset (Gentry et al., 2021). Concurrently, the government is exploring linkages between terrestrial REDD+ and nascent blue carbon projects. However, this functional integration is overshadowed by a fundamental disconnection: the "Blue Panama" vision struggles to reconcile the Panama Canal's role as a pillar of the global fossil-fuel-based shipping industry – a significant source of pollution and bio-invasions – with its stated marine conservation goals for areas like Coiba National Park. Furthermore, green economy policy remains largely terrestrial, with little systematic effort to address land-based pollution that flows from watersheds into coastal ecosystems. Thus, Panama's trajectory illustrates that even in the presence of a compelling natural nexus for integration, overcoming sectoral path dependency and aligning powerful,

standalone economic sectors with environmental goals remains a profound governance challenge.

Finally, **the Philippines** is a key example of the policy-implementation paradox, where failures in governance systematically weaken a strong legal framework for community-led environmental management. This causes a big gap between green goals and blue realities. As an archipelagic nation with very diversified ecosystems and a large coastal population, its policies must focus on resource management and climate resilience; nonetheless, its political system is marked by fragmentation and ineffective enforcement. This is clearly seen in the co-existence of strong, locally-driven integration and national-level disconnection. On one hand, there are model community-based initiatives that seamlessly integrate mangrove reforestation (a green activity for coastal protection and carbon sequestration) with the establishment of marine protected areas (a blue activity for fisheries management), demonstrating a grassroots understanding of the land-sea nexus (Song et al., 2021; Tomaquin, 2023; Walters, 2004). National policies for climate and catastrophe risk reduction also acknowledge this connection. But this promising base is disrupted by a big gap in policy implementation. Illegal and uncontrolled coastal expansion, together with pollution from unregulated plastics and mining operations, is worsening water quality and killing key marine habitats such as coral reefs (Satizábal et al., 2020). The experience in the Philippines teaches us a hard lesson: even the most progressive and community-focused laws for green-blue integration will fail if they do not fix the basic problems, such as fragmentation and weak enforcement, with administation. This will allow land-based economic activities to keep harming marine ecosystems and the livelihoods that depend on them.

The Governance Trilemma Framework in Context of the Green-blue Policy Integration

The cases exhibit distinctive performance patterns across the three trilemma dimensions confirm that no model achieves high performance on all dimensions simultaneously. Table 5 synthesizes these patterns.

Table 5. Comparative Trilemma Performance by Integration Model

Country	Model	Finance	Externality Control	Justice	Dominant Trade-off	Evidence Source(s)
Seychelles	Necessity-driven	High (US$22M debt swap + US$15M bonds)	Medium-High (MSP framework; capacity constrained)	Low-Medium (consultation exists; compensation limited)	Finance ↔ Justice	Booth & Brooks, 2023; Bennett et al., 2021; Schutter & Hicks, 2019
Bangladesh	Necessity-driven	Medium (US$400M annual domestic)	Low-Medium (mechanisms exist; enforcement weak)	Medium (formal recognition; limited implementation)	Externality ↔ Justice	Islam & Shamsuddoha, 2018; Mahadi et al., 2023; Rahman, 2022
China	Technocratically-driven	High (US$500B+ annual investment)	High (regulatory control; water quality improved)	Low (limited participation; displacement documented)	Justice ↔ Both	Han et al., 2025; Wang et al., 2023; Geng et al., 2023; Wu et al., 2016
Panama	Opportunity-driven	Medium (project-based; canal revenues)	Medium (watershed-canal nexus; limited beyond)	Low-Medium (consultation; limited influence)	Externality ↔ Justice	Gentry et al., 2021; Spalding et al., 2015; Suman, 2002
Philippines	Fragmented	Low (1% GDP environmental spending)	Low (enforcement failure; habitat degradation 50%+)	Medium (participation strong; enforcement weak)	Finance ↔ Externality	Satizábal et al., 2020; Sanchez-Escalona, 2023; Mendoza & Valenzuela, 2021

Seychelles and China both demonstrate high finance mobilization but low justice outcomes, indicating that financial innovation and state investment can generate integration resources but do not automatically benefit affected communities. In Seychelles, finance is mobilized through debt-swaps but compensation mechanisms for displaced fishers are limited (Bennett et al., 2021); in China, state investment achieves massive scale but coastal communities are systematically excluded from benefit streams (Geng et al., 2023; Wu et al., 2016). This confirms that justice performance tends to be lower than finance and externality performance across models, though the Philippines (medium justice) provides a partial exception, achieving justice through participation but at the cost of low performance on other dimensions.

While Bangladesh and Panama both demonstrate that externality control mechanisms, where they exist, can impose costs on vulnerable stakeholders. In Bangladesh, agricultural regulations for pollution control may burden small farmers (Mahadi et al., 2023); in Panama, watershed

management restrictions can affect indigenous communities' access to forest resources (Spalding et al., 2015). This trade-off is less pronounced in China (where externality control is top-down and justice is systematically excluded) and Seychelles (where capacity limitations constrain both externality control and justice).

Finally, the Philippines demonstrates that low finance and low externality control are correlated: without financial resources, monitoring and enforcement capacity is insufficient to control land-sea externalities. Budget tracking data indicates that environmental spending at approximately 1% of GDP is insufficient to support the enforcement mechanisms necessary for externality control (Sanchez-Escalona, 2023; Mendoza & Valenzuela, 2021). This confirms the hypothesis that finance is a necessary – though not sufficient – condition for externality control.

In the context of causalities, the cross-case comparison reveals four mechanisms that explain how contextual factors produce particular integration outcomes.

Mechanism 1: Crisis-Driven Policy Convergence (Seychelles, Bangladesh)

Existential threats—debt distress, climate vulnerability—create political imperative for integration by reducing sectoral resistance and enabling policy innovation. In Seychelles, the debt crisis enabled the debt-for-nature swap; in Bangladesh, climate vulnerability enabled the Delta Plan's cross-sectoral framework. The mechanism operates through threat perception generating political will for coordination, but its effectiveness is mediated by institutional capacity—stronger capacity enabling more comprehensive integration (Seychelles' MSP) versus weaker capacity generating more limited integration (Bangladesh's functional coordination). This mechanism confirms that shared vulnerability can drive integration, consistent with crisis-driven policy change literature (Birkmann et al., 2010).

Mechanism 2: State Capacity Enabling Strategic Coordination (China)

Formidable state capacity, those are centralized planning, administrative reach, enforcement capability, enables high levels of policy

coordination, resource mobilization, and regulatory control. The mechanism operates through hierarchical governance structures that can override sectoral fragmentation and implement integrated policies. However, the same capacity that enables technocratic efficiency also generates justice deficits by excluding participatory mechanisms and prioritizing state objectives. This mechanism suggests that state capacity is a double-edged sword: necessary for integration but potentially harmful to justice if not accompanied by democratic accountability.

Mechanism 3: Opportunity-Structuring by Geographic and Economic Endowments (Panama)

Specific geographic and economic features - the Panama Canal watershed – create functional integration opportunities that can be leveraged through policy design. The mechanism operates through the material interdependence created by shared resources; forest conservation and canal operations are objectively linked, generating institutional pressure for coordination. However, the mechanism is limited by path dependencies and entrenched sectoral interests that resist systematic integration beyond the immediate opportunity. This suggests that opportunities can catalyze but not substitute for systemic governance reform.

Mechanism 4: Institutional Fragmentation Generating Implementation Deficits (Philippines)

Policy fragmentation across multiple agencies, jurisdictional overlaps, and weak enforcement capacity systematically undermine progressive legal frameworks. The mechanism operates through governance failure: policies exist on paper but are not implemented due to limited capacity, political will, and coordination. This mechanism suggests that policy adoption is insufficient without institutional capacity for implementation; integration requires not just policy design but administrative and political capability.

Justice Implications Across Models

The analysis reveals three systematic patterns in justice achievement that have theoretical and policy significance.

First, **procedural justice vs. distributive justice trade-offs.** Countries with strong procedural justice – the Philippines (medium procedural justice) and, to a lesser extent, Seychelles – do not necessarily achieve strong distributive justice. Participation assessments in the Philippines (Tomaquin, 2023; Song et al., 2021) document high participation rates (70%+ in some localities) but limited livelihood protection. Seychelles' consultation documentation (Schutter & Hicks, 2019) shows participation occurred but influence on outcomes was limited. China's justice deficits are documented in community displacement studies (Geng et al., 2023; Wu et al., 2016). Therefore, countries with weak procedural justice (China and Panama) also tend to have weak distributive justice, suggesting that procedural justice is a necessary (though not sufficient) condition for distributive justice.

Second, **recognition justice as the weakest dimension**. Across all cases, recognition justice – acknowledgment of diverse knowledge systems, customary rights, and cultural values – is the weakest justice dimension. Even where procedural and distributive justice are partially achieved, recognition of indigenous knowledge, customary tenure, and alternative development visions remains limited. Recognition analyses across cases (Satizábal et al., 2020; Spalding et al., 2015; Schutter & Hicks, 2019) document the marginalization of indigenous knowledge and customary rights. In the Philippines, Song et al. (2021) document that while customary tenure is formally recognized, implementation remains contested and incomplete. This suggests that mainstream integration frameworks, even when inclusive in procedural terms, operate within a dominant rationality that marginalizes alternative ways of knowing and being.

Third, **justice as a constraint on other dimensions**. The analysis suggests that justice is not merely a secondary consideration but is systematically in tension with finance and externality control. In China, the pursuit of technocratic efficiency marginalizes justice; in Seychelles, the imperative to mobilize finance through debt-swaps limits compensation capacity; in Bangladesh, the focus on adaptation externality control can impose costs on vulnerable groups. This finding confirms that justice is not

automatically achieved through integration but requires explicit policy design and resource allocation—suggesting that the governance trilemma is not merely descriptive but identifies a fundamental challenge requiring political attention.

CONCLUSION

The integration of green and blue economies is time-sensitive and intricate. The empirical analysis yields six key findings that together constitute the study's core contribution, those are (1) integration is context-dependent; (2) the governance trilemma is empirically validated; (3) justice is systematically the weakest dimension; (4) institutional capacity mediates outcomes; (5) procedural justice does not guarantee distributive justice; and (6) integration requires explicit justice attention.

This paper contributes to IR Studies especially to the Global Environmental Political studies by proposing a unified approach to sustainable development. It highlights the need to combine green and blue economies, address global environmental problems, and follow international goals and policies. This approach is inecessary for making an economically stable, environmentally friendly, and socially inclusive world.

This study offers a critical examination of the synergies and disjunctions between green and blue economic policies; nonetheless, it is important to note its limits, which highlight fruitful directions for future research. A significant disadvantage is its dependence on qualitative, policy-level analysis and documented case studies, which, although they elucidate macro-level governance trends, may fail to cover the wide variety of implementation problem and micro-level socio-economic effect. This study indicates that more research needs to use detailed quantitative methods to look at the real social and environmental effects of integrated projects. The results will help set clear success criteria that go beyond surface-level policy discussions. This study has also found a major gap in our understanding of the political economy of integration. Future research should pay more attention to power dynamics, vested interests, and institutional barriers that make it possible or not to connect green and blue policy silos in different

governance settings. Finally, it's highly necessary to perform comparative transboundary research on governance models for managing integrated green-blue economies across common river basins, regional oceans, and international corridors. This is because both environmental challenges and economic systems cross boundaries. This type of study is required to use the ideas of integration in more than just the nation-state.

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