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APPROACHES TO STRENGTHENING FISHERIES FINANCING AND INSTITUTIONAL MECHANISMS: A CROSS-COUNTRY COMPARISON OF CAMBODIA, INDIA, AND INDONESIA

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Abstract

Using marine resources in a healthy and sustainable manner is at the center of building a blue economy that will make "Sustainable Development Goal 14: Life Below Water" achievable. Fisheries and aquaculture sectors alone provide employment for and support the livelihoods of more than 200 million people worldwide, besides providing food and nutrition for billions. Despite this importance, continued human activities that pollute water bodies are negatively affecting their health at an alarming pace. A change from the prevalent practices, particularly relating to fishing, to more sustainable approaches would entail substantial costs across the fisheries value chain. A key challenge is to mobilize the required financial resources to enable this transition. In the recent past, many countries have announced different institutional and financing mechanisms to promote private capital and commit public resources through budgetary allocations. This study undertook a comparative analysis to identify the similarities, differences, and emerging financing frameworks across three countries, Cambodia, India, and Indonesia. The results from the analysis indicated that an institutional design that has a specific focus on the fisheries sector, promoting constructive collaborations with diverse financing institutions and community organizations, is an enabler in this particular sector of the blue economy.

Keywords: blue economy, blue finance, Cambodia, fisheries, India, Indonesia, oceans

JEL Classification: D02, G23, Q22

Contents

1. INTRODUCTION

Using marine resources in a healthy and sustainable manner is at the center of building a blue economy that will make "Sustainable Development Goal 14: Life Below Water" achievable. Fisheries and related industries constitute an important component of the blue economy (World Bank 2018). Fisheries, other coastal, marine resources, and industries have an estimated market value of USD3 trillion to USD5 trillion, approximately 5% of the global GDP (FAO 2016). In 2018, the estimated global fish production was 179 million tons (FAO 2020b), its highest peak, representing a rise of over 120% since 1990. The global aquaculture production experienced even higher growth of 527% from 1990 to 2018. While the extent of aquaculture development differs across and within geographical regions, the People's Republic of China (PRC) (47.6 million tons), India (7.1 million tons), and Indonesia (5.4 million tons) dominated the production between 2003 and 2018 (FAO 2020b). According to the estimates of the Food and Agriculture Organization (FAO), about 60 million people work in the fisheries sector globally, of whom more than 83% are in Asia (FAO 2020b). The FAO has stated that Asia will continue to dominate the aquaculture sector and expand its production to more than 89% by 2030. There is increasing international recognition of developing blue economy principles through agencies such as the World Wide Fund for Nature, United Nations Development Programme, United Nations Environment Programme, Asian Development Bank, and World Bank. Agencies have developed several tools and guidance documents at the global level to help countries transition to blue economies. They based many of these tools on the FAO's Code of Conduct for Responsible Fisheries, which more than 170 member countries drafted and adopted and which focused on nutritional, economic, social, environmental, and cultural aspects. Worldwide, efforts are aiming to ensure positive outcomes for different blue economy-related projects. The blue economy can substantially improve people's income and livelihood; the sector has the potential to create 100 million jobs by 2030 (PEMSEA n.d.), particularly in Asian countries, such as Bangladesh (Hasan et al. 2018) and India (Pranathi and Gonchkar 2019). Projects like Mozambique's Mais Peixe Sustentável aim to reduce rural poverty through investments in the fisheries sector. In contrast, India's mapping of the "hazard line" of the coastline intends to improve the management of coastal spaces and minimize vulnerabilities through the protection of shorelines and land use plans.

Despite the importance of the ocean economy, ongoing human activities that pollute water bodies are negatively affecting the health of oceans at an alarming pace. A combination of factors, including indiscriminate dumping of waste, plastics in the oceans, unsustainable fishing, unregulated coastal redevelopment, and climate change, are adversely influencing the quantity and quality of the fish produce. The discharging of untreated effluents from land into water bodies, fishing above the sustainable levels, and steady damage to the habitat have resulted in a noticeable reduction in the health of oceans (Halpern et al. 2008; Cohen et al. 2019), thereby affecting the livelihood and food security of communities that depend on fishing and exerting a negative impact on the world economy (Hertel 2016; FAO et al. 2018). The decline in the percentage of fish stocks within biologically sustainable levels—from 90% in 1974 to 65.8% in 2017—is a disturbing trend (World Bank 2020). There is an increasing global consensus that continued overfishing will significantly affect the food security and the livelihoods of vulnerable people in the future. The seafood industry, which provides nutrition and livelihoods to millions of people across the globe, is facing a serious threat from declining fish stocks and degrading ocean habitats. Failure to adopt adequate and timely measures regarding sustainable ocean resource mining and

the protection of ocean biodiversity could have an adverse impact on food security and livelihood opportunities.

According to the estimate of the International Institute for Environment and Development (IIED), restoring the depleting fisheries sector globally would require more than USD200 billion (IIED 2020). Governments' common fiscal policy tools, such as taxes, subsidies, and budgetary allocations, are unlikely to be adequate to meet the vast financing needs. It is necessary to augment these resources by attracting private capital to bridge the financing gap and support the transition to blue economies. On the other hand, there is growing interest in the private sector in financing marine conservation and blue economy initiatives that need leveraging. The Meloy Fund and Althelia Sustainable Oceans Fund provide evidence of the role that private financing can play in supporting the growth of the blue economy and improving the livelihoods of local communities. Much of the success of these financing instruments will depend on the supporting frameworks that governments will create. The availability of appropriate institutional mechanisms and statutory support will incentivize the private sector to participate in fisheries and aquaculture sectors and other sustainable ocean-related economic activities (Yoshioka et al. 2020).

Recognizing this gap and enabling the transition to sustainable blue economies, many countries in the recent past have announced different institutional and financing mechanisms to promote private capital and commit public resources through budgetary allocations. Hence, the following question arises: What should be the features of an institutional and financing mechanism that supports sustainable fisheries sector development? Achieving the goals that countries set for themselves would mean moving beyond the operational contours and adopting a comprehensive approach comprising institutional structures, governance, financing mechanisms, community engagement, and stakeholder buy-in (Tirrell 2017). This research attempted to find an answer to the above question due to its relevance to many developing nations as they gear up to meet the targets that the sustainable development goals have set. The objective of this research was to study the different responses to the changing blue economy sectors, with particular reference to fisheries, and to investigate the features of an institutional and financing mechanism that promotes sustainable fisheries sector development. The research also investigated whether these financing structures enable private-sector capital flows that can help the transition to sustainable and inclusive blue economies.

About 25% of the world's fish production comes from 10 countries in the ASEAN region (Invest ASEAN 2020). Indonesia is the largest producer of seafood in Southeast Asia and ranks second globally, after the PRC. In 2018, fisheries contributed 2.6% of the country's gross domestic product (GDP), approximately USD26.9 billion (FAO 2020b). The estimates of the Nature Conservancy (2020) indicate that the fisheries industry employs about 12 million people. Cambodia, also an ASEAN member country, is known for its rich biodiversity and fishery resources owing to the Mekong River. The country is also home to Tonle Sap, the largest freshwater lake in Southeast Asia and a rich fishing ground. The fisheries sector contributes about 18% of the country's GDP, employing about 2 million people (RGOC 2010; FAO 2020b). Globally, India ranks third in fish production and second in aquaculture. The fisheries sector, which employs over 145 million people, accounts for about 1.07% of the country's GDP (GoI 2020). These countries vary in size and natural resources but are committed to improving their blue economy prospects. Though the approaches that the three countries have taken to build their blue economies are different, the overarching sustainable development goals (SDGs) are at the very core of all their development efforts.

This article presents a comparative analysis of the institutional and funding mechanisms of three countries—Indonesia, India, and Cambodia—to gain a better understanding of how they are addressing the finance gap in the fisheries sector. The authors conducted a literature review to adopt a framework within which to undertake the country comparison. This identified various elements that provide a perspective on the institutional and financial mechanisms. Next, the authors collected information about fisheries and financing in the three countries from their governments and other published sources and then analyzed the information using the comparative framework to identify the countries' similarities, differences, and uniqueness. They drew policy implications from the findings, providing pointers to shape a broader regional approach.

This article focuses on the institutional and financial strategies that the three countries are proposing to adopt rather than specific technical practices. Section 2 presents a review of the literature. Section 3 sets out the methodology for comparing the approaches that the countries have adopted. Section 4 outlines the backdrop of the fisheries sector with a focus on the financing and institutional structures of Cambodia, India, and Indonesia. Section 5 discusses the comparison of these structures. Section 6 presents the policy implications, and the article concludes in Section 7 by synthesizing the findings of this comparative analysis and lessons for their adoption for sustainable financing.

2. REVIEW OF THE LITERATURE

The discourse and research on the blue economy have ranged from determining what constitutes the blue economy (Keen, Schwarz, and Wini-Simeon 2018; World Bank 2018) to identifying the various components that comprise this sector and its functional sustenance (Patil et al. 2016; Smith-Godfrey 2016; Bhattacharya and Kumar 2020). The fisheries sector is an important component of the blue economy, contributing more than USD270 billion per year to the global GDP (World Bank 2020) and indirect benefits of approximately USD2.5 trillion per year to humankind (Hoegh-Guldberg et al. 2015). The potential for job creation in the blue economy and the fisheries sector has been a subject of interest to researchers (Teh and Sumaila 2013; Vyshnavi and Rao 2017; Cai, Huang, and Leung 2019).

A survey of institutional investors globally indicated that nearly 90% of them are keen to consider blue economy projects to promote SDG 14 and the associated financial benefits (Credit Suisse 2020). However, the scale of investments that they have deployed in the ocean economy so far has been limited (Vanderklift et al. 2019), and the multilateral/bilateral assistance for the marine sector decreased by about 30% during the period 2010 to 2015 (Blasiak and Wabnitz 2018). A review of countries' nationally determined contributions and voluntary commitments showed that approximately 70% are marine related (Gallo, Victor, and Levin 2017), but the prominence attached to SDG 14 is relatively minor (Singh et al. 2018). This reflects the shortfalls in conservation funding across the world (Bos, Pressey, and Stoeckl 2015), in part due to these sectors' dependence on the quantification of economic benefits (Fujita et al. 2013).

The commitments that various countries have made under SDG 14 aim to inculcate sustainable fishing practices through a diverse range of sectoral reforms. The change from the prevalent practices to more sustainable approaches will entail substantial costs across the fisheries value chain. A key challenge that remains is mobilizing the required financial resources to enable this transition. While the sector already absorbs a range of public sector, official development assistance, and private-sector funding sources, these reportedly fall short of supporting sustainability (Bos, Pressey, and Stoeckl 2015). Government budgets can only partially fill the gap, necessitating the exploration of innovative financing options to attract capital from private, philanthropic, and other sources. Many countries are developing innovative institutional and financial structures to support the development of sustainable fisheries. At the same time, there is growing interest in financing and supporting conservation measures and the sustainable use of marine resources in the private sector. Countries only committed USD42 million of formal private-sector capital to sustainable fisheries and aquaculture projects between 2004 and 2015 (IIED 2020), and, overall, the blue economy is yet to attract private investment at the scale and pace of other sectors. While the opportunity to create an inclusive blue economy is promising, governments must re-evaluate their strategies and strengthen their governance and financing frameworks. To achieve the SDGs and accelerate blue economy investments, it is imperative to use appropriate financing instruments and build institutional capacities (Tirumala and Tiwari 2020).

Given the importance of the sector and its contributions to the economy, the research attention has also focused on the governance and institutional structures that countries have adopted. A fundamental challenge for ensuring a sustainable governance structure in the blue economy is to balance the needs of a diverse group of stakeholders while mitigating the potentially disastrous environmental degradation (Cohen et al. 2019). A comprehensive fisheries governance structure needs to be flexible to encourage innovative solutions and adapt to the changing circumstances of the underlying characteristics (Sunil 2006). The fisheries governance has changed substantially to consider the sea as a whole (which resulted in the FAO-led ecosystem approach to fisheries) and to reflect the roles of various stakeholders (Stepanova 2015). The need for strong leadership, adherence to accepted principles of sustainability, and clear demarcation of rights relating to capture and transferability underpin the evolving governance frameworks in the fisheries sector in the context of global sustainable development. The economic aspects account for a more significant share of the governance sphere in relation to the biological, social, or political elements. The expectation is that the governance frameworks will connect the interdependencies of public and private participation with the prevailing policies (González Laxe et al. 2018).

Researchers have considered the estimation of the value of the marine ecosystem to be important for creating appropriate institutional structures (Spalding 2016; Keen, Schwarz, and Wini-Simeon 2018), which could lead to the necessary financing options. Global cooperation influences the growth of the blue economy and the marine fisheries sector, having a conservation financing mechanism, and adopting sustainable practices in the usage of waters and fishing (Thiele and Gerber 2017; Sarker et al. 2018; Cohen et al. 2019). In addition to the challenges of overfishing for the sustainability of fishing produce, research has related a substantial increase in this to a greater impact on the environment in terms of greenhouse gas emissions (Vivekanandan, Singh, and Kizhakudan 2013; Parker et al. 2018). This would mean that countries' institutional, governance, and financial structures need to align to consider the cross-impacts of various activities.

The management of the sector needs a shift from business as usual to an international effort on sustainability ranging across different sub-sectors and scales, which the active participation of the stakeholders concerned will support (Rudolph et al. 2020). The features of such an institutional mechanism comprise shared objectives across different entities, the development of frameworks that guide holistic oversight and require equitable distribution of market and government roles, and institutional structures (Rudolph et al. 2020). The existing systems need substantial alteration/redevelopment to effect a large-scale transformation while facing resistance from existing interests. The emerging systems need to balance the governance requirements of the top policymakers and on-the-ground communities and participants. A potential pathway to a more effective institutional and governance structure would be (i) to set out the underlying drivers of transformation; (ii) to demonstrate how the alteration of the drivers can result in the desired transformation; and (iii) to develop the contours of the desired new institutional and financing structures (Chaffin, Gosnell, and Cosens 2014).

Similar to the initial growth phase of green finance and sustainable finance, the blue economy does not have widely accepted principles and an investment framework. Frameworks provide the investing community with reassurance through definitions of eligible projects, information about the utilization of funds, and monitoring and reporting protocols (International Capital Market Association (ICMA) 2018). The European Commission, European Investment Bank, World Wide Fund, and the Prince of Wales's International Sustainability Unit launched the world's first framework for a sustainable blue economy (European Investment Bank 2021). The principles are broad, enabling them to address various subsectors and sustainability aspects, seven of them relating to investment and the other seven focusing on nurturing cooperation, research, data management, and innovation. The investment guidance regarding ESG, a set of six voluntary principles that offer a wide variety of actions, is gaining popularity (PRI Association 2021). The World Ocean Summit 2018 launched a different set of principles, which aims to provide investors with certainty about their funds (World Ocean Summit 2018). In October 2019, the UNDP introduced its Blue Financial Instrument Framework, which grades various blue economy projects by their impact, sets out indicators to measure the impact of interventions, and lists different potential financial instruments (UNDP 2019).

The Asian Development Bank has committed USD5 billion to the blue economy and is in the process of developing its blue finance framework (ADB 2019). The private sector, including financial institutions, community-based organizations, and development think tanks, has been active in promoting the transition toward the achievement of SDG 14. The existing gap in conservation funding is huge, an estimated USD7 trillion, leading to the need to leverage private financing to bridge this gap (Tirumala and Tiwari 2020). The integration of ecological conservation into blue economy projects, increased access to funds for the stakeholders across the value chain, cross-functional linkages of maritime and land-based activities, creation of new markets, and opportunities for participation of a diverse range of stakeholders are important for the sustainable blue economy (IIED 2020).

3. ANALYTICAL FRAMEWORK

From the literature review and preliminary analysis of secondary information, it was evident that no standard frameworks are in place across countries for financing the fisheries sector (González Laxe et al. 2018). Each country has developed its own financing mechanisms and created institutional capacities that align best with its country context and local needs. This motivated our research to undertake a comparative analysis of three countries that are adopting different institutional and financial elements regarding the principles of blue economy finance that are undergoing development. This study developed a comparative framework encompassing the elements that various researchers have considered to be important for a sustainable fisheries sector. The growing internationalization of the fisheries sector, coupled with the need to align toward sustainable practices, implies that the governments need to balance the commitments that countries make to achieve the SDGs, follow science-based policies, develop institutional structures that engage various stakeholders (from catching, processing, and trading sectors to community and environmental groups), and configure appropriate financing strategies. We categorized these features into seven parameters for the purpose of comparing the different countries. The following Table 1 sets out the adapted framework for the comparative analysis of the three countries.

Table 1: Framework for the Comparative Analysis

Parameters	Description
Integration of sustainability considerations (Bos, Pressey, and Stoeckl 2015)	Do the proposed institutional and financial structures consciously integrate biodiversity and climate considerations into the fisheries sector? Is there a mention of adopting any of the blue finance/sustainable finance principles in the systems?
Cohesive maritime and land-based activities (Fujita et al. 2013)	The strength of the linkage between the required activities and functions for the maritime and land-based activities that have a substantial impact on the sustaining of blue economy projects
Engagement with peer sectors (Bos, Pressey, and Stoeckl 2015)	The strength of the coordination and linkage with other government functions and ministries, such as environment, health, finance, trade and commerce, and infrastructure and logistics
Fiscal policy tools and instruments (IIED 2020)	The extent of the commitment through the traditional government tools and instruments (taxes, levies, and budgetary support)
International development partner engagement (Bhattacharya and Kumar 2020)	Leveraging and strengthening the existing relationships or forging new partnerships with international development partners, such as the World Bank and the Asian Development Bank
Pathways for market participation (Bhattacharya and Kumar 2020)	Initiatives allow the participation of a diverse investor base (multilateral, bilateral, private, institutional, commercial sources, and project-affected stakeholders). Does the fisheries sector attract the attention of international and national investors and operators?
Ease of access to funding (World Ocean Summit 2018)	Ease of funding access of the project proponents developing common infrastructure, such as harbors, jetties, landing sites, cold chains, conservation, monitoring, and governance Quicker access for individuals, community-based organizations, and medium-sized and small enterprises

Source: Authors' adaptation based on a review of the literature.

We initially carried out a country analysis that set out the important features of the fisheries sector relating to the size, the constraints that it faces, and the existing institutional and financing mechanisms. We based this analysis on secondary information. Using the synthesis of this analysis and a review of the published policies or strategies of the respective national documents, we populated the comparative framework.

4. COUNTRY ANALYSIS

During the period 2007–2016, 37 countries increased their inland fish production, representing 58.7% of the global catch. India, Cambodia, and Indonesia were among the top drivers (FAO 2020b). Below, we provide a description of the backdrop of each country's fisheries sector through the specific lens of institutional and financial mechanisms.

4.1 Cambodia

Almost 61% of Cambodia's animal protein consumption comes from fish, which contributes 6–9% of the national GDP (RGOC 2010; Lieng et al. 2018). Almost a third of the households in Cambodia engage in fishing activities. The fish capture in 2019 was an estimated 601,000 tons, of which the marine catch comprised a 20% share (FAO 2020b). Many rural poor people in Cambodia depend on fishing for their livelihoods. However, illegal fishing, rapid coastal development, and climate change are contributing to the decline of the fishing stock. Besides, the country suffers from unregulated and unsustainable exploitation practices, a lack of infrastructure, particularly for post-harvest activities, and limited access to finance for the fishing sector (small and medium-sized enterprises).

At the central level, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) oversees the fisheries sector in Cambodia, and the Fisheries Administration (FA) within the MAFF is responsible for research and development, law, and policymaking. At the local level, the MAFF has entered into partnerships with various international agencies, like the World Wide Fund for Nature (WWF) and the International Union for Conservation of Nature (IUCN) to assist with sustainable fisheries development and management at the local/community levels. The Government of Cambodia has also produced the "Strategic Planning Framework for Fisheries 2010–2019," which provides a roadmap for the government's plan for the management, conservation, and development of sustainable fisheries. It aims to boost tourism, revive industrialization, significantly augment the post-harvest infrastructure, and improve the availability of finance for the various individual and small-scale fisheries operators. There is a substantial overlap between multiple ministries, including the Ministry of Economy and Finance, Ministry of Planning, Ministry of Environment, Ministry of Industry and Handicraft, and Ministry of Commerce, which manage different stakeholders and functional aspects of the fisheries sector (RGOC 2010).

Table 2 below summarizes the key institutional and financial aspects of Cambodia's fishing sector:

Table 2: Cambodia's Fisheries Sector

Parameters	Description
Marine capture production (million tons—2018)	0.12
Fisheries' contribution to the GDP	6–9%
Size of the fisheries sector	Provides more than 1.5 million full-time jobs and involves at least 6 million people in fishing activities
Broad sector issues	• The long-term trend in declining fish sizes • Illegal fishing • Rapid coastal development • Climate change • Hydropower
Institutional structures	*Federal level* The Fisheries Administration (FA) of the Ministry of Agriculture, Forestry, and Fisheries (MAFF) of Cambodia is the government agency responsible for managing, regulating, and promoting the national fisheries sector. *Local/community level* • Partnership with WorldFish, an international, nonprofit research organization, to strengthen livelihoods and improve food and nutrition security. • WWF is working in partnership with the Fisheries Administration and local governments to assist local communities in developing community fisheries. • Partnership with the IUCN to strengthen local-level initiatives.
Financing mechanisms	• Funding from European Union ambassador George Edgar confirmed a USD98 million project to support the local fisheries sector from 2019 to 2023. • The IUCN and local NGO partner FACT implemented an EU-funded project from 2013 to 2016 to establish fish conservation areas (FCAs) with legal recognition and management from elected fisheries committees. • In 2018–2019, the IUCN established a "mini" trust fund in three focal communes in the Tonle Sap (and two more at the Stung Treng Ramsar site). Each trust fund received USD5,000 in capital deposited with LOLC, a local bank, and generates 9% annual interest in local currency or about USD35/month. This represents about half the cash necessary to pay for FCA patrols and other core management operations. • The Fisheries Administration (FiA) of the Ministry of Agriculture, Forestry, and Fisheries signed an MoU with the IUCN in December 2019 to strengthen collaboration on fisheries management and livelihoods. • The Asian Development Bank is exploring the provision of official development assistance through a targeted sovereign loan, which also includes the development of a financing facility that could unite capital from various government, development partner, and private sources. • UNIDO has been very active in promoting value chain investment opportunities, particularly among medium- and small-scale enterprises.
Sector financing	Substantial multilateral development partner assistance; limited national budgets.
Private-sector interest	Increasing interest from international fisheries investors and funds.
Budget/financing allocation	Every year, the Fisheries Administration (FiA) receives approximately USD2 million from the government. Development partners provide roughly USD10 million per year to the FiA. Bann and Sopha (2020) suggested that the provincial treasury or community budget should introduce a budget line specifically for community fisheries.

Source: Authors' compilation from Lieng et al. (2018), Bann and Sopha (2020), and FAO (2020b).

Most of the initiatives have focused on the efforts of the development partners and international organizations since early 2000. The development of various fisheries frameworks, the introduction of collaborative management with community stakeholders, and ecosystem conservation are some of the benefits that have resulted

from these efforts. The Royal Government of Cambodia is formalizing various institutional structures through its Public Sector Investment Management Strategy, which marks out the projects that state-owned entities, international development partners, and public–private partnerships will implement.

4.2 India

Globally, India ranks third in fisheries production and second in aquaculture. The sector contributes 1.07% of the country's GDP and USD45 million in exports. The fishing production in 2019 amounted to an estimated 13.42 million tons (out of the estimated total production potential of 23.2 million tons) (GoI 2020). Fishing is a direct source of livelihood for more than 20 million people along the coastline. The fishing sector has been one of India's main foreign exchange earners, accounting for 5% of total exports and nearly 20% of agricultural exports. Aquaculture has propelled inland fishing in the last decade but is currently facing challenges due to the limited diversification of species, the prevalence of diseases, and the high costs of inputs. Overall, the sector faces challenges due to inefficient management (wastage, traceability, and certification), limited improvements in the traditional fishing practices, inadequate infrastructure (landing jetties, harbors, and post-harvest cold chains), and insufficient skilled manpower capacity. Currently, the sector depends extensively on budgetary funding for infrastructure and public projects (which, like grants, are limited to leverage and raising credit). There is also minimal credit funding available across the value chain, particularly for individuals and small-scale enterprises (GoI 2020).

The fisheries sector is a state subject in India, with the federal government (sharing the responsibility for marine fisheries) providing support for the provincial governments (which manage the inland fisheries). At the central level, the newly formed Ministry of Fisheries, Animal Husbandry, and Dairying manages the fisheries sector. At the state level, separate state fisheries departments govern the industry. In 2006, the government set up a separate body called the "National Fisheries Development Board" exclusively to develop fisheries across the country. The Coastal Aquaculture Authority (CAA) is the agency responsible for the regulation of coastal aquaculture activities. There are numerous other fisheries institutions, including the Fishery Survey of India (FSI), National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT), Central Institute of Coastal Engineering for Fishery (CICEF), Central Institute of Fisheries Nautical and Engineering Training (CIFNET), and National Federation of Fishers Cooperatives Ltd. (FISHCOPFED).

The draft National Fisheries Policy proposes to continue the financial strategy of budgetary support along with the support of national financial institutions (National Bank for Agriculture and Rural Development (NABARD), National Cooperative Development Corporation and the assistance of development partners (including the World Bank, the Asian Development Bank, and Japan International Cooperation Agency). There is also a proposal to strengthen public–private partnerships and access to institutional credit.

Table 3 below summarizes the key institutional and financial aspects of India's fishing sector:

Table 3: India's Fisheries Sector

Parameters	Description
Marine capture production (million tons—2018)	3.62
Fisheries' contribution to the GDP	1.07%
Size of the fisheries sector	Provides more than 20 million full-time jobs and involves at least 14.5 million people in fishing activities
Broad sector issues	• Declining fish catch and depletion of natural resources • Overexploitation of coastal fisheries • Insufficient institutional support • Weak extension network • Inadequate legal and political recognition
Institutional structures	*Federal level* • Department of Animal Husbandry, Dairying, and Fisheries • National Fisheries Development Board • Central Marine Fisheries Research Institute (CMFRI) *State/regional level* State Fisheries Department *Local/community level* South Indian Federation of Fishermen Societies (SIFFS), a non-governmental organization
Financing mechanisms	• Budgetary allocations • Fisheries and Aquaculture Infrastructure Development Fund (FIDF)—for infrastructure development and the provision of viability gap funding for setting up processing plants, cold chain facilities, and marketing activities • Global Fisheries Sustainable Fund—a sustainable management plan for bait fisheries
Sector financing	Predominantly budgetary support; limited options for leverage/credit funding
Private-sector interest	Primarily domestic operators; limited interest of international funds
Budget/financing allocation	In 2020, the Indian Government launched a program titled "Pradhan Mantri Matsya Sampada Yojana" [Prime Minister Fishery Resource Scheme] as part of a new blue revolution, strengthening the fisheries sector. It allocated USD2.64 billion to fund the development of the fisheries sector.

Source: Authors' compilation from FAO (2020b), GOI (2020), and (Ministry of Fisheries, Animal Husbandry and Dairying (2020).

The government has created a separate fund, the "Fisheries and Aquaculture Infrastructure Development Fund" (FIDF), to support marine and inland fisheries and aquaculture, the modernization of fishing boats, the construction of fishing harbors, and the creation of allied infrastructure.

4.3 Indonesia

Indonesia is Southeast Asia's largest economy and the second-largest fish producer in the world after the PRC. The fisheries sector contributed over USD26.9 billion (around 2.6%) to Indonesia's gross domestic product (GDP) in 2019, which makes it a leader among its regional peers, namely the PRC, the Philippines, Malaysia, and Thailand (FAO 2020b). Over 12 million people work in fisheries, and 95% of fishery production comes from small-scale fishers (Nature Conservancy 2020). Indonesia's abundant marine life is currently facing many threats and challenges from human activities and natural stressors. Inefficient management of the fisheries sector costs the country

nearly USD7 billion per year (Nature Conservancy 2020). The seas of this region face major concerns in relation to illegal, unreported, and unregulated fishing; climate change; illegal wildlife trade; coastal development; and pollution.

At the federal government level, the Ministry of Marine Affairs and Fisheries (MMAF) is responsible for the fisheries sector in the country. The government has also created a separate institution for promoting sustainability and access to finance (the MFFI) to enable private-sector fund flows. In 2020, the Ministry proposed USD69 million in stimulus for promoting fisheries and aquaculture. Indonesia aims to increase the contribution of the blue economy to its national GDP to 12.5% by 2045. The country is also a leader in attracting private capital flows to the fisheries sector. The Meloy Fund, the Global Fisheries Sustainable Fund, and the more recent fishery platform startup, Aruna, have closed a USD5.5 million funding round with the country's current investors.

Table 4 below summarizes the key institutional and financial aspects of Indonesia's fishing sector:

Table 4: Indonesia's Fisheries Sector

Parameters	Description
Marine capture production (million tons—2018)	6.71
Fisheries' contribution to the GDP	2.6%
Size of the fisheries sector	Provides a livelihood for at least 12 million people in fishing activities
Broad sector issues	• Depleting fish stock—illegal, unreported, and unregulated fishing combined with legal fishing and expansion of the domestic fishing fleet is affecting fish stocks • Data deficiencies and a lack of coordination among agencies • Lack of a fishery-specific plan • High wastage and losses
Institutional structures	*Federal level* • Ministry of Marine Affairs and Fisheries (MMAF) • Planning agency (BAPPENAS) *State/regional level* Provincial governments *Local/community level* • Investments • MacArthur Foundation • RARE
Financing mechanisms	• Institution for promoting sustainability and access to finance (MFFI) • Global Fisheries Sustainable Fund • Meloy Fund • Aruna • World Bank—Coastal Fisheries Initiative Challenge Fund
Sector financing	A mix of domestic and development partner assistance
Private-sector interest	Increasing interest from international fisheries investors and funds
Budget/financing allocation	According to the press release that the Cabinet Secretariat of the Republic of Indonesia published, the Ministry of Marine Affairs and Fisheries proposed an additional budget of USD69 million (Office of Assistant to Deputy Cabinet Secretary for State Documents and Translation 2020)

Source: Authors' compilation from FAO (2020b), Invest ASEAN (2020), Nature Conservancy (2020), Office of Assistant to Deputy Cabinet Secretary for State Documents and Translation (2020).

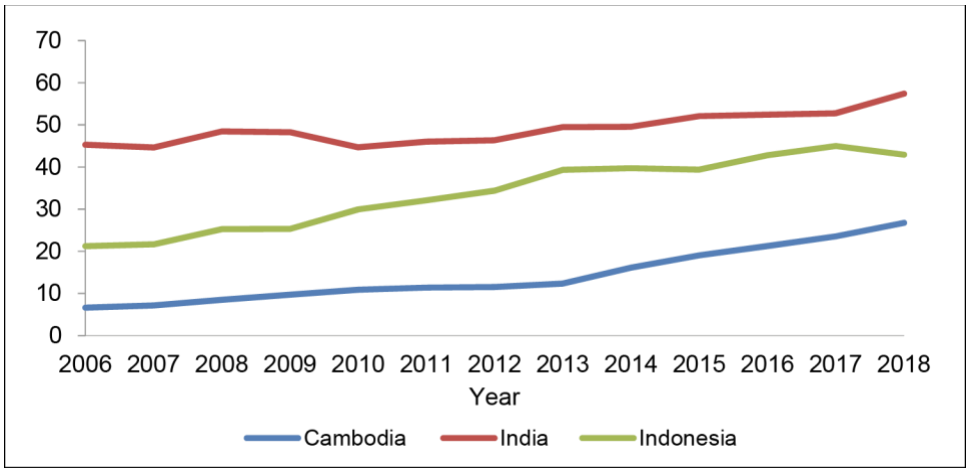
The Ministry of National Development of Indonesia (BAPPENAS) is developing an innovative blended finance vehicle: the Marine and Fisheries Financing Institution (MFFI). The MFFI aims to harness a blend of commercial capital, concessionary financing, and philanthropic contributions to deploy in participating provinces. ADB is assisting BAPPENAS in operationalizing this institution. This MFFI framework proposes to create contours for the financing of the fisheries sector, improve the capacities of local governments, create a fund that it will capitalize with the support of development partners, the private sector, and impact investors, and set in place effective engagement, monitoring, and reporting systems. The expectation is that the MFFI will be in a position to provide local governments of cities and coastal villages, which do not traditionally have access to capital, with long-term blended pools of financing. This structure aims to create an environment that links the need for hard infrastructure with improved governance and social infrastructure to ensure that the stakeholders have the necessary tools to be financially self-reliant and sustainable.

4.4 Cross-Country Comparison

Figure 1 and Table 5 present the pattern of increase in aquaculture production in the three countries. The compounded annual growth of aquaculture production was about 18.1% in Cambodia, 12.7% in Indonesia, and 6.9% in India from 2006 to 2018. Cambodia has grown less than the other two countries. Indonesian aquaculture production, which was about 40% of that of India in 2006, had grown to nearly three-fourths of its size by 2018.

Figure 1: Aquaculture Production in the Three Countries

(%)



Source: Food and Agriculture Organization of the United Nations (2020b, 2021).

Table 5: Growth in Aquaculture Production

	Aquaculture Production			
Country	**2006** (million tons)	**2012** (million tons)	**2018** (million tons)	**CAGR** (%)
Cambodia	34,200	74,000	251,850	18.10
India	3,180,863	4,209,478	7,176,000	6.90
Indonesia	1,292,899	3,067,660	5,426,943	12.70

Source: Food and Agriculture Organization of the United Nations (2020b, 2021).

Table 6 presents the growth of total fisheries capture in the three countries. The growth rates for all three countries are similar, lying between 4.8% and 6.3%.

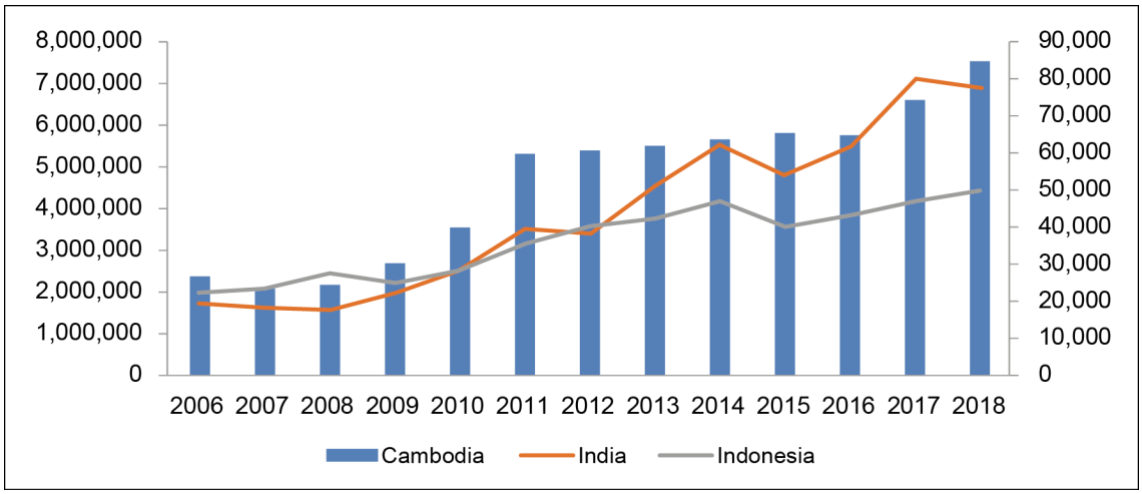
Table 6: Growth of the Total Fisheries Capture

	Total Fisheries Capture			
Country	**2006** (million tons)	**2012** (million tons)	**2018** (million tons)	**CAGR** (%)
Cambodia	482,500	3,844,837	4,792,923	5.1
India	566,695	4,871,641	5,856,860	4.8
Indonesia	689,155	5,320,253	7,216,405	6.3

Source: Food and Agriculture Organization of the United Nations (FAO 2020b, 2021).

The importance of exports, and consequently the need to adhere to international best practices of catch management, storing, and processing, has also been rising in these countries. The domestic consumption remains substantial in relation to the exports in Cambodia. Figure 2 and Table 7 present the value of fish and fishery product exports. The compounded annual growth rate of exports was 10.1% in Cambodia, 7.1% in Indonesia, and 12.1% in India over the period 2006 to 2018.

Figure 2: Exports of Fish and Fishery Products in the Three Countries
(USD)



Note: India and Indonesia appear on the primary axis on the left-hand side, and Cambodia is on the secondary axis on the right-hand side.

Source: Food and Agriculture Organization of the United Nations (2020b, 2021).

Table 7: Fish and Fishery Product Exports in the Three Countries

	Exports			
Country	**2006** (million tons)	**2012** (million tons)	**2018** (million tons)	**CAGR** (%)
Cambodia	26,771	61,000	85,306	10.1
India	1,762,747	3,404,437	6,929,760	12.1
Indonesia	1,954,538	3,592,165	4,465,081	7.1

Source: Food and Agriculture Organization of the United Nations (2020b, 2021).

5. DISCUSSION

The fisheries sector is an important component of the economies of Cambodia, India, and Indonesia. Indonesia and India appear in the top five countries in the total fish production, and Cambodia has significant inland fish production potential, predominantly freshwater fish farming. While the share of aquaculture in Cambodia increased from about 11% in 2010 to about 24% in 2017, it remains relatively small in relation to the total capture. Substantial overfishing has taken place in the Indian waters, leading to the plateauing of marine fisheries production. India is contemplating the development of export economic zones to improve its fisheries sector. All three countries have a long tradition of fishing practices and face similar challenges in infrastructure gaps, access to finance, inadequate data management systems, and sub-optimal adoption of sustainable fishing processes.

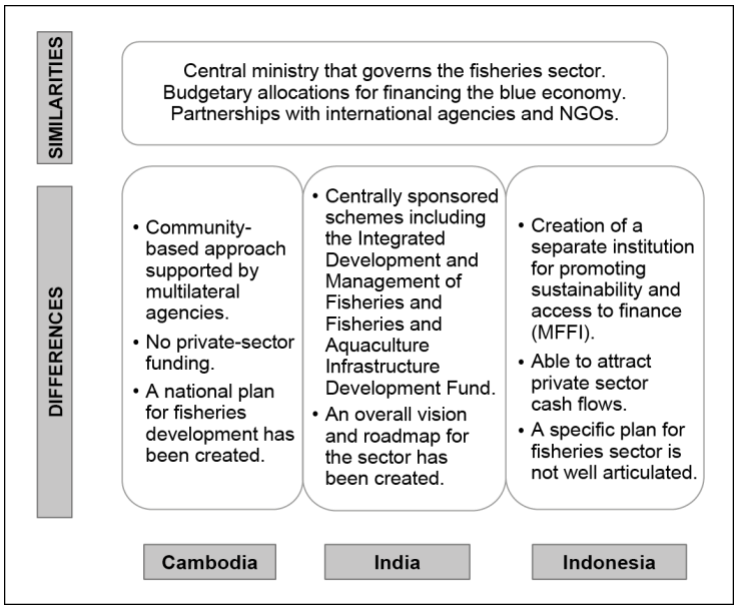
The financing mechanisms vary between the countries. While Cambodia has allocated budgets under a national plan for the improvement of the fisheries sector, India has created a separate fund for infrastructure development and for providing financing options for local projects and communities under a 5-year long-term plan. Indonesia has created a separate financing institution at the central level to enable private-sector funding to flow into the development of the fisheries sector. There is substantial involvement of development partners in the financing of the fisheries sector. Private institutional and sector-specific funds are showing an interest in Indonesia and Cambodia, while their interest in India is yet to emerge.

On the institutional front, all the countries have a dedicated agency for fisheries management at the federal level. In addition to the central ministry, Cambodia and India have set up parastatal institutions with the specific aim of promoting the fisheries sector, including fisheries development and management, regulation, research, and development activities. Due to the sheer size of the country and the fisheries sector, India has fisheries departments at the state/regional level that solely govern fisheries and aquaculture activities.

The approaches of the countries differ widely at the community level. Cambodia has established partnerships with international organizations and NGOs that work with local communities to promote sustainable fisheries. In India, especially in the southern coastal areas, a newly created NGO co-opts smaller fishing communities as societies. In Indonesia, RARE and other private-sector agencies and international agencies work with the local administration and communities to promote sustainable activities in the sector. Figure 3 below summarizes the similarities and differences in institutional and financial mechanisms.

Each country is proposing to adopt a different strategy to address the changing ecosystem while reiterating the need to uphold the importance of the fisheries sector to the overall economy. Cambodia is suggesting the continuance of its engagement with international development partners while augmenting its public-sector investment strategy and encouraging private participation. India has created a separate ministry (until recently, the fisheries sector was part of the agriculture ministry) to pay more concerted attention to the sector. India has also formulated a scheme to promote the sector (through a “mission” mode that allows the allocation of administrative and budgetary resources) and announced the establishment of a dedicated fund. Indonesia has been contemplating setting up a separate financing facility that combines different sources of funding and provides flexibility to attract newer investor groups. Table 8 below presents a comparison of these approaches.

Figure 3: Institutional Frameworks



Source: Authors' compilation.

Various policy documents have stated the intention to integrate different sustainability, biodiversity, and climate change practices and improved fishing practices into the governance structures and projects. This is generally in consonance with the respective commitments under various global accords and premises of engagement with international development organizations (Vanderklift et al. 2019). The translation of this intention into demonstrable projects is still underway in all three countries. The development and adoption of international blue finance frameworks could accelerate the transition to sustainable blue finance practices.

There is no perceptible discourse or statements of intent on approaching land-based and maritime activities cohesively in any of the three countries. They have paid considerable attention to improving the land-based infrastructure, particularly the landing sites and post-harvest infrastructure; however, the impact of land-based activities on marine productivity (pollution, runoff, waste disposal, and ecological damage due to human activities) are yet to receive adequate consideration. Indonesia has instituted a National Plastic Action Plan that indirectly refers to the initiatives to minimize pollution in water bodies.

The existing ministerial organization structures mean that the sectors associated with fisheries (such as health, pollution, finance, and infrastructure) are under different line regimes; however, the appreciation of the need to coordinate with different ministries has increased, as the number of committees and the oversight from the heads of government indicate. Nevertheless, no country has a single-window clearance system, and the nations rely on the conventional inter-ministerial coordination setups.

Table 8: Comparison of the Countries

Parameter	Cambodia	India	Indonesia
Future approach	Reliant on development partner support; initiatives to diversify sources of funding	Separate ministry formulated; a sector-specific fund and a financing scheme announced	Proposal of a marine and fisheries financing institution; increased collaboration with international community organizations
Integration of sustainability considerations	Substantial discourse on incorporating the principles due to the involvement of international development and community organizations	The draft national policy acknowledges the need for and relevance of various sustainable practices	Has taken initiatives to achieve SDGs in collaboration with international development and community organizations
Cohesive maritime and land-based activities	Land-based and maritime activities are addressed independently	No stated principles on the integration of land and maritime-based activities. Different institutional setups are present for the same	A few macro steps are taken to integrate these areas (the National Plastic Action Plan, etc.), which indirectly address the fisheries sector
Engagement with peer sectors	Substantial overlap with other ministries; the Ministry of Economy and Finance plays a coordinating role through its "financial" powers	The fisheries ministry has come into existence. The inter-ministerial coordination happens through conventional channels. No separate mechanism to address fisheries-specific constraints	The inter-ministerial coordination happens through conventional channels. The planning ministry is engaging with the sector-specific agencies
Fiscal policy tools and instruments	Budgetary support and sovereign backed loans. No separate proposals to increase taxes	Budgetary support, traditional taxes, and levies. Creation of a sector-specific fund	Part of nationally determined commitments; budgetary support; open to innovative instruments (blue bonds, etc.)
International development partner engagement	Increased activity of international development partners, community organizations, and investors	Continued engagement with international development partners; limited engagement with international community organizations or investors	Increased engagement with international development partners, community organizations, and investors
Pathways for market participation	Current government rules do not encourage commercial funding in projects; only available through public–private partnerships; substantial interest of the international community and impact investor groups	Largely focused on the domestic private-sector market given the size and scale. Public–private partnerships are being encouraged actively	The proposed structure of a financing facility gives adequate flexibility to attract different groups of market participants
Ease of access to funding	Multilateral development partner funding is expected to augment access to finance for common infrastructure substantially; initiatives to strengthen banking and microfinance systems for providing credit to small and medium-sized enterprises	Systems are being improved to enable better access to funding across the fisheries value chain	Substantial push to increase access to funding across the value chain

Through focused engagement with international development organizations, community groups, and the investing community, these countries are recognizing the role of partnerships. The investing community has slowly started to participate while also introducing the necessary frameworks to measure the impacts of the interventions. Each country is attempting to engage with the private sector to reflect its overall foreign investment philosophy.

The primary concern for all three countries has been the ease of access to funding, both at the public-sector level (which provides for common infrastructure and governance oversight) and among the market stakeholders, particularly individuals and small and medium-sized enterprises. Cambodia is seeking international development partner support to increase the access to funds for the public sector, while India and Indonesia are more reliant on the budgetary mechanisms. However, both these countries have intentions to configure dedicated fund/facility structures to provide tangible means of raising and disbursing funds. The microfinance sector has been the most active in all three countries to access funds for individuals and small and medium-sized enterprises. They do not, however, categorize fisheries separately. The dedicated routing through national institutions passes through “agriculture”-based financial enterprises, with fisheries representing a small portfolio. There has also been a considerable focus globally on blended finance, combining public and private sources of financing (Tirumala and Tiwari 2020). This could be a potential source of financing for these three countries.

South Asia and the Southeast region are attracting substantial interest from all the stakeholders concerned due to various geopolitical factors. The discourse and action in the blue economy, particularly in the fisheries sector, have a decisive focus on this region because of the large population, extensive availability and harvesting of marine catch, and presence of many polluting rivers. The growing influence of the PRC (which has substantial interests in Cambodia and Indonesia) through its Belt and Road Initiative, the expansion of the operations of the Asian Infrastructure Investment Bank, and the commitment of ADB to upscaling its investments mean that access to financing is likely to increase. Indonesia is poised to be the chair of the G20 from 2022, and, through its National Plastic Action Plan, is taking a lead role in the ASEAN region. India, through its diplomacy, is increasingly becoming a favored partner of OECD countries. The expectation is that all three countries, and the others in the region, will continue to attract investments from donors, which will also pave the way to greater participation from impact and philanthropic investors.

6. POLICY IMPLICATIONS

A cross-country comparison provides useful insights into the scaling-up, replication, and re-adaption of successes to suit regional contexts. While different countries are adopting innovative financing mechanisms to meet the investment requirements for marine and fisheries sectors, this research contributes to the understanding of the context in which these mechanisms have evolved and how countries can strengthen them for the sustainable growth of fisheries. The transformation of the fisheries sector in the developing world is contingent on the adoption of accepted inclusive governance principles while maintaining the agreed path toward the achievement of SDG 14 (Cohen et al. 2019). The recent public health crisis that COVID-19 caused has only exacerbated the need for transformative action from governments to ensure the protection of fish farmers’ livelihoods and food security for populations (FAO 2020a). The impact of the pandemic has resulted in income losses and increased the financial risks at every stage in the value chain, ranging from decreased cash flows to difficulty

in meeting loan repayment obligations and the investment of additional capital to meet safety and hygiene standards. Therefore, lessons from this research could be useful in designing appropriate financial mechanisms that boost the growth of the sector in the long term and address immediate financial solutions in the short term.

The current approach of extending loans (and limited subsidies) through microfinance institutions has a limited ability to scale up and is restricted to a few value chain segments. Policymakers can consider augmenting the credit delivery mechanisms through interventions targeting these stakeholders. To strengthen microfinance institutions and improve their profitability, policymakers and fisheries administration can facilitate infrastructure development, research and technology, and improved access to markets and services through a structured intervention, which can pool various sources of funding (IDA 2020). This would entail creating the necessary financial infrastructure through appropriate legal and regulatory frameworks. The MFFI structure of Indonesia is a step in that direction. More recent developments include the emergence of impact investors that support sustainable fisheries management by seeking a return on the capital deployed. RARE's work in the South-East Asian region demonstrates the potential for transitioning to more sustainable fisheries while supporting livelihoods and sustaining critical ecosystems. An ability to earmark dedicated funds for the defined components of the value chain would also enhance the prospects of sustainable finance, which can invest in infrastructure, strengthened logistics supply chains, storage and transportation facilities, safety equipment, and so on.

The governance of fisheries is increasingly leaning toward modern management systems (González Laxe et al. 2018). The sustainability principles demand that the economic and social issues are part of the conceptualization and design of any governance framework. The structure of governance mechanisms can also benefit from the early adoption of blue economy principles (as applicable to the fisheries sector). An institutional design with a specific focus on the fisheries sector (either as a standalone entity or under the umbrella of a line ministry) with the support of a well-thought-out long-term vision and plan is crucial in building a more resilient fisheries sector. The design should act as an enabler to promote constructive collaborations with multilateral agencies, international organizations, NGOs, and other stakeholders that are interested in contributing to the sector's growth. The presence of environmental community groups and the participation of impact investors give greater credence to a holistic ecosystem based on science, stakeholder engagement, and market dynamics and could result in a less politicized system. An awareness of these facets would help policymakers in configuring their region-specific responses to align with sustainable practices, community interests, and industry expectations.

This research focused on the institutional and financing landscape of three countries. As the blue finance sector gains pace, and when the outcomes of investments become available, research can investigate the efficacy of the approaches in greater detail, expanding the geographical footprint to the entire region.

7. CONCLUSIONS

The objective of this research was to study different responses to the changing blue economy sectors, with particular reference to fisheries, to understand the features of an institutional and financing mechanism that promotes sustainable fisheries sector development. A comparative analysis was undertaken to identify similarities, differences, and emerging financing frameworks across three countries, Cambodia, India, and Indonesia. Overall, this article presents the initiatives that the three countries

are proposing to adopt in the changing fisheries ecosystem, providing guidance to shape a broader regional approach. The results from the analysis indicate that the countries have identified a need to alter their existing institutional structures and configure newer entities to attract more funding sources. None of the three countries has radically transformed its systems to address the cross-ministerial coordination points or elevate the sector approach to include a comprehensive land-based and maritime approach. Future research can use the findings to develop more generalizable frameworks for strengthening financing interventions in the fisheries sector.

While the trends for financing in the sustainable finance sector, and consequently the blue finance sector, appear to be ascending (Wabnitz and Blasiak 2019), it remains unclear whether there will be a tipping point, whether the changes are tectonic, or whether the adoption of the principles will occur gradually in accordance with each country's bureaucratic pace (Cohen et al. 2019). The financing trends are also becoming more nuanced with the alignment toward sustainability and include multiple modalities, such as blended finance instruments and the attraction of investors from different groups. Nevertheless, the urgency to respond to the potentially critical damage to fisheries production is acute. Policymakers need to be aware of the opportunities, constraints, and bottlenecks involved in transitioning to more sustainable blue economy finance.

REFERENCES

ADB. 2019. “ADB Launches $5 Billion Healthy Oceans Action Plan.” Asian Development Bank. Accessed 3 November 2020. https://www.adb.org/news/adb-launches-5-billion-healthy-oceans-action-plan.

Bann, C., and S. Lieng. 2020. FishCounts – Increasing the visibility of small-scale fisheries (SSFs) in Cambodia’s national planning. IIED Working Paper, IIED, London. http://pubs.iied.org/16671IIED.

Bhattacharya, P., and A. Kumar. 2020. *Drivers of Blue Economy in Asia and Pacific Island Countries: An Empirical Investigation of Tourism and Fisheries Sectors*. ADBI Working Paper Series 1161. Tokyo: Asian Development Bank Institute. https://www.adb.org/publications/drivers-blue-economy-asia-pacific-island-countries.

Blasiak, R., and C. Wabnitz. 2018. “Aligning Fisheries Aid with International Development Targets and Goals.” *Marine Policy*. doi: 10.1016/j.marpol.2017.11.018.

Bos, M., R. Pressey, and N. Stoeckl. 2015. “Marine Conservation Finance: The Need for and Scope of an Emerging Field.” *Ocean and Coastal Management*. doi: 10.1016/j.ocecoaman.2015.06.021.

Cai, J., H. Huang, and P.S. Leung. 2019. *Understanding the Contribution of Aquaculture and Fisheries to Gross Domestic Product (GDP)*. FAO Fisheries and Aquaculture Technical Paper. Food and Agriculture Organization. Rome, Italy.

Chaffin, B., H. Gosnell, and B. Cosens. 2014. “A Decade of Adaptive Governance Scholarship: Synthesis and Future Directions.” *Ecology and Society* 19 (3). doi: 10.5751/ES-06824-190356.

Cohen, P. et al. 2019. “Securing a Just Space for Small-Scale Fisheries in the Blue Economy.” *Frontiers in Marine Science* 6 (March): 171. doi: 10.3389/fmars.2019.00171.

Credit Suisse. 2020. “Investors and the Blue Economy,” 44. https://www.esg-data.com/blue-economy.

European Investment Bank 2021. *Blue Finance Principles Unveiled to Support Ocean Health and Investment.* Accesses November 01, 2021. https://www.eib.org/en/press/all/2018-060-blue-finance-principles-unveiled-to-support-ocean-health-and-investment.

FAO. 2016. *Contribution of Fisheries to Food Security*. Fisheries and Aquaculture Department, Food and Agriculture Organization of the United Nations. Rome.

———. 2020a. *How Is COVID-19 Affecting the Fisheries and Aquaculture Food Systems*. Rome: Food and Agriculture Organization. doi: 10.4060/ca8637en.

———. 2020b. *The State of World Fisheries and Aquaculture 2020*. Rome: Food and Agriculture Organization. Accessed 3 November 2020. http://www.fao.org/state-of-fisheries-aquaculture.

———. 2021. *Statistics—Introduction*. Rome: Fisheries & Aquaculture Division, Food and Agriculture Organization. Accessed 8 October 2021. http://www.fao.org/fishery/statistics/en.

FAO, IFAD, UNICEF, WFP, and WHO. 2018. *The State of Food Security and Nutrition in the World*. *Building Climate Resilience for Food Security and Nutrition*. Rome: FAO.

Fujita, R., J. Lynham, F. Micheli, P. Feinberg, L. Bourillón, A. Sáenz-Arroyo, and A. Markham. 2013. "Ecomarkets for Conservation and Sustainable Development in the Coastal Zone." *Biological Reviews*. doi: 10.1111/j.1469-185X.2012.00251.x.

Gallo, N., D. Victor, and L. Levin. 2017. "Ocean Commitments under the Paris Agreement." *Nature Climate Change*. doi: 10.1038/nclimate3422.

GoI. 2020. *National Fisheries Policy, 2020*. New Delhi: Government of India. Accessed 3 November 2020. http://nfdb.gov.in/PDF/National_Fisheries_Policy_2020.pdf.

González Laxe, F., F. M. Bermúdez, F. M. Palmero, and I. Novo-Corti. 2018. "Governance of the Fishery Industry: A New Global Context." *Ocean and Coastal Management*. doi: 10.1016/j.ocecoaman.2017.12.009.

Halpern, B. et al. 2008. "A Global Map of Human Impact on Marine Ecosystems." *Science*. doi: 10.1126/science.1149345.

Hasan, M. M., S. Hossain, M. H. Alam, A. Chowdhury, A. Karim, and N. M. K. Chowdhury. 2018. "The Prospects of Blue Economy to Promote Bangladesh into a Middle-Income Country." *Open Journal of Marine Science* 8 (3). doi: 10.4236/ojms.2018.83019.

Hertel, T. 2016. "Food Security under Climate Change." *Nature Climate Change*. doi: 10.1038/nclimate2834.

Hoegh-Guldberg, O. et al. 2015. *Reviving the Ocean Economy: The Case for Action—2015*. Gland, Switzerland: WWF International.

ICMA. 2018. *The Green Bonds Principles—Voluntary Process Guidelines for Issuing Green Bonds*. Paris: International Capital Market Association. https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/.

IDA. 2020. *Oceans, Fisheries and Coastal Economies*, *Understanding Poverty*. International Development Association. Washington, US.

IIED. 2020. "Closing the Gap: Financing the Transition towards an Inclusive Blue Economy." International Institute for Environment and Development. Accessed 3 November 2020. https://www.iied.org/closing-gap-financing-transition-towards-inclusive-blue-economy.

Invest ASEAN. 2020. "Fisheries | ASEAN Investment, 2020." Accessed 3 November 2020. https://investasean.asean.org/index.php/page/view/fisheries.

Keen, M., A. M. Schwarz, and L. Wini-Simeon. 2018. "Towards Defining the Blue Economy: Practical Lessons from Pacific Ocean Governance." *Marine Policy* 88. doi: 10.1016/j.marpol.2017.03.002.

Lieng, S., N. Yagi, A. Mori, and J. Hastings. 2018. "Savings-Group Improvements Contribute to Sustainable Community-Fisheries Management: A Case Study in Cambodia." *Sustainability (Switzerland)* 10 (8). doi: 10.3390/su10082905.

Ministry of Fisheries, Animal Husbandry and Dairying 2020. *Department of Fisheries.* Accessed on November 02,2021. https://dof.gov.in/.

Nature Conservancy. 2020. “Indonesia Fisheries.” Accessed 3 November 2020. https://www.nature.org/en-us/about-us/where-we-work/asia-pacific/indonesia/stories-in-indonesia/indonesia-fisheries/.

Office of Assistant to Deputy Cabinet Secretary for State Documents and Translation 2020. *Cabinet Secretariat of the Republic of Indonesia.* Accessed on November 02,2021. https://setkab.go.id/en/author/naster/page/338/.

Parker, R., J. Blanchard, C. Gardner, B. Green, K. Hartmann, P. Tyedmers, and R. Watson. 2018. “Fuel Use and Greenhouse Gas Emissions of World Fisheries.” *Nature Climate Change* 8 (4). doi: 10.1038/s41558-018-0117-x.

Patil, P., J. Virdin, S. M. Diez, J. Roberts, and A. Singh. 2016. *Toward a Blue Economy: A Promise for Sustainable Growth in the Caribbean*. Washington, DC: The World Bank.

PEMSEA. 2019. “Blue Economy.” Accessed 30 August 2019. http://pemsea.org/our-work/blue-economy.

Pranathi, A., and P. Gonchkar. 2019. “The Study of Blue Economy as an Emerging Sector for Employment Generation in India.” *Asia Pacific Journal of Research* I(XCVII): 89–90.

PRI Association 2021. *What are the Principles for Responsible Investment?* Accessed on November 1, 2021. https://www.unpri.org/pri/what-are-the-principles-for-responsible-investment.

RGOC. 2010. *The Strategic Planning Framework for Fisheries: 2010–2019: “Fishing for the Future.”* Unofficial Translation. Phnom Penh: Kingdom of Cambodia. Accessed 3 November 2020. http://extwprlegs1.fao.org/docs/pdf/cam143042.pdf.

Rudolph, T. B., M. Ruckelshaus, M. Swilling, E. H. Allison, H. Österblom, Gelcich, S., and P. Mbatha. 2020. “A Transition to Sustainable Ocean Governance.” *Nature Communications* 11 (1). doi: 10.1038/s41467-020-17410-2.

Sarker, S., Md. A. H. Bhuyan, M. M. Rahman, Md. A. Islam, Md S. Hossain, S. C. Basak, M. M. Islam. 2018. “From Science to Action: Exploring the Potentials of Blue Economy for Enhancing Economic Sustainability in Bangladesh.” *Ocean and Coastal Management* 157. doi: 10.1016/j.ocecoaman.2018.03.001.

Singh, G. et al. 2018. “A Rapid Assessment of Co-benefits and Trade-Offs among Sustainable Development Goals.” *Marine Policy*. doi: 10.1016/j.marpol.2017.05.030.

Smith-Godfrey, S. 2016. “Defining the Blue Economy.” *Maritime Affairs* 12 (1). doi: 10.1080/09733159.2016.1175131.

Spalding, M. 2016. “The New Blue Economy: The Future of Sustainability.” *Journal of Ocean and Coastal Economics* 2 (2). doi: 10.15351/2373-8456.1052.

Stepanova, O. 2015. “Conflict Resolution in Coastal Resource Management: Comparative Analysis of Case Studies from Four European Countries.” *Ocean and Coastal Management* 103. doi: 10.1016/j.ocecoaman.2014.10.017.

Sunil, D. S. 2006. “Fish for Life: Interactive Governance for Fisheries edited by Jan Kooiman, Maarten Bavinck, Svein Jentoft and Roger Pullin.” *Development and Change* 37 (5). doi: 10.1111/j.1467-7660.2006.00516_10.x.

Teh, L., and U. R. Sumaila. 2013. “Contribution of Marine Fisheries to Worldwide Employment.” *Fish and Fisheries* 14 (1). doi: 10.1111/j.1467-2979.2011.00450.x.

Thiele, T., and L. Gerber. 2017. “Innovative Financing for the High Seas.” *Aquatic Conservation: Marine and Freshwater Ecosystems*. doi: 10.1002/aqc.2794.

Tirrell, A. 2017. “Sociocultural Institutions in Norwegian Fisheries Management.” *Marine Policy* 77. doi: 10.1016/j.marpol.2016.12.002.

Tirumala, R., D., and P. Tiwari. 2020. “Innovative Financing Mechanism for Blue Economy Projects.” *Marine Policy*. doi: 10.1016/j.marpol.2020.104194.

UNDP. 2019. “Indonesia and UNDP Ink Financing Mechanism to Support Archipelagic States on Climate Actions.” UNDP in Indonesia. Accessed 3 November 2020. https://www.id.undp.org/content/indonesia/en/home/presscenter/pressreleases/2019/indonesia-and-undp-ink--financing-mechanism-to-support-archipela.html.

Vanderklift, M. A., R. Marcos-Martinez, J. Butler, M. Coleman, A. Lawrence, H. Prislan, A. Steven, and S. Thomas. 2019. “Constraints and Opportunities for Market-Based Finance for the Restoration and Protection of Blue Carbon Ecosystems.” *Marine Policy*. doi: 10.1016/j.marpol.2019.02.001.

Vivekanandan, E., V. V. Singh, and J. Kizhakudan. 2013. “Carbon Footprint by Marine Fishing Boats of India.” *Current Science* 105 (3).361–366.

Vyshnavi, P. V., and P. V. Rao. 2017. “Importance of Marine Fisheries in Indian Economy.” *International Journal of Applied Science Engineering and Management* 2 (10).68–83.

Wabnitz, C., and R. Blasiak. 2019. “The Rapidly Changing World of Ocean Finance.” *Marine Policy*. doi: 10.1016/j.marpol.2019.103526.

World Bank. 2018. “What is the Blue Economy?” Accessed 31 October 2020. https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy.

———. 2020. Blue Economy. Accessed 2 November 2021. https://www.worldbank.org/en/topic/oceans-fisheries-and-coastal-economies#1

World Ocean Summit. 2018. “Principles for Investment in Sustainable Wild-Caught Fisheries.” Accessed 3 November 2020. http://www.fisheriesprinciples.org/.

Yoshioka, N., H. H. Wu, M. Huang, and H. Tanaka. 2020. *Proposing Regulatory-Driven Blue Finance Mechanism for Blue Economy Development*. ADBI Working Paper 1157. Tokyo: Asian Development Bank Institute.