ADBI Working Paper Series

PROPOSING REGULATORY-DRIVEN BLUE FINANCE MECHANISM FOR BLUE ECONOMY DEVELOPMENT

Nagisa Yoshioka, Hsing Hao Wu,
Michael C. Huang, and
Hajime Tanaka

No. 1157
June 2020

Asian Development Bank Institute

Nagisa Yoshioka and Hsing Hao Wu are research associates at the Ocean Policy Research Institute of the Sasakawa Peace Foundation in Tokyo. Michael C. Huang is a research fellow at the Ocean Policy Research Institute of the Sasakawa Peace Foundation. Hajime Tanaka is an associate professor at the Economic and Financial Law Department of the National University of Kaohsiung.

In this report, "$" refers to United States dollars.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Suggested citation:

Yoshioka, N., H. H. Wu, M. C. Huang, and H. Tanaka. 2020. Proposing Regulatory-Driven Blue Finance Mechanism for Blue Economy Development. ADBI Working Paper 1157. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/proposing-regulatory-driven-blue-finance-mechanism-blue-economy-development

Please contact the authors for information about this paper.

Email: n-yoshioka@spf.or.jp

Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

Abstract

The ocean is being jeopardized because of the adverse effects of climate change and human activities, such as marine plastic pollution, extreme weather events, sea level rises, and others. In addressing these ocean risks, ensuring sufficient finance to sustain the ocean economy is an ever-present challenge, particularly for those vulnerable regions, coastal communities, and small island developing states. Blue Finance, as a concept, is thus critical to ensure sustainability and conservation of the marine ecosystem and resources aligned with economic growth. Ocean sustainability has attracted global finance initiated by multilateral development banks and international institutions. This paper explores the interconnection between stakeholders among agents in the Blue Finance mechanism to illustrate incentives to increase private investment in addition to public donations in financing ocean health protection and boosting the blue economy. We then attempt to propose potential regulatory and institutional arrangements incorporating the concept of the blue financing principles in the context of the relevant legal regimes concerning marine governance both at the international and domestic levels. We further elaborate on the potentials of these legal and institutional arrangements to provide incentives for increasing private investment in marine development programs seeking economic growth and sustainability.

Keywords: Blue Finance, blue economy, climate change, ocean sustainability, ocean and coastal resilience

JEL Classification: G28, K33, O44

Contents

1. INTRODUCTION: BLUE ECONOMY AND OCEAN SUSTAINABILITY....1

2. FINANCING THE BLUE ECONOMY: BLUE FINANCE....2

3. EVOLUTION OF THE BLUE ECONOMY AND ITS *STATUS QUO* IN INTERNATIONAL LAW....4

3.1 From Economic Concept to Operational Principle....4
3.2 The Current Blue Finance Practices....5

4. THE FRAMING OF THE BLUE FINANCE MECHANISM AND IMPLEMENTATION...7

4.1 Stakeholders in the Mechanism....7
4.2 Regulatory Approach by International Law....9
4.3 Proposed Blue Finance mechanism....10

5. DISCUSSION....11

6. CONCLUSION....12

REFERENCES....13

1. INTRODUCTION: BLUE ECONOMY AND OCEAN SUSTAINABILITY

Our economy significantly depends on a healthy coast and ocean, which is particularly true for independent island nations. The economy associated with the ocean has grown in importance around the globe. The OECD 2016 report titled "The Ocean Economy in 2030" suggests that the market size of the ocean economy could reach more than $3 trillion and approximately 40 million full-time employed people by 2030, even in a business-as-usual scenario (OECD 2016). The report further predicts that particularly significant growth of value added is expected in marine aquaculture, offshore wind farming, fish processing, and shipbuilding and repair. On the other hand, the fastest growth in jobs is expected in offshore wind energy, marine aquaculture, fish processing, and port logistic activities. Furthermore, the EU's economic report 2019 indicates that all commercial activities related to oceans generated 174 billion euro of value added and job creation for nearly 3.5 million people (European Commission 2019). Above all, the fact that small island developing States (SIDS) are profoundly blessed with ocean resources provides a clue to the promotion and sustaining of their economic prosperity. In Pacific SIDS, fishing can produce between 30% and 80% of exports and GDP through their large exclusive economic zones (EEZs).

Global anthropogenic environmental changes, however, have undermined the health of the world's oceans more than ever before. For instance, marine plastic and microplastic pollution seems to be one of the most urgent threats impacting ocean health (Alava 2019). In 2019, the Intergovernmental Panel on Climate Change (IPCC) issued the Special Report on the Ocean and Cryosphere (SROCC), warning the unprecedented ocean conditions over the 21st century (Pörtner et al. 2019). The SROCC projects that the impact of reductions in ocean health on the global economy will be $428 billion per year by 2050, and $1,979 trillion per year by 2100. Sustaining ocean health is becoming increasingly significant as the debate on climate change is escalating. The impacts of climate change will decrease the productivity and change the spatial distribution of marine species, and cause the loss of coral reef cover and tourism values as well, which will undermine the economic potential, particularly in SIDS (Gaines et al. 2019).

Climate change is a shared global challenge as we face the likelihood of an extremely adverse outcome, which could be reduced if many participants took action (Ostrom 2010). Therefore, encouraging polycentric efforts to mitigate such risks by facilitating various policies. Basurto, Gelcich, and Ostrom (2013) proposed a framework for complex social-ecological systems and indicated that such governance mechanism indicates that the challenges to the development of a social-ecological system framework could be a diagnostic tool for knowledge accumulation.

In this context, the "blue economy" as a concept has emerged from the demand of the marine ecosystem and resources aligned with the economic growth. The idea of the blue economy emerged directly as the marine counterpart to the green economy, which argues that sustainable development could result in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities." The blue economy refers to the "sustainable use of ocean resources for economic growth, improved livelihoods, employment, and ocean ecosystem health" (World Bank and UNDESA 2017). OPRI (2019) indicates that such a concept has been attracting international attention as a policy to revitalize the economy and promote the growth of local communities collectively to preserve the oceanic environment and resources. The UN World Ocean Conference also recognized the importance of fostering "ocean-based economies" in 2017.

The blue economy calls explicitly for new ocean development for social equity and ecological sustainability, which is equivalent to economic growth. Many of us certainly want to live in a world where everyone has the opportunity not only to get by but to prosper in this regard. It should be recognized that economic growth has a ceiling. Nevertheless, an avenue for social equity and ecological sustainability are the ultimate purposes of development. Policies and practices affecting the sustainable ocean and coastal resource management decisions should be informed by the perspectives and tools of economics and based on reliable, consistent, and comprehensive data. Our research focuses on two areas—the "blue economy" as an organizing framework for deriving wealth from the oceans on a sustainable basis and the economics of climate change adaptation in coastal regions.

2. FINANCING THE BLUE ECONOMY: BLUE FINANCE

In Asia and the Pacific, where the blue economy is a crucial development model for islands with few territorial lands, some integrated plans have already been proposed involving multiple sustainable industries, and private and public financing sources. With all of these plans, it is essential to recognize that proper ocean management brings social benefits that go far beyond marine ecosystems.

Before investing in the blue economy, the social and political conditions should be identified to ensure equitable and sustainable guarantees on investment returns with insights from the natural and social sciences perspective. Empirical research on the social-ecological system focusing on resilience, vulnerability, and adaptability may support the evidence-based policy recommendations to help policy makers to tackle these issues (Young, Berkhout, and Gallopin et al. 2006).

While struggling with the impacts of historical models of industrial and economic development, ocean warming, acidification, overfishing, and loss of biodiversity have become severe problems on a global scale. Social inequities are also significant and threaten to increase further, even as the global economy grows. However, the lessons learned have fostered technological innovations to increase human productivity to a previously unimaginable level but also brought severe problems, including labor abuses, environmental decay, and the first instances of mass deaths due to air pollution. Internationally, (neo)colonialism and inequity have intensified with the successive exhaustion of natural resources in one region after another.

The concept of the blue economy has not yet achieved the full objective of implementation in developing regions; however, some development and research have shown the potential together with sustainable versions of existing activities such as fishing, tourism, and marine culture. Coexistence in the same region can develop in a socially equitable, ecologically sustainable, and economically viable way. In practice, greening the ocean industry is a way of sustaining the blue economy. Tourism in SIDSs is highly dependent on a healthy environment. Thus the external costs of marine-related industries require comprehensive planning. The growth in existing marine sectors will not only lead to more substantial rates of growth than in land-based industries, but those new marine industries and innovation could contribute to quality jobs and competitive advantage as "blue growth."

In financing the blue economy, "Blue Finance" is thus crucial as it supports and promotes the global transformation into blue growth. The boosting of the blue economy will also take sustainability into account. In other words, seeking economic growth as a result of ocean-related economic activities will not only comply with marine sustainable management measures required by laws but also support the marine conservation

initiatives via appropriate financial arrangements toward sustainability. Sustainability can further be comprehended by three aspects of environmental, economic, and social sustainability (Kuhlman and Farrington 2010), the choice of project may not result in a conflict between environment and economic development, but rather, a better off the cycle with additional input that links the above three aspects with following objectives:

1) Environmental sustainability: A condition in which residents or the society could satisfy their needs without exhausting resources and hurting the ecosystem, including their biodiversity, to enable the environment to support future generations (Brundtland 1987). If the resources consumption cannot be continued indefinitely, environmental sustainability may not exist. Thus, regulating the use and preserving the capacity are essential for an ocean-positive economy (Spalding 2016).

2) Economic sustainability: A system that can continuously produce in an economic system that enables one to cope with external changes within its viable structural adaptation (Spangenberg 2005). Such a practice would allow long-term economic growth without negatively impacting the social, environmental, and cultural aspects of the community that may encompass financial costs and benefits. Economic sustainability should be created through regulatory instruments that can be linked to positionally balancing (Fath 2015). The advantage of the process should be able to sustain the project development continuously and independently while increasing resource extraction (Visbeck et al. 2014).

3) (3) Social sustainability: Equity of access to services such as health, education, development, etc., mostly at the local level, which could be distributed continuously for generations without depriving the current generation (McKenzie 2004). Despite the recognition that capacity should be actively built with the involvement of the community (Magis 2010), the quantification of social sustainability remains challenging to capture. Thus equitable access is often neglected until being required by community advocacy (Dempsey et al. 2011).

Along with the development of tourism and a more complex ecosystem, the quantification and composition of their indicators show the importance of policy design (Anand and Sen 2000) or altering incentives from either economic or social norms to achieve positive outcomes (Lubchenco et al. 2016). The challenges of Blue Finance lie on how to help to coordinate these three types of sustainability by providing a transparent framework and incentives for all involved stakeholders. The international law and domestic legislation concerning ocean governance are thus capable of offering legal mandates to establish a financial mechanism aimed at implementing blue financial principles. In doing so, public donors and private investors, in particular, may be mobilized to increase sustainable financial resources provision in catalyzing blue economy objectives.

3. EVOLUTION OF THE BLUE ECONOMY AND ITS *STATUS QUO* IN INTERNATIONAL LAW

3.1 From Economic Concept to Operational Principle

In this part, the definition and distinction between the concept of the blue economy and the ocean economy by various international institutions and states will first be explored. The idea of a "blue economy" or "ocean economy" emerged from a need to integrate conservation and sustainability in the context of maritime management. The definitions of the "blue economy" and the "ocean economy," however, vary at present (Smith-Godfrey 2016). Some institutions, such as the UN Conference on Trade and Development (UNCTD), use these two terms interchangeably. However, the blue economy focuses firmly on the sustainability of ocean resource use, while the ocean economy simply indicates the development and growth of ocean-related industries (OECD 2016; World Bank and UNDESA 2017). The term "blue economy" was initially suggested in *The Blue Economy* (Pauli 2010), circulated at the 2012 United Nations Conference on Sustainable Development held in Rio de Janeiro by actors who sought further investment in ocean conservation and development within the broader green economy agenda. At that time, however, the term "blue economy" was often used by a set of actors in ways that were inconsistent or incompatible (Silver et al. 2015). While the blue economy is broadly defined and used in a range of different contexts, a common understanding of its concept has not been achieved so far. Reaching international consensus on the concept of "blue economy" and what it means in practice is thus critical for the fate of Blue Finance with a view to widespread usage in the international society.

Developing the blue economy from a simple economic concept to an international consensus-based guiding principle in the context of international law is a vital step toward achieving blue growth. In March 2018, the European Committee, in collaboration with the World Wild Foundation for Nature (WWF), the European Investment Bank, and the International Sustainable Unit, developed the "Sustainable Blue Economy Finance Principles" (European Commission 2018). The Principles are aimed at the promotion of SDG 14 (life below water) by providing 14 specific financing and investment principles for the financial community that aim to ensure ocean-related investment long-term gains without compromising the conservation and sustainable usage of ocean resources. It is the world's first-ever voluntary initiative to address sustainable ocean financing issues. Nevertheless, no legal obligation has been imposed requiring private investors or financial institutions to take into account sustainability while engaging in ocean-related financing and investment activities. In other words, there is a lack of strong incentives for private investors to invest capital in achieving ocean sustainability. In practice, this article suggests that the legal mandate for establishing the financial mechanism in promoting the blue economy in the context of the binding international legal regime should be provided first. States could thoughtfully implement the concept of the blue finance, and its authorized definition in global society could be developed.

In 2017, the UN Ocean Conference endorsed the concept of a blue economy to promote sustainable ocean-related economic activities such as fishery, tourism, aquaculture, ocean transportation, renewable energy, and marine biotechnology development. The authorized concept or definition of the blue economy, as previously mentioned, has yet to be incorporated in the international legal framework. The incorporation of the blue economy concept in the context of the marine constitutional framework convention, namely the UN Convention on the Law of the Sea (UNCLOS), is perhaps an ideal forum to reach international consensus on the official definition and what it means in practice.

We thus suggest that UNCLOS define the concept of the blue economy to establish blue economy financing principles. This amendment could serve as a platform to provide a mandatory obligation and a benchmark to promote ocean economy activities in the context of Part XII of the Protection and Conservation of the Marine Environment Convention. The incorporation of the blue economy and Blue Finance principles in the context of UNCLOS could provide a clear legal mandate and precise implementation guidance for sovereign states and international financing institutions to establish blue financing decision-making and an appropriate financial mechanism for sustainable ocean-related investment in ocean waters and coastal areas.

3.2 The Current Blue Finance Practices

The concept of Blue Finance, notwithstanding its current status in international law, has gradually been put into practice. The total estimated public financing from the Green Climate Fund (GCF), the Global Environmental Facility (GEF), and the World Bank to support ocean conservation and climate actions increased from $500 million to over $2 billion between 2013 and 2017 (ROCA 2019). The last few years have seen notable growth concerning ocean-oriented financing (Table 1).

In September 2018, the World Bank established a new multi-donor trust fund, namely "PROBLUE," as a crucial part of the World Bank's blue economy program. The trust fund aims to support fisheries and aquaculture, plastic pollution reduction, and the development of maritime sectors, including tourism, offshore renewable energy, and maritime transportation. In fiscal 2019, five donor countries agreed to contribute over $50 million, and actual funds received from donors totaled approximately $28.8 million (World Bank 2019a). More recently, the Asian Development Bank (ADB) announced the launch of the "Action Plan for Healthy Oceans and Sustainable Blue Economies for the Asia and Pacific Region" at the 52nd ADB annual conference in May 2019. As a part of the action plan, the ADB will also launch the Oceans Financing Initiative, which aims to expand investment to $5 billion between 2019 and 2024 to promote the blue economy as well as to create opportunities for the private sector to invest in bankable projects (ADB 2019).

In addition to the development banks' initiatives, it is also worth noting that the world's first sovereign "Blue Bond" was issued in October 2018 by the Republic of Seychelles (with a maturity of 10 years and coupons of 6.5%). An amount of $15 million was raised from international investors, with the aim of financing the expansion of marine protected areas, governance of priority fisheries, and the development of the blue economy. The core function of this scheme is that of a support system that achieves a satisfactory amount of interest payment to investors. Proceeds from the bond will be provided as grants and loans through the Blue Grants Fund and Blue Investment Fund, managed respectively by the Seychelles Conservation and Climate Adaptation Trust (SeyCCAT) and the Development Bank of Seychelles (DBS).

Before the issuance of the 2018 Blue Bond, The Nature Conservancy (TNC), a nonprofit conservation organization, developed the debt swap with Seychelles, which was completed in 2016. In this scheme, Seychelles' national debt, amounting to $20 million, would be restructured to a TNC loan and grants from various foundations in return of designating 210,000 square kilometers of its ocean as marine protected areas (MPAs). In other words, the debt swap scheme aimed to convert sovereign debt repayments into investment in marine conservation. In April 2019, TNC unveiled a plan to catalyze investment of up to $1.6 billion (through a grant of $200 million funded by TNC to purchase the country's debt) by applying this Blue Bond model to other 20 coastal countries over the next five years.

In January 2019, as another example, the Nordic Investment Bank (NIB) launched a "Nordic-Baltic Blue Bond" to raise $200 million for water-related projects around the Baltic Sea (Nordic Investment Bank 2019). In July 2019, as the first case of a financial service firm, Morgan Stanley became the sole distributor of a $10 million World Bank Sustainable Development Bond, aimed at solving marine plastic waste pollution (World Bank 2019b).

Table 1: Blue Finance Practices Launched in 2018–2019

Blue Finance Initiative				
Agent	**Name**	**Year**	**Scale** (USD)	**Duration**
World Bank	PROBLUE Umbrella 2.0	2018	29 million as of fiscal 2019	-
Asian Development Bank (ADB)	Oceans Financing Initiative	2019	5 billion	5 years
The Nature Conservancy (TNC)	Blue Bonds for Conservation	2019	1.6 billion	5 years

Blue Bond					
Issuer	**Year**	**Amount** (USD)	**Coupon**	**Redemption**	**Involved Organizations**
Seychelles Government	2018	15 million	6.5%	10 years	TNC, World Bank, GEF SeyCCAT, and DBS
Nordic Investment Bank (NIB)	2019	200 million	0.37%	5 years	
World Bank	2019	10 million	2019: 2.35% 2020: 2.70% 2021: 3.15%	3 years	Morgan Stanley

Source: Asia Development Bank (2019); Nordic Investment Bank (2019); World Bank (2018); World Bank (2019a); World Bank (2019b)

These existing bond issuances demonstrate the potential for countries to attract capital markets to the sustainable use of marine resources. A Blue Bond scheme provides countries with opportunities to raise funding more sustainably with a lower financial burden. Furthermore, developing Blue Bonds enables nations to set clear sustainable marine conservation targets. For instance, TNC's Blue Bond scheme imposes a commitment to protect at least 30% of its near-shore ocean areas, which is, in fact, an incentive for countries seeking financial support.

On the other hand, there are challenges for the existing Blue Bond schemes as their function are limited to those of conventional bonds. First, they do not directly stimulate the domestic market for the blue economy. As a result, the existing schemes are still dependent on public finance, including support provided by international donors. For instance, the Blue Bonds issued by Seychelles and others do not directly approach the marine industry. In other words, incentive provision remains a challenge to profitable companies that potentially play a role in promoting blue growth in SIDSs. Connecting Blue Bond schemes with the domestic market might be the key to facilitating private capital investment in financing the blue economy. In this regard, the regulatory amendment at the national law level aimed at providing incentives for private investors to invest in ocean-related development projects may have the potential to fill the gap between the international Blue Bonds and the boosting of the blue economy.

4. THE FRAMING OF THE BLUE FINANCE MECHANISM AND IMPLEMENTATION

4.1 Stakeholders in the Mechanism

In comparison to green finance, the progress in developing Blue Finance has lagged far behind despite the existence of UNCLOS for it takes much more capability and more scientific instruments to identify ocean resources and accountability. Along with the growing attention to climate change and exhausting mariculture resources, the importance of the blue economy and Blue Finance has recently received significant attention, especially in regard to SIDS. We now introduce the role of stakeholders in the Blue Finance mechanism.

a. Developing States

The ocean economy is more vulnerable to climate change in a stable fishery harvest, and the coastal area is prone to natural hazards such as hydrological disasters. The developing states, especially the SIDSs in the Pacific, are more self-dependent on the economy, which is highly reliant on the utilization of the environment in the primary industry and tourism. Meanwhile, their EEZ land ratios could be far more significant than their capacity and thus require external funds for infrastructure investments to effectively strengthen the management and supervision of coral reef and IUU fishery elimination, as well as integrated coastal management.

Meanwhile, it would also be significant for SIDSs to take the initiative by committing to environmental conservation such as MPAs. Developing states and SIDSs are also the main stakeholders to utilize this opportunity to upgrade the circulated economy. Although the investment in risk reduction and environmental protection may not reveal economic benefits in the short run, in the longer term, the resources preserved could become a valuable asset and base for sustainable ocean development.

b. NGO, NPO, and IGO

The implementation of self-commitment will be the key to success for environmental conservation. Given the limited human resources in developing countries, nongovernment organizations play flexible roles in coordinating the commitment procedures as well as providing capacity building and training for developing countries. Another critical factor is the provision of evidence-based research to make appropriate and quantitative policy recommendations.

An international government organization (IGO) may be an excellent platform for developing states to seek collaboration opportunities and agenda setting for implementation. Another vital function is the call for global partnership regionally to perform resource allocation more efficiently. The review and evaluation of commitments and support programs by an appropriate IGO are essential to ensure the full implementation of specific Blue Finance schemes.

c. Development Banks and Global Funds

The objectives for multilateral development banks (MDBs) aiming to assist with poverty reduction and country development are both socially and economically sensible. Human development, environment protection, and empowerment of women are also their core functions. Interregional organizations like the World Bank and the IMF and regional organizations such as the Asian Development Bank (ADB), the Inter-American

Development Bank (IADB), and the Asian Macroeconomic Research Office (AMRO) are working to provide economic and social advancement, technical assistance, investment promotion, and support in policies and plans with particular attention to the needs of smaller and less developed countries.

For instance, the Oceans Financing Initiative announced by the ADB in 2019 shows the intense attention given to supporting ocean development, healthy oceans, and the blue economy through various approaches upon request for proposals. Global funds such as the GEF and the World Wide Fund for Nature (WWF) have been advocating a financing mechanism for fishery and a certificate system for sustainable seafood.

d. Private Sectors and Industries

The collaboration between the private sector and industry will be the most critical part in examining whether the Blue Finance mechanism could be feasible and sustainable. The private sector not only advises investors to purchase Blue Bonds or other financial instruments but could also play a vital role in providing bankable projects for ocean development in many forms of collaboration, e.g. technology transfer, market accessibility, or even global cooperation with their original countries.

SDG14.A specifies the importance of increasing scientific knowledge, developing research capacity, and transferring marine technology to improve ocean health and to enhance the contribution of marine biodiversity to developing countries and SIDSs. The policy recommendations made at the APEC Ocean Conference in 2019 also advise the ocean energy industry to create innovative financing mechanisms to enhance environmental conservation (APEC 2019).

e. Private Investors and the General Public

The cumulative issuance of green bonds since 2007 has reached $521 billion (Climate Bonds Initiative 2019), with the highest growth rate being in the Asia and the Pacific region. The many successful cases from sovereignty or corporate bonds indicate that green/blue financing could mean more than fund access, and raise awareness of the selection of cleaner energy and infrastructure investment from private investors and the general public. The behavior change in investment selection may also be an important driving force in creating a larger market for sustainable ocean governance.

Table 2: Roles of Stakeholders in the Blue Finance Mechanism

Stakeholder	Objective	Strength	Opportunity
a. Developing states and SIDSs	Development and better quality of life	Access to the environment	Activation of civil society and global collaboration
b. NGO, NPO, and IGO	Provision of policy recommendation and implementation support	Flexibility and bottom-up power for an environmental initiative	Creation of a global agenda and human resources for implementation capacity
c. Development banks and global funds	Poverty reduction and provision of development advancement	Resource and connectivity are widely accepted	Assisting development locally and regionally
d. Private sectors and industries	Increment of shareholders' equity and business scale	R&D capacity and technology transfer	A platform for the global arena under development partnership
e. Private investors and the general public	Return on bonds/contribution to the environment	Strong image creation for environment conservation	Initiative to community base and drive toward eco-friendliness

Source: developed by the authors.

4.2 Regulatory Approach by International Law

In the long term, the key to ensuring sustainable Blue Finance will be focusing on the promotion of private investment rather than heavily depending on donations from public sectors. It is thus critical to provide incentives for private companies or investors to invest in sustainable ocean-related projects. In this regard, the promotion of Blue Bonds or another similar financial mechanism allowing investment return for private investors is arguably the preferred approach in implementing the Blue Economic Financing Principles in supporting marine economic activities (Pascal et al. 2017).However, a gap exists between the international marine conservation legal framework and the scale and number of funding and financing mechanisms in place. There is a great need to provide regulatory incentives for both public donors and private investors to capitalize on sustainable ocean economic activities.

It is thus important to explore the potential for incorporating the blue economy concept in the context of the international law system. In implementing multilateral environmental agreement (MEAs), many developed countries have made their commitment to provide financial resources to global environmental governance. For instance, the United Nations Framework Convention on Climate Change (UNFCCC) Article 11 stipulates that developed countries shall provide financial assistance to developing states in response to climate change. The financial mechanisms have thus to be established, namely the Green Climate Fund (GCF), to fulfill the obligation for developed counties to finance greenhouse gas emission reduction and climate adaptation programs undertaken by developing parties at the Convention.

In addition to the GCF, the GEF, which serves as a financial mechanism to various MEAs, operates the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). In contrast, the Kyoto Protocol operates adaptation funds as the financing entity to determine the priorities and eligibility criteria for climate-related programs. None of these climate funds explicitly address the issue of ocean conservation and governance, though there is a close linkage between climate change and the marine environment.

Blue carbon presents a potential application of climate funds to Blue Finance. The concept of “blue carbon” refers to the carbon stored in the coastal and marine ecosystems. It is becoming significant and attracting growing international attention concerning the promotion of a blue carbon policy as climate change mitigation measures to reduce CO_2 emissions from ships, developing marine renewable energy, and ocean-based capture and storage because of 82% of the global carbon gas emission (ROCA 2019). Several countries and organizations have started to initiate coastal blue carbon field-based demonstration projects aimed at actively protecting and managing coastal ecosystems in order to sequester and store large quantities of carbon found in the seagrass, mangroves, salt marshes, and sediment below worldwide. For instance, a collaboration between NGOs, universities, and the Ministry of Marine Affairs and Fisheries in Indonesia launched the Kaimana Coastal Conservation and Community Development Blue Carbon project, which aims to demonstrate the climate mitigation potential and viability of blue carbon projects by building capacity with local communities to protect and manage the coastal ecosystem (Blue Carbon Initiative 2019). In the long term, financing blue carbon site projects requires further endorsement from existing climate funding. Moreover, the development of wind power energy and resilient coastal programs in some developing states that are parties to the UNFCCC may be eligible for receiving funding from the GCF and adaptation funds.

It is a fact, however, that political commitments made by parties to the UNFCCC only apply to public financing and not to private investors. For the sake of promoting stable finance for a sustainable blue economy, as mentioned earlier, this article suggests that international policymakers should seek a precise legal mandate for the establishment of sustainable ocean governance financial mechanisms in the context of UNCLOS and the International Convention for the Prevention of Pollution from Ships (MARPOL).

The incorporation of the blue economy concept and a clear legal mandate for the establishment of financial mechanisms could impose legal obligations for developed countries to provide financial assistance to sustainable blue economy activities proposed by developing countries. This article suggests that Blue Finance mechanisms could be entrusted to the GEF as the primary facilitator to finance marine conservation projects under the blue economic financing principles and further to provide a guarantee for Blue Bonds issued by development banks or other international financial institutions.

In addition to the provision of regulatory incentives for public financing by international norms, there is also a need for appropriate regulatory reforms in the context of domestic law. It is expected that the statutory incorporation of Blue Finance will provide incentives for private investors to capitalize on sustainable ocean-related economic activities such as sustainable fishery, aquaculture, ocean tourism, and offshore wind power energy development. In other words, the inclusion of Blue Finance concepts in the context of domestic legislation is capable of providing strong regulatory incentives for profitable ocean-related project developers such as offshore wind power, offshore drilling, or coastal tourism facility developers to choose to purchase Blue Bonds issued by the international financial institutions or national banks.

For instance, marine conservation-centric legislation such as the Coastal Management Law or Marine Spatial Management that oversee marine development projects or economic activities could require ocean-related developers to either implement marine conservation or climate adaptation measures to their capacities or purchase Blue Bonds or donate to special sustainable marine resource funds as alternative approaches to fulfill their legal obligation or environmental protection commitments. Investment in market-based mechanisms may be preferable financing solutions for private sectors because they could comply with legal obligations while receiving a long-term financial return.

4.3 Proposed Blue Finance mechanism

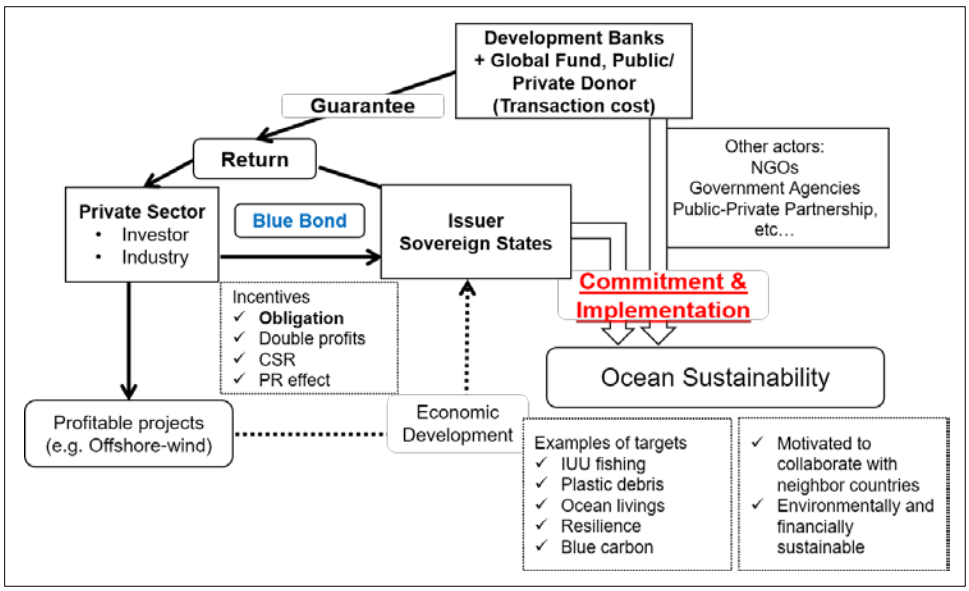
To visualize the concept proposed here, Figure 1 illustrates the proposed conceptual mechanism of the regulatory-driven Blue Bond. Issuers such as sovereign states invite private sectors to purchase Blue Bonds. Then they will provide return accordingly. Development banks or global funds are expected to guarantee the return. In Seychelles' case, the Blue Bond is partially guaranteed by the World Bank up to $5 million and further supported by a $5 million concessional loan from the GEF. Issuers then commit to carrying out some projects in the short run, which contribute to ocean sustainability through projects such as IUU eradication, marine plastic debris reduction, ocean conservation, and coastal resilience building, as well as blue carbon projects.

Development banks and other actors, including NGOs, intergovernmental organizations, and public–private partnerships (PPPs), will support the implementation of these projects. This seems to be generally applicable to existing Blue Bond schemes. However, this article proposes a new element for this framework or obligation for private sectors. In the scheme, private sectors that are seeking opportunities to implement profitable projects in ocean industries may be obligated to purchase a Blue Bond in order to fulfill their legal obligations. In doing so, the states issuing Blue Bonds would be able

to ensure that profitable projects in their ocean will stimulate their economic development, which will also allow ocean-related developers to double their profits on returns from a Blue Bond and such ocean development projects.

Furthermore, this serves as an incentive for private sectors because purchasing Blue Bonds would be good promotion and also contribute to their CSR (corporate social responsibility). As for potential issuers, this will motivate them to collaborate with neighboring countries and also provide them with environmental and financial sustainability. Consequently, the regulatory-driven Blue Bond mechanism creates a platform where all stakeholders are well motivated and committed to many forms of incentives.

Figure 1: The Conceptual Framework of the Proposed Blue Finance Mechanism



Source: illustrated by authors.

5. DISCUSSION

Compared with green finance principles, the category identification for Blue Finance may be more difficulty due to a lack of conscience concerning ocean resources, regulation, and externalities. To fill the gap, SIDSs could collaborate with research institutes and private sectors with initiatives from a regional scope to propose tangible and bankable projects under evidence-based support for further advocacy of better finance access for ocean conservation and economic development. The Blue Finance mechanism suggested in the research could strengthen the connectivity between stakeholders with incentives to participate in the framework. The financial mechanism for the marine initiative to support developing countries in improving plastic waste management has the potential to adopt this innovative approach to issue certain Blue Bonds that encourage partnership between private investment, government, and MDBs' aid.

Practical application and implementation of the Blue Finance mechanism require some further steps. First, the implementation bodies of the Blue Finance mechanism should be identified. Briefly, the GEF is an ideal financial entity that serves as the financial mechanism facilitator to many multilateral environmental agreements (MEAs). In so doing, UNCLOS and MARPOL could provide an explicitly legal mandate for the GEF to

establish blue economy funds (financial resources come from national governments and international organization aid budgets, NGO donations, and the GEF), which could be utilized in supporting larger-scale matters such as blue carbon or integrated coastal management.

As the second step, the information dissemination to the general public is as indispensable as that to the investment market. The mechanism could facilitate the relationship between investment projects and ocean conservation activity inclusively with general public including NGOs to oversee the implementation. The initiation of the projects may attract more quantitative research to visualize the impact for informative references. The Blue Finance mechanism thereby creates its benchmark as an instrument for environmental investment as well as sustainable ocean development and governance.

6. CONCLUSION

To end the tragedy of commons in the ocean, sustaining a healthy marine environment is an everlasting challenge for human society. We have proposed a regulatory-driven Blue Finance mechanism to serve as an effective framework aiming to promote sustainable ocean development and governance by highlighting the importance of converting the concept of a blue economy into an operational principle. The boosting of the sustainable blue economy requires sustainable financial resource support. It is insufficient to expect private investors to invest in Blue Bonds, mainly driven by the CSR or enhancement of public image. Instead, incentives should be given to promote public donations and private investments to capitalize on blue economic funds or Blue Bonds.

Given the critically changing situation of the global ocean environment due to climate change, the international momentum toward stable financing in the blue economy is one of the urgent and vital tasks at international, regional, and national levels. We identified the key stakeholders and attempted to propose an innovative Blue Finance mechanism involving both public and private donors taking into consideration environmental, economic, and social sustainability. All these financial instruments could be adopted to achieve the policy objectives of marine conservation and sustainable ocean resource management. In sum, our proposed mechanism suggests that a regulatory approach should be adopted in both international and domestic law that incentivizes private investors to purchase Blue Bonds. This functions as a facilitator in investing financial resources in the blue economy.

REFERENCES

Alava, J. J. (2019). Ocean pollution and warming oceans: Toward ocean solutions and natural marine bioremediation. In *Predicting Future Oceans* (pp. 495–518). Elsevier. https://doi.org/10.1016/B978-0-12-817945-1.00046-0.

Anand, S., and Sen, A. (2000). Human development and economic sustainability. *World Development*, *28*(12), 2029-2049. https://doi.org/10.1016/S0305-750X(00)00071-1.

Asian Development Bank. (2019 May 2). *ADB Launches $5 Billion Healthy Oceans Action Plan* [Press release]. Retrieved from https://www.adb.org/news/adb-launches-5-billion-healthy-oceans-action-plan (accessed 20 February 2020).

Asian-Pacific Economic Co-operation (APEC). (2019). Recommendations of the 20th Annual APEC Roundtable Meeting on the Involvement of the Business/Private Sector in the Sustainability of the Marine Environment. APEC.

Basurto, X., S. Gelcich, S., E. and Ostrom, E. (2013). The social–ecological system framework as a knowledge classificatory system for benthic small-scale fisheries. *Global Environmental Change, 23*(6), 1366–1380.

Blue Carbon Initiative. (2019, April 26). *Kaimana Coastal Conservation and Community Development – Indonesia*. Retrieved from https://www.thebluecarboninitiative .org/blue-carbon-activities/2019/4/26/kaimana-coastal-conservation-and-community-development-indonesia (accessed 1 April 2020).

Brundtland, G. H. (1987). *Our Common Future* (Report for the World Commission on Environment and Development, United Nations). United Nations.

Climate Bonds Initiative. (2019). *Green Bonds: The State of the Market 2018.* Retrieved from https://www.climatebonds.net/files/reports/cbi_gbm_final _032019_web.pdf (accessed 1 April 2020).

Dempsey, N., Bramley, G., Power, S., and Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Development*, *19*(5)5, 289-300. https://doi.org/10.1002/sd.417.

European Commission. (2018). *Introducing the Sustainable Blue Economic Financing Principles*. Retrieved from https://ec.europa.eu/maritimeaffairs/sites/ maritimeaffairs/files/introducing-sustainable-blue-economy-finance-principles_en.pdf (accessed 20 January 2020).

European Commission. (2019). *The EU Blue Economy Report 2019*. Luxembourg: Publications Office of the European Union. Retrieved from https://op.europa.eu/ en/publication-detail/-/publication/676bbd4a-7dd9-11e9-9f05-01aa75ed71a1/ language-en/ (accessed 10 January 2020).

Fath, B. D. (2015). Quantifying economic and ecological sustainability. *Ocean and Coastal Management,* 108, 13–19. https://doi.org/10.1016/ j.ocecoaman.2014.06.020.

Gaines, S., Cabral, R., Free, C., Golbuu, Y., Arnason, R., Battista, W., Bradley, D., Cheung, W., Fabricius, K., Hoegh-Guldberg, H., Juinio-Meñez, M. A., Molinos, J. G., Ojea, E., O'Reilly, E., and Turley, C. (2019). *The Expected Impacts of Climate Change on the Ocean Economy*. Washington, DC: World Resources Institute. Retrieved from https://www.oceanpanel.org/sites/default/files/2019-12/expected-impacts-climate-change-on-the-ocean-economy.pdf.

Kuhlman, T., and Farrington, J. (2010). What is sustainability? *Sustainability*, *2*(11), 3436-3448. https://doi.org/10.3390/su2113436.

Lubchenco, J., Cerny-Chipman, E. B., Reimer, J. N., and Levin, S. A. (2016). The right incentives enable ocean sustainability successes and provide hope for the future*. Proceedings of the National Academy of Sciences of the United States of America*, *113*(51), 14507–14514. https://doi.org/10.1073/pnas.1604982113.

Nordic Investment Bank. (2019, January 25). *Nordic Investment Bank (NIB) launches an Inaugural 5-year Year SEK 2 Billion Nordic–Baltic Blue Bond.* [Press release]. Retrieved from https://www.nib.int/who_we_are/news_and_media/news_press_releases/3170/nib_issues_first_nordic-baltic_blue_bond (accessed 20 February 2020).

Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society and Natural Resources*, *23* (5), 401–416. https://doi.org/10.1080/08941920903305674.

McKenzie, S. (2004). Social sustainability: Towards some definitions, *Hawke Research Institute Working Paper Series No 27*. South Australia: University of South Australia.

OECD. (2016). *The Ocean Economy in 2030*. Paris: OECD Publishing. Retrieved from https://www.oecd.org/sti/ind/Session%201_b%20-%20Claire%20Jolly%20-%20Web.pdf (accessed 10 January 2020)

Ocean Policy Research Institute (2019). *White Paper on the Ocean and Ocean Policy in Japan*. Tokyo: The Ocean Policy Research Institute, The Sasakawa Peace Foundation, in press.

Ostrom, E. (2010). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change, 20*(4), 550–557.

Pascal, N., Brathwaite, A., Philip, M., and Walsh, M. (2017). Impact investment in marine conservation. *Duke Environmental Law and Policy Forum, 28*, 2(1), 199–219.

Pauli, G. A. (2010). *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*. New Mexico: Paradigm Publications.

Pörtner, H. O., Roberts, D., Masson-Delmotte, V., Zhai, P., Tignor, M., Poloczanska, E., Mintenbeck, K., Nicolai, M., Okem A., and Petzold, J. (2019). *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*. Geneva: IPCC Intergovernmental Panel on Climate Change.

Roadmap to Oceans and Climate Action (ROCA). (2019). *Assessing Progress on Ocean and Climate Action: The Roadmap to Oceans and Climate Action (ROCA) Initiative.* Retrieved from https://rocainitiative.files.wordpress.com/2019/12/roca-2019-progress-report-1.pdf (accessed 20 February 2020).

Silver, J. J., Gray, N. J., Campbell, L. M., Fairbanks, L. W., and Gruby, R. L. (2015). Blue economy and competing discourses in international oceans governance. *The Journal of Environment and Development*, *24*(2), 135–160. https://doi.org/10.1177/1070496515580797.

Smith-Godfrey, S. (2016). Defining the blue economy. *Maritime Affairs: Journal of the National Maritime Foundation of India*, *12*(1), 58–64. https://doi.org/10.1080/09733159.2016.1175131.

Spalding, M. J. (2016). The new blue economy: the future of sustainability. *Journal of Ocean and Coastal Economics*, *2*(2), 8. https://doi.org/10.15351/2373-8456.1052.

Spangenberg, J. H. (2005). Economic sustainability of the economy: Concepts and indicators. *International Journal of Sustainable Development*, *8*, 47–64. https://doi.org/10.1504/ijsd.2005.007374.

Visbeck, M., Kronfeld-Goharani, U., Neumann, B., Rickels, W., Schmidt, J., van Doorn, E., Matz-Lück, N., Ott, K., and Quaas, M. (2014). Securing blue wealth: The need for a special sustainable development goal for the ocean and coasts. *Marine Policy*, *48*, 184–191.

World Bank and United Nations Department of Economic and Social Affairs (UNDESA). (2017). *The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries*. Washington, DC: World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/26843/115545.pdf?sequence=1&isAllowed=y (accessed 4 January 2020).

World Bank. (2018, October 29). *Seychelles Launches World's First Sovereign Blue Bond.* [Press release]. Retrieved from https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-first-sovereign-blue-bond (accessed 20 February 2020).

———. (2019a). *PROBLUE 2019 Annual Report*. Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/559541570047740595/PROBLUE-2019-Annual-Report (accessed 20 February 2020).

———. (2019b, April 3). *World Bank Launched Bonds to Highlight the Challenge of Plastic Waste in Oceans.* [Press release]. Retrieved from https://www.worldbank.org/en/news/press-release/2019/04/03/world-bank-launches-bonds-to-highlight-the-challenge-of-plastic-waste-in-oceans (accessed 20 February 2020).

Young, O, Berkhout, F., Gallopin, G., Janssen, M., Ostrom, E., and Leeuw, S. (2006). The globalization of socio-ecological systems: An agenda for scientific research. *Global Environmental Change, 16*(3), 304-316. https://doi.org/10.1016/j.gloenvcha.2006.03.004.