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INDONESIA BLUE ECONOMY ROADMAP

Ministry of National Development Planning/
National Development Planning Agency (Bappenas)

Indonesia Blue Economy Roadmap

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Foreword

Indonesia is an archipelagic nation with the sixth-largest exclusive economic zone in the world. Its ocean economy now creates substantial income and jobs. Indonesia's waterways provide business prospects in several fields, including industry, tourism, logistics, and marine living and non-living resources. The ocean economies in Indonesia currently cover traditional industries, with marine capture fisheries, aquaculture, and fish processing accounting for 83 percent of the total value contributed. The growth of Indonesia's ocean economy yet faces a challenge related to the health of the marine ecosystem, due to poor sustainability in harvesting methods and tourism, pollution, and the impact of climate change. For the last three years, the coronavirus pandemic has also undermined Indonesia' efforts to achieve sustainable development, especially the achievement of Sustainable Development Goal 14 to protect and sustainably utilize ocean resources.

The sustainable blue economy, which includes new sources of food, medicine, and renewable energy, is increasingly seen as being essential to the future of human security. The High-Level Panel for a Sustainable Ocean Economy's prominent work has amply illustrated the necessity for swift action to preserve the ocean's ability to provide significant economic, environmental, and social value in light of the ocean's potent answers to the world's problems. The fantastic area of Indonesia has a crucial part to play in the growth of the blue economy. The sustainable use of marine and coastal resources is a key component of the region's healthy sustenance and success because so many people in the region depend on them. This need a collaborative action to create significant impact of blue economy development for better livelihood, higher economic growth, as well as quality and sustainable marine and coastal resources.

The Indonesia Blue Economy Roadmap 2023-2045 serves to consolidate the policies, programs and activities supported by all stakeholders and to provide guidance to realize sustainable ocean economies. The roadmap also elaborates the relevant direction of Indonesia's Vision 2045 and relevant policy instruments which provide the basis for its implementation, particularly to realise Indonesia as a sovereign, advanced and resilient archipelagic country. The roadmap defines issues and projections of main Blue Economy's targets and priority sectors supported by forward-looking policies with strong collaboration among stakeholders. The results are expected to sustain high economic growth based on well managed marine resources, and to allow Indonesia to become an advanced economy.

Suharso Monoarfa

Minister of National Development Planning/Head of BAPPENAS

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Executive Summary

Indonesian Blue Economy Roadmap sets out a pathway towards a diversified and sustainable maritime economy for Indonesia, based on ensuring the health and resilience of ocean ecosystems and securing benefits for current and future generations. It provides the guidance on how the blue economy can increase productivity and contribute to economic transformation towards Indonesia Vision 2045.

The development of blue economy in Indonesia is guided with a vision of *“Our diverse coastal and marine resources are sustainably managed through a knowledge-led blue economy to create socio-economic prosperity, ensure a healthy marine environment and strengthen resilience for the benefit of current and future generations.”* This vision will be realized through the implementation of four missions, which are; (1) promoting environmentally sustainable economic growth; (2) securing healthy, resilient, and productive oceans; (3) improving human health, well-being, and shared prosperity; and (4) creating an enabling environment.

The vision and mission of blue economy development in Indonesia are built based on the strengths and challenges that Indonesia has. The strengths rely on Indonesia’s feature as the world’s largest archipelagic nation with over 17,000 islands and the fourth largest population in the world, as well as its wealth of natural marine resources, both living and non-living. Indonesia is also the world’s second-largest fishing nation, and has become the global hotspot for marine biodiversity (e.g., coral triangle). These strengths become the modalities for Indonesia to deal with several challenges, such as (i) the lack of coherence, synergy and capacity in policy and implementation; (ii) lack of investment in infrastructure, including in transportation; (iii) high inequality across income groups and regions; (iv) heavy reliance on fossil fuel; (v) low levels of and poor access to ocean literacy; (vi) environmental degradation, including in marine and coastal ecosystem; and (vii) lack of data on marine and coastal resources as well as its socio-economic impacts.

The achievements of the vision and mission are represented by three main targets, which are (1) maritime sector gross domestic product (GDP); (2) the number of maritime employments; and (3) the percentage of Indonesia’s marine environment designated as Marine Protected Area (MPA). All three targets also represent the national commitment on ensuring that the development of blue economy in Indonesia is capable to optimise the nation's environmental, social, and economic benefits.

The four missions will be implemented through some strategic action plans encompassing five phases of implementation, which are: (1) Phase I 2023-2024 focusing on the strengthening of the blue economy ecosystem consolidation in Indonesia; (2) Phase II 2025-2029 focusing on the development of blue economy as a new source of growth for Indonesia; (3) Phase III 2030-2034 focusing on the expansion of Indonesian blue economy sector through diversification; (4) Phase IV 2035-2039 focusing on increasing contribution and competitiveness of the Indonesian blue economy; and (5) Phase V 2040-2045 focusing on advancing the sustainable blue economy in Indonesia. Overall, the roadmap will lead the collaborative actions involving public and private parties to achieve the Indonesian 2045 agenda and the sustainable development goals.





CHAPTER 1

Introduction

Chapter 1 Introduction

Indonesian Blue Economy Roadmap is developed to set out a pathway towards a diversified and sustainable maritime economy for Indonesia, based on ensuring the health and resilience of ocean ecosystems and securing benefits for current and future generations. Taking forward the Blue Economy Development Framework for Indonesia's Economic Transformation (BEDF)¹, it seeks to provide an overarching structure for facilitating action in realising Indonesia's blue economy, defining the direction of travel and a practical approach to the steps needed to make progress.

The blue economy provides an essential component of economic transformation towards Indonesia's Vision 2045, including escaping the middle-income trap before 2045. It will contribute towards ensuring that Indonesia's national and international commitments are met while realising opportunities to optimise the nation's environmental, social, and economic benefits. This Roadmap is comprised of:

Section 1. Introduction to the Roadmap, defining the blue economy in Indonesia, providing an overview of the policy landscape supporting the blue economy, and describing the current conditions of the Blue Economy in Indonesia summarising environmental and social status and issues along with an overview of the strengths, weaknesses, opportunities and threats.

Section 2. Benchmarking, showing the effort in blue economy development from other countries as well as in Indonesia. The benchmarking is described within three focuses: national policy, resources management and waste, and implementation.

Section 3. Indonesian Blue Economy Roadmap, outlining the vision, mission, outcomes and indicators, and priority sectors for the Blue Economy in Indonesia.

Section 4. Strategic Action Plan, elaborating a practical framework detailing how these priority considerations will be addressed through specific actions with identified lead authority, resources and timeframe.

Section 5. Supporting mechanism, guiding key supporting mechanisms and platforms at national and regional level and Indonesia's institutional structure for blue economy development.

1.1 Definition

Fundamentally, the blue economy represents the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health. A blue economy approach sets out to facilitate appropriate development and manage competing interests within a marine space without placing economic priorities in competition with ecological or social needs.

While the concept is well known, different definitions of the blue economy exist. The European Commission define it as "*all economic activities related to oceans, seas and coasts*"², similar to the ocean economy definition from the Organization for Economic Cooperation and Development (OECD),

¹ Ministry of National Development Planning / National Development Planning Agency (Bappenas) & OECD, 2021. Blue Economy Development Framework for Indonesia's Economic Transformation.

² The European Commission. 2020. The EU Blue Economy Report 2019. <https://op.europa.eu/en/publication-detail/-/publication/676bbd4a-7dd9-11e9-9f05-01aa75ed71a1/language-en/>



which includes *“the assets, goods and services provided by marine ecosystems”*³. The World Bank considers it related to the *“sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem and health”*⁴. To emphasise the importance of environmental and social considerations, the United Nations Environment Programme (UNEP) uses the term ‘sustainable blue economy’, defined as *“one in which the sustainable use of ocean and coastal resources generates equitably and inclusively distributed benefits for people, protects and restores healthy ocean ecosystems, builds resilience and contributes to the delivery of global ambitions for a sustainable future.”*⁵ The definition of blue economy in the context of Indonesia refers to the explanation of Article 14, Paragraph 1 in the Law Number 32 Year 2014 concerning the Sea, which is: *“The blue economy is an approach to promoting sustainable marine management and the conservation of marine and coastal resources and their ecosystems to generate economic growth through community engagement, resource efficiency, minimizing waste and multiple incomes.”* Despite differences in the formulation, the various definitions share the same core characteristics, namely the importance of balancing the current need to utilise resources for economic and social development while minimising, if not eliminating, the potential environmental risk to ocean sustainability.

A blue economy will vary from country to country depending on national circumstances, including the mix of sectors active within the marine space, the social and ecological conditions and overarching policy objectives and development trajectory. The key challenges facing each country are developing new, emerging sectors and identifying realistic targets for growth, transitioning established sectors to a more sustainable trajectory and addressing existing and ongoing damage to ocean ecosystems. Developing a diverse blue economy, which is resilient to external shocks and crises, will support economic growth and establish an expanded and more stable economy.

1.2 Indonesia’s Blue Economy and SDGs

The development of blue economy in Indonesia has a role in supporting Indonesia in achieving the Sustainable Development Goals (SDGs). The inclusion of a specific goal for the ocean (SDG 14) highlights the increasing recognition of the importance of the oceans in global policy. For island nations, oceans underpin their entire sustainable development agenda, with interlinkages between SDG 14 and other goals addressing poverty (SDG 1), food security (SDG 2), quality education (SDG 4), clean and affordable energy (SDG 7), decent work and sustainable economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), reduced inequalities (SDG 10), responsible consumption and production (SDG 12), adapting to climate change impacts (SDG 13), among others.

The delivery of targets across the SDGs can be directly and substantially accelerated by progressing to a blue economy approach. There are strong interdependencies between SDGs due to the complex interactions between their social, economic and ecological components, including across scales, and this requires developing an understanding of the interactions and interdependencies between different policy areas at national level. This is captured in SDG 17⁶ addressing implementation and

³ OECD. 2016. The Ocean Economy in 2030. <https://dx.doi.org/10.1787/9789264251724-en>

⁴ The World Bank. What is the Blue Economy. 2017. Infographic. <https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy>

⁵ UNEP in The Commonwealth. 2023. Rapid Readiness Assessment for the Transition to a Sustainable Blue Economy. <https://production-new-commonwealth-files.s3.eu-west-2.amazonaws.com/s3fs-public/2023-03/D19096-TONR-Transition-to-Sustainable-Blue-Econ-Antigua-Barbuda.pdf>

⁶ SDG Target 17.14: Enhance Policy Coherence for Sustainable Development



supports the need for policy coherence to maximise synergies, minimise conflicts and ensure that SDGs are addressed in an effective and efficient manner. Synergies between the SDGs and the blue economy in Indonesia is explored further in Chapter 1.3.2.

1.3 Indonesia's Blue Economy

As the largest archipelagic nation in the world— containing 17,504 islands and a coastline of approximately 108,000 km in length⁷, Indonesia has an abundant wealth of biodiversity and natural marine resources that sustain a diverse array of marine and present considerable prospects for the establishment of new, emerging sectors. Indonesia's waters offer economic opportunities in various sectors, including marine living and non-living resources, industry, tourism, transportation, and logistics.

The World Bank⁸ estimated Indonesia's ocean economy to have an annual worth of more than USD 280 billion, with marine building and manufacturing being the two major sectors. Reef tourism alone is worth USD 3 billion in the country, known for its coral richness. Marine capture fisheries production had a USD 4.12 billion trade surplus in 2018, hinting at substantial demand from the international market⁹.

Despite the great size and estimated value of the blue economy, Indonesia's utilization of ocean economies is limited to conventional sectors, with marine capture fisheries, aquaculture, and fish processing accounting for 83 percent of the total value added. The average contribution of the blue economy sector to Gross Domestic Product (GDP) in the last five years has been low at just around 3.6 percent, mainly owing to activities in the fisheries sector. The blue economy, nevertheless, is fast growing— during 2012-2020, the blue economy grew 10.5 percent per annum, outpacing the national growth rate of around 5 percent. This reflects an ongoing demand increase for blue economy products and indicates great potential if investments are strategically deployed. This long-term trajectory of the blue economy is aligned with the Indonesian 2045 Vision¹⁰, in which the contribution of the blue economy is expected to reach 12.45 percent of the national GDP by 2045.

Indonesia's blue economy development is essential for economic transformation and escaping the middle-income trap. Indonesia's Vision 2045 calls for economic transformation from a natural resource-dependent economy to a modern, competitive manufacturing- and service-based economy with high value-added to secure prosperity and social justice for all Indonesians. Economic transformation will capitalise on the country's maritime strengths by incorporating better ocean resource management to leverage the blue economy development for increasing environmental sustainability as well as building competitive, innovative, and sustainable maritime sectors. The economic transformation is expected to help boost employment, productivity, and value-added.

⁷ Pusat Hidro-Oseanografi TNI Angkatan Laut. 2020. 8 Destinasi Wisata Bahari Indonesia.

https://www.pushidrosal.id/ebook_/ebookhidros/show/FILE-20200211-050830.pdf

⁸ World Bank (2019), Indonesia Economic Quarterly: Oceans of Opportunity, <https://openknowledge.worldbank.org/handle/10986/31993>.

⁹ UNDP, 2022. Blue Financing Strategic Document.

¹⁰ Ministry of National Development Planning/Bappenas. 2019. Ringkasan Eksekutif Indonesia 2045.

https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Policy_Paper/Ringkasan%20Eksekutif%20Visi%20Indonesia%202045_Final.pdf



1.3.1 Economic Status

The composition of Indonesia’s ocean economy differs from that of other ASEAN and East Asia Pacific countries. Indonesia's ocean economy is dominated by marine capture fisheries, aquaculture and fish processing. Marine fishing, aquaculture, and fish processing account for 83 percent of the value added generated from the six ocean-based sectors measured (marine capture fisheries, aquaculture, fish processing, ship building, maritime passenger transport and maritime freight). In 2015, 84 percent of the value added generated from marine fish processing in ASEAN countries was attributable to Indonesia, as was 73 percent of marine capture fisheries, and 54 percent of marine aquaculture. Indonesia also generated the largest value added from maritime freight (USD 2.6 billion) and maritime passenger transport (USD 2.2 billion) among ASEAN countries in 2015¹¹.

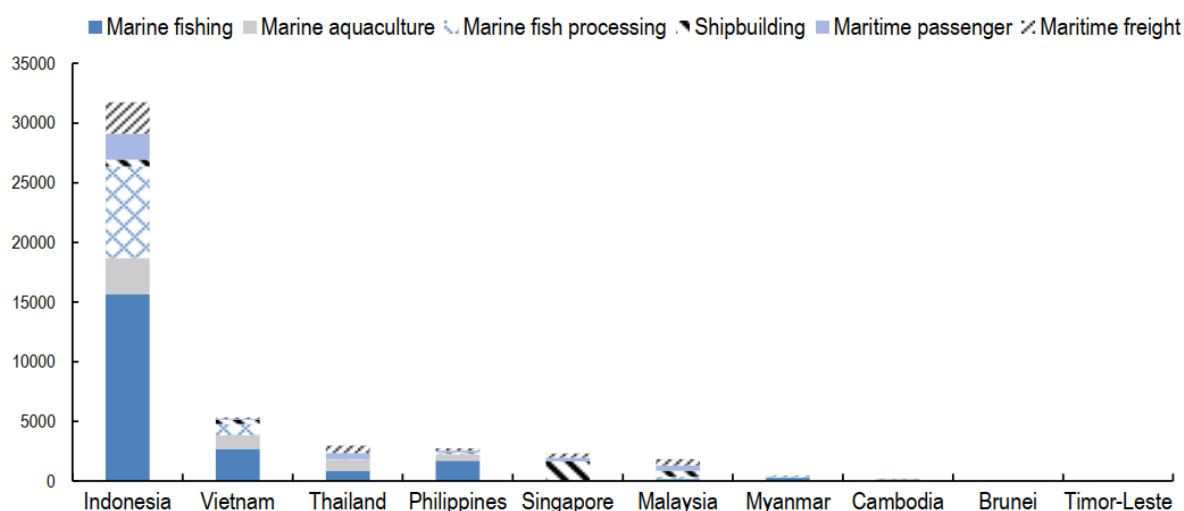


Figure 1. Ocean-economy Value Added in ASEAN Countries in 2015¹²

The COVID-19 pandemic has caused the Indonesian economy to decline and expose structural issues. Numerous ocean-based sectors have been severely impacted, and tourism is particularly hard struck. As Indonesia continues its recovery from the COVID-19 pandemic, there is growing interest and support for investing in a green recovery that builds economic resilience, but also contributes to the global effort to transition to a more sustainable blue economy for the benefit of people and future generations. Blue recovery based around sustainable blue economy development has the potential to transform both established and emerging ocean-based sectors into catalysts for long-term shared prosperity.

Indonesia’s blue economy development has the potential to contribute to the Indonesia’s economic transformation agenda including escaping the middle-income trap. Pursuant to Indonesia's 2045 Vision, economic transformation represents transforming from a natural resource-dependent economy to a modern and competitive manufacturing- and service-based economy that has high value-added to ensure prosperity and social justice for all Indonesians. Economic transformation will capitalize on the country's maritime strengths by incorporating better ocean resource management to leverage the blue economy development for increasing environmental sustainability as well as

¹¹ OECD. 2021. Sustainable Ocean Economy Country Diagnostics of Indonesia. <https://www.oecd.org/development/environment-development/sustainable-ocean-country-diagnostics-indonesia.pdf>

¹² OECD. 2019. Experimental Ocean-Based Industries Database.



building competitive, innovative, and sustainable maritime sectors. The economic transformation is expected to help boost employment, productivity, and value added.

In pursuit of transforming towards a more sustainable blue economy, understanding the current condition of the blue sectors is imperative to set out development plans for these sectors. This section analyses the current economic conditions of the traditional and the future emerging sectors of the blue economy scope.

Marine Capture Fisheries and Aquaculture – With abundant marine resources, Indonesia has become the world's second-largest seafood producer, after China. According to the Indonesian Ministry of Marine Affairs and Fisheries (MMAF)¹³, Indonesia's capture fish production amounted to 7.22 million tonnes and aquaculture production reached 14.65 million tonnes in 2021, and became a source of national and global food providers. Fisheries contributed around USD 32.11 billions of GDP in 2022, with the share of 2,6 percent of the country's GDP¹⁴. These sectors involved around 2.93 million fishers in marine capture fisheries and 2,25 fish farmers in 2021, with more 3,76 millions of household relies on these sectors for the main sources of income.

Indonesia has a diversity of fisheries commodities. Marine capture fisheries include the main products of cob, scad/flying fish, skipjack, squid, and tuna with production centers in North Sumatera, Maluku, East Java and South Sulawesi Province. The top five Indonesian aquaculture/marine culture products are seaweed, tilapia, catfish, shrimp, and milkfish, with main production centers in the Provinces of West Java, East Java and South Sumatera. Skipjack tuna, shrimp and seaweed are primary export commodities.

Indonesia needs to manage the diverse coastal and marine ecosystem and reduce overfishing to realize the potentials of ocean economy in Indonesia particularly from the marine capture fisheries and aquaculture. Many aquaculture productions have not complied with sustainability standard. The fishpond systems need also to be improved to become more environmentally friendly, and to reduce carbon emission by adopting efficient and clean practices. Resilience towards the impact of climate change and the efficacy of environmental conservation needs to be improved if Indonesia would like to sustain the production and increase export earnings. The results, as the World Fish program report¹⁵ in 2015, may boost job creation, for example, in aquaculture in Indonesia up to 8.9 million jobs by 2030. An estimated 15 million jobs would be created under an export or domestic growth scenario.

Marine-based Manufacturing - To add value to fisheries and marine products, Indonesia still has ample opportunities to develop its processing industry as one step to downstream marine products. Several raw materials derived from marine resources, such as fish, salt, seaweed and other raw materials, have great potential to be further processed to increase added-value. The marine-based manufacturing sector can include a range of marine industries, such as shipbuilding and marine construction, many of which will play significant roles in supporting the development and expansion of other blue economy sectors including marine renewables and aquaculture. Therefore, the Indonesian government must consider supporting industrial development in this sector as an engine of new economic growth and a provider of jobs for the community.

¹³ Ministry of Marine Affairs and Fisheries. 2023. Statistik KKP. https://statistik.kkp.go.id/home.php?m=prod_ikan_prov&i=2#panel-footer-kpda

¹⁴ Statistics Indonesia. 2023. Produk Domestik Bruto (Lapangan Usaha). <https://www.bps.go.id/indicator/11/65/2/-seri-2010-pdb-seri-2010.html>

¹⁵ Phillips M, et.al. 2015. Exploring Indonesian aquaculture futures. Penang, Malaysia: WorldFish. Program Report: 2015-39.



Shipbuilding Industry – As one of the largest maritime countries in the world, Indonesia expects to be a highly competitive, sovereign and strong economic maritime nation. Indonesia’s long-term maritime development for 2020-2045 is directed to build sovereignty enforcement as a maritime country which actively participates at a regional and global level. To build maritime sovereignty, the shipping industry or shipbuilding is one of the future industries that is strategically important and is to be strengthened in Indonesia, and connecting islands in Indonesia requires ships for various purposes, making shipbuilding a promising industry. Moreover, the characteristics of the shipping industry are labour-intensive, capital-intensive and technology-intensive. Transportation investment revitalises employment. Foreign direct investment dominates transportation, unlike capture fisheries and aquaculture. Indonesia has attracted foreign investment in the last three years due to the government's focus on regional connectivity.

Coastal-based Tourism – The contribution of tourism to GDP is still low at only less than 5 percent¹⁶. The contribution is lower than other G20 countries such as Spain (14 percent), Italy (13 percent), Turkey (11 percent), as well as an ASEAN country such as Thailand (12 percent)¹⁷. It is estimated that 10 percent of the national workforce is working in tourism, while 16.1 million international tourists arrived in 2019¹⁶. Pandemic hit the tourism sector and domestic tourists in the last two years before the pandemic (2018 and 2019) spent much less than international tourists. In 2022, tourism started to recover and increased international tourists to 5.47 million¹⁸. Some positive impacts on promoting tourism are to increase the economic value of coastal communities, government revenue, promotion of local industry, employment, and provide a market for Indonesian products. The opportunity now is that Indonesia should diversify into coastal and sea-based tourism as it potentially establishes non-fisheries value chain in the coastal area.

Maritime Services –Maritime services are essential for Indonesia’s blue economy, providing important domestic and international transportation, distribution, and trade links and for developing equity among Indonesia's archipelago. Indonesia itself has designated three Indonesian Archipelagic Sea Lanes (ALKI), which are important transportation assets in the Southeast Asian region and a major international trade route between Asia and Europe. It is estimated that Indonesian waters and territorial waters of the region carry out 40 percent of the world’s commercial maritime trade, and are considered one of the world’s busiest maritime Sea Lanes of Communications (SLOCs)¹⁹. Indonesia is also among the top 25 countries in terms of world fleet ownership, ranked by commercial value in millions of US dollars and including main vessel types. Its total value is around USD 13,953 million²⁰. It also leads in flags of registration by dead-weight tonnage with 29,332 thousand dead-weight tons and has the largest share of world vessels at 10,7 percent with 11,015 registered vessels. Container ships make about 15,648 arrivals to Indonesian ports, which is among the highest in the world and among the top 25 economies. Indonesia needs to further promote its maritime infrastructure to accelerate development and drive economic growth and equity. This will create new jobs, and increase access to markets and investment in Indonesia’s development.

¹⁶ Ministry of Tourism and Creative Economy. 2020.

¹⁷ILO. 2022. The Future of Work in the Tourism Sector: Sustainable and Safe Recovery and Decent Work in the Context of the COVID-19 pandemic. https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/meetingdocument/wcms_840403.pdf

¹⁸ Statistics Indonesia. 2023. Berita Resmi Statistik 1 Februari 2023.

¹⁹ Agastia, I.G.B.D., and Perwita, A.A.B. 2016. Indonesia’s Maritime Axis and the Security of Sea Lanes of Communications (SLOCs) in the Indo-Pacific. *Jurnal Hubungan Internasional*, 5(1): 10.21. <http://dx.doi.org/10.18196/hi.2016.0081.10-21>

²⁰ UNCTAD, 2022. Review of Maritime Transport. https://unctad.org/system/files/official-document/rmt2022_en.pdf



Biotechnology and Bioeconomy – Indonesia has an extensive marine area with a wealth of diverse natural marine assets and ecosystems. As understanding of marine processes increases, there will be more opportunities to develop a marine biotechnology sector that can contribute positively to human health, well-being, and food security. Marine biotechnology has the potential to address challenges with food security, environmental health, human health and well-being, and the greening of industrial products and processes. These outcomes could directly contribute to addressing the SDGs. The global market of marine biotechnology was estimated at USD 5.9 bn in 2022 and is estimated to grow to USD 11,7 bn in 2032²¹. South-east Asia is recognised as potentially one of the fastest growing regions for marine biotechnology. Biotechnology and bioeconomy in Indonesia are still in the development stages. Considering global opportunities and Indonesia’s large marine area and diversity of marine life means it is well-placed to benefit from this expansion and potentially lead the development of the marine biotechnology sector in the region.

Research and Development and Education – In 2021, the Government of Indonesia made research and technology a priority for structural reform by establishing National Research and Innovation Agency. The GDP spending on research and development (R&D) in Indonesia was relatively low, which was around 0,23 percent of total GDP in 2018, with predominant allocation from the government budget (84 percent)²². This was a contrasting condition compared to the average of GERD in ASEAN at around 0,7 percent and share of private R&D in Viet Nam (73 percent), Thailand (79,9 percent) and Singapore (59,6 percent). The issue of funding, the low amount of research being conducted and the limited supply of talent are among the problems that need to be addressed. The Research and Development and Education sector is a gateway for the advancement of other sectors. For this reason, the welfare of educators, as actors in this sector, is very important so that more workers are interested in being involved in the education sector. However, the salaries of education sector workers are not higher than the average salary of employees in Indonesia. In 2019, it was even lower. This shows that in terms of compensation, this sector is less attractive than other economic sectors in attracting talents.

1.3.2 Environmental Status

Indonesia is recognised as a global hotspot for marine wildlife, with 22.6 percent of the world's mangroves (the largest in the world)²³ and 18 percent of the world's total coral reefs.²⁴ The marine and coastal environments contain a variety of habitats, including mangroves, coral reefs, and seagrass meadows that play vital roles in supporting marine ecosystems throughout Indonesia's marine area. As it is located in the coral triangle area, the highest coral diversity in the world, Indonesia's marine habitats play a vital role in supporting blue economy sectors, most notably fisheries and tourism.

While abundant with untapped potential in the blue economy, climate change and environmental degradation threaten the health of the marine environment, including physical damage caused by capture fisheries, coastal development, and poorly managed tourism. There are concerning trends in biodiversity loss, both regionally and locally, driven by unsustainable resource use and climate change.

²¹ Precedence Research. 2023. Marine Biotechnology Market Size to Hit USD 11.7 Bn by 2032. <https://www.precedenceresearch.com/marine-biotechnology-market>

²² ADB. 2022. Promoting Research and Innovation through Modern and Efficient Science and Technology Parks Projects. <https://www.adb.org/sites/default/files/linked-documents/55063-001-ssa.pdf>

²³ Giri et al., 2011. Status and distribution of mangrove forests of the world using earth observation satellite data. *Global Ecology and Biogeography*, 20 (1), 154–159. <https://doi.org/10.1111/j.1466-8238.2010.00584.x>

²⁴ UNEP-WCMC, 2014. UNEP-WCMC Annual Report. <https://www.unep-wcmc.org/en/news/2014-unep-wcmc-annual-report>



Rising ocean water temperatures exacerbate the condition further, putting 82 percent of Indonesia's coral reefs at risk. Marine plastic debris also substantially risks Indonesia's blue economy development, fisheries, seafood quality and safety, shipping, and marine tourism development goals. Recent estimates of plastic debris damage to the Indonesia ocean economy exceed USD 450 million per year.²⁵

In Indonesia, the ocean health index (OHI) ranks 137 out of 221 countries, indicating low sustainability, driven mainly by unsustainable seafood harvesting practices and tourism. Ocean pollution – especially from plastics – is affecting the health of communities as well as the profitability of many economic sectors, including tourism and fisheries.

Indonesia's conservation efforts have positively impacted the marine environment, and surrounding social conditions, with the OHI score increasing in 2020 to 65.8 from 57.08 in 2012 (Figure 2). However, as shown in Figure 2, the food provision component declined over this period, representing the state of fisheries, including wild-caught fisheries and aquaculture. This indicates the unsustainability of harvesting fish stock and aquaculture production. Indonesia's Marine Trophic Index (MTI) indicator in 2020 is also low, with a score of 16.3 out of 100 (ranked 56 in the world)²⁶, representing declines in the abundance of fish in high trophic level relatives to those in low trophic levels, which can have significant consequences for ecosystems and food chains. Further effort is thus needed to improve the OHI and ensure that the ongoing development of the blue economy in Indonesia is sustainable and can continue to support current and future generations.

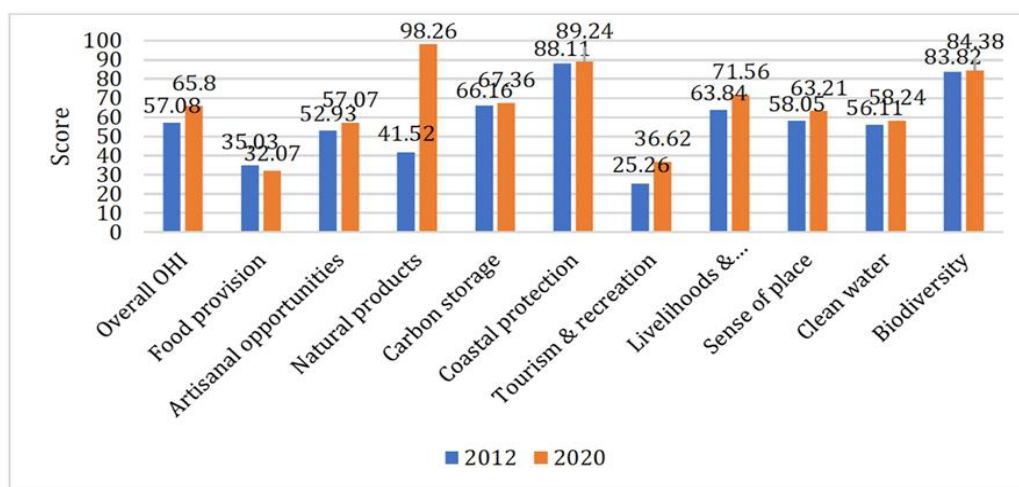


Figure 2. Ocean Health Index (OHI) Score for Indonesia²⁷

Currently, 28.91 million ha of Indonesian waters are designated as MPAs. Through its commitment to the Convention on Biological Diversity (CBD) and SDG 14, Indonesia plans to establish 32.5 million ha

²⁵ Ministry of National Development Planning / National Development Planning Agency (Bappenas) & OECD, 2021. Blue Economy Development Framework for Indonesia's Economic Transformation.

²⁶ Environmental Performance Index. 2020. Maritime Trophic Index. <https://epi.yale.edu/epi-results/2020/component/rms>

²⁷ Ocean Health Index, 2021. https://oceanhealthindex.org/images/htmls/Supplement_Results.html#Overview_of_goals_and_subgoals



(10 percent of the total marine area) as MPAs by 2030. While progress in designating MPAs is relatively rapid, the status of protection and effectiveness of MPAs management is still very low (Figure 3).²⁸

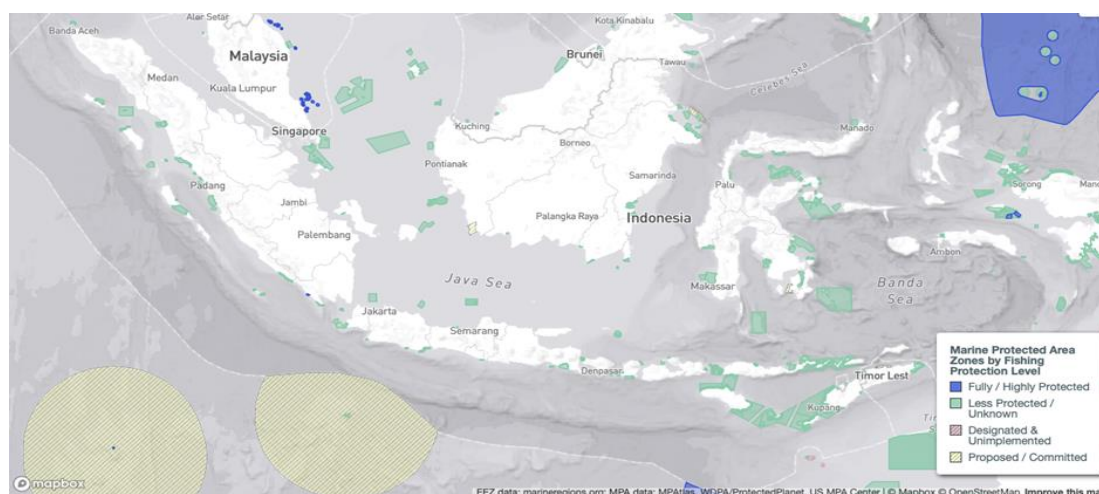


Figure 3. Marine Protected Areas Zones in Indonesia Waters Categorised by Fishing Protection Level²⁹

As Indonesia's marine sectors flourish and expand, competition for space will increase, placing additional pressure on marine ecosystems. Without proper planning and preservation for marine ecosystems, the health of Indonesia's marine environment will decline, which in turn will negatively impact blue economy sectors dependent on healthy marine ecosystems (e.g. fisheries and marine tourism). Ecosystem degradation lowers the value of ocean ecosystem services for fisheries, tourism, and commercial shipping, as well as obstructing another important economic function: community protection. At the same time, Indonesia is still on its journey to attain SDG 14 of Life Below Water, which implies the integral need to balance economic utilisation with safeguarding the environment and future needs.

1.3.3 Social Status

As the fourth most populous country in the world, Indonesia's growing population has raised food consumption and food insecurity. In Java, where 56.10 percent of the population³⁰ lives and rice are produced, agricultural land is converted to houses. Food security across Indonesia varies by region (Figure 4), depending on regional resources and wealth. The opportunity to fill in the gap in food security then relies on marine and coastal resources. Nevertheless, the access to quality ocean-based food is still limited, as the utilization of marine resources, such as fish, salt, seaweed and other raw materials, have not been optimal. This is particularly relevant to communities in the coastal areas.

According to OECD's Sustainable Ocean Economy data³¹, 95 percent of Indonesia's population lives within 100 km of the coastline, and 40 million rural Indonesians depend on biodiversity for subsistence. Currently, most coastal communities engage in traditional sectors – particularly fisheries,

²⁸ Ministry of Marine Affairs and Fisheries. 2021. MMAF Annual Report. https://kkp.go.id/an-component/media/upload-gambar-pendukung/zzzz/laporan%20kinerja%20kkp/Laporan%20Kinerja%20KKP%202021_Cetak.pdf

²⁹ Marine Conservation Institute, 2022. Marine Protected Area Atlas, <https://mpatlas.org/zones/>

³⁰ Statistics Indonesia. 2021. Population Census.

³¹ FAO in OECD, 2021. OECD (2021), Sustainable Ocean Economy Country Diagnostics of Indonesia, <https://www.oecd.org/development/environment-development/sustainable-ocean-country-diagnostics-indonesia.pdf/>



and to some extent marine-based processing. There is a need for the government to improve the capacity of communities to tap into new economic opportunities in the blue economy, as well as improve their capacity to participate in marine resource management and address the challenges related to gap in food security, ocean resource degradation and pollution, overfishing and climate change.

Indonesia's marine environment plays a vital role in Indonesian people's daily subsistence and livelihood, with marine capture fisheries and aquaculture employing approximately 5.18 million people. With the impact from the COVID-19 pandemic, the development of blue economy and its various sectors are expecting to tackle the rising unemployment. This needs to be complemented by promoting the better employment and the growth of small and medium enterprises, particularly in the coastal area.

In the fishery sector in Indonesia, the character is dominated by a combination of subsistence and small-scale commercial fisheries. The Ministry of Marine Affairs and Fisheries noted that 2.1 million people living in coastal areas are involved in small-scale fisheries³². Nevertheless, although small-scale fisheries are the epicentre of dynamic economic activity, they have not yet brought prosperity for the community. The income of fish workers (fishers, processors, and traders) could exceed the average wage of rural labour but rarely exceeds the national poverty line substantively, except where fish workers have fishing gear and boats.

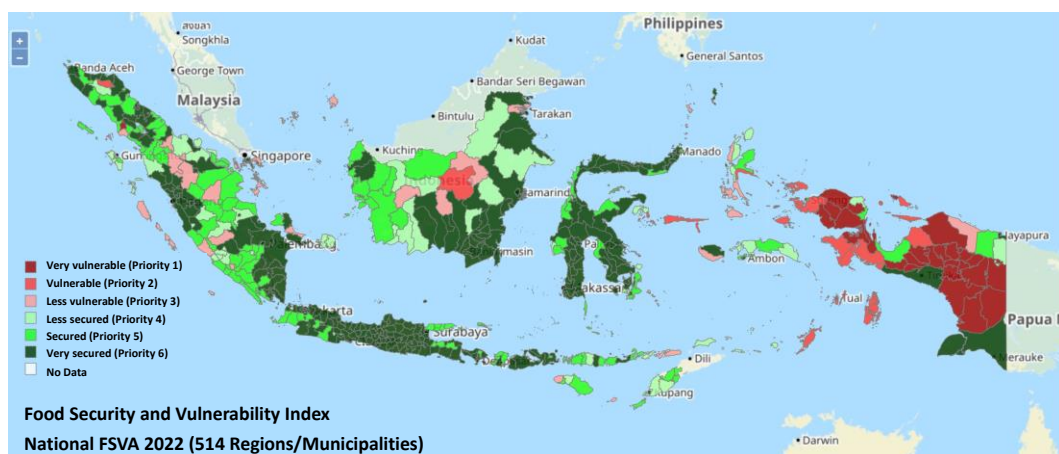


Figure 4. Food Security and Vulnerability Map of Indonesia by Region³³

To improve the livelihood of coastal communities, stakeholders, including the government, need to support to improve small-scale fisheries governance. This can be implemented through better provision of data and information in the fishery sector. The data can include local wisdom that has been adopted by the community and formalised by positive law. Based on the data, the local government can propose the protection of local marine and coastal areas, and this correspond to the Law No. 27 year 2007 jo. No. 1 year 2014 on the Management of Coastal Zone and Small Islands, which mandates the protection of indigenous people in coastal and small islands. The approach to sustainable utilization of fishery resources through a fisheries open and close system that is integrated

³² Ministry of Marine Affairs and Fisheries.2022. Side Event UN Ocean Conference 2022, International Year of Artisanal Fisheries and Aquaculture. Lisbon Portugal.

³³ Food Security Agency of the Republic of Indonesia, 2023. Food Security and Vulnerability Map of Indonesia by Region. <https://fsva.badanpangan.go.id/>



with customary law and positive law not only supports fisheries activities but also in terms of ecosystem protection.

To maximise the blue economy's social and economic benefits, opportunities must be available and accessible for communities throughout Indonesia. This condition requires ensuring the actions are considered from the perspective of regional diversity, accounting for the variation in opportunities, needs and context and supporting addressing inequality across the nation. Considering the economic, environmental, and social status described above, it is required to identify further the strategic issues through a detailed SWOT Analysis.

1.4 The Blue Economy SWOT Analysis

The Strength, Weakness, Opportunity and Threat (SWOT) analysis of Indonesia's blue economy was informed by in-country workshops and a range of key information documents, including the BEDF and the ILO report on the Assessment of Blue Economy Sectors. The analysis provides a general overview of the key considerations in the development of Indonesia's blue economy and the results become the basis for developing the mission and Strategic Action Plan in this Roadmap.

Overall, Indonesia has a number of strengths, weaknesses, opportunities and challenges in developing its blue economy. Indonesia has several strengths, including the following (i) the world's largest archipelagic nation with over 17,000 islands; (ii) the fourth largest population in the world; (iii) abundant natural marine resources, both living and non-living; (iv) the world's second largest fishing nation; (v) the global hotspot for marine biodiversity (e.g., coral triangle); and (vi) strong government commitments that have been outlined in the national long-term and medium-term development plans, the Indonesian 2045 Vision, the Ocean Policy, BDEF, Indonesia's participation in the ASEAN Leaders Declaration on the Blue Economy 2021, as well as The Plan of Action on Indonesia's Maritime Policy for 2021-2025. Based on these strengths, Indonesia has the opportunity to develop a new engine of economic growth through the maritime sector, including (i) optimally utilizing two major global shipping routes; (ii) promoting emerging marine renewable energy sector; (iii) promoting ecotourism including marine and coastal tourism; (iv) establishing globally significant marine biotechnology sector; (v) developing a skilled domestic workforce; and (vi) establishing quality marine education and training facilities.

Indonesia still needs to tackle weaknesses including (i) lack of coherence and synergy between national and regional policies and their implementation; (ii) lack of investment in infrastructure, including transportation; (iii) high inequality among income groups and regions; (iv) heavy reliance on fossil fuels; (v) low ocean literacy and access to relevant training, particularly in coastal communities; (vi) habitat damage from development (e.g. mangrove forest loss and marine debris); and (vii) limited data availability at regional level related to marine ecosystems and their contribution to socio-economic wellbeing, including data on employment and skills supply/demand.

Several challenges that need to be considered to implementing blue economy in Indonesia, including (i) the impact from climate change in the form of warming seas, ocean acidification, increased coastal erosion, etc.; (ii) reliance on imported raw materials exposing to global market variability; (iii) resilience towards risks from disasters, including new pandemics; (iv) increased international competition; (v) lack of investment from global companies (e.g. offshore renewable energy companies); (vi) illegal, unreported, and unregulated fishing activity; (vii) pollution both at the sea and on the land; and (viii) threats related to disruption in global supply chain affecting food security.



Besides the national level of SWOT analysis on blue economy, a more detailed SWOT analyses are also conducted for some of ocean-related sectors, as presented below.

1.4.1 Capture Fisheries and Aquaculture Sector

Indonesia is supported by a number of fisheries and maritime policies in the domain of catch fisheries and aquaculture. The government's commitment to rehabilitation and restoration of marine and coastal ecosystems, to increase fishery and maritime contribution to Indonesia's GDP, and to create decent jobs, is a force for the development of a blue economy in this area. Several weaknesses and challenges to be tackled include among others strengthening law enforcement, improving the condition of fishery workers including their access to social security, improving the efficacy of policy implementation, and minimizing ecological degradation due to climate change, waste, and pollution.

Table 1 summarizes the results of the SWOT analysis on the Capture Fisheries and Aquaculture.

Table 1. SWOT Analysis on Capture Fisheries and Aquaculture

Strength	Weakness
<ul style="list-style-type: none"> ▪ Indonesia is the world's second largest fishing nation (after China). ▪ Fisheries contribute over USD 27 billion to GDP and creates millions of jobs (the World Bank). ▪ Marine Protected Areas (MPAs) are enacted to reduce overfishing. ▪ Indonesia has ratified almost all international regulatory framework related fishery and maritime. ▪ Indonesia is a member in the Regional Fisheries Bodies (RFBs) and Regional Fisheries Management Organizations (RFMOs). ▪ National Regulatory Framework (Law 31/2004 on Fisheries amended by Law 45/2009) is implemented, ▪ Wild capture fisheries sector employs an estimated 2.1 million workers. ▪ Indonesia is proactive in implementing Ecosystem approach to Fisheries Management (EAFM) ▪ Indonesia is situated in a tropical region, allowing for aquaculture to be carried out year-round without significant limitations or challenges related to seasons. 	<ul style="list-style-type: none"> ▪ High level of overfishing (38 percent) with 600,000 vessels unmonitored and unregulated in Indonesia (2017). ▪ Governance in marine resource management-dealing with Illegal, Unreported, and Unregulated (IUU) fishing. ▪ Most of small fishers are informal, involving informal workers without access to social protection. ▪ The policy implementation gap exists, particularly where responsibilities are delegated to province ▪ Non-compliance of protection for domestic and migrant fishing workers based on Occupational Safety and Health (OSH) and labour rights. ▪ Aquaculture sector is characterised by widespread use of shrimp ponds and fishponds using plastics, which can pose a threat to mangrove ecosystems. ▪ Up to 52,000 hectares of mangroves are lost per year. ▪ Plastic pollution has caused USD 450 millions of economic damage annually (Indonesian Water Portal, 2022).



Opportunity	Threat
<ul style="list-style-type: none"> ▪ The Indonesian government has issued policies related to aquaculture especially on Ecosystem Approach to Aquaculture (EAA), including the Provincial Spatial Plan, which is intended to govern any areas that can be allocated to the aquaculture sector within the provincial boundary. ▪ Indonesia's fisheries are potentially the largest in the world, both in capture fisheries and aquaculture, and can be further developed with a sustainable production potential of around 67 million tons per year. ▪ Local wisdom in the management of fishery areas (sassi, panglima laot). 	<ul style="list-style-type: none"> ▪ Illegal, Unregulated and Unreported (IUU) fishing still exists. ▪ Climate change and unsustainable practices cause one third of coral reefs in poor condition. ▪ Aquaculture contributes to deforestation and changes in land use affecting mangroves and the overall blue carbon ecosystems. ▪ Aquaculture sector is highly dependent on imported inputs in particular for feeds, contributing to high production cost ▪ Fish and shrimp diseases are the main threat for aquaculture

1.4.2 Marine-Based Industry (Processing of Marine Resources and Shipbuilding)

Indonesia, an archipelago country, has potential in the development of the transport sector, especially maritime transport services and the shipbuilding industry. The importance of inter-island connections as a means of industrial supply chains and human transport makes these industries a possible development in the future. In addition to the shipping and transport industry, the manufacturing of marine products such as salt, seaweed, seafood industry, etc also has a huge potential to further developed and strengthened. The industry can supply food to the world and has a wide impact on increasing economic value. Table 2 describes the results of the SWOT analysis for the marine-based industry.

Table 2. SWOT Analysis on Marine-based Manufacturing Industry

Strength	Weakness
<ul style="list-style-type: none"> ▪ Strategic geographical position consisting of more than 17,000 large and small islands providing market potentials for the industry to grow. ▪ Currently, Indonesia has 2,154 ports. On average there is approximately one port for every 40 kilometres of coastline in Indonesia. The country's ports have good market potential in terms of their number and capacity. ▪ Ocean potential, various types of fish (processing industry), coral reefs and 	<ul style="list-style-type: none"> ▪ Management of natural resources has not been integrated into industrial activity. ▪ Lack of policy coherence and synergy between ministries/agencies, central and regional governments in implementation in the field. ▪ Limited government budget. ▪ Poor infrastructures and gaps in the level of development across regions. ▪ Low quality assurance of products and raw materials.



<p>various types of fish (tourism industry) as well as marine/coastal potential for (i) salt industry, (ii) seaweed, and (iii) mangrove.</p>	<ul style="list-style-type: none"> ▪ Low productivity and lack of value addition as well as innovation in most of the seafood and seaweed processing plants ▪ Fishing and fisheries enterprises have limited linkages with raw material sources and global seafood value chains ▪ High logistics costs to bring raw materials (mainly outside Java) and to processing plants mainly located in Java and other major cities in Indonesia ▪ Low productivity of most national shipyards compared to other Asian countries (below 500 deadweight tonnage). ▪ Lack of mastery, application and transfer of technology in coastal communities and fishers. <p>Lack of an integrated manufacturing industry plan to guide its development.</p>
<p>Opportunity</p> <ul style="list-style-type: none"> ▪ The maritime sector is among priority sector in the National Medium-Term Development Plan (RPJMN), National Industry Development Master Plan (RIPIN), and National Industrial Policy (KIN), which all provide directions in the industrialization/ downstream processing of fish, seaweed, salt, mangroves, etc. ▪ Growth of processing industries in fish, salt and seaweed production serving domestic needs and increasing exports. ▪ Increasing the welfare of coastal communities. 	<p>Threat</p> <ul style="list-style-type: none"> ▪ Dynamic changes of consumer preferences and technological trends. ▪ Reliance on imported raw materials (e.g. about 65 percent in shipping industry). ▪ The concept of 'maritime highways' requires a huge amount of funds. ▪ Environmental threats: (i) abrasion, and (ii) pollution from household and industrial waste, etc. ▪ Trade threats: (i) Illegal, Unregulated and Unreported (IUU) fishing, and (ii) increased competition in the export market.



1.4.3 Coastal Tourism Sector

Coastal and ocean-related tourism has many forms, including diving, marine archaeology, surfing, cruises, eco-tourism and recreational fishing. Coastal areas account for 80 percent of tourism³⁴, with beaches and coral reefs being the most popular destinations. It also has a high contribution to the economy. For example, the tourism sector in Indonesia generates GDP and becomes a major source of income and employment.

Despite the multiple benefits offered by coastal tourism, the development of tourism can affect the environmental carrying capacity and sustainability. This appears in the forms of degradation of natural resources and pollutions. At the same time, the development of coastal tourism is still hindered by limited investment and financing, weak destination management organization, limited capacity in implementing sustainable tourism development, as well as limited capacity of human resources, amenities, and accessibility. one example is the growing demand on cruise ships tourism with a compound annual growth rate of 34 percent since 2012³⁵ has created risks of direct air emissions from burning fuel and passing ballast transfer of invasive water species.

A well-managed marine tourism, hence, can become an important and sustainable source of social, economic and environmental well-being of many countries, including small island developing states (SIDS) and coastal least developed countries. Sustainable tourism can become part of the blue economy, promote the protection and sustainable use of the marine environment and species, generate income for local communities—thus reducing poverty, and maintain and respect local culture, traditions and heritage. Table 3 describes the results of the SWOT analysis for the coastal tourism sector.

Table 3. SWOT Analysis on Coastal Tourism

Strength	Weakness
<ul style="list-style-type: none"> ▪ Located in coral triangle with the Indonesian territory covering 76 percent of the world's coral reef species and 37 percent of the world's coral reef fish species. ▪ Rich coastal culture and heritage. ▪ Plays a key role in job creation. ▪ Contributes to export revenue and domestic value-added. 	<ul style="list-style-type: none"> ▪ Limited investment and financing in the tourism sector. ▪ Degradation of natural resources. ▪ Declining of destination carrying capacity. ▪ The absence of marine debris management. ▪ Weak destination management organization. ▪ Limited capacity in implementing sustainable tourism development. ▪ Limited number and skills of local tourism human resources.

³⁴ Bold Insights. 2019. Bold Business; Series on the Blue Economy. The Blue Economy: Challenges and Solutions in Sustainable Coastal Tourism Development. <https://www.boldbusiness.com/infrastructure/coastal-tourism-challenges-solutions-in-its-sustainable-development/>

³⁵OECD, 2020. Tourism Trends and Policies. <https://dx.doi.org/10.1787/6b47b985-en>.



	<ul style="list-style-type: none"> ▪ Limited amenities and accessibility. ▪ Limited capability of local governments to build and manage infrastructure.
<p>Opportunity</p> <ul style="list-style-type: none"> ▪ Tourism is one of the priority sectors in the current national development planning. Priority tourism destinations are dominated by coastal and sea-based tourism. ▪ The growing demand for tourism has become the new source of growth for local community. 	<p>Threat</p> <ul style="list-style-type: none"> ▪ Tourism development may have negative consequences not only on biodiversity, but also on social, economic, political, and cultural aspects. ▪ Unsustainable tourism practices. ▪ Indonesia is ranked 135th out of 140 countries in terms of tourism environmental sustainability. ▪ Risk from natural disasters.

1.4.4 Research and Development (R&D) and Education Sector

R&D and the education sector are critical enablers of maritime sustainability. Efforts in R&D and education are aimed at making the blue economy more competitive and sustainable in the future. The development of these sectors will focus on the promotion of literacy, skills, and innovation in the field of marine and coastal ecosystems, as well as the response to ensure the survival of marine and coastal wildlife.

Table 4. SWOT Analysis on R&D and Education

<p>Strength</p> <ul style="list-style-type: none"> ▪ Indonesia is the largest archipelagic country with more than 17,000 large and small islands. ▪ Abundant ocean potential, various types of fish, coral reefs (76 percent of the world's coral reef species and 37 percent of the world's coral reef fish species), and marine/coastal potential (salt, seaweed, and mangrove). ▪ Rich coastal culture and heritage. ▪ About 123 college/ university across Indonesia has major on fisheries and marine with 10 of them under overseen by Ministry of Marine Affairs and Fisheries. 	<p>Weakness</p> <ul style="list-style-type: none"> ▪ Limited technical and vocational education and training are still not being able to reduce mismatches and skills gaps. ▪ Limited budget on research and innovation (0.3 percent of GDP). ▪ Limited quality research and supply of talent. ▪ Limited incentive in attracting talents into research and innovation. ▪ Low public awareness of maritime education and training. ▪ Lack of innovative technologies. ▪ Lack of linkages between R&D centres and industry's needs
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<p>Opportunity</p> <ul style="list-style-type: none"> ▪ GOI commitment for implementing a knowledge-based blue economy. ▪ Maritime is one of the priority sectors in the current national development planning. 	<p>Threat</p> <ul style="list-style-type: none"> ▪ A slowing down of the global economic recovery. ▪ Disruptive technologies. ▪ Risks of losing intellectual property rights on Indonesian marine and coastal resources due to limited research on Indonesian resources and products.

The importance of marine and coastal scientific research in providing critical information for the development of marine and coastal policy and management interventions cannot be overstated. Despite the current technological limitations in Indonesia, as well as the vastness and complexity of the oceans, ocean research capabilities have steadily improved in recent years. The importance of marine scientific research for economic and industrial development is increasing for supporting decision making. For example, the formulation of policy aiming at tackling marine pollution requires better understanding of data that are built from the research on the marine environment. Increasing literacy and capacity based on data are crucial. This can be further developed through training and marine education tailored to fit in the dynamic of the maritime development. Table 4 describes the results of the SWOT analysis for the R&D and education.

1.4.5 Renewable Energy Sector

As an archipelagic country, Indonesia has been underutilizing its vast ocean resources primarily in terms of harnessing energy. Offshore renewable energy (ORE) development has been rarely included in national strategic planning, nor has a targeted installed capacity in the upcoming years. The most recent development in OREs is the study on the tidal bridge potential application in the Larantuka Strait, East Nusa Tenggara Province. The study offers a potential of 30 MW capacity to be produced from the tidal bridge technology. Nevertheless, the study still requires further assessment related to the potential risk of diverting the migration routes of marine biota, such as whale shark, and shipping line routes in the region. In the future, Indonesia needs to explore potential technologies that can be applied to optimize the development of other ORE resources, such as offshore wind, wave, and ocean current according to the characteristics and potentials in different parts of Indonesia.

Overall, the SWOT analyses for five sectors of blue economy above shows that the biggest challenge for Indonesia to develop a blue economy revolves around low productivity due to limitations in technology, innovation, capacity, governance, unsustainable practices, and environmental degradation. Even so, Indonesia has a high opportunity because it still has a lot of untapped maritime resource potentials and a strong commitment of the government in promoting maritime sector. In addition, when referring to the existing regulations and policies, Indonesia will likely develop a more optimal blue economy in the future.



Table 5. SWOT Analysis on Renewable Energy Sector

<p>Strength</p> <ul style="list-style-type: none"> ▪ Three-quarters of Indonesia’s territory comprises oceans. ▪ Total potential of marine renewable energy in Indonesia is up to 60,000 MW, with the potential from tidal energy reaching 18 GW. ▪ The South Java Sea, Arafura Sea along the South Sumatra coastline, and South Kuta Bali are the locations identified with a strong wave energy potential of 30 kW/m. ▪ Indonesia has also developed plants for wave energy in Yogyakarta, tidal current energy in East Lombok and ocean thermal energy conversion (OTEC) in Bali. 	<p>Weakness</p> <ul style="list-style-type: none"> ▪ Contribution of marine and wind energy remains limited. ▪ Little commitment to utilising the energy potential offered by the sea. ▪ Currently, there is no installed capacity of any offshore renewables. ▪ Lack of investment in ORE. ▪ Poor incentives provided by existing regulations.
<p>Opportunity</p> <ul style="list-style-type: none"> ▪ Global commitment to use renewable energy and low emissions. ▪ The demand and potential for renewable energy in Indonesia are increasing. ▪ Offshore wind energy is the most developed form of marine-based renewable energy. ▪ Commitment to Net Zero Emission provides the trigger to accelerate the provision of renewable energy, including ORE, and to create new markets for low- to no-emission energy production. ▪ Green investment grows progressively and becomes the push factor for the acceleration of renewable, including ORE, development. 	<p>Threat</p> <ul style="list-style-type: none"> ▪ Affordability of technology. ▪ Limited capability of human resources. ▪ Risks related to climate change and natural disaster.

1.5 Policy Reference for developing Indonesia’s Blue Economy

In Indonesia, the blue economy has been enshrined in national policies and plans with a number of ongoing related activities in the relevant ministries. This section will summarise the main existing policy instruments that form the basis for implementing this Blue Economy Roadmap.



1.5.1 The Indonesia's National Development Plan

Indonesia's National Development Planning System includes long-term, medium-term, and annual plans, in which, the blue economy aspects have been included in each planning document. The Law Number 17 of 2007 concerning the National Long-Term Development Plan (RPJPN) 2005-2025 has included the development blue economy in the seventh development mission. It is designed to realize Indonesia to become an archipelagic nation that is independent, advanced, strong, and based on national interests through strategies include generating insight and fostering a maritime culture, strengthening the role of maritime human resources, establishing the territory and assets of the Republic of Indonesia, securing sovereignty jurisdiction and assets, developing the maritime industry in synergy, reducing coastal disasters and marine pollution, and improving the welfare of poor families in coastal areas.

In line with this, the development of the blue economy sector has been included in the derivative planning document of the National Medium-Term Development Plan (RPJMN), respectively in RPJMN Phase I (2004-2009), Phase II (2010-2014), Phase III (2015-2019), and Phase IV (2020-2024). The Phase IV RPJMN 2020-2024 provides seven development agendas that incorporates the RPJPN, and Indonesia's 2045 Vision, which serve as the basis for creating a *"developed Indonesia that is sovereign, independent, and with characteristics based in gotong-royong (mutual cooperation)"*.³⁶

The basis for blue economy development has been incorporated in Phase IV or RPJMN 2020-2024, mainly, in order to support the 4 agendas respectively, which are (i) strengthening economic resilience for quality and equitable growth; (ii) increasing the quality and competitiveness of human resources; (iii) improving the environment and increasing disaster and climate resilience; and (iv) strengthening the stability of political, legal, security affairs and transforming public services. As the next RPJPN 2025-2045 will be developed, followed by the RPJMN (2025-2029), the Blue Economy Roadmap—which includes suggested actions, will be a direct resource to inform the development of both the long- and medium-term development plans.

1.5.2 Indonesian Ocean Policy and Ocean Policy Action Plan 2021-2025

The Indonesia Ocean Policy of 2017³⁷, under Presidential Regulation Number 16 Year 2017, recognizes the importance of the ocean values and the development direction through blue economy in achieving a sustainable and successful blue economy. The Ocean Policy aims to enhance the welfare of people in coastal areas and small islands, promote competitive marine economic and industrial growth, and protect the marine environment. This policy also sets out key aims for Indonesia's marine environment, such as the optimal and sustainable management of ocean resources, the development of human resources and maritime technology, strong maritime defence and security, and implementing good ocean governance. The importance of Indonesia's blue economy is highlighted as one of the six basic principles, but a truly sustainable and successful blue economy should incorporate all the principles of the Ocean Policy.

To complement to Ocean Policy, the Ocean Policy Action Plan 2021-2025 is built and enacted through Presidential Regulation Number 34 Year 2022. It outlines seven pillars of activity, including (i) the

³⁶ Ministry of National Development Planning/Bappenas. 2019. Ringkasan Eksekutif Indonesia 2045.

https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Policy_Paper/Ringkasan%20Eksekutif%20Visi%20Indonesia%202045_Final.pdf

³⁷ Coordinating Ministry of Maritime Affairs and Investment. 2017. Indonesian Ocean Policy. https://maritim.go.id/konten/unggah/2017/07/offset_lengkap_KKI_eng-vers.pdf



management of marine resources and the development of human resources; (ii) maritime security, law enforcement, and safety at sea (iii) ocean governance and institution; (iv) economic and infrastructure of the marine sector and the improvement of prosperity; (v) marine spatial management and marine protected areas; (vi) maritime culture; and (vii) maritime diplomacy. The Plan of Action serves two purposes. First, it is a guidance for Ministries/Institutions and regional governments on how to plan, implement, monitor, and evaluate maritime development to make the world maritime axis a reality. Second, it serves as a reference for communities and business players to play roles in realising the world maritime axis.

Indonesia's Ocean Policy and Ocean Policy Action Plan 2021-2025 provide a valuable basis to shift towards a blue economy development which involves integrated ocean governance and emphasising marine spatial planning and management in order to encourage responsible and balanced use of Indonesia's marine resources to support long-term economic growth and social welfare, while preserving the marine environment, and these two documents complement each other. The seven key pillars set in Indonesia's Ocean Policy are fundamental to the Blue Economy Roadmap. In return, the new initiatives and commitments proposed in Blue Economy Roadmap work as catalysts in realising the vision of Indonesia's Ocean Policy to become the world maritime axis. The maritime development programmes in the Blue Economy Roadmap should fill the gap that Ocean Policy 2021-2025 did not accommodate, such as elaborating the importance of emerging sectors and strengthening the marine established sectors, proposing a refined strategic action plan through phases, and creating supporting mechanisms through international collaborations that help accelerate the Indonesia's marine vision.

1.5.3 Indonesian Sustainable Development Goals (SDGs) Road Map

The roadmap of SDGs for Indonesia has been enacted through Presidential Regulation Number 59 Year 2017, and updated through Presidential Regulation Number 111 Year 2022. It provides policy directions and strategies for meeting many of the SDGs. It serves as a guideline for national and local institutions and stakeholders to develop, implement, monitor and evaluate the National and Subnational Action Plans. The Presidential Regulation also defines powers and responsibilities of the Minister of National Development Planning/National Development Planning Agency (Bappenas) concerning the implementation of the Plans, including the appointment of a coordination team and panels of experts. The role of Bappenas in the coordination of planning in Indonesia on SDGs as well as the blue economy presents a key opportunity for maximising alignment and synergy between these activities.

Considering the size of Indonesia's marine environment, the development and expansion of the blue economy will play a fundamental role in achieving the SDGs as global agreements. Blue economy interlinkages employment opportunity, food security, education quality, energy, economic growth, industrial and infrastructure development, equality, consumption and production, climate change, marine ecosystem, as well as partnerships. This interconnectedness creates the premise of the Blue Economy sectors development in Indonesia, both traditional (fisheries and aquaculture, marine-based industry, trade, and tourism) as well as the emerging sectors that comprise renewable energy, biotechnology and bioeconomy, research and education, and environmental and resource management. In monitoring the extent to which Indonesia is achieving the SDGs targets integrated



with the blue economy, measurable indicators are needed to track the progress of Indonesia's SDG. The alignment between the targets for Indonesia and the actions set out in this Roadmap is needed.

Table 6. Linkages between the SDGs and Indonesia's Blue Economy

SDG	Linkage to the Blue Economy
SDG 1: No Poverty	Development of blue economy sectors will increase welfare and employment opportunities across Indonesia, particularly in coastal areas. This should consider the need to address working conditions, social dialogue, and social protection, in line with the decent work concepts of the International Labour Organization (ILO).
SDG 2: Zero Hunger	The development of sustainable capture fisheries and particularly the aquaculture sector, marine-based manufacturing, and marine biotechnology can address food security and improve the quality of food and nutrition consumption and safety.
SDG 4: Quality Education	Marine research, development and education underpins the blue economy, and expanding capacity to address the blue economy would support education and training for a domestic skilled workforce.
SDG 7: Clean Affordable Energy	Indonesia's emerging offshore renewable energy sector presents a low/zero carbon energy source that could meet domestic energy demand, with sufficient investment. Through the expansion of marine renewable energy production, Indonesia has the potential to establish a green hydrogen sector, which could support Indonesia in becoming a green hub for international shipping.
SDG 8: Decent Work and Economic Growth	Development of blue economy sectors such as aquaculture, marine-based manufacturing, coastal tourism, offshore renewables, and marine biotechnology will increase employment opportunities, establish training and career development opportunities within the sectors, and support a highly skilled domestic workforce.
SDG 9: Industry, Innovation and Infrastructure	The blue economy relies upon industrial development and infrastructure to support expansion across sectors such as renewable energy, marine-based manufacturing sector and maritime transport.
SDG 10: Reduced Inequalities	Key blue economy sectors such as renewable energy, tourism and aquaculture rely on resources which occur across Indonesia's many islands. Developing opportunities in these sectors can ensure that social and economic benefits of the blue economy are available to communities throughout Indonesia, supporting addressing inequality across the nation.



SDG	Linkage to the Blue Economy
SDG 12: Responsible Consumption and Production	The blue economy depends on promoting environmental and resource management, and ensuring effective waste management and promotion of a circular economy to ensure waste streams that enter marine ecosystems are reduced and ultimately eliminated.
SDG 13: Climate Action	Strengthening environmental and resource management and expansion of the offshore renewable energy sector would play a key role in supporting the decarbonisation of other blue economy sectors and help Indonesia meet its net zero targets.
SDG 14: Life below water	Addressing environmental sustainability and resource management in sectors such as fishing as well as reducing waste and marine pollution alongside direct action to protect and restore marine ecosystems is fundamental to achieving SDG 14.
SDG 17: Partnerships for the goals	The blue economy requires integrated actions across sectors and boundaries to effectively and sustainably manage shared natural resources.

1.5.4 Indonesian 2045 Vision

Indonesia's 2045 Vision³⁸ sets out the country's goal of becoming one of the world's top five economies by 2045. The vision is built around four pillars, namely (i) human development and mastery of science and technology; (ii) sustainable economic development; (iii) equitable development; and (iv) good governance. Particularly in pillar 2, the vision recognises the importance of Indonesia's maritime economy and set the target of growing the maritime economy from 6.4 percent of GDP in 2015 to 12.5 percent in 2045 through three strategies, namely (i) increasing the role by focusing on effective and efficient sea connectivity, a sustainable and competitive fishing industry, and inclusive marine tourism; (ii) creating competitive quality maritime human resources, maritime technological innovation, and a strong maritime culture as the basis of maritime civilization; and (iii) realizing a strong and reliable maritime defence and security capability to face regional and global challenges.

To achieve sustainable economic development, Indonesia is considering the importance of maritime economic development. A maritime economic approach is also believed to be able to create equitable development by targeting sea transport as the main element of promoting domestic connectivity and integration across the archipelagic. This target was built through (i) the development of 48 port cities; (ii) the central port system of sea highways and seven international hubs; (iii) short sea-shipping; and (d) modern port management. The development a sustainable and competitive fishing industry, and inclusive marine tourism are also expected to value-added creation and expand employment opportunity for the population, boosting economic progress. Supported by quality maritime human

³⁸ Ministry of National Development Planning/Bappenas. 2019. Ringkasan Eksekutif Indonesia 2045. https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Policy_Paper/Ringkasan%20Eksekutif%20Visi%20Indonesia%202045_Final.pdf



resources, the progress in technological innovation, and a strong maritime culture, the results from developing these sectors are also expected to support better environmental and resource management.

The strategy also aims to increase renewable energy share from 5 percent in 2015 to 30 percent in 2045, as well as to enhance water security through integrated and sustainable land-water management, city forest development, rainwater harvesting, and forest and land rehabilitation. These efforts are aligned with Indonesia's goal to reduce emissions by around 41 percent from the baseline scenario and boost the Environment Quality Index by more than 80 points. Through these actions, Indonesia is working to make the environment more suitable for living creatures, including water habitats, while also promoting sustainable economic growth.

The progress in maritime economy will be strengthened through establishing maritime power focusing on creating strong and capable maritime security and defence to face regional and global challenges. It will also be supported by stronger maritime culture seeking to create excellent foundation of Indonesia's maritime development.

1.5.5 ASEAN Leaders Declaration on the Blue Economy 2021

In October 2021, all member states signed the ASEAN Leaders' Declaration on the Blue Economy, which acknowledges that the *"ocean and seas are key drivers of economic growth and innovation, while taking into account the need to ensure ocean sustainability and rules-based ocean governance."* The declaration further notes that *"the blue economy is a multifaceted and cross-cutting concept that involves all three pillars of the ASEAN Community"* (Political Security Community, Economic Community, and Socio-Cultural Community).

The main commitments of the ASEAN Declaration are to promote regional collaboration amongst member states on the blue economy, in accordance with international laws, agreements, and frameworks, to reach a common understanding on the blue economy, and ensure engagement with all relevant stakeholders. It recognizes the need for ASEAN collective effort and holistic response to mitigate the impact of COVID-19, and acknowledges ocean and seas are critical drivers of economic growth while considering the need to ensure ocean sustainability. The ASEAN Declaration thus provides an important foundation and starting point for developing the blue economy in Indonesia. The declaration further expects ASEAN member states to develop a regional action plan and identify the Lead Sectoral Body.

Main areas that will be explored are (i) marine environmental protection; (ii) illegal, unreported and unregulated (IUU) fishing; (iii) marine and coastal ecosystems protection; (iv) sustainable aquaculture and fishing practices; (v) sustainable production and consumption; (vi) biotechnology; (vii) marine industrial development; (viii) marine pollution; (ix) marine litter and plastic pollution; (x) food security; (xi) trade; (xii) coastal tourism and heritage conservation; (xiii) maritime transport; (xiv) security and safety of navigation; (xv) marine science; (xvi) ocean energy; (xvii) sea and ocean governance and management; (xviii) data, statistics, and data analytics; and (xix) as well as capacity-building, digitisation and innovation.

Given the contribution of Indonesia's blue economy sector to ASEAN, the development of the Indonesian Blue Economy Roadmap will further strengthen the recognition of oceans and seas as crucial economic growth drivers while also addressing the need to ensure ocean sustainability. The Indonesian government assumes the ASEAN presidency in 2023 and will use the opportunity to



promote the development of the ASEAN Blue Economy Framework as one of the Priority Economic Deliverables (PED), creating ASEAN standards based on sustainable development, and preparing the ASEAN Framework for Transition Finance to support sustainable financing.

ASEAN Leaders' Declaration on the Blue Economy mandates the ASEAN Member States to adopt the blue economy agreement. Therefore, in view of this Declaration, Indonesia's Blue Economy Roadmap is envisaged to promote the Blue Economy by engaging and partnering with relevant stakeholders. A firm understanding of the Blue Economy concept helps translate the ASEAN Blue Economy Declaration's purpose, which is to establish a regional collaboration, develop a regional action plan, and identify the relevant Lead Sectoral Body. Supporting this aim, Indonesia's Blue Economy Roadmap has mapped out a path towards a diversified and sustainable maritime economy, harnessing oceans and marine resources to drive economic growth, job creation, and innovation while ensuring environmental protection and sustainability. Further, the Blue Economy Declaration will serve as a guide and supporting mechanism in establishing and strengthening economic cooperation among ASEAN Member States related to the Blue Economy.

1.5.6 Blue Economy Development Framework for Indonesia's Economic Transformation

The Blue Economy Development Framework (BEDF)³⁹ was a joint product developed by OECD and the Ministry of National Development Planning/Bappenas in 2021 and provides the main basis for the development of the Blue Economy Roadmap. The BEDF contributes towards the integration of ocean management and development, while recognising the importance of policy coherence, managing trade-offs among ocean-related sectors, and capitalising on policy synergies that benefit multiple sectors in Indonesia's ocean economy. As the components of ocean economy varies in each country, BEDF proposes the scope for categorising related activities based on economic realities and the latest accessible data, and it serves as a supplement to evidence-based policymaking. It also serves as a source of motivation for all stakeholders concerned with the blue economy.

The BEDF provides guidance for policies and programmes aimed at achieving Indonesia's 2045 Vision and contributes towards the global ambition of transitioning to sustainable blue economies that focus on conservation and responsible use of marine and coastal resources. The sustainable blue economy has a role as a new economic paradigm alongside the green economy.

To develop the marine-based economy, The BEDF recognises the importance of marine living and non-living products as two sources of industrial development in the blue economy. Developing marine-based primary sectors can create value-added and improve productivity of marine-based economies to achieve inclusive and sustainable economic growth by fulfilling industrial raw resources, product quality, and adding value to manufacturing fisheries. The marine non-living sector includes sources of ocean economy other than marine-based sectors. This includes the chemical, shipbuilding, and salt industries.

Other ocean-based sectors, such as tourism, trade, transportation, and logistics, and other fishery industries are also highlighted as important to Indonesia's blue economy, as these sectors support

³⁹ Ministry of National Development Planning/Bappenas. 2019. Ringkasan Eksekutif Indonesia 2045. https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Policy_Paper/Ringkasan%20Eksekutif%20Visi%20Indonesia%202045_Final.pdf



local economic development and employment creation, including small and remote islands. These sectors also promote the growth of new economic growth centres in many parts of Indonesia.

The BEDF also suggests for Indonesia to utilise the ocean resources to develop renewable energy, bio-economy and biotechnology, research, and education, as these sectors have the potential to futureproof Indonesia's blue economy. The BEDF also recognises that for these sectors to develop, a better enabling environment that incentivises new investment in the sectors is required.

Moreover, all areas covered in the BEDF are also expected to support recovery post COVID-19 pandemic recovery, a model for building economic resilience and advancing economic transformation and , as well as contribution to a global effort to accelerate the transition to a more sustainable blue economy for the benefit of the people and future generation, which emphasises on Indonesia's modalities optimization as an archipelagic country with diverse marine resources, as well as its political and economic strategic position in the region.

The Blue Economy Roadmap is developed based on BEDF and is expected to provide a more operational guideline to promote competitive, innovative, and sustainable maritime sectors that may help enhance employment, productivity, and value contributed to the economy by including conservation into spatial planning and adhering to sustainable maritime principles, and to achieve the economic transformation. The Blue Economy Roadmap uses the comprehensive overview of the current status of Indonesia's marine sectors, along with current challenges and future trends in the BEDF as the basis for constructing mission and strategic action plans for blue economy development in Indonesia.





CHAPTER 2

Blue Economy Benchmarking

Chapter 2. Blue Economy Benchmarking

This chapter summarizes the implementation of the blue economy in other countries and in Indonesia that can become a reference for an efficient way to promote effective change. The successful experiences of others can provide lessons learned for the Blue Economy Roadmap to adopt and ensure the action plans can be implementation to good effect.

2.1 Norway: Sustainable Ocean Policies

The Norwegian government introduced international policies for the ocean economy to respond to issues in developing ocean economy. One of the main issues is the reduction of marine trash and plastics in the waters. The policies include two white papers titled "*Update of the Integrated Management Plan for the Norwegian Sea*" and "*The position of the oceans in Norway's Foreign and Development Policy*". In addition to the two white papers, the government of Norway issued their ocean strategy for new growth in 2017. With the release of the Norwegian Government's Revised Ocean Strategy: Blue Opportunities in 2019⁴⁰, the ocean strategy was updated.

In 2021, the government of Norway released a comprehensive national plan for the preservation of key marine habitats. This strategy attempts to safeguard sensitive places, rebuild ecosystems, and identify and conserve carbon-rich locations, and hence contributes to stop climate change. At the same year, a study on the value of the ocean to the globe and to Norway was also released. This report, titled Blue Ocean, Green Future, aims at mapping the importance of both the ocean and ocean related businesses. Historically, the Norway's blue economy has been heavily reliant on close collaboration between firms, the research and development institutions, employees, and governments.

The report also highlights some challenges to achieving optimal role of ocean. The challenges include emissions, litter, pollution, climate change, overfishing, biodiversity loss, as well as population growth inducing demand for food, medicines, energy, and transportation. The policies implemented to deal with the challenges are (i) increasing value creation along the supply chain of ocean industry to create employment; (ii) advancing skills development, including digitalization and automation, to respond to more advanced technology in the existing and emerging ocean industries; (iii) progressing as the global leader in ocean management to balance between goals of value creation and food security and the sustainability of the sea and ocean; (iv) expanding efforts to combat marine litter and pollution, to conserve and improve marine resource management including maintaining blue forest (carbon sink), and to facilitate environmentally friendly industries; (v) progressing the development and use of knowledge, research and technology to support sustainable growth and marine resource and ecosystem; and (vi) strengthening international cooperation in promoting sustainable blue economy, particularly in developing countries, and in achieving SDGs.

The implementation of these policies includes the strengthening of Norwegian high-tech oil and gas industry to create quality jobs, the development of green and sustainable shipping and food industries, expanding the ocean aquaculture and offshore wind industries, promoting mineral activities on the seabed, as well as the application of technology, including digitalization and automation, to develop

⁴⁰ Norwegian Ministries. 2019. Blue Opportunities. The Norwegian Government's Updated Ocean Strategy. https://www.regjeringen.no/globalassets/departementene/nfd/dokumenter/strategier/w-0026-e-blue-opportunities_uu.pdf



safe and efficient carbon capture and storage, to use hydrogen for energy source, and to develop further technology solution for ocean industries. The government of Norway also sets the focus for future ocean policy to be implemented, which are (i) strengthening skills and digitalization; (ii) creation of regional and local value; and (iii) mitigation of climate change and the expansion of green shipping. The policies also consider the importance to mainstream a green and circular economy to address future challenges. International cooperation will also be strengthened to promote better conservation of the ocean environment that will become a sustainable source of healthy food, clean energy, quality jobs and transportation.

2.2 Sweden: Blue Economy for Sustainable Growth

The government of Sweden introduced A Swedish Maritime Strategy – for People, Jobs and the Environment in 2015 to guide a holistic approach in promoting the maritime industries. The Strategy set out the vision of the Swedish maritime industry as “a competitive, innovative and sustainable maritime sector can contribute to increased employment, reduced environmental impact and an attractive living environment”⁴¹. The vision is developed based on the modalities of having the longest coastlines in Europe and strong maritime culture, the various productive activities growing from the utilization of maritime resources, as well as the need to sustainably manage the maritime resources.



Figure 5. Swedish’s Maritime Policy for Sustainable Growth⁴²

The strategy becomes the guidance for national government, local government and relevant actors to work together in promoting education, research and innovation, and development activities to achieve the vision. The implementation relies on three pillars, which are (i) a balanced marine environment; (ii) competitive maritime industries; dan (iii) attractive coastal areas. These pillars are further elaborated into strategic areas of work as follows: (i) a healthy and safe marine environment; (ii) knowledge and innovation; (iii) maritime spatial planning; (iv) functional rules and efficient permit process; (v) international cooperation; and (vi) conditions for the business sector and industry-specific measures processes. These areas guide the implementation of maritime policies in priority sectors, which are transportation, maritime technology and production, marine foodstuffs, energy, minerals and bioresources, leisure and tourism, dan service.

⁴¹ Government Offices of Sweden. 2015. A Swedish Maritime Strategy – for People, Jobs and the Environment. <https://maritime-spatial-planning.ec.europa.eu/practices/swedish-maritime-strategy>

⁴² Hallberg, M. 2023. Towards a Sustainable Blue Economy Experiences from Sweden. Unit for Manie Spatial Planning. Swedish Agency for Marine and Water Management.



The government of Sweden is working on the monitoring and evaluation framework. There are 28 indicators for the framework which are divided into achieving the three pillars. The 28 indicators are described in the illustration below:

Table 7. Indicators in Achieving the Blue Economy Development Vision⁴³

No.	Competitive Marine Industries	A Balanced Marine Environment	Attractive Coastal Areas
1	Maritime industries, employment, value added and export value	Eutrophication, nitrogen, and phosphorus load	Attractive living, share of population at coastal zones
2	National relative competitiveness	Environmental toxins in herring and shellfish	Access to jobs, share of employment at coastal zones
3	Maritime innovation index	Sustainable stock fish and shellfish	Education level in coastal areas
4	Transport regulation/information	Public health: Bathing water quality	Public health: Remaining average life experience
5	Sweden's shipping fleet	Marine debris on beaches	Public health: Local economic standard
6	Off-shore energy	Reduce risk of flooding	Maritime tourism, employment and turnover
7	Catch of fish and shellfish	Climate impact of maritime industry	Visitor attraction, guest night at coastal areas
8	Aquaculture production	Coastal marine spatial planning	Maritime guest night
9	Digital connect coastal areas	Marine protection area	Visitors seasonal extension
10	-	Accidents and incident on sea	-

In 2023, the Stockholm Environment Institute, funded by FORMAS—the Swedish Government Research Council for Sustainable Development, in collaboration with Mistra—the Swedish foundation supporting environmental research and sustainable development, and Vinnova—Sweden Innovation Agency, and in consultation with the Swedish Agency for Marine and Water Management (SwAM) and Swedish Government Offices, releases the report titled *Towards a Sustainable Blue Economy in Sweden*. The report highlights the progress of a sustainable blue economy in Sweden, including how research, innovation and business in Sweden can support global green transition in blue economy development. The report also becomes the first comprehensive report on blue economy development in Sweden. It describes information about businesses; employment; exports; investment in wave energy; environmental innovation; blue food (commercial fishing and beyond); offshore renewable

⁴³ Hallberg, M. 2023. *Towards a Sustainable Blue Economy Experiences from Sweden*. Unit for Marine Spatial Planning. Swedish Agency for Marine and Water Management.



energy; tourism and recreation; and shipping. The report also highlights the importance of cross-cutting collaboration to promote a sustainable blue economy supported by sound innovation ecosystem, institutional arrangement to manage human social and economic system, and further works needed to sustain the collaboration.

Besides current effort in consolidating collaboration in blue economy, the government of Sweden also promotes collaboration for better Marine Spatial Planning (MSP) in the region. SwAM which has the responsibility for the national management of Sweden's marine and freshwater environments including fisheries management has been working with a broad perspective and broad collaboration, both internally (the Swedish Government) and with external partners (The EU) in applying MSP for the Gulf of Bothnia, the Baltic Sea, the Skagerrak Strait, and the Kattegat Gulf. It promotes how the sea can be used efficiently and sustainably, now and in the future. In concrete terms, this may be about where offshore wind turbines should be located, where electric cables can be laid and how commercial fishing can be developed. The implementation follows the three European Union (EU) strategies, namely (i) save the sea, (ii) connect the region, (iii) increase prosperity. There are four priority programs in the development of the Baltic sea, which are (i) innovative society that focuses on resilient economies and community, and responsive public services; (ii) water smart societies that focus on sustainable water, and blue economy; (iii) climate-neutral society that focuses on circular economy, energy transition, and smart green mobility; and (iv) cooperation governance that focuses on project platforms, and macro-region governance.

2.3 Seychelles: Blue Financing for Promoting Sustainable Blue Economy

The Government of Seychelles has adopted the concept of blue economy to support sustainable economic progress based on the use of ocean and coastal resources while at the same time improving human and environmental wellbeing. The blue economy is applied to improve Seychelles' comparative advantage in terms of geographical characteristics, interaction between its population and the ocean and coastal resources for food, fisheries, trade, tourism and travel, as well as the need to sustain the resources for its future generation. In 2015, the government of Seychelles established the Blue Economy Department under the Ministry of Finance and Trade and renamed the ministry into the Ministry of Finance, Trade and Blue Economy.

In 2018, the government of Seychelles introduced the Blue Economy Strategic Policy Framework and Roadmap (2018-2030) with the vision *"To develop a blue economy as a means of realizing the nation's development potential through innovation, knowledge-led approach, being mindful of the need to conserve the integrity of the Seychelles marine environment and heritage for present and future generations"*⁴⁴. The roadmap outlines seven principles to include economic efficiency, sustainability, social equity, good governance, resilience, research and innovation, and partnerships. The principles guide the implementation of four pillars of the blue economy, which covers economic diversification and resilience, shared prosperity, food security and integrity of habitats and ecosystem services.

The four blue economy pillars are translated into four key strategic priorities, each is further elaborated into priority actions and investment plan. The expected outcomes are measured using seven indicators, which are (i) increased investment on existing ocean-based economic sectors (fishery, tourism and ports); (ii) the growth of new and emerging maritime sectors (marine-based

⁴⁴ Republic of Seychelles. 2018. Seychelles' Blue Economy Strategic Policy Framework and Roadmap: Charting the Future 2018-2030. http://www.seychellesconsulate.org.hk/download/Blue_Economy_Road_Map.pdf



aquaculture, renewable energy, offshore petroleum and marine biotechnology); (iii) increased resilience to reduce economic and environmental risks, as well as reliance on imports of food and energy; (iv) improved protection of ocean space and resources; (v) new research, innovation and knowledge creation; (vi) improved capacity in sustainably managing ocean and the utilization of ocean resources; and (vii) improved capacity in preventing risks from IUU fishing, marine pollution and climate change. The implementation of priority actions applies an integrated, transparent, inclusive and accountable cross-sectoral management, and is supported by an adaptive monitoring and evaluation framework aligned with SDGs.

The implementation of the blue economy framework and roadmap are supported by relevant master plan, including the Fisheries Management Plans and the Aquaculture Master Plan. The government of Seychelles also devises some thematic areas enabling the growth of economic activities and investment, as well as the ensuring the ocean and coastal conservation. Seychelles also becomes the first country to successfully issue the blue bonds. This sustainable finance is expected to raise capital to support projects related to marine and ocean resources, both for value creation and protection. The government of Seychelles also actively promotes the blue economy development globally, and particularly among Small Island Developing States. Overall, the development of blue economy in Seychelles is expected to ensuring food security, economic diversification, job creation, and marine environment sustainable management. The focus on blue economy development is to strengthen the use of marine, land and other resources for sustainable development.

2.4 Mauritius: Blue Economy for Economic Transformation

The government of Mauritius has put blue economy as its economic transformation pillar aiming at balancing activities related to increasing economic growth, sustainably managing ocean resources and ecosystem, and promoting social inclusion. The implementation is supported by devising careful policy, planning, and management, through the creation of an Oceans Economy Roadmap, as well as the establishment of a dedicated government institution for managing ocean related policies and activities, which is the Ministry of Blue Economy, Marine Resources, Fisheries and Shipping. These policy and institutional instruments are expected to allow Mauritius to sustainably coordinate stakeholders in the use of the economic potential of and, at the same time, maintaining the country's ocean resources. Mauritius has set the target of doubling the GDP contribution of the blue economy from 10.5 percent to become 20 percent by 2025.

From the economic purposes, the blue economy covers the diversification and expanding the value chain in some priority sectors including fisheries, aquaculture, energy (waves and currents), seabed exploration (minerals and hydrocarbons), marine-based manufacturing (seafood processing, shipbuilding and repairs, salt, pharmaceutical), transport and trade, coastal tourism, ocean knowledge and marine biotechnology, including deep ocean water applications (DOWA). The fisheries sector is expanded to include 42 species of fish as well as the cultivation of seaweed to support Mauritius as a seafood hub and to diversify its role as one of the biggest tuna exporters to Europe, other African countries and Caribbean. The development of aquaculture involves cooperative societies and small-scale aquaculture. The infrastructures to support blue economy, such as ports and harbours, have also been improved significantly following international standards. The deepening of ocean knowledge is supported by research, surveys and trainings.



At the same time, Mauritius also applies technological and innovative solutions to mitigate the impact from climate change through promoting low carbon and sustainable practices. A plastic bag-free policy was adopted in 2016. Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP) are managed by the Ministry of Environment, Solid Waste Management and Climate Change that safeguards government commitment in coastal environment protection. Mauritius has also promoting MSP to cover fisheries, aquaculture, seafood processing, port infrastructure, shipping, coastal tourism, underwater cultural heritage and marine-based renewable energy as a part of its economic transformation effort. The implementation of ICZM and MSP is strengthened through stakeholders' participation, both from public and private actors, in managing holistic plan and management based on shared data and information. Mauritius' ocean conservation strategy is aligned with the implementation of SDGs. To advance the blue economy sector, Mauritius is now working on expanding collaboration in the region to promote better framework for policy change towards a sustainable blue economy.

2.5 Maldives: Waste Management

Within 100 metres of its seashore, the Maldives is perfectly situated to take advantage of the blue economy, which refers to the sustainable utilisation of ocean resources for economic growth and better living conditions. Nonetheless, the Maldives' fragmented topography, which includes 1,190 coral islands strewn across 90,000 square kilometres, presents particular difficulties. The Maldives' Ministry of Environment is carrying out the Coastal Protection Projects with assistance from the World Bank in order to protect its coastline and strengthen its booming blue industry.

Maldives has excelled in waste management since using the blue economy philosophy. The rubbish produced by the nation's holiday islands and its international airport is roughly six times greater than that produced by the local population. In order to enhance the use of bulk water as a substitute for plastic bottles and to encourage recycling and reuse, the government of the Maldives is eager to put into place a national solid waste management policy. The country's capital, Malé, where one-third of the people reside, serves as proof that environmental sustainability is feasible. All citizens have access to a sewer system, and sanitation has been made widely available. Now, the World Bank is supporting the construction of a sewerage treatment plant in Hulhumalé, in the south of the North Male Atoll, to prevent untreated sewage from being released into the ocean. Overall, out of 186 islands, 66 have adequate sewer facilities, while work on 27 other islands is ongoing.

2.6 The Caribbean Region: Ocean Principles to Safeguard Blue Economy Development

The Caribbean region has the Ocean Principles for the Caribbean Blue Economy (Ocean Principles) which were created by the World Bank. These principles aimed to help the Caribbean countries in understanding the benefits of their natural resources, managing them in the Blue Economy, and guiding policy-making and investment. They consist of (i) sustainable development/sustainable livelihoods, which emphasise the optimal use of natural resources and their availability for future generations; ((=ii) marine ecosystem health, which focuses on maintenance, restoration, and protection of marine ecosystems diversity, productivity, and core functions; (iii) integrated ocean governance to achieve the sustainable blue economy transition; (iv) science-based, precautionary and adaptive decision-making in response to the absence of the related information and data in marine planning and management; (v) duty of care and accountability, which focuses on appropriate action



and transparency of the activities impacts; and (vi) inclusive and transparent decision-making to ensure the information is well received by all parties in common grounds.

2.7 Indonesia: Marine Protection and Sustainable Coastal Development

2.7.1 The Eradication of IUU Fishing in Indonesia for Fisheries Resources Sustainability

Illegal, unreported, and unregulated (IUU) fishing has been illegal for many years in Indonesia. Fish supplies are depleted, and both human and non-human life are lost as a result of IUU fishing practices harming ecosystems and natural resources. To respond to IUU fishing, the government of Indonesia enacts Presidential Regulation Number 115 Year 2015 to accelerate the elimination of IUU fishing, which includes all fishing operations conducted both on the high seas and within national jurisdictions. The result includes progressive reduction of overfishing that benefits production and the well-being of coastal populations. The loss inside the exclusive economic zone (EEZ) has dropped by at least 25 percent since the anti-IUU fishing policy was put into place. The amount of fish caught in Indonesian fisheries has also grown. Yet, there are still undocumented fisheries production captures that need to be addressed. Better coordination in surveillance is expected after the central government decided to give the provincial government with the supervisory role on marine capture fisheries practices within the area up to 12 miles from coast, and the central government will supervise marine capture fisheries in the area beyond 12 miles from coast.

2.7.2 Managing Marine Protected Area

To achieve SDG 14, Indonesia has pledged to designate 32.5 million hectares, or 10 percent of its territorial seas as marine protected areas by 2030. About 28.91 million hectares of marine protected areas (MPAs) has been established by the end of 2022, with 9.93 million hectares under the management of the national government and 18.98 million hectares under the management of the provincial government. Based on the amount of utilization, Indonesia's MPAs are separated into four zones, which are a core zone, a limited sustainable fishery zone, a utilization zone and other zones. A core zone is a completely locked off region that is only accessible for research and education purposes. This area acts as a nursery for marine resources, a hub for replenishment, and a spill-over area for the area around it. Limited sustainable activities, including eco-tourism and ecologically friendly fishing, are permitted in the sustainable fishery zone, utilisation zone, and other zones. By preserving crucial marine ecosystems, the creation of MPAs is expected to promote management of marine resources in a more sustainable way and, at the same time, allow those whose way of life depends on the ocean to gain socio-economic benefits from the resources.

2.7.3 Making Near-Shore Fish Stocks More Sustainable through Improved Fisheries Management and Capacity Building in Indonesia

The Indonesian government and Rare, an international conservation group, collaborated in 2018 to create the largest Territorial Use Rights in Fisheries (TURF) network in the world. Around 58 local leaders in the Dampier Strait, now in Southwest Papua Province, signed an agreement for the creation of 21 inshore marine waters protected zones as part of this framework. In Indonesia, near-shore marine habitats are the most seriously threatened by overfishing and ecological degradation, although 90 percent of fishers work in these regions. The creation of these new protected areas coincided with the granting of local communities' exclusive fishing rights as well as a new framework for fisheries regulation that includes several conservation measures such as fish minimum size limitations, bans on



destructive fishing, and seasonal restrictions. This initiative not only integrates social and environmental aspects, but it also gives fishers access to loans and helps them improve their fishing gear and methods. This project promotes the environmental sustainability of the fishing industry, while also enhancing the lives and food security of fishers via improved marine conservation and coastal fisheries management.

2.7.4 Blue Economy and Small-scale Fisheries

Local wisdom for sustainable marine resource management can be found in many regions in Indonesia. For some local communities practising tradition, local wisdom has played a central role in human social relations and has become the cohesion building instrument between humans and nature. One of the local wisdoms related to natural resources is *sasi*, which is a local practice that aims to regulate the use of natural resources by people in a village or clan—utilizing for supporting livelihood combined with cultural values and respect for the environment.

The Moi tribe, one of the tribes in Sorong (now in West Papua Province) and Haruku Island in Maluku Province, has long understood the concept of traditional conservation according to their customs. In their cultural tradition, the conservation practices of *sasi* are known as "*egek*", which means prohibition. The essence of *egek* is to utilize fishery resources through a fisheries open and close system integrated with customary law and positive law. This practice supports the flourishing of fisheries activities and ecosystem protection by prohibiting catching several types of marine products and fishing gear that are considered damaging to the ocean's biodiversity, such as coral reefs.

In setting up a traditional conservation area (*egek*) for the Moi Tribe, the consideration should always be based on the availability of the nature potentials (core zone). This topic will then be discussed in the routine gatherings attended by the local community and several neighbouring villages. This deliberation seeks to inform the public about boundaries and the nature potentials that *egek* will preserve. This practice can take around two to six years of preservation, creating value up to IDR 300 million once it is ready to be harvested. *Egek* is not only contributing towards the improvement of the socio-economic conditions of the local people but, at the same time, promoting selective fishing practices.

2.7.5 Community-based sustainable livelihoods development in Marine Protected Areas

The Alor Islands, known for being a conservation area, serves as a natural habitat for thresher sharks in East Nusa Tenggara Province of Indonesia. The importance of thresher sharks (*Alopias pelagicus*) as a flagship species in a particular marine environment cannot be underestimated. Nevertheless, the population of thresher sharks shows a declining trend due to overfishing both intentionally and as bycatch, which has led to their listing as endangered. With the determination to protect the thresher shark population in the waters of the Alor Islands, a local NGO in collaboration with the local government of the district and province has successfully developed a community-based conservation approach.

Through advocacy efforts to shift the livelihoods of fishers and their families to alternative sources of income, complemented by policy measures to provide full protection for thresher sharks, significant progress has been made. The advocacy process includes living in the communities to understand the way of life of the communities and the traditional practice of catching thresher sharks. By doing so, local champions with can be identified and their capacity subsequently can be improved to become advocates for their communities. At the same time, for participating households in the communities,



the wives are invited to form a group and receive training and mentoring to create home industries and increase added-value from local commodities such as fish, corn, honey and local woven fabrics. Each group works together to process corn and honey to produce healthy granola, to process tuna fish to produce fish floss, and to use thresher shark design in their woven fabrics. The involvement of young generation in local ocean resource safeguarding is also growing indicating a promising future of sustainable ocean environment in the communities. The NGO also successfully works together with local primary schools in other communities to develop an ocean literacy curriculum to increase students' awareness about their ocean environment since early age.

In addition to the collaboration between the local NGO and the local government, a provincial level policy on the management of thresher sharks in the marine protected areas has been formulated⁴⁵. The NGO plays a crucial role by providing scientific data and information on the movement patterns of thresher sharks, while the government follows up by developing a framework for the management policy, demonstrating a strong commitment to protect the shark population from declining. This exemplifies a positive approach to on-site collaboration, highlighting how such collaboration at the grassroots level can contribute significantly to the development of a blue economy within the community.

Some challenges are still yet to be dealt including to expand the participation from local community members, as well as the production capacity and market outreach of local products (granola, fish floss and thresher shark woven fabrics). Some innovations are also sought to allow many more local products to be processed and to create better source of income for the communities that have a thriving commitment in safeguarding the health of ocean environment. Other challenges include securing funding for the management of marine protected areas, as there is insufficient fiscal support from the local government. Additionally, providing necessary infrastructure and livelihood opportunities for the local community, as well as establishing a regulatory framework for the utilization of conservation areas while preserving the areas, are crucial. This will enable financial benefits and the sharing of authority and revenue between the provincial and city governments, while fostering stronger relationships among stakeholders, including the local communities

2.8 ILO: Better Labour and Working Condition in Fishery Sector

2.8.1 Labour and Working Condition in Fishery Sector

In its centenary International Labour Conference (ILC), ILO adopted a Centenary Declaration of the Future of Work which, among other factors, is driven by climate change. Based on the declaration, ILO implements the Sea Fisheries Project, funded by the United States Department of State, which aims to reduce human trafficking and labour exploitation in the fisheries sector by strengthening coordination and increasing the efficiency and effectiveness of existing national and regional anti-trafficking efforts in Indonesia and throughout South-East Asia. In addition, the project also strengthens coordination at the national and regional levels by establishing a regional coordination body that specialises in the fishing sector.

The result found that there are some potential decent work deficit that needs to be addressed for Blue Economy implementation, for example (I) The need for social protection systems will increase as

⁴⁵ East Nusa Tenggara Governor's Instruction No. Dis Pkl 188.48/B1.57/VIII/2022 concerning Prohibition of Catching and Trading of thresher sharks (*Alopias pelagicus*) in the Marine Protected Areas of the Province of East Nusa Tenggara.



temperatures increase, precipitation patterns change, and natural disasters become more common and intense; (II) Unemployment protection schemes need to cover more workers and support those who lose their jobs in the shift to an environmentally sustainable economy; (III) Cash transfer programmes can help people cope with environmental events or natural disasters. Moreover, changes in technology and a shift in environmental attitudes to address climate change and the Blue Economy can minimize layoffs and provide adaptable skills through skilling, reskilling, and upskilling.

2.8.2 Harmonizing Central and Local Regulatory Frameworks for Improving the Monitoring of Fishery Sector Working Conditions

The ILO Ship for Shore program has initiated efforts to improve coordination and develop a regulatory framework at the provincial level to conduct a joint inspection of the fisheries sector. The joint inspection ensures the implementation of safe and healthy working conditions that require regulation support at the local level. This is in line with the decentralisation context in Indonesia, in which provincial governments play a significant role in developing and implementing cross-region regulations, including in the fisheries sector. To speed up the process, the program works with relevant provincial government offices in East Java Province and West Java Province. The Project is now working with relevant government stakeholders in reviewing the existing policy and regulations against the International Labour Standard, specifically ILO Convention 188 on Working in Fisheries. Once the provincial regulation is enacted based on participatory processes involving relevant stakeholders, a capacity building series will be conducted to better equip relevant officials undertaking labour inspection in the fisheries sector and to ensure compliance with safety and work norms. Currently a series of interventions have been made from policy formulation, campaign and advocacy, capacity building and pilot projects. As the result, several stakeholders, including central and local governments, social partners, educational institutions, and other relevant interests, are engaged to close the gap between the needs of industry and the supply of labour in this sector, with the goal of delivering long-term results.

The 8.7 Accelerator Lab under ILO has also developed a checklist for reviewing the implementation of working conditions in the fisheries sector. The project in collaboration with Ship for Shore program is jointly working to improve inspection models involving relevant local government stakeholders. The project aims at improving coordination with relevant stakeholders who have different roles and tasks in addressing decent work deficits in the fisheries sector. The project conducted an assessment reviewing existing regulations to be better coordinated and in line with International Labour Standard ILO Convention 188 on work in fisheries. The relevant stakeholders involved in developing the inspection model are the Manpower, Marine and Fisheries and Transportation offices. The program will last for four years to improve the skills and competencies of Indonesia's maritime workforce. In order to increase the productivity of the industry, including its seaports. In the program, the activities will also be carried out to modernize curriculum, standards and qualifications for maritime vocational education in maritime logistics, shipping, shipbuilding and the economy of coastal communities.

2.9 Stockholm University and Stanford University: Blue Food Assessments

A global effort in achieving the more diverse, resilient, just, and healthier food system, Stockholm University in collaboration with Stanford University, EAT (the science-based global start-up/platform for food system transformation), and other 25 institutions around the world construct the Blue Food Assessment (BFA), which provides the scientific foundation for decision-makers to make blue foods



part of an improved food system. Blue foods are defined as animals, plants and microorganisms, as well as cell- and plant-based foods of aquatic origin emerging from new technologies⁴⁶. They present myriad options for supplying nutrients (including omega-3, vitamin A, B12, calcium, iodine, iron, zinc) compared to domesticated terrestrial animal-source foods (for example beef, poultry, and pork).

Blue Foods are recognized for their potentials to improve human health through reducing micronutrient deficiencies that can lead to subsequent diseases; providing the dominant source of DHA+EPA, which may reduce the risk of heart disease and promote brain and eye health; and displacing the consumption of less-healthy red and processed meats that can cause adverse health outcomes. Furthermore, they are beneficial for filling the nutrient gap with bioavailable forms of micronutrients, particularly in geographies where blue foods reliance and nutritional deficiencies are high, such as equatorial region; lowering greenhouse gas emissions as they have lower environmental footprints than land-based foods; supporting the vulnerable as the increased blue foods production and consumption disproportionately improved the intakes of women and girls (average of 51.4 percent of countries) over men and boys (average of 18.2 percent of countries); and supporting 800 million livelihoods in the blue food sector.

Blue foods are produced in a wide variety of systems. They range from large industrial fishing vessels on the high seas to small fishponds integrated within agricultural systems in each country, such as inland lake-fisheries in Canada, fish processing cooperative in Mexico, Anchoveta fisheries in Chile, Trawl Fishing in United Kingdom, Pluriactive crop farming and fisheries in Zambia, Fisher-women in Myanmar, Pirogue fisheries in West Africa, Salmon Aquaculture in Norway, Seaweed Harvesting in Tanzania, Fresh-water shrimps in Bangladesh, Integrated rice-carp aquaculture in China, and Mussel aquaculture in New Zealand.

According to the Report of Blue Food Assessment (2021), Blue foods are the most highly traded food commodity. They resulted in \$38 billion export revenue a year in 2018 in developing countries. However, Blue Foods are also facing environmental challenges. Some of their sectors depend on healthy aquatic ecosystems that are being compromised by climate change and other stressors. To achieve the climate-resilient Blue Foods, several countries are taking actions to mitigate the risks.

Countries with low to medium vulnerability with their high dependence on marine fisheries and poor environmental performance of aquaculture such as Ghana, Palau, Peru, Timor-Leste and Viet Nam, are prone to high climate risk for just one or two food system outcomes which can be reduced by targeted interventions in specific areas through designing measures to effectively balance between supporting economic development aspirations through efficiency and revenue generation. However, supporting food security through local and domestic consumption of fish will be one the challenges to face.

On another side, achieving climate-resilient Blue Foods for highly vulnerable countries such as Bangladesh, Cambodia, Central African Republic, Malawi, Côte d'Ivoire, El Salvador, Madagascar, Belarus, Bosnia and Herzegovina, and Israel which are facing compound climate risk from freshwater and deltaic fisheries, aquaculture, or from marine fisheries is most challenging and urgent as these countries are projected to have the greatest number of food system outcomes. For such countries, resilience efforts focused on aquatic food systems provide options such as nature-based solutions,

⁴⁶ Golden, C.D., Koehn, J.Z., Shepon, A. et al. Aquatic foods to nourish nations. *Nature* 598, 315–320 (2021). <https://doi.org/10.1038/s41586-021-03917-1>



sustainable intensification, livelihood diversification and investments in local value chains as a part of a more generalised resilience framework that addresses the social dimensions of vulnerability.

2.10 Australia and Global Collaboration: Aquatic and Coastal Tourism

Coastal and marine tourism represents at least 50 percent of total global tourism and constitutes the largest economic sector for most small island developing states and many coastal states⁴⁷. In Asia and the Pacific, coastal and marine tourism are major sources of employment in most Small Island Development States, two-thirds of which rely on tourism for more than 20 percent of their GDP in 2019⁴⁸. This applies to Australia, which has been putting the emphasis on its aquatic and coastal attractions (beaches, marine wildlife, The Great Barrier Reef, remote coastal/marine/aquatic locations, coastal lifestyle, island experiences) for its tourism campaign since 2016 and had established 62 marine parks around the country.

In its development, Tourism Australia partnered with The New School (TNS) and Google Think Board to understand the potential of Virtual Reality (VR) as a marketing and promotional tool for marine tourism businesses and destination marketing organisations. Tourism Australia developed 18 different VR film sequences in collaboration with Finch, Vrse and Clemenger BBDO, with the aim of bringing Australia's immersive aquatic and coastal offering to customers in selecting vacation destinations. The campaign helped drive a 9 percent increase in visitation and 64 percent rise in engagement on Australia.com, with length on site exceeding eight minutes.

Three dimensions or 'pillars' of sustainable development are now well recognised in coastal and marine tourism⁴⁹ which includes environmental sustainability, economic sustainability, and social sustainability. In Australia, The Nature Conservancy has initiated a national programme to rebuild and restore Australia's lost shellfish reefs in partnership with state and commonwealth governments which resulted in addition of 375 kilograms (kg) of new fish stocks; filtration of 2 billion litres of seawater (equivalent to the annual water use of 21,000 Australians); and removal of 225 kg of nutrient pollution (nitrogen and phosphorous) in coastal areas. In Latin America, the InterAmerican Development Bank launched a collaboration with the UNWTO to finance sustainable tourism development. Businesses that won financing through the challenge include the Green Fins Global Hub with its aims at supporting small marine tourism enterprises in Costa Rica and the Dominican Republic to achieve higher environmental standards, and Experience Nariva (Trinidad and Tobago), which pursued to stimulate ecotourism in the Narira Swamp, a Ramsar-protected site, to benefit local communities and create incentives for good environmental stewardship.

2.11 Technology and Innovation

Looking beyond the general picture of recent advances in science and technologies, a focal point of the report concerns innovations, and combinations of innovations, which may have the capacity to foster both economic development and ocean sustainability. This is accomplished by presenting four

⁴⁷ Ocean Panel. 2022. Opportunities for Transforming Coastal and Marine Tourism. Towards Sustainability, Regeneration and Resilience. 2022. <https://oceanpanel.org/opportunity/sustainable-coastal-marine-tourism/>

⁴⁸ Asian Development Bank, 2022. With These Actions, Coastal and Marine Tourism can have a Bright Future. <https://www.adb.org/news/features/these-actions-coastal-and-marine-tourism-can-have-bright-future>.

⁴⁹ Ocean Panel. 2022. Opportunities for Transforming Coastal and Marine Tourism. Towards Sustainability, Regeneration and Resilience. 2022. <https://oceanpanel.org/opportunity/sustainable-coastal-marine-tourism/>



in-depth case studies of innovation that were chosen due to the widespread interest they spark globally and the range of technological and business maturity that allows for the development of some valuable lessons. The four case studies are: floating offshore wind power; conversion of decommissioned oil and gas rigs and renewables into artificial reefs; advances in ballast water treatment to combat the spread of (alien) species; and innovations in the marine aquaculture sector which contribute to making the industry economically and environmentally more sustainable.

The fact that science has been obviously at the forefront of or at least the foundation of progress in every sector highlights the critical role that science plays in the ocean economy. Moreover, the breakthroughs are seldom created "stand-alone"; rather, they work in tandem with, or at the very least, in close proximity to, other technologies and inventions.

For instance, new foundation designs, the use of composite materials in the production of turbine blades, and the deployment of marine automated unmanned vessels (AUVs) and remotely operated vehicles (ROVs) for monitoring, inspection, maintenance, and repair of offshore facilities will all contribute to the steep drops in energy costs anticipated for floating offshore wind turbines. In marine aquaculture, a variety of methods are being used to address the issues of disease prevention, control, and treatment. These methods include hyperspectral analysis for locating lice infestations and improvements in breeding for greater disease resistance (e.g., marker assisted selection) and new generations of vaccines. Research has led to the development of hundreds of various applications for the treatment of ship's ballast water, using a range of underlying technical concepts, including ultraviolet, oxidation and de-oxygenation, electrolysis, ultrasound, and heat.

Table 8. Step Change Progress in the Development of Sustainable Ocean Activity Requires Multiple Innovations from Different Disciplines and Sectors⁵⁰

Floating wind energy	Rigs/Renewables to Reefs	Ballast water treatment	Marine aquaculture
Siting (e.g., satellite remote sensing +modelling)	New types of well plug	Detection of organisms & bacteria (e.g., lab-on-chip techniques, new-generation DNA etc.)	Sitting/area-wide assessment (earth observation high spatial resolution; GIS mapping + modelling)
New construction and inspection (e.g., rotor blades, foundations)	Subsea vehicles for materials and methods survey	Conventional disinfection processes (e.g., ultraviolet irradiation, electro- chlorination)	Breeding (selective breeding, genome sequencing, marker assisted selection)
New designs (e.g., twin hulls/multi-turbine arrays, dynamic cable systems)	DNA barcoding, population fingerprinting for connectivity analysis	New environmentally friendly treatments, e.g., pasteurisation	Feed (micro-algae, plant- and insect-based, fish oil replacements)
Inspection, maintenance & repair (e.g., AUVs / ROVs, AI-driven monitoring)	For renewables – ecosystem impact modelling of biomass aggregation		Waste management (IMTA, sensor-platforms, decision algorithms) and disease control (eDNA tools, mass spectrometry +AI, use of cleaner-fish)
	Network analysis and modelling tools		Open ocean engineering

⁵⁰ OECD, 2019. Rethinking Innovation for a Sustainable Ocean Economy. <https://doi.org/10.1787/9789264311053-en>



2.12 Industry and Logistic: Blue Economy and Logistic Connectivity through Maritime

Two of the six established industries included in blue economy are maritime transport and port operations. Around 90 percent of all global trade is moved over the sea, making shipping a key facilitator of world trade and economic growth. Shipping is a substantial source of waste that pollutes the marine environment, even if it is a tiny contributor to marine pollution in comparison to other human activities. Shipping emits a significant quantity of air pollution, with greenhouse gas emissions (GHG) accounting for 2.6 percent of all world emissions in 2012 and projected to increase by more than 3.9–6.5 percent by 2050. By putting a number of measures and operating practises into place, GHG emissions might be significantly reduced. Ports, in addition to ships and their operations, are a substantial contributor to environmental pollution, and although they are the primary consumer of shipping's emissions, their actions appear to have a direct impact on the carbon footprint of shipping. Shore power plants help reduce the environmental impact, but there are significant issues with the financial incentives and the regulatory framework.

On 2014, the European Union Parliament and Council enacted a directive 2014/94/EU to promote the use of alternative infrastructure⁵¹ for increasing efficiency as well as reducing greenhouse gas emissions in the transport system by 2050. The new International Maritime Organization (IMO) standard went into effect in 2020 also requires sulphur emissions in shipping to be reduced from the current level of 3.5 percent to 0.50 percent m/m. It is true that the shipping industry uses out-of-date fuels, some of which are no longer used in any other transportation sector, while the high sulphur dioxide emissions in the environment and the new IMO standards together necessitate the use of alternative fuel sources/types. By using LNG as a fuel or scrubbers to "clean" the pollutants before discharge, ships can comply with the reduced sulphur emission regulations mentioned above.

Electricity is a new and promising option that is assisting the marine industry in moving closer to decarbonization. This is in addition to the highly advocated usage of liquefied natural gas in shipping, to reduce dependency on oil. Electric boats can meet the demands of wider maritime connections, for example in electric boats in the Greek islands in the Aegean and Ionian Sea can allow over 100 short maritime connections, with around 30 of them being separated by about 5nm, since electromobility is perfect for short distances. There is a huge prospect for hybrid technologies and clean energy because the power used in those connections will be produced by renewable energy sources situated on the islands.

More and more ports apply green policy to help reduce emission. A strategy known as environmentally differentiated port fees is used in 28 percent of the busiest ports; it frequently takes the form of reduced port taxes for "greener" boats depending on particular traits. Another strategy is to provide facilities in the ports to allow vessels to charge their batteries while at berth. A research-based Electrification of Eastern Mediterranean Corridor (EIMed) project⁵², for example, has installed shore side power interconnection known as "cold ironing" in Koper port in Slovenia, Limassol port in Cyprus, and Killini port and Piraeus Port in Greece to reduce air pollution in the port area. Such application can

⁵¹ Directive 2014/94/EU of the EU Parliament and of the Council of 22 October 2014 on the Deployment of Alternative Fuels Infrastructure. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0094>

⁵² Pournara, A., Emmanouil, C., and Kungolos, A., 2019. The Challenges of Blue Economy: Marine Pollution, Port and Shipping Sustainability. Conference: 7th International Conference on Environmental Management, Engineering, Planning and Economics (CEMEPE 2019) and SECOTOX. https://www.researchgate.net/publication/348311140_The_challenges_of_Blue_Economy_Marine_pollution_Port_and_Shipping_Sustainability



eliminate environmental impact and, thus, be categorized as "green shipping". The cold ironing technology has been applied in these 28 ports throughout Europe⁵³. The application of these technologies will revolutionize the maritime transportation industry.

Various regulations, policies, programs, projects and local wisdom outlined in this chapter become resourceful input for the development of Indonesian Blue Economy Roadmap. They produced many recommendations that can be used to shape up strategies and action plans for sustainable development of the maritime sector to promote sustainable economic growth and development while protecting the marine environment and the livelihoods of local communities that depend on it.

⁵³ WCPI, 2018. Existing fleet and current orderbooks. <http://lngbunkering.org/lng/vessels/existing-fleet-orderbooks>.



An underwater photograph of a vibrant coral reef. The scene is dominated by large, rounded, light-colored coral structures that create a textured, undulating landscape. Several bright yellow butterflyfish are swimming among the coral, their bodies contrasting sharply with the blue water and white coral. In the background, a large, rounded coral formation rises, and the water is filled with numerous small, dark fish, creating a sense of a busy, healthy ecosystem. The lighting is bright and clear, highlighting the intricate details of the coral and the movement of the fish.

CHAPTER 3

Vision, Outcomes and
Priority Sectors

Chapter 3. Vision, Missions, Outcomes and Priority Sectors

3.1 Vision, Targets and Missions

The narrative vision of blue economy development in Indonesia is constructed based on good international development practices and, at the same time, is aimed at inspiring stakeholders in Indonesia on how they can do and contribute in assuring an inclusive and sustainable blue economy in Indonesia. **The vision of blue economy development in Indonesia by 2045** is to realize that

“Our diverse coastal and marine resources are sustainably managed through a knowledge-led Blue Economy to create socio-economic prosperity, ensure a healthy marine environment and strengthen resilience for the benefit of current and future generations.”

The vision contains some very important messages. It shows how Indonesia puts the safeguard of its resources and environment as priorities, so that they can become a powerful modality for development purposes. The safeguarding will be implemented through better use of information, data and research, complemented by the strengthening of technology capability and innovation, to create socio-economic well-being for the people, ensure a sound marine environment, and strengthen resilience for now and in the future. This vision is hopefully well-rounded and influential to drive joint collaboration among stakeholders to realize a more complete goal of blue economy development in the future.

Blue Economy development aims to become a source for sustainable and inclusive growth for Indonesia. It relies on the balance of social, economic and environmental pillars of sustainable development, and translates the achievement of the three pillars into **three main targets**, which are GDP contribution of the maritime sector, maritime employment, and percentage of Indonesia’s marine environment designated as Marine Protected Area (MPA). The commitment to achieve all three targets is a step towards achieving Indonesia's Blue Economy Vision. The targets are as follows:

1. The preservation of marine environments is a key target for balancing quality economic growth and social wellbeing. Indonesia endeavours to **increase its marine protected area to 30 percent or 97.5 million hectares of its waters by 2045**. These efforts will preserve marine biodiversity and restock fisheries while providing ecosystem services such as carbon absorption and protecting valuable assets. This will protect essential ecosystems such as mangroves, seagrass beds and coral reefs.
2. GDP contribution of the maritime sector is a key target to illustrate the significance of the maritime sector in creating added value for the Indonesian economy. By 2045, it is targeted that **the GDP contribution of the maritime sector to reach 15 percent**. The target is in line with the National Long-term Development Plan 2025-2045.
3. Employment is a key target to illustrate the role of the maritime sector in creating and improving social well-being. It is expected that **the maritime employment can contribute to 12 percent of total employment in Indonesia by 2045**.

An additional target is also applied to reflect the overall progress of blue economy development in Indonesia. The target refers to the projection of the Indonesian Blue Economy Index (IBEI) value comprising three blue economy development pillars (see Section 5.5 for a complete description on



IBEI). The value of IBEI at the national level in 2022 is 42.06 out of 100. The value in 2045 is expected to reach up to twelve times higher than the 2022 value.

The projection of IBEI in 2045 is generated based on the different scenarios plausible to be adopted by Indonesia for promoting the blue economy development. Two scenarios are chosen for the best policy scenarios for the blue economy development, which are environment-led scenario and environment-dominated scenario. When the projection applies 30 percent generation of renewable energy capacity in 2045, the most effective scenario is the environment pillar-led scenario. In this scenario, the progress of the social and economic pillars of blue economy development will follow the growth of the environment pillar, which is always higher than the social and economic pillars. This will result in the best overall progress of blue economy development as shown by the increase of the IBEI value 12 times higher than the value in 2022. The result is higher than the environment-dominated scenario, in which the growth of the environment pillar is always higher or at least at the same rate as whichever is highest between social and economic pillar growth. According to the projection lines in Figure 6, the environment-led scenario sets off from the baseline scenario much faster, specifically after 2024. Meanwhile, the environment-dominated scenario sets off much later, after 2038.

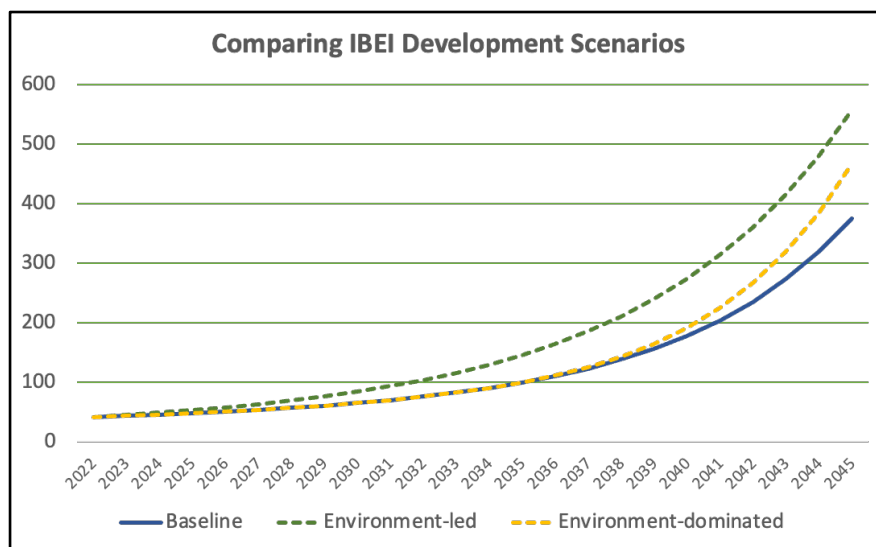


Figure 6. IBEI Projection Based on 30% Generation of Renewable Energy Scenario in 2045

Source: ARISE+ Calculation, 2023

However, when the projection applies the normal utilization rate are around 15 percent generation of renewable energy capacity in 2045, the environment-dominated scenario becomes the most effective scenario among the two scenarios. As can be seen in that, it will overlap the environment-led scenario in 2043. The lower utilization rate of renewable energy capacity will bring all scenarios to a much lower 2045, targeting the increase of the IBEI value is only 9 times higher than the value in 2022.



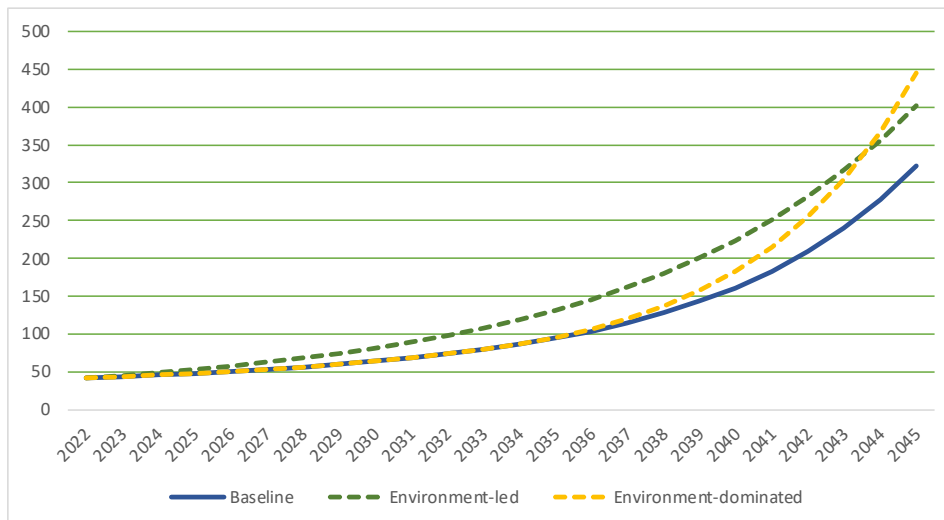


Figure 7. IBEI Projection Based on 15% Renewable Energy Scenario in 2045

Source: ARISE+ Calculation, 2023

Nevertheless, both scenarios, the environment-led and the environment-dominated scenarios, confirm that Indonesia needs to put the first priority on its environment well-being, in order to achieve highest benefits from all three pillars of sustainable blue economy development. This also implies that there will be a few years from now to consolidate the environment pillar before having rapid growth. A better quality of underwater life will be the focus for consolidating the environment pillar with the aim to provide abundant good-quality resources for economic growth. It is also important to note that in the projection of IBEI in 2045 uses a 30 percent utilization rate of renewable energy capacity, which is also in line with the rationale of putting the environment first for greater socio-economic and overall benefits.

For both scenarios, the social pillar needs to emphasize that the improvement fishers's and fish farmers' wellbeing, and the eradication of inequality may be achieved through higher production and more investment. Infrastructure development and excellent education/training can also be assisted by investments. For the economic pillar, increased investment is needed to expand the output recorded by the indicators and to increase productivity. Increasing investment can also boost the multiplier effect by expanding production into other industries including the effect of job creation in other sectors. Moreover, investing in cutting-edge technology will raise productivity by boosting output volume and quality across different sectors of the blue economy.

The achievement of the blue economy vision and targets will be carried out through four missions:

- **Mission 1: Securing healthy, resilient, and productive oceans**

Ensuring that the sustainability of essential marine ecosystems, environmental priorities, climate change mitigation and adaptation are at the heart of Indonesia's blue economy development to secure the nation's healthy, flourishing, and resilient marine ecosystems.



- **Mission 2: Promoting environmentally sustainable economic growth**

Transitioning existing sectors to more sustainable pathways, advancing new sectors where relevant, and prioritising sustainable economic prosperity articulated within Indonesia’s vision for a blue economy that is, entrepreneurial, collaborative, and reflective of international best practices.

- **Mission 3: Improving Human health, well-being, and shared prosperity**

Ensuring communities and all relevant actors to have access to the prosperity from ocean resources for enhancing their health and well-being.

- **Mission 4: Creating an enabling environment**

Addressing cross-cutting issues through policy and governance, institutional capacity development, and sustainable financing.

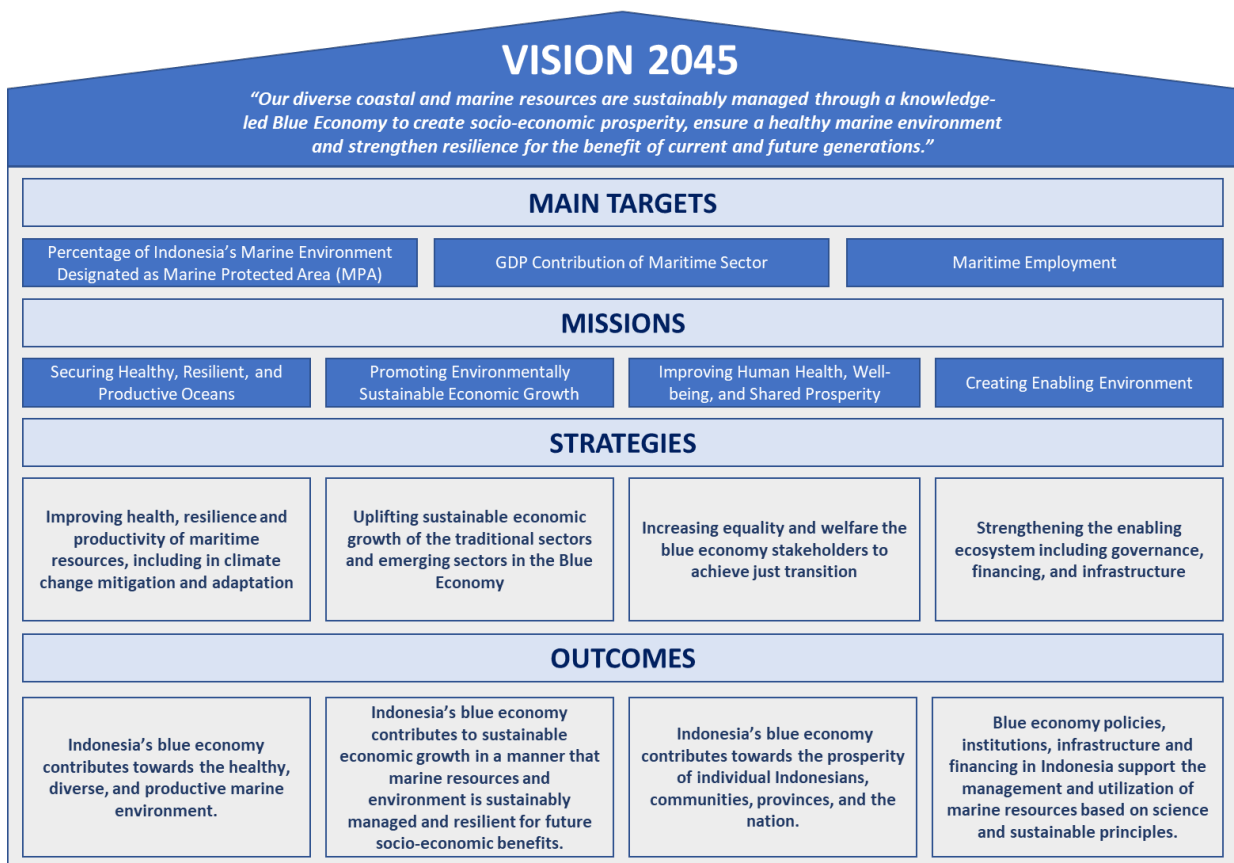


Figure 8. The Vision, Target, Missions, Strategies and Outcomes of Blue Economy Development in Indonesia⁵⁴

⁵⁴ Ministry of National Development Planning/Bappenas. 2023



3.2 Outcomes and Indicators

The four missions are further elaborated through four strategies that will guide the achievement of four outcomes outlined in Figure 6. The achievement of the results is measured based on four outcomes and several indicators, such as follows:

Outcome 1: Indonesia’s blue economy contributes towards the healthy, diverse, and productive marine environment.

Table 9. List of Indicators for Outcome 1⁵⁵

No.	Indicators	Sources
1	Indonesia’s marine environment designated as Marine Protected Area (hectare and percent)	Ministry of Marine Affairs and Fisheries
2	Ratio of optimally managed marine conservation area (percent)	Ministry of Marine Affairs and Fisheries
3	Coverage of monitoring activity of marine spatial planning and business actors in marine space from IUUF (percent) <ul style="list-style-type: none"> Effective Implementation of Ecosystem approach to Fisheries Management (EAFM) 	Ministry of Marine Affairs and Fisheries
4	Ocean resource quality <ul style="list-style-type: none"> Good quality of coral reef (percent of total area) Good quality of seagrass (percent of total area) Good quality of mangrove forest (percent of total area) Rehabilitation of mangrove forest, swamp, and peat area rehabilitation (growth rate, percent) Total coastal village with garbage disposal (number of village) Total coastal village by defecation site and sewerage (number of village) Average sea surface temperature (growth of degree Celsius) Waste disposal at sea (kg/person) 	<ul style="list-style-type: none"> Ministry of Marine Affairs and Fisheries Ministry of Environment and Forestry Local Governments
5	Ocean renewable energy (ratio of total energy supply) <ul style="list-style-type: none"> Installed capacity of solar power plant (percent) Electricity generated from solar power plant (percent) Electricity generated from other ocean renewable energy (percent) 	To be developed by the Ministry of Energy and Mineral Resources

⁵⁵ The achievement of these indicators will also contribute to Indonesia’s Enhanced National Determined Contribution (ENDC) related to mitigation actions (renewable energy) and adaptation (waste management, coastal zone protection, ecosystem conservation and restoration)



Outcome 2: Indonesia’s blue economy contributes to sustainable economic growth in a manner that marine resources and environment is sustainably managed and resilient for future socio-economic benefits.

Table 10. List of Indicators for Outcome 2

No.	Indicators	Sources
1	Maritime GDP contribution to economy (IDR trillion and percentage of total GDP)	Statistics Indonesia and Coordinating Ministry of Maritime Affairs and Investment
2	GDP contribution of priority blue economy sectors (IDR billion and percentage of maritime GDP): <ul style="list-style-type: none"> ● Fisheries and aquaculture ● Marine-based manufacturing ● Trade, transportation, ports and logistics, and other maritime services ● Tourism ● Ocean-based renewable energy ● Biotechnology and bioeconomy ● Research and education ● Marine conservation 	To be developed involving: <ul style="list-style-type: none"> ● Statistics Indonesia ● Ministry Marine and Fisheries Ministry ● Ministry of Industry ● Ministry of Trade ● Ministry of Transport ● Ministry of Tourism and Creative Economy ● BRIN ● Ministry of Education, Culture, Research and Technology ● Ministry of Environment and Forestry
3	Investment in blue economy sectors (foreign and domestic investment, USD million, IDR billion and percentage of total investment)	To be developed by Ministry of Investment
4	Export of blue economy products and services (USD million and percentage of total export)	To be developed by Statistics Indonesia and Ministry of Trade
5	Energy mix derived from ocean-based renewable energy sources (percentage of total source of energy)	To be developed by Ministry of Energy and Mineral Resources
6	GDP contribution of maritime tourism (percentage of tourism GDP)	To be developed by Ministry of Tourism and Creative Economy
7	Share of tourist arrival in maritime destination (percentage of total tourist arrival)	To be developed by Ministry of Tourism and Creative Economy



Outcome 3: Indonesia’s blue economy contributes towards the prosperity of individual Indonesians, communities, provinces, and the nation.

Table 11. List of Indicators for Outcome 3

No.	Indicators	Sources
1	Number of fisher and fish farmers (number of person) in marine capture fisheries, aquaculture and marine culture <ul style="list-style-type: none"> • Number of women fisher and fish farmers (number of person) 	Ministry of Marine Affairs and Fisheries
2	Employment in blue economy sectors (number of persons, percentage of total employment)	To be developed by Statistics Indonesia and Ministry of Manpower
3	Labor productivity (value added/labor in IDR million)	To be developed by Statistics Indonesia and Ministry of Marine Affairs and Fisheries
4	Average monthly income of fisheries community (IDR million)	To be developed by Statistics Indonesia
5	Poverty rate in coastal areas	To be developed by Statistics Indonesia
6	Fish consumption (kg/capita)	Ministry of Marine Affairs and Fisheries and Statistics Indonesia
7	Human Development Index	Statistics Indonesia
8	Graduates from maritime-based school (number of person)	To be developed involving: <ul style="list-style-type: none"> • Ministry of Education, Culture, Research, and Technology • Ministry of Marine Affairs and Fisheries • Ministry of Industry • Ministry of Transport



Outcome 4: Indonesia’s blue economy contributes to creating enabling factors for knowledge-led use, exploitation, and management of marine resources.

Table 12. List of Indicators for Outcome 4

No.	Indicators	Sources
1	Blue economy database by provinces	To be developed involving: <ul style="list-style-type: none"> ● Statistics Indonesia ● Ministry of National Development Planning/Bappenas ● Ministry Marine and Fisheries Ministry ● Ministry of Industry ● Ministry of Trade ● Ministry of Transport ● Ministry of Tourism and Creative Economy ● BRIN ● Ministry of Education, Culture, Research and Technology ● Ministry of Environment and Forestry ● Local Governments
2	Marine space management per province: <ul style="list-style-type: none"> ● Issuance of permits and business licenses related to marine resource utilization (outside oil and gas), as well as processing and trade of marine products and services (number or percentage of permits and licenses); and ● Empowerment of coastal and small island communities (number of communities) 	To be developed by Local Governments
3	Technology in blue economy (e.g. maritime research and innovation index)	To be developed by BRIN
4	Blue finance scheme	To be developed involving: <ul style="list-style-type: none"> ● Ministry of National Development Planning/Bappenas ● Ministry of Finance ● Financial Service Authority ● Bank Indonesia



3.3 Priority Sectors

Indonesia has the modalities as an archipelagic country with a diversity of marine resources and also political and economic strategic position in the region. Nevertheless, Indonesia needs to focus on optimizing these modalities by supporting several priority sectors related to the blue economy in order to create significant impacts. This approach is also in line with the SDGs, Indonesian Medium-Term Development Plan, and other regulations. Therefore, for achieving SDGs and relevant development targets, the Indonesian blue economy development will focus on encouraging priority sectors with two development focuses, which are to uplift the established sectors and to develop some emerging sectors while safeguarding the health of coastal and marine ecosystems. The development of these sectors is expected to uplift the domestic value-chain and the opportunity to boost GDP growth. Uplifting established sectors will provide a stronger push to optimize their development and expected outputs; while promoting some emerging sectors is expected to expand the potential to create added value from marine resources for inclusive and sustainable growth.

3.3.1 Uplift Established Sectors

In uplifting established sectors, Blue Economy Roadmap focused on four subsectors, which are (i) marine capture fisheries and aquaculture; (ii) marine-based industry (including marine-based food processing industry, shipbuilding industry, and salt and chemical industry); (iii) maritime trade, transportation, and logistics; and (iv) tourism. A brief description and the relevant policy direction of each sector to create sustainable and productive sectors, as well as to strengthen their capability to create jobs and increase competitiveness are outlined as follows.

1. Marine Capture Fisheries and Aquaculture

Marine capture fisheries and aquaculture are the largest sectors in Indonesia's Blue Economy in their contribution to the economy and as a source of national and global food providers. Marine capture fisheries and aquaculture also have a role in creating jobs and employment opportunities. The positive and significant impact of marine capture fisheries and aquacultures in Indonesia's economy occurs due to the high demand for marine capture fishery and aquaculture products in the market, which leads to an increase in marine capture fisheries and aquaculture volume. Despite the modalities, **the issues and challenges** such as (i) overstock and overfishing; (ii) unsustainable practices, including the replacement of mangrove and sea grass areas into aquaculture; (iii) lack of governance in marine resources management to deal with IUUF; (iv) stagnated productivity due to welfare and working conditions problems; and (v) pollution and ecosystem degradation. In order to improve productivity, enhance the value added and the sustainable practices of this sector, **the direction of marine capture fisheries and aquaculture development will focus on promoting the implementation of sustainable management of fisheries and aquaculture activities**, including (i) implementing marine capture fisheries based quota, ecosystem approach and better harvest strategy; (ii) improving aquaculture practices into more sustainable and nature positive including improved regulation on aquaculture zoning, and applying sustainable technology solutions, robust standards and certification schemes as well as providing incentive schemes for sustainable practices; standards; (iii) boosting the downstream of marine capture fisheries and aquaculture products supported by the development of a resilient supply chain involving the partnership between small-scale fishers and medium-large industries, and the application of innovative and sustainable technology solutions; (iv) providing training,



including on good practices in fish handling and aquaculture in order to improve the quality of fishery products, and monitoring to reduce IUUF practices; (v) improving productivity supported by a social protection scheme for fishers and maritime workers, and better access to finance for small scale actors; (vi) improving marine capture fisheries and aquaculture technology, research and data; and (vii) promoting effective policies and program related to the implementation of marine debris and food-loss control management to maintain a healthy marine ecosystem for sustainable fisheries.

2. Marine-based Manufacturing

Marine-based manufacturing is important in supporting the downstream marine products. Abundance of marine resources can provide inputs for creating products that are more complex and have higher added value. This sector can include marine commodities processing, shipbuilding industry, marine-based chemical and pharmaceutical industry (including salt), marine construction, and marine-based manufacturing services; many of which play significant roles in supporting the development and expansion of other blue economy sectors including marine renewables, fisheries and aquaculture. Several **issues and challenges** are identified for this sector to grow, such as (i) low quality assurance of products and raw materials; (ii) low productivity; (iii) lack of mastery, application and transfer of technology; (iv) poor infrastructures; (iv) limited investment; (v) weak supply chain; (vi) pollution and ecosystem degradation, (vii) lack of policy and program synergies among ministries/agencies, and between central and regional governments; and (viii) rapid changes in the market and technology. Based on the issues and challenges, **the development of marine-based manufacturing industry in Indonesia needs to focus on increasing productivity, value addition, competitiveness and sustainability** by (i) expanding relevant education and trainings; (ii) enhancing technology application and innovation for productivity and diversification; (iii) improving product quality assurance; (iv) strengthening the supply chain supported by improved maritime infrastructures and investment; (v) expanding circular economy, and sustainable consumption and production to reduce environmental damage and create added value including from marine debris; (vi) expanding market; (vii) promoting creative financial schemes and incentives to support marine-based manufacturing projects with strong focus on sustainability; and (viii) improving policy soundness and synergies in policy and program implementation involving public and private collaboration.

3. Maritime Trade, Transportation, and Logistics

The development of maritime trade, transportation, and logistics through the utilisation of Indonesian Archipelagic Sea Lanes (ALKI) will be the focus in blue economy development by expanding and improving the competitiveness of Indonesian sea transportation-integrated with land and air transportations, ports and logistics, trade and other maritime support services. The three ALKI are important transportation assets in the Southeast Asian region and can be developed further to facilitate the growth of trade centres, regional hubs and shipping centres in Southeast Asia. One of the important trade routes that crosses Indonesian waters, which is the Malacca Strait has played the role as the main international trade route between Asia and Europe. **Some of the challenges faced** include (i) disparity of maritime infrastructures; (ii) high logistic costs; (iii) reliance on fossil fuels for sea transportation; (iv) risks of security at sea; and (v) underutilized cooperation in the utilisation of ALKI. **The development of maritime trade, transportation, and logistics in the Indonesian blue economy** is directed to (i) improve the



provision, quality and integration of maritime infrastructures; (ii) develop Indonesia as a global hub through strengthening shipping liners as well as ports and logistics management; (iii) improve interisland trade and supply chain; (iv) promote the greening of transportation, shipping, ports and logistics services; (v) expand maritime finance; (vi) improve monitoring and law enforcement at sea; (vii) expanding maritime research and development; and (viii) strengthen legal instruments and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional and global cooperation framework in the utilisation of ALKI.



Figure 9. Indonesian Archipelagic Sea Lanes (ALKI)

4. Tourism

Tourism is a potential sector to grow as Indonesia has a wealth of natural marine assets. At the same time, it has a major responsibility to create nature positive realities for its customers and the communities within which it operates. Growing Indonesia’s marine tourism industry has the potential to provide a diverse range of benefits to the environment, society, and economy, and become a long-term, sustainable component of Indonesia’s blue economy. However, **the development of the tourism sector faces several challenges**, including (i) an increase pollution in tourist destination which alters vegetation diversity and ecosystems, as well as reduces tourism quality experiences; (ii) limited amenities and accessibility; (iii) decreasing destination carrying capacity; (iv) limited investment; (v) limited capacity of local communities, destination management organization, industries and government in sustainable tourism management; and (vi) limited supply of quality human resources. To deal with these challenges, **the direction to develop sustainable tourism sector within the Indonesian blue economy** includes (i) establishing zoning of areas for tourism activities; (ii) improving tourism skills; (iii) strengthening sustainable tourism destination management; (iv) expanding the adoption of tourism industry standard; (v) improving sustainable amenities and transportation in tourism destinations; (vi) increasing sustainable tourism investment; (vii) developing sustainable community-based marine tourism supported by community access to coastal areas; and (viii) strengthening the sustainability and resilience of tourism supply chain, including to involve local communities, indigenous people and local tourism industries, as well as to increase the benefit from circular economy application in the tourism supply chain.



3.3.2 Promote Emerging sectors

The Indonesian Blue Economy Roadmap support the growth of emerging sectors, which are (i) renewable energy; (ii) biotechnology and bioeconomy; (iii) research and education; and (iv) marine conservation and sustainable management of ecosystem services. The development of these sectors is part of an effort to utilise the untapped potential of marine resources. The emerging sectors are expected to become new sources of growth and diversify numerous opportunities to strengthen Indonesia's sustainable marine-based economy and marine resource management. A brief description and the relevant policy direction of each emerging sector are outlined as follows.

1. Renewable Energy

Indonesia's emerging offshore renewable energy sector presents an opportunity to develop renewable energy production across Indonesia, particularly in the eastern islands, providing a renewable, low/zero carbon energy source that can meet the energy demands of coastal and island communities. The size of the marine renewable energy resources available in Indonesia suggests their potential for meeting domestic energy demand, with sufficient investment. Expansion of the offshore renewable energy sector would play a key role in supporting the decarbonisation of other blue economy sectors and help Indonesia meet its net zero targets. At the same time, investment for the expansion of the offshore renewables sector would increase employment opportunities, establish training and career development opportunities within the sector, and develop a highly skilled domestic workforce, as well as present an opportunity to develop a green hydrogen industry. However, **some issues and challenges exist** such as (i) limited investment for generating offshore energies resulting in low contribution of offshore energies in the national energy mix; (ii) limited studies available for proven feasibility generation of offshore energies; and (iii) affordability of utilising and distributing the energy potential offered by the sea. **The development of emerging offshore renewable energy needs in the future is directed to include** (i) strengthening the enabling factors for feasible offshore energy generation including relevant regulation and policies, research and development, feasibility studies for offshore energy project, and provision of incentives for offshore energy investment; (ii) expanding collaboration including public-private partnerships in offshore energy investment; (iii) leveraging investment from multipurpose infrastructures, including for supporting offshore energy supply can support the greening of transportation, shipping, ports and logistics services; and (iv) encouraging inclusivity of coastal communities during the project planning and development of offshore renewable energy.

2. Biotechnology and Bioeconomy

Indonesia's large marine area and diversity of marine life means it is well-placed to benefit from this expansion and potentially lead the development of the marine-based bioeconomy and biotechnology sector in the region. Indonesia's marine-based bioeconomy and biotechnology sector is in the early stages of development. As the understanding of marine processes and technology in Indonesia increases, there will be more opportunities to develop a marine-based bioeconomy and biotechnology sector that can contribute positively to food security, human health and well-being, environmental health, renewable energy source, and the greening of industrial products and processes. These outcomes could directly contribute to addressing the SDGs. **Some issues and challenges exist in developing this sector**, such as (i) limited supply of quality human resources, particularly researchers and engineers; (ii) limited funding and



supporting infrastructure for research, technology development and innovation, including for technology outreach (commercialization); (iii) limited bioprospecting to create products from the most optimal bioresources; (iv) limited capacity of marine processing industries, particularly in small and medium enterprises related to access to information, technology and financing; and (v) potential waste produced by processing marine commodities. **Indonesia will devise some policies to undertake some breakthrough strategies** for promoting bioeconomy and biotechnology. The policies focus on (i) strengthening the innovation ecosystem related to human capital development, funding, research and innovation infrastructure, and technology/patent commercialization; (ii) expanding bioprospecting to supply the most potential bioresources for creating added value; (iii) developing bioeconomy supply chain with expanded collaboration with institutions already engaged in marine biotechnology in other countries; (iv) providing incentives for nurturing new bioeconomy and biotechnology businesses, including through the improvement of the upstream chain through the application of a low cost cultivation/harvesting system; (v) promoting capacity building partnerships with multiple benefactors across blue economy sectors; and (vi) improving waste management in bioeconomy and biotechnology sector, including through circular economy approach.

3. Research and Education

Investment in the research and development and education sector will support the sustainable expansion, growth, and diversification of Indonesia's blue economy. Research and education are critical enablers of maritime sustainability and over the last few decades. The Government of Indonesia has focused on marine scientific research and the preservation of the marine and coastal environment. In the future, better education and advanced research capability potentially produce a generation that fully understands how to maximise the economic and social benefits of maritime potential while preserving the environment in the long term. Nevertheless, **research and education faces some issues and challenges** such as (i) limited supply of quality human resources, particularly teachers and talents in science, technology, engineering, art, dan mathematics (STEAM); (ii) rapid changes in the industries demanding new and higher skills set; (iii) poor research and innovation ecosystem; (iv) disruptive technologies; and (v) low public awareness of maritime education which affects understanding in the need for protecting the environment, especially coastal ecosystems. In order to deal with the above issues and challenges, **research and education for the development of blue economy sectors are directed to apply several strategies**, including (i) improving the education system particularly related to STEAM, including curricula, teachers, and infrastructure supported by cooperation between educational institution and industry; (ii) developing an integrated plan and facilitating its implementation to develop, modify, transfer and adopt technology through research collaboration, licensing, reverse engineering and procurement supported by collaboration between public, academia, research and industry stakeholders; (iii) strengthening the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and patent commercialization; and (iv) increasing investment for quality education and research.



4. Marine Conservation and Ecosystem Services

Indonesia is characterized as a global hotspot for a variety of marine habitats, including blue carbon ecosystems, and rich marine biodiversity. These unique features need to be maintained through an integrated marine conservation and area-based management approaches, which plays vital roles in supporting sustainable coastal and marine ecosystems throughout Indonesia. By protecting and conserving these ecosystems, Indonesia can enhance its resilience to climate change and promote the sustainable development of the blue economy. The current efforts in marine conservation in Indonesia have resulted in a significant increase in marine protected areas (MPAs), which safeguard biodiversity and at the same time provide enhanced ecosystem services and economic opportunities especially for local communities who depend on the health of ecosystems for their livelihoods. By promoting blue carbon development in conjunction with marine conservation, Indonesia can strive towards a more sustainable and resilient blue economy while ensuring the long-term health and productivity of its coastal and marine ecosystems. Nevertheless, these efforts still faces **some issues and challenges** such as (i) low status of protection and effectiveness of MPAs management as well as the lack of basic MPA management implementation and enforcement, including zoning systems, management plans, management bodies/agencies; (ii) limited capacity for applying area-based management approaches including ecosystem-based marine spatial planning, ridge-to-reef, and source-to-sea approaches; (iii) high rate of biodiversity lost due to climate change and unsustainable practices; (iv) lack of data and analytics on the status and trends of coastal and marine ecosystems, including impacts and dependencies of blue economy sectors on coastal and marine ecosystems; and (v) Insufficient funding and resources, coupled with gaps in integrated policy and governance (central and local government) and funding mechanism. In the future, **marine conservation and sustainable management of ecosystem services development** are put as a cross-cutting sector and will be further enhanced by (i) improving the enforcement and efficacy of MPAs and their utilisation; (ii) strengthening co-management and engaging in multi-stakeholder partnership approaches in the implementation of MPAs and blue carbon development; (iii) strengthening coordination among line ministries and local governments related to conservation and blue carbon development; (iv) increasing plantation and rehabilitation of mangroves, sea grasses and coral reefs; (v) developing and effectively implementing an integrated policy framework around marine conservation and blue carbon development; (vi) developing financial mechanisms, innovative funding to support the transition towards a sustainable blue economy and blue carbon market-based approaches; (vii) promoting research and development and capacity building on MPAs management and blue carbon development; and (viii) designing an effective marine and coastal spatial plan that promotes harmony between protection mechanisms for the marine and coastal environment and human activities.

The development of the established and emerging sectors in Indonesia need the expansion of cross-stakeholder collaboration in knowledge exchange, capacity building, and institutional strengthening. This can be implemented through the expansion of the National Blue Agenda Actions Partnership (NBAAP), which include blue food, blue health, blue innovation and blue finance. The four pillars can be a starting point for promoting collaboration and maximizing the impact for sustainable prosperity, livelihood, environmental health. For example, by developing blue food, Indonesia will take benefits not only in the form of quality nutrition supply, but in the form of increased people's participation the food system as a provider in the upstream and



middle supply chain that can be developed with the food industry, and its distribution. This also means that the relevance of increasing productivity in fisheries and aquaculture, marine-based industries, implementing biotechnology and bioeconomy, as well as research results within the blue food framework is expected to provide multiple benefits for Indonesia.

3. 4 Inclusiveness of Blue Economy

To ensure the inclusiveness of blue economy development in Indonesia, particularly in priority sectors, this Blue Economy Roadmap recognizes the livelihoods of the people involved in the supply chain of the eight priority sectors. The implementation of this Blue Economy Roadmap encourages the application of livelihood strategies by considering different activities and roles of different actors in contributing to the supply chain of the priority sectors. Such strategies are expected to improve people's understanding about their modalities and resources, socio-economic opportunities available, options to enable higher resilience against risks including disasters, and their potential contribution to better environmental planning and management.

The employment structure on these sectors is complex. The Food and Agriculture Organization (FAO) has assessed that the global employment in fisheries and aquaculture covers a complex and large range of jobs. It can include from the input production and sales (vessels, fishing gear, bait, etc) to fish farming, harvesting, post-harvesting, processing, marketing and distribution of fish/products. This condition also attracts many parts of people living in the coastal areas and the surroundings to get involved in the fisheries and aquaculture. The condition also accommodates from labor intensive small-scale business operations to capital- and labor-intensive large investment-based businesses⁵⁶.

Such a description also matches with the reformulated structure of different actors involved in the supply chain of marine capture fisheries and aquaculture (Figure 10). Employment opportunities may start from being a supplier of fishing bait and fishing gear to fisher who catch the fish from the ocean or fish seeds for fish farmers. The fish captured by the fisher or fish harvested by fish farmers are then sent to the collection point for processing (or stored in the cold storage). This collection point can be managed by the communities in the coastal area. The production of fishing bait, harvesting, processing, and collection point management can involve women living in the coastal areas. In the collection point, processing activities may cover cleaning, grading, etc., before it is sent to the market (either domestic or export; retailer or wholesaler). This whole supply chain process can be further enhanced should community engagement be widely promoted in the coastal area.

One aspect that also needs consideration within the livelihood strategies for the implementation of this Blue Economy Roadmap is to recognize different categories of people according to their backgrounds to ensure that no one is left behind. At IBEI, social pillar represents inclusiveness, which implies attention to marginalized communities. Marginalized communities are the people excluded from mainstream social, economic, educational and/or cultural life. Examples of marginalized communities include, but are not limited to, groups excluded due to race, gender identity, age, physical ability, language etc. In the blue economy context, gender equality issues and employment opportunities in every sector for marginalized communities need to be tackled to ensure that the

⁵⁶ FAO. 2023. Decent Rural Employment. Fisheries and Aquaculture. <https://www.fao.org/rural-employment/agricultural-sub-sectors/fisheries-and-aquaculture/ar/>



future growth of the blue economy sectors will also be beneficial to this community. A particular attention is given to the role of women in blue economy.

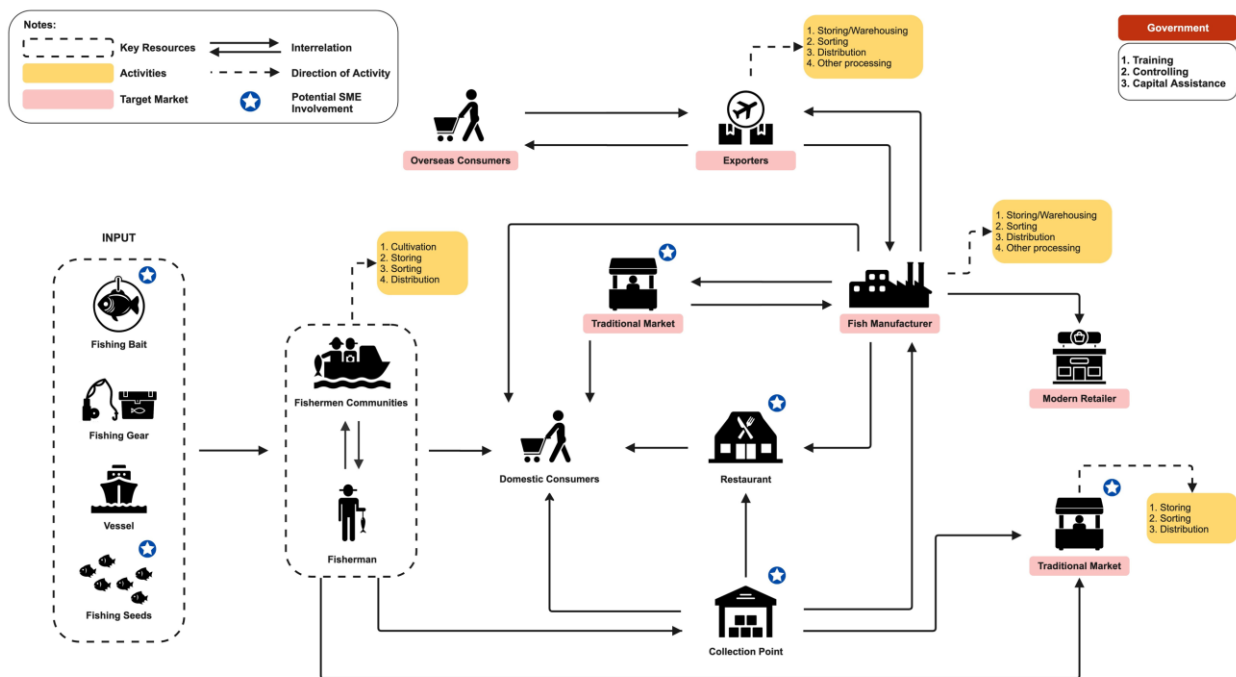


Figure 10. Various Actors Involved in an Inclusive Supply Chain of Marine Capture Fisheries and Aquaculture⁵⁷

Taking the case of marine capture fisheries and aquaculture, this Roadmap recognizes the importance to balance the role between men and women. Globally, men are usually involved in commercial, high value fisheries, while women have a lesser role in subsistence, low-valued fisheries. Furthermore, there had been a disproportionate skew towards the capture side of fisheries, with less -attention on post-harvest activities (e.g. processing, value added, sales, etc.) where women often are most active.

Women make up an estimated 47 percent of workers (56 million women) in the small-scale fisheries sector operating along fisheries value chains worldwide and contribute to around half of the annual coastal fisheries catch in the Pacific⁵⁸. According UN Woman, the proportion of women in the fishery sectors is estimated to reach 37 percent to total employment in Indonesia (Table 13). These data, however, do not provide a clear reference on how this data is derived. UN Women used assumption that women’s participation in marine capture fisheries and aquaculture is approximately similar to the global average of 14 percent. There was also an estimation of employment in processing and marketing which total 6.2 million, of which 60 percent are women. As a comparison, data collected by the Indonesian Ministry of Marine Affairs and Fisheries (MMAF) show that woman participation in the blue economy sectors was still small at around 10 percent to total employment (Figure 11).

⁵⁷ ARISE+’s modification based on IPB and Bappenas. 2022. Sharing Lessons Learned Pelaksanaan Kajian Keterkaitan Antarwilayah di Wilayah Sumatera: Analisis Rantai Nilai.

⁵⁸ Mangubhai, S., & Lawless, S. 2021. Exploring gender inclusion in small-scale fisheries management and development in Melanesia. Marine Policy, 123. <https://doi.org/10.1016/j.marpol.2020.104287>



Table 13. Women Employment in Fisheries in Selected Countries⁵⁹

Country	Women’s and men’s employment: harvest (including marine and inland fisheries)	Women’s and men’s employment: post-harvest	Women’s and men’s total sector employment	Proportion of women (estimates)
Indonesia	6.0 million	6.2 million	12.2 million	37%
India	N/A	N/A	14.5 million	27%
Malaysia	0.17 million	N/A	N/A	N/A
Thailand	0.8 million	1.2 million	2.0 million	50%
Australia	11,818	4,013	15,831	19%

The 10 percent women employment in blue economy according to MMAF was below the UN Women data mentioned previously at 37 percent. Nevertheless, these data outline the range of roles that the women can contribute in blue economy sectors. Based on data from MMAF, around 92.5 percent of women employment in the blue economy sectors can be categorized into harvesting activities (fishers, fish farmer and salt farmer), while the remaining 7.5 percent belong to post-harvest activities (inter-port trader, fish trader and fish processor). Another data set compiled by the Ministry of Transportation⁶⁰ shows women’s participation as seafarers was also minimal, accounted for 2.6 percent to total 1.4 million seafarers in Indonesia.

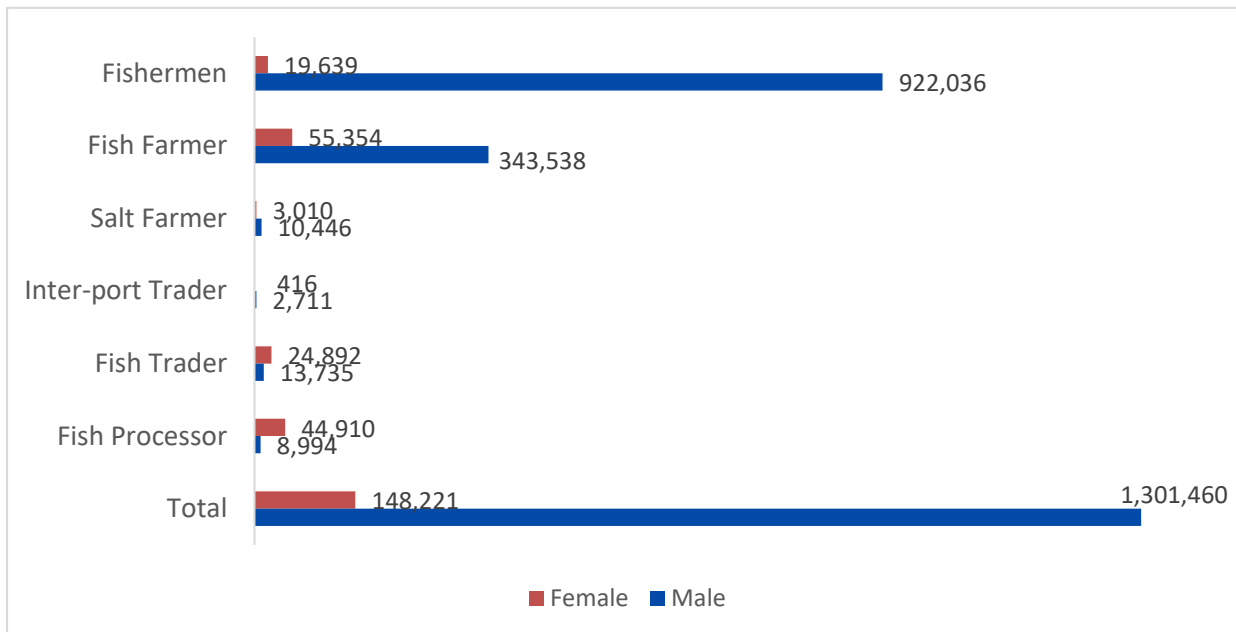


Figure 11. Women Employment in the Indonesian Blue Economy Sector (People) in 2022⁶¹

⁵⁹ UN Women. 2020. Women’s Economic Empowerment in Fisheries in the Blue Economy of the Indian Ocean Rim.

⁶⁰ Ministry of Transportation. (2023). Jumlah Pelaut Berdasarkan Jenis Kelamin Per 10 Jun 2023. <https://pelaut.dephub.go.id/>

⁶¹ Ministry of Marine Affairs and Fisheries, 2022. Pelaku Usaha Perikanan Berdasarkan Gender. <https://kkp.go.id/brsdm/sosek/artikel/38656-pelaku-usaha-perikanan-berdasarkan-gender>



Despite the difference in data and the scale of involvement, the role of women in the marine capture fisheries and aquaculture businesses are important as most are still small-scale businesses with employment mostly coming from family members. How women are involved and share tasks with men in the sectors are reported by several studies. One study provides the summary of the division of roles between men and women in the fisheries sector as presented in Figure 12.

To secure equal opportunities and roles by women in the supply chain of the marine capture fisheries, the implementation of this Blue Economy Roadmap advocates equal roles and opportunities for women in decision making in the sector, access to natural, social and material resources, as well as rights to manage assets for fishing (e.g., land, ponds, capital, skills, technologies and extension services). For that purpose, the capacity building for women should also include skills improvement related to fish technologies and production methods, as well as financial and marketing management. As many women often combines their task in the sector with household duties, it is encouraged that the division of labor in the sector considers the time allocation to fit with their aspiration of earning a living while maintaining the aspirations for their children's future and old age in their family. All of the above efforts will enable women with necessary capacity to have a bigger decision-making role and an equal right in the sector, and reduce potential vulnerability in their own condition and their household overall wellbeing.

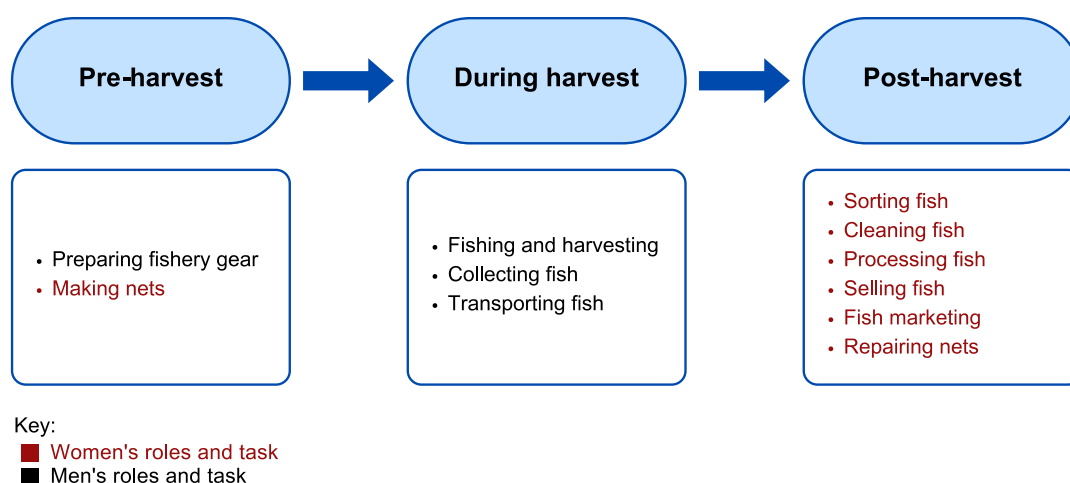


Figure 12. The Division of Roles in Marine Capture Fisheries Business by Gender⁶²

A particular attention is also put forward to parts of the population with disabilities. A non-exhaustive mapping of persons with disabilities' role in blue economy is presented in Table 14. The mapping was developed based on potential involvement of people with disabilities in the activities along the value chain of three sectors of blue economy. The mapping is also an attempt to encourage data collection and a more complete mapping of occupations in the blue economy sectors potentially to be filled by people with disabilities, as there has not yet data available on the participation of people with disabilities in the blue economy sectors.

⁶² Torre, A. R., et.al. 2019. Opportunities for gender equality in fisheries and coastal resource management in South and Southeast Asia



Table 14. Employment Mapping for Disabled People in Blue Economy^{63,64}

Type of disabilities		Activities		
		Capture Fisheries and Aquaculture	Marine Based Manufacturing	Marine Based Tourism
Physical disability	Loss of a limb	√	√	√
	Cerebral palsy	-	-	-
	Paraplegia	√	√	-
Sensory disability	Deafness/hearing loss	-	√	-
	Blindness/low vision	√	√	-
Mental/psychosocial disability	Mental illness	√	√	√
	Autism	-	√	-
Intellectual disability	Development delay	√	√	√
	Learning disorder	√	√	√
	Down syndrome	-	√	-

For capture fisheries and aquaculture, catching wild fish from the ocean may sound too risky for disabled persons, but involving them in aquaculture business will be plausible as long as the equipment and technique are adjusted to their needs. For marine-based manufacturing, some activities are related to fish processing, such as fish grading, cutting, etc. Some of these activities may involve disabled people provided the tools to perform these activities have considered their safety. For marine-based tourism, as majority of the activities require mobility, it may not be suitable for disabled people. However, some activities like call center in some tour operators or other behind-desk jobs may be appropriate.

Overall, this Blue Economy Roadmap advocates stakeholders' collaboration in improving the socio-economic wellbeing of the people whose livelihoods depend on healthy coastal and ocean resources.

⁶³ Law No. 8 year 2016 concerning Persons with Disabilities

⁶⁴ ARISE+ compilation



A photograph of an offshore wind farm in the ocean. The sky is a clear, vibrant blue. In the foreground, the white, churning wake of a boat stretches from the bottom center towards the middle of the frame. In the middle ground, several white wind turbines with three blades each are visible, mounted on yellow and white support structures. The water is a deep blue, and the overall scene is bright and clear.

CHAPTER 4

Strategic Action Plan

Chapter 4. Strategic Action Plan

As part of the economic transformation efforts, the development of the Blue Economy will be carried out in several phases, as follows:



Figure 13. Indonesia Blue Economy Development Phases

1. Phase I 2023-2024: Strengthening of the consolidation of the Indonesia's Blue Economy Ecosystem

The first phase of the blue economy development will focus on strengthening the consolidation of the Indonesia's blue economy ecosystem. This phase is expected to establish a better coordination scheme and mainstream the Blue Economy Roadmap to the line ministries/institutions, local government, non-governmental actors, as well as development partners. Identification of gaps, possible enabling factors, and supporting regulations such as marine spatial planning scheme is expected to be consolidated in this phase.

2. Phase II 2025-2029: Development of Indonesia's blue economy as a new source of growth

This phase focuses on the strategy to boost development of the Indonesia blue economy as a new source of growth. This is shown by increasing the added value of the blue economy in the established sectors supported by investment, technology adoption, quality assurance, and promoting the emerging sectors to include renewable energy, biotechnology and bioeconomy, research and education, and marine conservation, supported by better ecosystems (robust and harmonized and integrated policies, good governance, competent institutions, quality infrastructure, and sustainable financing). Marine conservation (blue health) supported by research and education as well as better ocean literacy will direct the strengthening of existing sectors and the growth of emerging sectors, while safeguarding the health of costal and marine ecosystems.. The improvement on blue food has contributed to better resilience in food security and thriving food systems.

3. Phase III 2030-2034: Expansion of Indonesia blue economy through diversification

In this phase, Indonesia's blue economy is expected to be led by the emerging sectors. Marine conservation (blue health) has continuously improved to provide sustainable supplies of marine resources for expansion and diversification. Blue economy development in this phase focuses on expanding Indonesia blue economy sector through diversification. This is shown by increasing investment and product diversification in the established and emerging sectors, increasing the capacity, feasibility and affordability of emerging sectors particularly renewable energy, biotechnology and bioeconomy, as well as research and innovation. More quality jobs are being created based on emerging sectors, leading to better community well-being. Blue innovation and



blue food have led the collaboration between the established sectors and existing sectors, resulting in diversification and market outreach.

4. Phase IV 2035-2039: Increased contribution and competitiveness of Indonesia's blue economy

Blue economy development in this phase focuses on increasing the contribution and competitiveness of Indonesia's blue economy. This is shown by the improvement of quality and supply chain of the established and emerging sectors, increasing the commercialization of superior products in emerging sectors especially biotechnology and bioeconomy, increasing the contribution of blue economy-based renewable energy, expanding markets for products in the blue economy sector, developing regional-based blue economy development center, strengthening qualified and globally competitive blue economy human resources, improving the quality of the environment health of costal and marine ecosystems, strengthening the resilience of food security, improving local economic development based on coastal and ocean resources, increasing the quality of coastal community wellbeing, as well as increasing the quantity and quality of financing in the blue economy sector. Indonesia's blue economy is expected to be more competitive to enter the global value chain.

5. Phase V 2040-2045: Inclusive, advanced and sustainable Indonesia's blue economy

The development in this phase aims to create inclusive, advanced and sustainable Indonesia's blue economy. This is shown by better prosperity contributed by sustainable ocean resources, the strengthening role of the established sector in global supply chains, becoming the centre for research and innovation for leading emerging sectors, strengthening the independence of regional-based blue economy development centres, globally competitive human resources, and improving the quality of the maritime environment and the health and sustainability of costal and marine ecosystems. Indonesia blue economy is expected leading the global value chain sustainability and being able to create a new growth curve for the next generations.

Each phase will be implemented through a set of action plans that will also become a reference for public and private stakeholders' work plan, support and participation in achieving the vision of sustainable blue economy development in Indonesia. Five sets of proposed action plans have been developed for the five phases. These proposed actions plans are non-exhaustive and will be updated on the year before the next phase starts to respond to the progress as well as the evolving issues and potential solutions. The action plans are as follows.



Table 15. Strategic Action Plans: Phase I 2023-2024 Strengthening Consolidation of the Blue Economy Ecosystem

Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 1</p> <p>Improving health, resilience, and productivity of maritime resources, including in climate change mitigation and adaptation</p>	<ul style="list-style-type: none"> ● Consolidation of development target achievement of Blue Health for 2020-2024 under the National Blue Agenda Actions Partnership. ● Strengthening of coordination, harmonization and synergy in managing marine resources, marine protected areas and marine capture fisheries zoning among different levels of authority. ● Strengthening of international cooperation in achieving Net Zero Emission and other environmental commitments. ● Strengthening of resource and environment data management, research and development. <ul style="list-style-type: none"> ○ Development of ocean and ecosystem services accounting mechanism. ○ Development of data standardization methods for establishing baseline and blue carbon accounting. ○ Identification and mapping of existing maritime resources along with conditions and possible risks in the maritime ecosystem. ○ Strengthening of the mechanism for calculating fisheries stock data. ○ Study of quota-based fisheries. ○ Strengthening of community scientist on marine resources management. ● Improvement in marine resources and marine protected area management. <ul style="list-style-type: none"> ○ Expansion of public awareness of the importance of the ocean and its resources and the protection coastal and marine ecosystem. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Industry ● Ministry of Education, Culture, Research and Technology ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Agrarian Affairs and Spatial Planning



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Identification of the potential management of other effective area-based conservation measures in conjunction with traditional/locally managed management area. ○ Development of participatory mechanisms in decision-making related to marine resources. ○ Strengthening of local wisdoms and community based fisheries management. ○ Support for the creation and formalization of locally-managed resource schemes. ○ Improvement in surveillance and marine security systems. ○ Study of the development of surveillance systems and technologies in the use of maritime resources, including the use of remote sensing, numerical modelling, etc. ○ Strengthening of marine protected area and biodiversity networks. ○ Identification of potential additional marine protected areas. ● Strengthening of law enforcement at sea. <ul style="list-style-type: none"> ○ Strengthening of the maritime authorities' capacity to enforce regulations and ensure compliance with international maritime standards and procedures. ○ Improvement in the monitoring and law enforcement at sea schemes. ● Strengthening of the realization of Indonesia's Enhanced National Determined Contribution related to renewable energy, waste management, coastal zone protection, and ecosystem conservation and restoration. 	<ul style="list-style-type: none"> ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Meteorological and Geophysical Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of effective policies and program of marine debris management to maintain a healthy marine ecosystem for sustainable fisheries. <ul style="list-style-type: none"> ○ Strengthening of central and regional policies and planning, institutions, protocols and measurement in reducing, handling and promoting recycling of marine waste/debris and waste on land and coastal areas. ○ Improvement in waste management system on land and marine through <ul style="list-style-type: none"> ■ Improved data, governance and monitoring, ■ Expansion of technical assistance to reduce marine plastic pollution from source to the sea and to restore river and ocean health, ■ Development of viable business model for securing funding particularly for supporting local waste management system, ■ Technical assistance to support a range of mutually agreed policy and institutional reforms to reduce plastic waste in the ocean, ■ Improved collection infrastructure including for community-based facilities, coastal facilities and ports, ■ Circular economy application for post collection, and ■ Improved enforcement for anti-marine dumping (penalties for dumping of wastes and other matter into ocean and coastal areas). ○ Reduction of undegradable plastic production and consumption through: <ul style="list-style-type: none"> ■ Collaboration with industry to develop and implement industry's transition roadmap to reduce producers' plastic footprint by utilizing environmentally friendly materials, production processes and waste handling/processing including with the use of circular economic approach, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Promotion of technology and innovation on alternative environmentally friendly materials, production processes and plastic recycle, ■ Provision of incentives for producers' performance in extended producer responsibility for the collection and recycling of specified volumes of plastic packaging, ■ Strengthening and expansion of eco-design standards and recyclable plastics, ■ Expansion of consumers' participation to make careful choices to reduce plastic use and to manage waste disposal through increasing their awareness, expansion of single-used plastic ban, and provision of incentives for better practice of waste disposal, and ■ Improvement of waste management (collection and processing) and its linked with energy production and circular economy. <ul style="list-style-type: none"> ○ Assessment of the impact of micro and macro plastics on ecosystems and marine organisms. <ul style="list-style-type: none"> ● Improvement in the coastal areas and small islands management. <ul style="list-style-type: none"> ○ Prevention and ecosystem restoration of damage in coastal areas and small islands. ○ Capacity building and technical assistance for strengthening coastal resilience. ○ Strengthening of policies for mangrove, sea grasses and coral reef rehabilitation management, and calculating the potential carbon sequester (blue carbon) by mangroves and seagrass.. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Support and facilitation for community-based monitoring for mangroves, sea grasses, and coral reef restoration. ● Improvement in relevant sectors to support the resilience and sustainability of marine resources <ul style="list-style-type: none"> ○ Strengthening of the forest management schemes. ○ Development of regulation related to mooring buoy points to support tourism and marine transportation to reduce environmental damage. ○ Promotion of the importance of greening of transportation, shipping, ports, and logistics services to reduce carbon emissions. ○ Improvement in the capacity of fishing vessel crews to maintain vessel efficiency and reduce greenhouse gas emission. 	
<p>Strategic actions 2</p> <p>Uplifting sustainable economic growth of the traditional sectors and emerging sectors in the blue economy</p>	<ul style="list-style-type: none"> ● Consolidation of development target achievement of Blue Food for 2020-2024 under the National Blue Agenda Actions Partnership. ● Improvement and harmonization in blue economy statistics (e.g., development of blue economy monitoring indicators, as well as direct and indirect GDP contributions of the blue economy sectors), employment, and social and environmental data sets. ● Strengthening of the resilience and sustainability of seafood production, seaweed farming, marine-based manufacturing supply chain, tourism supply chain, tourism destination management, and maritime transportation and logistics systems. ● Improvement of blue economy sectors' productivity and resilience through sustainable and practices. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Education, Culture, Research and Technology



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Support for blue economy products and services (seed management, licensing, and marketing, waste and disease monitoring). ○ Study of increasing productivity of marine capture fisheries and aquaculture that are environmentally friendly and applies low carbon practices. ○ Improvement of aquaculture productivity through technology and innovation. ○ Promotion of sustainable and efficient irrigation technologies for coastal agriculture. ○ Technical assistance in developing national strategies and environmentally friendly infrastructure improvement projects for shrimp farming. ○ Development of an inclusive supply chain of fisheries and aquaculture products, upstream to downstream products, through fair and feasible partnerships between small-scale fishers and medium-large industries. ○ Increase in quality investment for seafood and seaweed production and processing, shipbuilding, ports, and logistic system including in cold chain storage and logistic services. ○ Promotion of sustainable seafood processing and value-added industries to increase the value and strengthen competitiveness of Indonesian seafood products. ○ Expansion of sustainable seaweed farming and processing industries to tap into the growing global demand for seaweed-based products, and its potential roles for climate change mitigation and adaption. ○ Expansion of salt production for industry. 	<ul style="list-style-type: none"> ● Ministry of Manpower ● Ministry of Trade ● Ministry of Tourism and Creative Economy ● Ministry of Investment ● Ministry of Finance ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Public Works and Housing ● Ministry of Environment and Forestry ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Support for salt producers in accessing financial resources, such as loans or grants, for infrastructure upgrades or technology adoption to improve efficiency, productivity and quality, and promote sustainable salt harvesting practices. ○ Development of a clear, data-driven marine research strategy on maritime technology that focuses on commercialization-ready outcomes. ○ Expansion of technology application and innovation for productivity and diversification in marine-based manufacturing. ○ Improvement of good handling practices, quarantine and quality assurance of fishery and other coastal and ocean products. ○ Promotion of sustainable and efficient energy use in food production and processing. ○ Promotion of the use of sustainable and climate-smart pest and disease management practices. ○ Improvement in aquatic animal disease preparedness and response systems to support sustainable cultivation. ○ Strengthening of sustainable coastal and marine manufacturing industries, including shipbuilding, marine equipment manufacturing, and marine bioproducts, to stimulate economic growth and innovation. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of regenerative tourism to support sustainable coastal and marine environment. <ul style="list-style-type: none"> ○ Development of the readiness diagnostic for sustainable natural marine and coastal tourism. ○ Promotion of sustainable coastal and marine heritage tourism initiatives to showcase Indonesia's rich cultural and natural heritage by taking into account the interests of local communities, traditional wisdom, conservation areas, and environmental sustainability. ○ Development of sustainable amenities, accessibility, and transportation in coastal and marine-based tourism destinations, including marinas, ports, jetties, docking facilities, and coastal resorts, to enhance accessibility and connectivity to popular tourist destinations and to foster sustainable tourism based on coastal and marine potentials. ○ Implementation of responsible tourism guidelines to promote waste management and recycling, and educate tourists and local communities on the importance of conservation and minimizing environmental impact. ● Development of marine energy potentials. <ul style="list-style-type: none"> ○ Improvement in marine energy resource mapping and assessment to identify viable areas with the highest potential for ocean-based renewable energy generation. ○ Development of project preparation activities for investment in offshore renewable energy (wind and ocean currents). 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of blue economy product and service quality assurance. <ul style="list-style-type: none"> ○ Implementation of standards in blue economy priority sectors to ensure inclusivity, quality assurance and sustainability. ○ Development of supply chain certification and regulatory infrastructure for the maritime industry. ○ Promotion of good manufacturing practices in the production and processing of seafood and seaweed for food products and pharmaceutical. ○ Promotion of sustainable seafood certification and labelling programs and identifying international standards and certification requirements for blue economy sectors. ○ Support for traceability systems to ensure transparency and legality in seafood supply chains. ● Promotion of capacity building partnerships with multiple benefactors across blue economy sectors. ● Strengthening of export potentials. <ul style="list-style-type: none"> ○ Increase in export volume and earning from high value products from marine capture fisheries, aquaculture, seaweed farming, and marine-based manufacturing. ○ Improvement in the efficacy of export promotion for blue economy products. ● Development of circular economy as a source of value creation in blue economy sectors. <ul style="list-style-type: none"> ○ Implementation of a circular economy to reduce environmental damage and create added value, including from marine debris. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Facilitation for technology and innovation commercialization for the development of new materials from marine debris for providing various development solutions (manufacturing, construction, etc.). 	
<p>Strategic actions 3</p> <p>Increasing equality and welfare the blue economy stakeholders to achieve just transition</p>	<ul style="list-style-type: none"> ● Consolidation of development target achievement of Blue Food, Blue Innovation and Blue Finance for 2020-2024 under the National Blue Agenda Actions Partnership. ● Promotion of an inclusive stakeholders' participation in blue economy. <ul style="list-style-type: none"> ○ Development of education and awareness programs to enhance ocean literacy among coastal communities. ○ Awareness raising of the community's and indigenous people's role in the blue economy value chain. ○ Improvement in the participation of indigenous and marginalized communities in decision-making processes related to the blue economy. ○ Promotion of gender equality and women's empowerment in the blue economy sector. ● Skills development in blue economy. <ul style="list-style-type: none"> ○ Development of employment occupancy and talent mapping in the blue economy sector. ○ Improvement of the education system, particularly related to science, technology, engineering, arts and mathematics, including curricula, teachers, capacity, facilities and infrastructure, supported by cooperation between educational institutions and industry. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Human Development and Culture ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Education and Culture ● Ministry of Manpower ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Energy and Mineral Resources ● Ministry of Women's Empowerment and Child Protection ● Ministry of Youth and Sports



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Promotion of an integrated study programs (formal and informal) related to the blue economy. ○ Development of standards and certification of human resource competencies in the blue economy sector. ○ Improvement in skills related to marine-based research and development, manufacturing and logistics. ○ Improvement of the tourism skills in natural marine and coastal tourism. ● Development of decent work in blue economy. <ul style="list-style-type: none"> ○ Identification of needs for corporate support and blue economy workforce cooperative partnerships. ○ Promotion of decent work supported by healthy and safe working environment in the priority blue economy sectors. ● Strengthening of community empowerment in blue economy <ul style="list-style-type: none"> ○ Improvement of social capital including in the forms of local/grassroot/ community organization in managing the business, conservation and social wellbeing in small islands and the coastal areas. ○ Promotion of small and medium industry cluster development, cooperatives and village-owned businesses in the coastal areas to strengthen community-based businesses in blue economy sectors. ○ Provision of business development services for new entrepreneurs and micro and small enterprises in the coastal areas and small islands. ○ Increased access to affordable finance, training, technology and innovation, and market support for local entrepreneurs. 	<ul style="list-style-type: none"> ● Ministry of Social Affairs ● Ministry of Home Affair ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of community-based fisheries management to empower local fishing communities. ○ Support for the development of community-based fisheries co-management initiatives. ○ Development of sustainable community-based marine and coastal tourism supported by community access to coastal areas. ○ Empowerment of youth, women and people with disabilities in priority blue economy sectors through capacity buildings, entrepreneurship and employment opportunities. ○ Promotion of appropriate technology adoption and innovation among communities in coastal areas, involving youth, women and people with disabilities. ● Strengthening of communities' resilience in blue economy. <ul style="list-style-type: none"> ○ Improvement of basic infrastructure and connectivity in coastal areas and small islands. ○ Mainstreaming of policies related to consuming good nutritious food derived from sustainable marine food. ○ Development of a social protection scheme for fishers and maritime workers supports productivity improvement. ○ Improvement in awareness and understanding about drought and water scarcity mapping. 	



Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 4</p> <p>Strengthening the enabling ecosystem including governance, financing, and infrastructure</p>	<ul style="list-style-type: none"> ● Consolidation of development target achievement of Blue Health, Blue Food, Blue Innovation and Blue Finance for 2020-2024 under the National Blue Agenda Actions Partnership. ● Development of effective blue economy policies, planning, programs and procedures. <ul style="list-style-type: none"> ○ Mainstreaming of blue economy agenda in the planning and implementation of policies in relevant government institutions. ○ Institutional analysis to ensure the effectiveness of implementing the Blue Economy Roadmap. ○ Improvement in blue economy related policy soundness and synergies in policy and program implementation involving public and private collaboration. ○ Support for policies promoting potential blue economy sectors at regional level. ○ Promotion of the blue economy roadmap in bilateral and multilateral forums. ○ Development of collaboration between the public and private sectors in marine resource management dan blue economy data at national and provincial levels. ○ Establishment of marine data repositories and open-access platforms to facilitate knowledge sharing. ○ Digital technologies adoption and data-sharing platforms to improve efficiency and transparency in maritime trade and logistics. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Coordinating Ministry for Human Development and Culture ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Home Affairs ● Ministry of Foreign Affairs ● Ministry of Education, Culture, Research and Technology ● Ministry of Telecommunication and Informatics



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of marine spatial planning that promotes harmony between protection mechanisms for the marine and coastal environment and human activities at the national and regional levels. ○ Development of clear guidelines and criteria for issuing permits and licenses for marine resource utilization, processing, and trade, as well as ensuring transparency and accountability in establishing marine protected areas to conserve critical habitats and biodiversity. ○ Development of a comprehensive study to optimize the utilization of the Indonesian Archipelago Sea Lanes (ALKI) in blue economy priority sectors. ○ Strengthening of the legal instruments and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional, and global cooperation frameworks using ALKI. ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ● Investment promotion for blue economy sectors. <ul style="list-style-type: none"> ○ Simplification of regulations to increase of investment and local business' participation in the blue economy. ○ Identification of high-tech-based investment potentials, including biotechnology and marine bioeconomy. ○ Improvement in the readiness of business facilities, investment, and supporting infrastructure for promoting blue economy at central and regional levels. 	<ul style="list-style-type: none"> ● Ministry of Energy and Mineral Resources ● Ministry of Manpower ● Ministry of Trade ● Ministry of Investment ● Ministry of Transportation ● Ministry of Industry ● Ministry of Tourism and Creative Economy ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Strengthening of the role of science and technology in blue economy <ul style="list-style-type: none"> ○ Strengthening of the role of science and technology, research, and development of marine information systems. ○ Strengthening of the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and technology/patent commercialization. ○ Development of marine centre of excellence (centre of excellence), and research centers to promote scientific knowledge and innovation on blue economy. ○ Facilitation of basic research and improvement in priority sectors in the blue economy. ○ Investment in the development of eco-friendly marine biotechnology. ○ Investment in research and development for sustainable marine protein sources. ○ Identification of the potential to research and develop technology based on underwater and seabed mapping. ● Development of just energy transition in blue economy. <ul style="list-style-type: none"> ○ Review of existing regulatory mandates of agencies relating to the energy sector and marine mining (e.g., offshore petroleum). ○ Strengthening of policy coordination and cooperation between government agencies responsible for energy, environment, and maritime affairs to enable the sustainable growth of ocean-based renewable energy. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of the enabling factors for feasible offshore energy generation, including relevant regulation and policies, research and development, feasibility studies for offshore energy projects, and provision of incentives for offshore energy investment. ● Development of sustainable blue finance. ○ Development of collaboration in blue finance to support the implementation of the Blue Economy Roadmap. ○ Development of a new roadmap and articulating the policy, regulatory, and institutional development to foster blue finance through limited public finance. ○ Preparation of assessment of the funding needs for conservation areas and biodiversity protection. ○ Development of the Blue Action Fund aiming at protecting the globally significant biodiversity of Indonesia's Bird's Head Seascapes for marine protected areas in Bird's Head Seascapes. ● Improvement in disaster resilience and mitigation capacity. 	

Table 16. Strategic Action Plans: Phase II 2025-2029: Development of the Indonesia Blue Economy as A New Source of Growth

Strategic actions	Action plans	Relevant institutions
Strategic actions 1 Improving health, resilience, and productivity of	<ul style="list-style-type: none"> ● Strengthening of coordination, harmonization and synergy in managing marine resources, marine protected areas and marine capture fisheries zoning among different levels of authority. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs



Strategic actions	Action plans	Relevant institutions
maritime resources, including in climate change mitigation and adaptation	<ul style="list-style-type: none"> ● Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ● Strengthening of international cooperation in achieving Net Zero Emission and other environmental commitments. ● Strengthening of resource and environment data management, research and development. <ul style="list-style-type: none"> ○ Development of ocean and ecosystem services accounting mechanism. ○ Strengthening of data standardization methods for establishing baseline and blue carbon accounting. ○ Development and implementation of frameworks and manuals health indices and marine resources balance. ○ Strengthening of community scientist on marine resources management. ○ Expansion of research and development of marine resources. ● Strengthening of marine resources and marine protected area management. <ul style="list-style-type: none"> ○ Expansion of public awareness of the importance of the ocean and its resources and the protection of the coastal and marine ecosystem.. ○ Development of policy on other effective area-based conservation measures in conjunction with traditional/ locally managed management area. ○ Development of participatory mechanisms in decision-making related to marine resources. 	<ul style="list-style-type: none"> ● Coordinating Ministry for Politics, Law, and Security ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Industry ● Ministry of Education, Culture, Research and Technology ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Meteorological and Geophysical



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of local wisdoms and community based fisheries management. ○ Support for the creation and formalization of locally-managed resource schemes. ○ Policy development based on ocean and ecosystem services accounting. ○ Implementation of quota-based fisheries. ○ Strengthening of infrastructure and management capacity of ecosystems and marine protected areas. <ul style="list-style-type: none"> ■ Development of measurement tools for the effectiveness of conservation area management. ■ Strengthening of surveillance and marine security systems for the use of maritime resources, including in: <ul style="list-style-type: none"> ⇒ the use of latest technology in monitoring and controlling marine resources, including remote sensing, numerical modelling, etc. ⇒ identification and mapping of existing maritime resources based on geographic information systems along with conditions and possible risks in the maritime ecosystem, and ⇒ adoption of modelling systems to predict changes in the condition of marine resources. ○ Expansion of marine protected areas. ○ Strengthening of marine protected area and biodiversity networks. ○ Development of blue economy cooperation and knowledge sharing with ASEAN Member States on marine conservation. 	<p>Agency</p> <ul style="list-style-type: none"> ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of reporting and verification systems to track the utilization of marine resources. ○ Development of incentives and disincentives to promote stakeholders' participation in marine resource management. <ul style="list-style-type: none"> ■ Provision of market-based incentives, such as eco-certifications, to encourage sustainable practices in blue economy sectors. ■ Identification of potential implementation of ecosystem service payment schemes with area management planning, e.g. potential implementation of payment for ecosystem services schemes that reward communities and individuals for the conservation and sustainable use of marine resources, marine polluter pays schemes policy, etc. ■ Development of financial incentives to encourage the adoption of sustainable aquaculture practices, fishing gear and techniques that minimize bycatch and habitat damage: <ul style="list-style-type: none"> ⇒ affordable and flexible credit for coastal communities engaged in sustainable aquaculture practices such as recirculating aquaculture systems, ⇒ grants and subsidies to support implementing sustainable fishing and aquaculture certification programs, such as Marine Stewardship Council or Aquaculture Stewardship Council certification, and ⇒ low-interest loans for implementing sustainable coastal infrastructure projects, such as coral reef restoration and mangrove rehabilitation. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ■ Promotion of carbon removal and offset for achieving net-zero company pledges, followed by renewable energy use and energy efficiency improvements. ● Strengthening of law enforcement at sea. <ul style="list-style-type: none"> ○ Strengthening of the maritime authorities' capacity to enforce regulations and ensure compliance with international maritime standards and procedures. ○ Strengthening enforcement and monitoring capabilities to prevent illegal, unreported, and unregulated (IUU) fishing practices through issuing permits and licenses that promote transparency and traceability in the fisheries sector. ○ Improvement in the monitoring and law enforcement at sea schemes. ○ Strengthening environmental court and laws ● Strengthening of the realization of Indonesia's Enhanced National Determined Contribution related to renewable energy, waste management, coastal zone protection, and ecosystem conservation and restoration. ● Improvement in policies and program implementation of marine debris management to maintain a healthy marine ecosystem for sustainable fisheries. <ul style="list-style-type: none"> ○ Increased efficacy of central and regional policies and planning, institutions, protocols and measurement in reducing, handling and promoting recycling of marine waste/debris and waste on land and coastal areas. ○ Improvement in waste management system on land and marine through <ul style="list-style-type: none"> ■ Improved data, governance and monitoring, ■ Expansion of technical assistance to reduce marine plastic pollution from source to the sea and to restore river and ocean health. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Strengthening of viable business model and funding for supporting local waste management system, ■ Technical assistance to support a range of mutually agreed policy and institutional reforms to reduce plastic waste in the ocean, ■ Improved collection infrastructure including for community-based facilities, coastal facilities and ports, ■ Circular economy application for post collection, and ■ Improved enforcement for anti-marine dumping (penalties for dumping of wastes and other matter into ocean and coastal areas). <p>○ Reduction of undegradable plastic production and consumption through:</p> <ul style="list-style-type: none"> ■ Collaboration with industry to develop and implement industry's transition roadmap to reduce producers' plastic footprint by utilizing environmentally friendly materials, production processes and waste handling/processing including with the use of circular economic approach, ■ Promotion of technology and innovation on alternative environmentally friendly materials, production processes and plastic recycle, ■ Provision of incentives for producers' performance in extended producer responsibility for the collection and recycling of specified volumes of plastic packaging, ■ Strengthening and expansion of eco-design standards and recyclable plastics, ■ Expansion of consumers' participation to make careful choices to reduce plastic use and to manage waste disposal through increasing their 	



Strategic actions	Action plans	Relevant institutions
	<p>awareness, expansion of single-used plastic ban, and provision of incentives for better practice of waste disposal, and</p> <ul style="list-style-type: none"> ■ Improvement of waste management (collection and processing) and its linked with energy production and circular economy. ○ Development of policy to reduce the impact of micro and macro plastics on ecosystems and marine organisms. ● Improvement in the coastal areas and small islands management. <ul style="list-style-type: none"> ○ Revitalization of coastal areas and small islands. ○ Support and facilitation to safeguard critical resources for coastal livelihoods, climate change mitigation, and resilience. ○ Expansion of capacity building and technical assistance for strengthening coastal resilience. ○ Strengthening of policies for mangrove, sea grasses and coral reef rehabilitation management. ○ Support and facilitation for the expansion of community-based monitoring and management for mangroves, sea grasses, and coral reef restoration. ○ Increase in the plantation and rehabilitation of mangroves, seagrasses, and coral reefs. ● Improvement in relevant sectors to support the resilience and sustainability of marine resources <ul style="list-style-type: none"> ○ Expansion of the improved forest management schemes. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of the use of sustainable and climate-smart agricultural extension services. ○ Enforcement and monitoring of regulation related to mooring buoy points to support tourism and marine transportation to reduce environmental damage. ○ Strengthening the application and expansion of the renewable energy transition in coastal and marine activities (fishery, tourism, transportation, trade). ○ Promotion of greening transportation, shipping, ports, and logistics services to reduce carbon emissions. <ul style="list-style-type: none"> ■ Improvement in the management of fishing vessels, fishing equipment, and crewing fishing vessels to maintain efficiency and reduce greenhouse gas emission. ■ Development of green transportation, shipping, ports, and logistics services to reduce carbon emissions. ■ Development and implementation of an integrated policy framework around marine conservation and climate change mitigation. ■ Development of ballast water wastewater treatment technology at ports and maritime industry services. 	
Strategic actions 2 Uplifting sustainable economic growth of the traditional sectors and	<ul style="list-style-type: none"> ● Strengthening of blue economy statistics (e.g., development of blue economy monitoring indicators, as well as direct and indirect GDP contributions of the blue economy sectors), employment, and social and environmental data sets. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and



Strategic actions	Action plans	Relevant institutions
emerging sectors in the blue economy	<ul style="list-style-type: none"> ● Strengthening of the resilience and sustainability of seafood production, seaweed farming, marine-based manufacturing supply chain, tourism supply chain, tourism destination management, and maritime transportation and logistics systems. ● Improvement of blue economy sectors' productivity and resilience through sustainable and practices. <ul style="list-style-type: none"> ○ Development and activation of generic Indonesian brands. ○ Development of sustainable coastal and marine fashion and lifestyle brands with environmentally friendly materials and manufacturing processes. ○ Development of investment potentials mapping in the blue economy sector. ○ Development of competitive blue economy clusters for marine-based manufacturing, tourism, marine biotechnology and bioeconomy, port and trade. ○ Development of an inclusive supply chain of fisheries and aquaculture products, upstream to downstream products, through fair and feasible partnerships between small-scale fishers and medium-large industries. ○ Support for blue economy products and services (seed management, licensing, and marketing, waste and disease monitoring). ○ Supply chain monitoring through digitization and sharing data for better resource planning. ○ Implementation of sustainable fisheries and aquaculture management practices to ensure the long-term productivity. 	<ul style="list-style-type: none"> Fisheries ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Education, Culture, Research and Technology ● Ministry of Manpower ● Ministry of Trade ● Ministry of Tourism and Creative Economy ● Ministry of Investment ● Ministry of Finance ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Public Works and Housing ● Ministry of Environment and Forestry ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Escalation of the adoption of integrated fish farming to efficient the utilization of available resources, recycling waste, and saving energy while maintaining the ecological balance. ○ Technical assistance in developing national strategies and infrastructure improvement projects for potential fishery products. ○ Development of sustainable mariculture systems technology, such as integrated multitrophic aquaculture. ○ Integrated multi-trophic aquaculture and coastal farming to diversify income sources and increase productivity. ○ Promotion of the use of sustainable and climate-smart pest and disease management practices. ○ Improvement in aquatic animal disease preparedness and response systems to support sustainable cultivation. ○ Improvement of good handling practices, quarantine and quality assurance of fishery and other coastal and ocean products. ○ Quality investment for seafood and seaweed production and processing, shipbuilding, ports, and logistic system including in cold chain storage and logistic services. ○ Promotion of sustainable seafood processing and value-added industries to increase the value and strengthen competitiveness of Indonesian seafood products. 	<ul style="list-style-type: none"> ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of sustainable seaweed farming and processing industries to tap into the growing global demand for seaweed-based products, and its potential roles for climate change mitigation and adaption. ○ Strengthening of the Tropical Seaweed Innovation Network to increase productivity, the application of low-carbon seaweed cultivation, etc. ○ Promotion of the downstream of fisheries and aquaculture products supported by developing a resilient supply chain. ○ Strengthening of sustainable coastal and marine manufacturing industries, including shipbuilding, marine equipment manufacturing, and marine bioproducts, to stimulate economic growth and innovation. ○ Development of an inclusive, quality and sustainable blue food. ○ Facilitation in developing resilient blue food value chain based on coastal and marine resources. ○ Facilitation of business development in producing nutrition from the ocean. ○ Promotion of sustainable and efficient energy use in blue food production and processing. ○ Development of sustainable marine biotechnology industries, including the extraction of bioactive compounds from marine organisms for pharmaceutical and nutraceutical applications. ○ Expansion of salt production for industry supported by the application of advanced production techniques, such as using saltwater-tolerant crops, hydroponics, pharmaceuticals, renewable energy, automated systems, precision cultivation, sustainable irrigation methods, etc. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of salt production clusters in coastal areas to leverage synergies supported by better access to finance, technology application, efficient and sustainable production. ○ Promotion of sustainable salt farming practices to minimize environmental impacts, use eco-friendly fertilizers, efficient water management systems, and proper waste disposal methods. ○ Strengthening of the coastal community businesses based on geographic indications, intellectual property, and community development principles. ○ Development of a clear, data-driven marine research strategy on maritime technology that focuses on commercialization-ready outcomes. ○ Expansion of technology application and innovation for productivity and diversification in marine-based manufacturing. ○ Development of incentive schemes to support the growth of high-tech-based blue economy sectors and new sectors such as shipbuilding, renewable energy, bioeconomy, and biotechnology. ○ Development of marine innovation hubs and incubators development to nurture entrepreneurship and accelerate the development of blue economy start-ups. ○ Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. ● Development of regenerative tourism to support sustainable coastal and marine environment. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of an inclusive and sustainable coastal and marine tourism including in protected areas involving local communities and businesses. ○ Improvement in sustainable amenities, accessibility, and transportation in coastal and marine-based tourism destinations, including marinas, ports, jetties, docking facilities, and coastal resorts, to enhance accessibility and connectivity to popular tourist destinations. ○ Increase in quality investment to support sustainable coastal and marine tourism destinations. ○ Study on potential partnership with the yachting sector from the economic potential and feasibility of further development of the recreational yachting sector. ○ Improvement of capacity in managing cruise tourism, such as marine tourism and the marine environment. ○ Implementation of responsible tourism guidelines to promote waste management and recycling, and educate tourists and local communities on the importance of conservation and minimizing environmental impact. ● Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. <ul style="list-style-type: none"> ○ Development of pilot projects for offshore renewable energy investment activities (wind and ocean currents) based on feasibility studies in areas with the highest energy generation potential and demand. ○ Development of regulatory frameworks that incentivize the deployment of ocean-based renewable energy technologies and ensure fair market competition. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Study on local supply chains and manufacturing capabilities for ocean-based renewable energy technologies to foster domestic industry growth and job creation. ● Development of blue economy product and service quality assurance. <ul style="list-style-type: none"> ○ Expansion of technology solutions for the implementation of standards in blue economy priority sectors to ensure inclusivity, quality assurance and sustainability. ○ Development of supply chain certification and regulatory infrastructure for the maritime industry. ○ Promotion of good manufacturing practices in the production and processing of seafood and seaweed for food products and pharmaceutical. ○ Promotion of sustainable seafood certification and labelling programs and identifying international standards and certification requirements for blue economy sectors. ○ Support for traceability systems to ensure transparency and legality in seafood supply chains. ○ Capacity building for food safety and quality assurance. ○ Improvement in the facility and infrastructure for food safety and quality assurance. ● Strengthening of export potentials. <ul style="list-style-type: none"> ○ Increase in export volume and earning from high value products from marine capture fisheries, aquaculture, seaweed farming, and marine-based manufacturing. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement in the efficacy of export promotion for blue economy products. ● Development of competitive logistics, transportation and ports. <ul style="list-style-type: none"> ○ Expansion of digital technologies adoption and data-sharing platforms to improve efficiency and transparency in maritime trade and logistics. ○ Development of climate-resilient infrastructure for food storage and processing, including cold chain infrastructure to reduce post-harvest losses. ○ Improvement of advanced logistics technologies and systems to optimize supply chain management and reduce transportation costs. ○ Improvement of the provision, quality, and integration of port and maritime infrastructures. ○ Development of efficient and sustainable maritime transport systems to facilitate the movement of goods and services. ○ Development and upgrade of port infrastructure such as container terminals, dry ports, intermodal facilities, and hinterland connections to improve connectivity and efficient ride and supply chain interisland. ○ Development and modernization of marine infrastructure and logistics facilities to accommodate increased trade volumes and larger vessels to improve cargo handling and transportation efficiency. ○ Development of new port facilities in strategic locations to cater to emerging trade routes and market demands. ○ Development of intensive monitoring, control, and surveillance measures using satellite imagery data to capture real-time images of fishing vessels at sea. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of maritime safety and security measures, including vessel tracking systems, surveillance technologies, and anti-piracy measures. ○ Implementation of port audit and "port risk assessment" and related facilities according to internationally recognized safety standards and rules. ○ Research and development of autonomous shipping and unmanned maritime systems to increase efficiency and safety. ○ Development of maritime services, such as ship repair and maintenance, maritime insurance, and maritime law services. ● Promotion of capacity building partnerships with multiple benefactors across blue economy sectors. ● Development of circular economy as a source of value creation in blue economy sectors. <ul style="list-style-type: none"> ○ Expansion of a circular economy to reduce environmental damage and create added value, including from marine debris. ○ Studies on the potential of creating various higher-value products from fish waste. ○ Facilitation for technology and innovation commercialization for the development of new materials from marine debris for providing various development solutions (manufacturing, construction, etc.). 	
Strategic actions 3 Increasing equality and welfare the blue economy	<ul style="list-style-type: none"> ● Promotion of an inclusive stakeholders' participation in blue economy. <ul style="list-style-type: none"> ○ Expansion of education and awareness programs to enhance ocean literacy among coastal communities. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Human Development and Culture



Strategic actions	Action plans	Relevant institutions
stakeholders to achieve just transition	<ul style="list-style-type: none"> ○ Improvement in the role of community and indigenous people in the blue economy value chain. ○ Improvement in the participation of indigenous and marginalized communities in decision-making processes related to the blue economy. ○ Promotion of gender equality and women's empowerment in the blue economy sector. ○ Involvement of coastal communities during the project planning and development of offshore renewable energy. ● Skills development in blue economy. <ul style="list-style-type: none"> ○ Development of employment occupancy and talent mapping in the blue economy sector. ○ Improvement of the education system, particularly related to science, technology, engineering, arts and mathematics, including curricula, teachers, capacity, facilities and infrastructure, supported by cooperation between educational institutions and industry. ○ Strengthening of the integrated study programs (formal and informal) related to the blue economy. ○ Development of standards and certification of human resource competencies in the blue economy sector. ○ Development and facilitation of a new assessor for worker competency certification in the blue economy sector. ○ Improvement in skills related to marine-based research and development, manufacturing and logistics. 	<ul style="list-style-type: none"> ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Education and Culture ● Ministry of Manpower ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Energy and Mineral Resources ● Ministry of Women's Empowerment and Child Protection ● Ministry of Youth and Sports ● Ministry of Social Affairs ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Re-training or skill transformation for workers in coastal and marine tourism. ○ Skills development in ocean renewable energy. ○ Facilitation of training, competency certification and job placement of workers in the blue economy sector. ● Development of decent work in blue economy. <ul style="list-style-type: none"> ○ Improvement of policies related to social security and the formalisation of worker arrangements in the blue economy sector. ○ Alignment between corporate support programs and blue economy workforce cooperative partnerships. ○ Expansion of decent work supported by healthy and safe working environment in the priority blue economy sectors. ○ Promotion of workforce transformation scheme to allow talent movement to higher skills or more productive type of jobs across priority sectors, particularly in responding to investment and emerging blue economy sectors. ○ Development of the blue economy workforce supports programs that can increase productivity. ● Strengthening of community empowerment in blue economy. <ul style="list-style-type: none"> ○ Improvement of social capital including in the forms of local/grassroot/ community organization in managing the business, conservation and social wellbeing in small islands and the coastal areas. ○ Promotion of small and medium industry cluster development, cooperatives and village-owned businesses in the coastal areas to strengthen community-based businesses in blue economy sectors. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of aquaculture production to meet the growing demand for aquatic food and enhance inclusive livelihoods. ○ Provision of business development services for new entrepreneurs and micro and small enterprises in the coastal areas and small islands. ○ Skills improvement for local facilitators with scientific and business expertise to leverage local/community knowledge for advancing local businesses. ○ Improvement of financial literacy and management, and implementation geographical indications to help local entrepreneurs expand their businesses. ○ Increased access to affordable finance, training, technology and innovation, and market support for local entrepreneurs. ○ Strengthening of community-based fisheries management to empower local fishing communities. ○ Support for the development of community-based fisheries co-management initiatives. ○ Development of sustainable community-based marine and coastal tourism supported by community access to coastal areas. ○ Expansion on the empowerment of youth, women and people with disabilities in priority blue economy sectors through capacity buildings, entrepreneurship and employment opportunities. ○ Development of microfinance initiatives specifically tailored for women in coastal communities to promote their engagement in sustainable blue economy activities. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Promotion of appropriate technology adoption and innovation among communities in coastal areas, involving youth, women and people with disabilities. ● Strengthening of communities' resilience in blue economy. <ul style="list-style-type: none"> ○ Improvement of basic infrastructure and connectivity in coastal areas and small islands, including to support integrated food-energy-water systems in these areas. ○ Development of saltwater treatment in small and remote islands supported by sustainable operation and management for the facilities by local communities. ○ Expansion of community movement to increase consumption of good nutritious food derived from sustainable marine food. ○ Increase in the availability of access and sustainable marine commodity production facilities to support public health. ○ Development of a social protection scheme for fishers and maritime workers supports productivity improvement. ○ Development of social safety nets to support vulnerable communities affected by environmental changes, supported by possible development of climate-resilient insurance or risk-sharing mechanism to protect coastal farmers and small-scale fishers financially due to seasonality or in case of unforeseen events or disasters. ○ Improvement in awareness and understanding about drought and water scarcity mapping. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of sustainable and climate-resilient seed varieties for coastal agriculture. ○ Investment in the development of sustainable and climate-resilient coastal food production hubs. ○ Technical assistance and financial support to promote the transition of fishers and coastal communities to alternative livelihoods that are less dependent on marine resources, such as ecotourism or sustainable agriculture. ○ Involvement of local communities and local industries to work together to solve environmental and sustainable development issues in the vicinity 	
<p>Strategic actions 4</p> <p>Strengthening the enabling ecosystem including governance, financing, and infrastructure</p>	<ul style="list-style-type: none"> ● Development of effective blue economy policies, planning, programs and procedures. <ul style="list-style-type: none"> ○ Integration of blue economy agenda in the planning and implementation of policies in relevant government institutions. ○ Improvement in blue economy related policy soundness and synergies in policy and program implementation involving public and private collaboration. ○ Support for policies promoting potential blue economy sectors at regional level. ○ Promotion of the blue economy roadmap in bilateral and multilateral forums. ○ Strengthening of collaboration between the public and private sectors in marine resource management dan blue economy data at national and provincial levels. ○ Improvement of marine data repositories and open-access platforms to facilitate knowledge sharing. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Coordinating Ministry for Human Development and Culture ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of National Development



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of a comprehensive marine spatial planning framework (land and sea) to promote harmony between protection mechanisms for the marine and coastal environment and human activities at the national and regional levels. ○ Development of clear guidelines and criteria for issuing permits and licenses for marine resource utilization, processing, and trade, as well as ensuring transparency and accountability in establishing marine protected areas to conserve critical habitats and biodiversity. ○ Improvement in the utilization of the Indonesian Archipelago Sea Lanes (ALKI) in blue economy priority sectors, supported by sound regulatory framework and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional, and global cooperation frameworks using ALKI. ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ● Investment promotion for blue economy sectors. <ul style="list-style-type: none"> ○ Simplification of regulations to increase of investment and local business' participation in the blue economy. ○ Regular reviews and evaluations of permit and license issuance procedures to identify areas for improvement and enhance efficiency. ○ Capacity-building to enhance the skills and knowledge of government officials involved in issuing and managing permits and licenses for marine resource utilization and trade. 	<p>Planning</p> <ul style="list-style-type: none"> ● Ministry of Finance ● Ministry of Home Affairs ● Ministry of Foreign Affairs ● Ministry of Education, Culture, Research and Technology ● Ministry of Telecommunication and Informatics ● Ministry of Energy and Mineral Resources ● Ministry of Manpower ● Ministry of Trade ● Ministry of Investment ● Ministry of Transportation ● Ministry of Industry ● Ministry of Tourism and Creative Economy ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Ease of permits and tax relief policy for those who invest part of their capital for R&D in the blue economy sector. ○ Identification of high-tech-based investment potentials, including biotechnology and marine bioeconomy. ○ Facilitation of investment in blue food value chain. ○ Facilitation of investment in the development of eco-friendly marine biotechnology. ○ Improvement in the readiness of business facilities, investment, and supporting infrastructure in developing the central and regional blue economy. ○ Establishment of maritime hubs and free trade zones to attract investment and facilitate trade activities. ○ Development of mechanisms for public feedback related to the issuance of permits and licenses, allowing affected communities and stakeholders to voice their concerns and seek resolution. ● Strengthening of the role of science and technology in blue economy. <ul style="list-style-type: none"> ○ Strengthening of the role of science and technology, research, and marine information systems. ○ Strengthening of the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and technology/patent commercialization. ○ Development of an integrated plan for expanding technology development, modification, transfer and adoption supported by collaboration, licensing, reverse engineering, and procurement. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of marine centre of excellence (centre of excellence), and research centers to promote scientific knowledge and innovation on blue economy. ○ Development of sustainable coastal and marine research parks and innovation clusters, facilitating collaboration and knowledge exchange between academia, industry, and government. ○ Facilitation of basic research and improvement in priority sectors in the blue economy. ○ Expanding bioprospecting to supply the most potential bioresources for creating added value. ○ Supporting the growth of sustainable coastal and marine information and communication technology solutions such as smart fishing technologies and marine spatial planning tools. ○ Identification of the potential to research and develop technology based on underwater and seabed mapping. ○ Development of research framework and implementation on hydro-oceanography. ● Development of just energy transition in blue economy. <ul style="list-style-type: none"> ○ Strengthening of regulatory mandates of agencies relating to the energy sector and marine mining (e.g. offshore petroleum). ○ Strengthening of policy coordination and cooperation between government agencies responsible for energy, environment, and maritime affairs to enable the sustainable growth of ocean-based renewable energy. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of the enabling factors for feasible offshore energy generation, including relevant regulation and policies, research and development, feasibility studies for offshore energy projects, and provision of incentives for offshore energy investment. ○ Involvement of financial institutions and investors to create dedicated funding mechanisms and investment vehicles for ocean-based renewable energy projects. ○ Facilitation of investment in sustainable marine renewable energy projects (such as offshore wind farms and tidal energy installations) to reduce dependence on fossil fuels and create green jobs. ○ Improvement in the readiness of leveraging investment from multipurpose infrastructures (including supporting offshore energy supply for greening of transportation, shipping, ports, and logistics services). ● Development of sustainable blue finance. <ul style="list-style-type: none"> ○ Strengthening of collaboration in various blue finance schemes to support blue economy activities, i.e: <ul style="list-style-type: none"> ■ Blue bond for fisheries management projects and ocean renewable energy projects, ■ Blended finance for marine resource and waste management, ■ Revolving loan funds for small-scale fishers to invest in sustainable fishing practices and equipment, ■ Impact investment funds to support the growth of sustainable marine-based businesses and start-ups, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Blue carbon funds to finance projects that protect and restore coastal ecosystems, such as mangroves and seagrasses, for carbon sequestration, ■ Trust funds mechanism to support the long-term management and conservation of marine protected areas, ■ Grants and seed funding for research and development projects focused on innovative solutions for sustainable fisheries and marine resource management, ■ Grants and seed funding for start-ups engagements in the blue economy and business incubation, ■ Blue Investment Bank approaches as complementary to Public–Private Partnerships (PPP), ■ Project-based Blue Financing, etc. ○ Increasing awareness of financing and development mechanisms/thematic investment platform related to blue economy. ○ Expansion in the implementation of the Blue Action Fund: protect the biodiversity and environment in coastal and ocean area. ○ Expansion of the implementation of marine insurance and risk management services, providing coverage and support to businesses operating in the blue economy. ● Strengthening of disaster resilience and mitigation capacity. <ul style="list-style-type: none"> ○ Research and development to understand the impacts of climate change on marine ecosystems and development of adaptation strategies. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement in disaster resilience and mitigation capacity to supported by a management plan of ecosystem-based marine resources. ● Development of Blue Carbon. <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Implementation of the Indonesia Blue Carbon Strategic Framework. ○ Establishment of carbon market to optimize the benefits from blue carbon ecosystem potentials. ● Improvement in the Indonesia Blue Economy Index and monitoring of its progress. <ul style="list-style-type: none"> ○ Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ○ Development of collaboration schemes in the blue economy database between public and private stakeholders at national and provincial levels 	



Table 17. Strategic Action Plans: Phase III 2030-2034: Expansion of Indonesia Blue Economy through Diversification

Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 1</p> <p>Improving health, resilience, and productivity of maritime resources, including in climate change mitigation and adaptation</p>	<ul style="list-style-type: none"> ● Strengthening of coordination, harmonization and synergy in managing marine resources, marine protected areas and marine capture fisheries zoning among different levels of authority. ● Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ● Strengthening of international cooperation in achieving Net Zero Emission and other environmental commitments ● Strengthening of and expansion of resource and environment data management, research and development <ul style="list-style-type: none"> ○ Strengthening of ocean and ecosystem services accounting mechanism. ○ Strengthening of blue carbon accounting. ○ Expansion of the implementation of frameworks and manuals health indices and marine resources balance. ○ Strengthening of community scientist on marine resources management. ○ Expansion of research and development of marine resources. ● Strengthening of marine resources and marine protected area management. <ul style="list-style-type: none"> ○ Expansion of public awareness of the importance of the ocean and its resources and the protection of the coastal and marine ecosystem.. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Industry ● Ministry of Education, Culture, Research and Technology ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of Home Affairs



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of policy on other effective area-based conservation measures in conjunction with traditional/ locally managed management area. ○ Strengthening of participatory mechanisms in decision-making related to marine resources. ○ Strengthening locally-managed resource schemes. ○ Improved efficacy of policies based on ocean and ecosystem services accounting. ○ Strengthening of quota-based fisheries. ○ Improvement in the standards of sustainable marine resource management. ○ Strengthening of infrastructure and management capacity of ecosystems and marine protected areas. <ul style="list-style-type: none"> ■ Improvement of measurement tools for the effectiveness of conservation area management. ■ Strengthening of surveillance and marine security systems for the use of maritime resources, including in: <ul style="list-style-type: none"> ⇒ expansion in the use of latest technology in monitoring and controlling marine resources, including remote sensing, numerical modelling, etc. ⇒ strengthening of maritime resources based on geographic information systems long with conditions and possible risks in the maritime ecosystem, and ⇒ improvement in modelling systems to predict changes in the condition of marine resources. 	<ul style="list-style-type: none"> ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Meteorological and Geophysical Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of marine protected areas. ○ Strengthening of marine protected area and biodiversity networks. ○ Strengthening of blue economy cooperation and knowledge sharing with ASEAN Member States on marine conservation. ○ improvement in the quality of reporting and verification systems to track the utilization of marine resources. ○ improvement in the incentives and disincentives to promote stakeholders' participation in marine resource management. <ul style="list-style-type: none"> ■ Improvement of market-based incentives, such as eco-certifications, to encourage sustainable practices in blue economy sectors. ■ Implementation of ecosystem service payment schemes with area management planning, e.g. payment for ecosystem services schemes that reward communities and individuals for the conservation and sustainable use of marine resources, marine polluter pays schemes policy, etc. ■ Improvement of financial incentives to encourage the adoption of sustainable aquaculture practices, fishing gear and techniques that minimize bycatch and habitat damage: <ul style="list-style-type: none"> ⇒ affordable and flexible credit for coastal communities engaged in sustainable aquaculture practices such as recirculating aquaculture systems, ⇒ grants and subsidies to support implementing sustainable fishing and aquaculture certification programs, such as Marine Stewardship Council or Aquaculture Stewardship Council certification, and 	



Strategic actions	Action plans	Relevant institutions
	<p>⇒ low-interest loans for implementing sustainable coastal infrastructure projects, such as coral reef restoration and mangrove rehabilitation,</p> <ul style="list-style-type: none"> ■ Improvement of carbon removal and offset for achieving net-zero company pledges, followed by renewable energy use and energy efficiency improvements. <ul style="list-style-type: none"> ● Strengthening of law enforcement at sea. <ul style="list-style-type: none"> ○ Strengthening of the maritime authorities' capacity to enforce regulations and ensure compliance with international maritime standards and procedures. ○ Strengthening enforcement and monitoring capabilities to prevent illegal, unreported, and unregulated (IUU) fishing practices through issuing permits and licenses that promote transparency and traceability in the fisheries sector. ○ Improvement in the monitoring and law enforcement at sea schemes. ○ Strengthening environmental court and laws ● Strengthening of the realization of Indonesia's National Determined Contribution to climate change mitigation. ● Strengthening of policies and program implementation of marine debris management to maintain a healthy marine ecosystem for sustainable fisheries. <ul style="list-style-type: none"> ○ Strengthening of central and regional policies and planning, institutions, protocols and measurement in reducing, handling and promoting recycling of marine waste/debris and waste on land and coastal areas. ○ Improvement in waste management system on land and marine through <ul style="list-style-type: none"> ■ Improved data, governance and monitoring, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Expansion of technical assistance to reduce marine plastic pollution from source to the sea and to restore river and ocean health. ■ Strengthening of viable business model and funding for supporting local waste management system, ■ Technical assistance to support a range of mutually agreed policy and institutional reforms to reduce plastic waste in the ocean, ■ Improved collection infrastructure including for community-based facilities, coastal facilities and ports, ■ Circular economy application for post collection, and ■ Improved enforcement for anti-marine dumping (penalties for dumping of wastes and other matter into ocean and coastal areas). <p>○ Significant reduction of undegradable plastic production and consumption through:</p> <ul style="list-style-type: none"> ■ Strengthening of collaboration with industry to develop and implement industry's transition roadmap to reduce producers' plastic footprint by utilizing environmentally friendly materials, production processes and waste handling/processing including with the use of circular economic approach, ■ Expansion of technology and innovation on alternative environmentally friendly materials, production processes and plastic recycle, ■ Improvement of incentives for producers' performance in extended producer responsibility for the collection and recycling of specified volumes of plastic packaging, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Strengthening and expansion of eco-design standards and recyclable plastics, ■ Expansion of consumers’ participation to make careful choices to reduce plastic use and to manage waste disposal through increasing their awareness, expansion of single-used plastic ban, and provision of incentives for better practice of waste disposal, and ■ Expansion of waste management (collection and processing) and its linked with energy production and circular economy. <ul style="list-style-type: none"> ○ improvement in the efficacy of policy to reduce the impact of micro and macro plastics on ecosystems and marine organisms. <ul style="list-style-type: none"> ● Improvement in the coastal areas and small islands management. <ul style="list-style-type: none"> ○ Revitalization of coastal areas and small islands. ○ Support and facilitation to safeguard critical resources for coastal livelihoods, climate change mitigation, and resilience. ○ Expansion of capacity building and technical assistance for strengthening coastal resilience. ○ Strengthening of policies for mangrove, sea grasses and coral reef rehabilitation management. ○ Support and facilitation for the expansion of community-based monitoring and management for mangroves, sea grasses, and coral reef restoration. ○ Expansion in the plantation and rehabilitation of mangroves, seagrasses, and coral reefs. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Improvement in relevant sectors to support the resilience and sustainability of marine resources <ul style="list-style-type: none"> ○ Expansion of the improved forest management schemes. ○ Expansion of the use of sustainable and climate-smart agricultural extension services. ○ Enforcement and monitoring of regulation related to mooring buoy points to support tourism and marine transportation to reduce environmental damage. ○ Expansion of the application and expansion of the renewable energy transition in coastal and marine activities (fishery, tourism, transportation, trade). ○ Strengthening of greening transportation, shipping, ports, and logistics services to reduce carbon emissions. <ul style="list-style-type: none"> ■ Improvement in the management of fishing vessels, fishing equipment, and crewing fishing vessels to maintain efficiency and reduce greenhouse gas emission. ■ Expansion of green transportation, shipping, ports, and logistics services to reduce carbon emissions. ■ Improved implementation of an integrated policy framework around marine conservation and climate change mitigation. ■ Application of ballast water wastewater treatment technology at ports and maritime industry services. 	
Strategic actions 2 Uplifting sustainable	<ul style="list-style-type: none"> ● Strengthening of blue economy statistics (e.g., development of blue economy monitoring indicators, as well as direct and indirect GDP contributions of the blue economy sectors), employment, and social and environmental data sets. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic



Strategic actions	Action plans	Relevant institutions
<p>economic growth of the traditional sectors and emerging sectors in the blue economy</p>	<ul style="list-style-type: none"> ● Strengthening of the resilience and sustainability of seafood production, seaweed farming, marine-based manufacturing supply chain, tourism supply chain, tourism destination management, and maritime transportation and logistics systems. ● Improvement of blue economy sectors' productivity and resilience through sustainable and practices. <ul style="list-style-type: none"> ○ Strengthening of Indonesian brands for blue economy products and services. ○ Development of sustainable coastal and marine fashion and lifestyle brands with environmentally friendly materials and manufacturing processes. ○ Development of investment potentials mapping in the blue economy sector. ○ Development of competitive blue economy clusters for marine-based manufacturing, tourism, marine biotechnology and bioeconomy, port and trade. ○ Development of an inclusive supply chain of fisheries and aquaculture products, upstream to downstream products, through fair and feasible partnerships between small-scale fishers and medium-large industries. ○ Strengthening of blue economy products and services (seed management, licensing, and marketing, waste and disease monitoring). ○ Improvement in supply chain monitoring through digitization and sharing data for better resource planning. ○ Strengthening of sustainable fisheries and aquaculture management practices to ensure the long-term productivity. 	<p>Affairs</p> <ul style="list-style-type: none"> ● Ministry of Marine Affairs and Fisheries ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Education, Culture, Research and Technology ● Ministry of Manpower ● Ministry of Trade ● Ministry of Tourism and Creative Economy ● Ministry of Investment ● Ministry of Finance ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Public Works and Housing ● Ministry of Environment and Forestry ● National Standardization Agency ● National Research and Innovation



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of integrated fish farming to efficient the utilization of available resources, recycling waste, and saving energy while maintaining the ecological balance. ○ Adoption of sustainable and efficient irrigation technologies for coastal agriculture. ○ Expansion of technical assistance in developing national strategies and infrastructure improvement projects for potential fishery products. ○ Strengthening of sustainable mariculture systems technology, such as integrated multitrophic aquaculture. ○ Improvement in the Integrated multi-trophic aquaculture and coastal farming to diversify income sources and increase productivity. ○ improvement in the use of sustainable and climate-smart pest and disease management practices. ○ Improvement in aquatic animal disease preparedness and response systems to support sustainable cultivation. ○ Improvement of good handling practices, quarantine and quality assurance of fishery and other coastal and ocean products. ○ Quality investment for seafood and seaweed production and processing, shipbuilding, ports, and logistic system including in cold chain storage and logistic services. ○ Promotion of sustainable seafood processing and value-added industries to increase the value and strengthen competitiveness of Indonesian seafood products. 	<p>Agency</p> <ul style="list-style-type: none"> ● Statistics Indonesia ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of sustainable seaweed farming and processing industries to tap into the growing global demand for seaweed-based products, and its potential roles for climate change mitigation and adaption. ○ Expansion of the Tropical Seaweed Innovation Network to increase productivity, the application of low-carbon seaweed cultivation, etc. ○ Strengthening of the downstream of fisheries and aquaculture products supported by developing a resilient supply chain. ○ Strengthening of sustainable coastal and marine manufacturing industries, including shipbuilding, marine equipment manufacturing, and marine bioproducts, to stimulate economic growth and innovation. ○ Strengthening of an inclusive, quality and sustainable blue food. ○ Improvement in the resilient blue food value chain based on coastal and marine resources. ○ Improvement in business development in producing nutrition from the ocean. ○ Improvement of sustainable and efficient energy use in blue food production and processing. ○ Improvement of sustainable marine biotechnology industries, including the extraction of bioactive compounds from marine organisms for pharmaceutical and nutraceutical applications. ○ Expansion of salt production for industry supported by new investment and the application of advanced production techniques, such as using saltwater-tolerant crops, hydroponics, pharmaceuticals, renewable energy, automated systems, precision cultivation, sustainable irrigation methods, etc. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of salt production clusters in coastal areas to leverage synergies supported by better access to finance, technology application, efficient and sustainable production. ○ Development of salt production diversification, such as specialty salts or salt-based food products with high value-added, such as gourmet salts or salt-based cosmetics, to diversify market offerings. ○ Foster partnerships and knowledge exchange between salt producers, researchers, and industry associations. ○ Continuous research and development in salt-related technologies, such as salt processing, product diversification, and salt-derived products to drive innovation and create new opportunities for the salt industry. ○ Promotion of sustainable salt farming practices to minimize environmental impacts, use eco-friendly fertilizers, efficient water management systems, and proper waste disposal methods. ○ Strengthening of the coastal community businesses based on geographic indications, intellectual property, and community development principles. ○ Strengthening of data-driven marine research strategy on maritime technology that focuses on commercialization-ready outcomes. ○ Expansion of technology application and innovation for productivity and diversification in marine-based manufacturing. ○ Development of incentive schemes to support the growth of high-tech-based blue economy sectors and new sectors such as shipbuilding, renewable energy, bioeconomy, and biotechnology. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expanding the marine innovation hubs and incubators development to nurture entrepreneurship and accelerate the development of blue economy start-ups. ○ Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. ● Development of regenerative tourism to support sustainable coastal and marine environment. <ul style="list-style-type: none"> ○ Expansion of an inclusive and sustainable coastal and marine tourism including in protected areas involving local communities and businesses. ○ Improvement in sustainable amenities, accessibility, and transportation in coastal and marine-based tourism destinations, including marinas, ports, jetties, docking facilities, and coastal resorts, to enhance accessibility and connectivity to popular tourist destinations. ○ Increase in quality investment to support sustainable coastal and marine tourism destinations. ○ Promotion of competitive and sustainable yachting sector. ○ Improvement of capacity in managing cruise tourism, such as marine tourism and the marine environment ○ Development of low carbon and zero waste transport and access to the tourism destination. ○ Implementation of responsible tourism guidelines to promote waste management and recycling, and educate tourists and local communities on the importance of conservation and minimizing environmental impact. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. <ul style="list-style-type: none"> ○ Development of offshore renewable energy investment activities (wind and ocean currents) based on feasibility studies in areas with the highest energy generation potential and demand, supported by public-private partnerships. ○ improvement in the regulatory frameworks that incentivize the deployment of ocean-based renewable energy technologies and ensure fair market competition. ○ Support for the development of hybrid energy system development which combines ocean-based renewable energy with other renewable sources, such as solar or geothermal energy. ○ Support for the integration of ocean-based renewable energy into national energy grids by developing offshore transmission infrastructure and smart grid technologies to efficiently transport electricity generated from ocean-based renewable energy sources to onshore grid connections. ○ Integration of offshore wind farms along the potential coast that is interconnected with ports and utilized by industries along the coast. ○ Promotion of international collaboration in standardization efforts for ocean-based renewable energy technologies, ensuring interoperability and reducing costs. ○ Development of local supply chains and manufacturing capabilities for ocean-based renewable energy technologies to foster domestic industry growth and job creation. ● Development of blue economy product and service quality assurance. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of technology solutions for the implementation of standards in blue economy priority sectors to ensure inclusivity, quality assurance and sustainability. ○ Improvement of supply chain certification and regulatory infrastructure for the maritime industry. ○ Strengthening of good manufacturing practices in the production and processing of seafood and seaweed for food products and pharmaceutical. ○ Strengthening of sustainable seafood certification and labelling programs and identifying international standards and certification requirements for blue economy sectors. ○ Improvement in traceability systems to ensure transparency and legality in seafood supply chains. ○ Strengthening of capacity building for food safety and quality assurance. ○ Strengthening of the facility and infrastructure for food safety and quality assurance. ● Strengthening of export potentials. <ul style="list-style-type: none"> ○ Increase in export volume and earning from high value products from marine capture fisheries, aquaculture, seaweed farming, and marine-based manufacturing. ○ Improvement in the efficacy of export promotion for blue economy products. ● Development of competitive logistics, transportation and ports. <ul style="list-style-type: none"> ○ Expansion of digital technologies adoption and data-sharing platforms to improve efficiency and transparency in maritime trade and logistics. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement of climate-resilient infrastructure for food storage and processing, including cold chain infrastructure to reduce post-harvest losses. ○ Strengthening of advanced logistics technologies and systems to optimize supply chain management and reduce transportation costs. ○ Strengthening of the provision, quality, and integration of port and maritime infrastructures. ○ Improvement of efficient and sustainable maritime transport systems to facilitate the movement of goods and services. ○ Improvement of port infrastructure such as container terminals, dry ports, intermodal facilities, and hinterland connections to improve connectivity and efficient ride and supply chain interisland. ○ Modernization of marine infrastructure and logistics facilities to accommodate increased trade volumes and larger vessels to improve cargo handling and transportation efficiency. ○ Development of new port facilities in strategic locations to cater to emerging trade routes and market demands. ○ improvement of intensive monitoring, control, and surveillance measures using satellite imagery data to capture real-time images of fishing vessels at sea. ○ Enhancement of maritime safety and security measures, including vessel tracking systems, surveillance technologies, and anti-piracy measures. ○ Application of spatial monitoring and surveillance instruments and strengthening intermodal traffic/combined transport (waterways, railways). 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement of port audit and "port risk assessment" and related facilities according to internationally recognized safety standards and rules. ○ Research and development of autonomous shipping and unmanned maritime systems to increase efficiency and safety. ○ Strengthening of maritime services, such as ship repair and maintenance, maritime insurance, and maritime law services. ● Promotion of capacity building partnerships with multiple benefactors across blue economy sectors. ● Development of circular economy as a source of value creation in blue economy sectors. <ul style="list-style-type: none"> ○ Expansion of a circular economy to reduce environmental damage and create added value, including from marine debris. ○ Development of various higher-value products from fish waste. ○ Expansion of technology and innovation commercialization for the development of new materials from marine debris for providing various development solutions (manufacturing, construction, etc.). ○ Implementation of circular economy in the tourism supply chain. 	
<p>Strategic actions 3</p> <p>Increasing equality and welfare the blue economy stakeholders to achieve just</p>	<ul style="list-style-type: none"> ● Promotion of an inclusive stakeholders' participation in blue economy. <ul style="list-style-type: none"> ○ Expansion of education and awareness programs to enhance ocean literacy among coastal communities. ○ Strengthening of the role of community and indigenous people in the blue economy value chain. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Human Development and Culture ● Coordinating Ministry for Economic Affairs



Strategic actions	Action plans	Relevant institutions
transition	<ul style="list-style-type: none"> ○ Strengthening of the participation of indigenous and marginalized communities in decision-making processes related to the blue economy. ○ Strengthening of gender equality and women's empowerment in the blue economy sector. ○ Improvement of coastal communities during the project planning and development of offshore renewable energy. ● Skills development in blue economy. <ul style="list-style-type: none"> ○ Development of employment occupancy and talent mapping in the blue economy sector. ○ Strengthening of the education system, particularly related to science, technology, engineering, arts and mathematics, including curricula, teachers, capacity, facilities and infrastructure, supported by cooperation between educational institutions and industry. ○ Expansion of the integrated study programs (formal and informal) related to the blue economy. ○ Improvement of standards and certification of human resource competencies in the blue economy sector. ○ Improvement and facilitation of a new assessor for worker competency certification in the blue economy sector. ○ Strengthening in skills related to marine-based research and development, manufacturing and logistics. 	<ul style="list-style-type: none"> ● Ministry of Marine Affairs and Fisheries ● Ministry of Education and Culture ● Ministry of Manpower ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Energy and Mineral Resources ● Ministry of Women's Empowerment and Child Protection ● Ministry of Youth and Sports ● Ministry of Social Affairs ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Re-training or skill transformation for workers in coastal and marine tourism: to expand more active science-based tourism products such as marine wildlife safaris, eco-tourism, and citizen science. ○ Skills development in ocean renewable energy. ○ Improvement of training, competency certification and job placement of workers in the blue economy sector. ● Development of decent work in blue economy. <ul style="list-style-type: none"> ○ Strengthening of policies related to social security and the formalisation of worker arrangements in the blue economy sector. ○ Strengthening of the alignment between corporate support programs and blue economy workforce cooperative partnerships. ○ Expansion of decent work supported by healthy and safe working environment in the priority blue economy sectors. ○ Improvement in workforce transformation scheme to allow talent movement to higher skills or more productive type of jobs across priority sectors, particularly in responding to investment and emerging blue economy sectors. ○ Expansion of the blue economy workforce supports programs that can increase productivity. ● Strengthening of community empowerment in blue economy. <ul style="list-style-type: none"> ○ Strengthening of social capital including in the forms of local/grassroot/ community organization in managing the business, conservation and social wellbeing in small islands and the coastal areas. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of small and medium industry cluster development, cooperatives and village-owned businesses in the coastal areas to strengthen community-based businesses in blue economy sectors. ○ Expansion of aquaculture production to meet the growing demand for aquatic food and enhance inclusive livelihoods. ○ Improvement of business development services for new entrepreneurs and micro and small enterprises in the coastal areas and small islands. ○ Skills improvement for local facilitators with scientific and business expertise to leverage local/community knowledge for advancing local businesses. ○ Strengthening of financial literacy and management, and implementation geographical indications to help local entrepreneurs expand their businesses. ○ Increased access to affordable finance, training, technology and innovation, and market support for local entrepreneurs. ○ Expansion of community-based fisheries management to empower local fishing communities. ○ improvement of community-based fisheries co-management initiatives. ○ Improvement of sustainable community-based marine and coastal tourism supported by community access to coastal areas. ○ Expansion on the empowerment of youth, women and people with disabilities in priority blue economy sectors through capacity buildings, entrepreneurship and employment opportunities. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of microfinance initiatives specifically tailored for women in coastal communities to promote their engagement in sustainable blue economy activities. ○ Improvement of appropriate technology adoption and innovation among communities in coastal areas, involving youth, women and people with disabilities. ● Strengthening of communities' resilience in blue economy. <ul style="list-style-type: none"> ○ Expansion of basic infrastructure and connectivity in coastal areas and small islands, including to support integrated food-energy-water systems in these areas. ○ Improvement of saltwater treatment in small and remote islands supported by sustainable operation and management for the facilities by local communities. ○ Expansion of community movement to increase consumption of good nutritious food derived from sustainable marine food. ○ Expansion in the availability of access and sustainable marine commodity production facilities to support public health. ○ Improvement of a social protection scheme for fishers and maritime workers supports productivity improvement. ○ Improvement of social safety nets to support vulnerable communities affected by environmental changes, supported by possible development of climate-resilient insurance or risk-sharing mechanism to protect coastal farmers and small-scale fishers financially due to seasonality or in case of unforeseen events or disasters. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of literacy and capacity to respond to drought and water scarcity mapping. ○ Development of sustainable and climate-resilient seed varieties for coastal agriculture. ○ Strengthening of sustainable and climate-resilient coastal food production hubs. ○ Expansion of technical assistance and financial support to promote the transition of fishers and coastal communities to alternative livelihoods that are less dependent on marine resources, such as ecotourism or sustainable agriculture. ○ Improvement of local communities and local industries to work together to solve environmental and sustainable development issues in the vicinity 	
Strategic actions 4 Strengthening the enabling ecosystem including governance, financing, and infrastructure	<ul style="list-style-type: none"> ● Development of effective blue economy policies, planning, programs and procedures. <ul style="list-style-type: none"> ○ Integration of blue economy agenda in the planning and implementation of policies in relevant government institutions. ○ Improvement in blue economy related policy soundness and synergies in policy and program implementation involving public and private collaboration. ○ Support for policies promoting potential blue economy sectors at regional level. ○ Promotion of the blue economy roadmap in bilateral and multilateral forums. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Coordinating Ministry for Human Development and Culture ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of collaboration between the public and private sectors in marine resource management dan blue economy data at national and provincial levels. ○ Improvement of marine data repositories and open-access platforms to facilitate knowledge sharing. ○ Strengthening of a comprehensive marine spatial planning framework (land and sea) to promote harmony between protection mechanisms for the marine and coastal environment and human activities at the national and regional levels. ○ Development of clear guidelines and criteria for issuing permits and licenses for marine resource utilization, processing, and trade, as well as ensuring transparency and accountability in establishing marine protected areas to conserve critical habitats and biodiversity. ○ Improvement in the utilization of the Indonesian Archipelago Sea Lanes (ALKI) in blue economy priority sectors, supported by sound regulatory framework and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional, and global cooperation frameworks using ALKI. ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Support for the growth of sustainable coastal and marine consulting and advisory services, providing expertise on environmental impact assessments, sustainable business practices, and policy development. <ul style="list-style-type: none"> ● Investment promotion for blue economy sectors. 	<ul style="list-style-type: none"> ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Home Affairs ● Ministry of Foreign Affairs ● Ministry of Education, Culture, Research and Technology ● Ministry of Telecommunication and Informatics ● Ministry of Energy and Mineral Resources ● Ministry of Manpower ● Ministry of Trade ● Ministry of Investment ● Ministry of Transportation ● Ministry of Industry ● Ministry of Tourism and Creative Economy ● National Standardization Agency



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Simplification of regulations to increase of investment and local business' participation in the blue economy. ○ Regular reviews and evaluations of permit and license issuance procedures to identify areas for improvement and enhance efficiency. ○ Capacity-building to enhance the skills and knowledge of government officials involved in issuing and managing permits and licenses for marine resource utilization and trade. ○ Ease of permits and tax relief policy for those who invest part of their capital for R&D in the blue economy sector. ○ Identification of high-tech-based investment potentials, including biotechnology and marine bioeconomy. ○ Facilitation of investment in blue food value chain. ○ Facilitation of investment in the development of eco-friendly marine biotechnology. ○ Improvement in the readiness of business facilities, investment, and supporting infrastructure in developing the central and regional blue economy. ○ Establishment of maritime hubs and free trade zones to attract investment and facilitate trade activities. ○ Development of mechanisms for public feedback related to the issuance of permits and licenses, allowing affected communities and stakeholders to voice their concerns and seek resolution. <ul style="list-style-type: none"> ● Strengthening of the role of science and technology in blue economy. 	<ul style="list-style-type: none"> ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of the role of science and technology, research, and marine information systems. ○ Strengthening of the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and technology/patent commercialization. ○ Development of an integrated plan for expanding technology development, modification, transfer and adoption supported by collaboration, licensing, reverse engineering, and procurement. ○ Development of marine centre of excellence (centre of excellence), and research centers to promote scientific knowledge and innovation on blue economy. ○ Development of sustainable coastal and marine research parks and innovation clusters, facilitating collaboration and knowledge exchange between academia, industry, and government. ○ Facilitation of basic research and improvement in priority sectors in the blue economy. ○ Expanding bioprospecting to supply the most potential bioresources for creating added value. ○ Supporting the growth of sustainable coastal and marine information and communication technology (ICT) solutions such as smart fishing technologies and marine spatial planning tools. ○ Identification of the potential to research and develop technology based on underwater and seabed mapping. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Development of research framework and implementation on hydro-oceanography. ● Development of just energy transition in blue economy. <ul style="list-style-type: none"> ○ Strengthening of regulatory mandates of agencies relating to the energy sector and marine mining (e.g. offshore petroleum). ○ Strengthening of policy coordination and cooperation between government agencies responsible for energy, environment, and maritime affairs to enable the sustainable growth of ocean-based renewable energy. ○ Development of the enabling factors for feasible offshore energy generation, including relevant regulation and policies, research and development, feasibility studies for offshore energy projects, and provision of incentives for offshore energy investment. ○ Involvement of financial institutions and investors to create dedicated funding mechanisms and investment vehicles for ocean-based renewable energy projects. ○ Facilitation of investment in sustainable marine renewable energy projects (such as offshore wind farms and tidal energy installations) to reduce dependence on fossil fuels and create green jobs. ○ Improvement in the readiness of leveraging investment from multipurpose infrastructures (including supporting offshore energy supply for greening of transportation, shipping, ports, and logistics services). ○ Establishment of local initiatives in the sub-national governments, such as 100% renewable energy islands, provinces, and cities. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of sustainable blue finance. <ul style="list-style-type: none"> ○ Strengthening of collaboration in various blue finance schemes to support blue economy activities, i.e: <ul style="list-style-type: none"> ■ Blue bond for fisheries management projects and ocean renewable energy projects, ■ Blended finance for marine resource and waste management, ■ Revolving loan funds for small-scale fishers to invest in sustainable fishing practices and equipment, ■ Impact investment funds to support the growth of sustainable marine-based businesses and start-ups, ■ Blue carbon funds to finance projects that protect and restore coastal ecosystems, such as mangroves and seagrasses, for carbon sequestration, ■ Trust funds mechanism to support the long-term management and conservation of marine protected areas, ■ Grants and seed funding for research and development projects focused on innovative solutions for sustainable fisheries and marine resource management, ■ Grants and seed funding for start-ups engagements in the blue economy and business incubation, ■ Blue Investment Bank approaches as complementary to Public–Private Partnerships (PPP), ■ Project-based Blue Financing, etc. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Increasing awareness of financing and development mechanisms/thematic investment platform related to blue economy. ○ Expansion in the implementation of the Blue Action Fund: protect the biodiversity and environment in coastal and ocean area. ○ Expansion of the implementation of marine insurance and risk management services, providing coverage and support to businesses operating in the blue economy. ○ Impact measurement and reporting systems to track blue finance investments' environmental and social outcomes. ● Strengthening of disaster resilience and mitigation capacity. <ul style="list-style-type: none"> ○ Research and development to understand the impacts of climate change on marine ecosystems and development of adaptation strategies. ○ Improvement in disaster resilience and mitigation capacity to supported by a management plan of ecosystem-based marine resources. ● Development of Blue Carbon. <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Implementation of the Indonesia Blue Carbon Strategic Framework. ○ Establishment of carbon market to optimize the benefits from blue carbon ecosystem potentials. ● Improvement in the Indonesia Blue Economy Index and monitoring of its progress. <ul style="list-style-type: none"> ○ Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, 	



Strategic actions	Action plans	Relevant institutions
	<p>analysis, methodology, and reports to help monitor the progress of blue economy development.</p> <ul style="list-style-type: none"> ○ Development of collaboration schemes in the blue economy database between public and private stakeholders at national and provincial levels. ○ Capacity building and development of monitoring assessments using space technology/real-time monitoring systems. 	

Table 18. Strategic Action Plans: Phase IV 2035-2039: Increase Contribution and Competitiveness of Indonesia Blue Economy

Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 1</p> <p>Improving health, resilience, and productivity of maritime resources, including in climate change mitigation and adaptation</p>	<ul style="list-style-type: none"> ● Strengthening of coordination, harmonization and synergy in managing marine resources, marine protected areas and marine capture fisheries zoning among different levels of authority. ● Expansion of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ● Expansion of international cooperation in achieving Net Zero Emission and other environmental commitments. ● Strengthening of and expansion of resource and environment data management, research and development. <ul style="list-style-type: none"> ○ Strengthening of ocean and ecosystem services accounting mechanism. ○ Strengthening of blue carbon accounting. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Industry



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion of the implementation of frameworks and manuals health indices and marine resources balance. ○ Strengthening of community scientist on marine resources management. ○ Expansion of research and development of marine resources. ● Strengthening of marine resources and marine protected area management. <ul style="list-style-type: none"> ○ Expansion of public awareness of the importance of the ocean and its resources and the protection of the coastal and marine ecosystem.. ○ Strengthening of policy on other effective area-based conservation measures in conjunction with traditional/ locally managed management area. ○ Strengthening of participatory mechanisms in decision-making related to marine resources. ○ Strengthening locally-managed resource schemes. ○ Improved efficacy of policies based on ocean and ecosystem services accounting. ○ Strengthening of quota-based fisheries. ○ Improvement in the standards of sustainable marine resource management. ○ Strengthening of infrastructure and management capacity of ecosystems and marine protected areas. <ul style="list-style-type: none"> ■ Improvement of measurement tools for the effectiveness of conservation area management. ■ Strengthening of surveillance and marine security systems for the use of maritime resources, including in: 	<ul style="list-style-type: none"> ● Ministry of Education, Culture, Research and Technology ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Meteorological and Geophysical Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ⇒ expansion in the use of latest technology in monitoring and controlling marine resources, ⇒ strengthening of maritime resources based on geographic information systems along with conditions and possible risks in the maritime ecosystem, and ⇒ improvement in modelling systems to predict changes in the condition of marine resources. <ul style="list-style-type: none"> ○ Expansion of marine protected areas. ○ Strengthening of marine protected area and biodiversity networks. ○ Expansion of blue economy cooperation and knowledge sharing on marine conservation at regional and global level. ○ Improvement in the quality of reporting and verification systems to track the utilization of marine resources. ○ Expansion of the incentives and disincentives to promote stakeholders' participation in marine resource management. <ul style="list-style-type: none"> ■ Improvement of market-based incentives, such as eco-certifications, to encourage sustainable practices in blue economy sectors. ■ Implementation of ecosystem service payment schemes with area management planning, e.g. payment for ecosystem services schemes that reward communities and individuals for the conservation and sustainable use of marine resources, marine polluter pays schemes policy, etc. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Improvement of financial incentives to encourage the adoption of sustainable aquaculture practices, fishing gear and techniques that minimize bycatch and habitat damage: <ul style="list-style-type: none"> ⇒ affordable and flexible credit for coastal communities engaged in sustainable aquaculture practices such as recirculating aquaculture systems, ⇒ grants and subsidies to support implementing sustainable fishing and aquaculture certification programs, such as Marine Stewardship Council or Aquaculture Stewardship Council certification, and ⇒ low-interest loans for implementing sustainable coastal infrastructure projects, such as coral reef restoration and mangrove rehabilitation ■ Expansion of carbon removal and offset for achieving net-zero company pledges, followed by renewable energy use and energy efficiency improvements. ● Strengthening of law enforcement at sea. <ul style="list-style-type: none"> ○ Strengthening of the maritime authorities' capacity to enforce regulations and ensure compliance with international maritime standards and procedures. ○ Strengthening enforcement and monitoring capabilities to prevent illegal, unreported, and unregulated (IUU) fishing practices through issuing permits and licenses that promote transparency and traceability in the fisheries sector. ○ Improvement in the monitoring and law enforcement at sea schemes. ○ Strengthening environmental court and laws 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Strengthening of the realization of Indonesia's National Determined Contribution to climate change mitigation. ● Strengthening of policies and program implementation of marine debris management to maintain a healthy marine ecosystem for sustainable fisheries. <ul style="list-style-type: none"> ○ Strengthening of central and regional policies and planning, institutions, protocols and measurement in reducing, handling and promoting recycling of marine waste/debris and waste on land and coastal areas. ○ Development of Marine Plastics Innovation Hub by supporting start-ups to design and deliver in-depth technology solutions on plastic and paper alternatives from bio-compostable and biodegradable materials, and waste collection. ○ Improvement in waste management system on land and marine through <ul style="list-style-type: none"> ■ Improved data, governance and monitoring, ■ Expansion of technical assistance to reduce marine plastic pollution from source to the sea and to restore river and ocean health. ■ Strengthening of viable business model and funding for supporting local waste management system, ■ Technical assistance to support a range of mutually agreed policy and institutional reforms to reduce plastic waste in the ocean, ■ Improved collection infrastructure including for community-based facilities, coastal facilities and ports, ■ Circular economy application for post collection, and 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Improved enforcement for anti-marine dumping (penalties for dumping of wastes and other matter into ocean and coastal areas). ○ Significant reduction of undegradable plastic production and consumption through: <ul style="list-style-type: none"> ■ Strengthening of collaboration with industry to develop and implement industry’s transition roadmap to reduce producers’ plastic footprint by utilizing environmentally friendly materials, production processes and waste handling/processing including with the use of circular economic approach, ■ Expansion of technology and innovation on alternative environmentally friendly materials, production processes and plastic recycle, ■ Improvement of incentives for producers’ performance in extended producer responsibility for the collection and recycling of specified volumes of plastic packaging, ■ Strengthening and expansion of eco-design standards and recyclable plastics, ■ Expansion of consumers’ participation to make careful choices to reduce plastic use and to manage waste disposal through increasing their awareness, expansion of single-used plastic ban, and provision of incentives for better practice of waste disposal, and ■ Expansion of waste management (collection and processing) and its linked with energy production and circular economy. ○ Acceleration in the reduction of micro and macro plastics on ecosystems and marine organisms. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Improvement in the coastal areas and small islands management. <ul style="list-style-type: none"> ○ Revitalization of coastal areas and small islands. ○ Support and facilitation to safeguard critical resources for coastal livelihoods, climate change mitigation, and resilience. ○ Expansion of capacity building and technical assistance for strengthening coastal resilience. ○ Strengthening of policies for mangrove, sea grasses and coral reef rehabilitation management. ○ Support and facilitation for the expansion of community-based monitoring and management for mangroves, sea grasses, and coral reef restoration. ○ Expansion in the plantation and rehabilitation of mangroves, seagrasses, and coral reefs. ● Improvement in relevant sectors to support the resilience and sustainability of marine resources <ul style="list-style-type: none"> ○ Expansion of the improved forest management schemes. ○ Expansion of the use of sustainable and climate-smart agricultural extension services. ○ Enforcement and monitoring of regulation related to mooring buoy points to support tourism and marine transportation to reduce environmental damage. ○ Expansion of the application and expansion of the renewable energy transition in coastal and marine activities (fishery, tourism, transportation, trade). 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of greening transportation, shipping, ports, and logistics services to reduce carbon emissions. <ul style="list-style-type: none"> ■ Expansion of green transportation, shipping, ports, and logistics services to reduce carbon emissions. ■ Improvement in the management of fishing vessels, fishing equipment, and crewing fishing vessels to maintain efficiency and reduce greenhouse gas emission. ■ Expansion of sustainable marine transportation practices, such as using fuel-efficient vessels and adopting clean propulsion technologies, to reduce carbon emissions and improve economic efficiency. ■ Investments in new ships that reduce greenhouse gas emissions. ■ Expansion of changes in transportation modes through automation (digitalization and automation of intermodal traffic, data, and water). ■ Improved implementation of an integrated policy framework around marine conservation and climate change mitigation. ■ Expansion of ballast water wastewater treatment technology at ports and maritime industry services. 	
Strategic actions 2 Uplifting sustainable economic growth of the traditional sectors and emerging sectors	<ul style="list-style-type: none"> ● Strengthening of blue economy statistics (e.g., development of blue economy monitoring indicators, as well as direct and indirect GDP contributions of the blue economy sectors), employment, and social and environmental data sets. ● Strengthening of the resilience and sustainability of seafood production, seaweed farming, marine-based manufacturing supply chain, tourism supply chain, tourism 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries



Strategic actions	Action plans	Relevant institutions
in the blue economy	<p>destination management, and maritime transportation and logistics systems, supported by transparency, traceability and fair-trade practices.</p> <ul style="list-style-type: none"> ● Improvement of blue economy sectors' productivity and resilience through sustainable and practices. <ul style="list-style-type: none"> ○ Strengthening of Indonesian brands for blue economy products and services, including sustainable coastal and marine fashion and lifestyle brands with environmentally friendly materials and manufacturing processes. ○ Development of investment potentials mapping in the blue economy sector. ○ Development of competitive blue economy clusters for marine-based manufacturing, tourism, marine biotechnology and bioeconomy, port and trade. ○ Development of an inclusive supply chain of fisheries and aquaculture products, upstream to downstream products, through fair and feasible partnerships between small-scale fishers and medium-large industries. ○ Strengthening of blue economy products and services (seed management, licensing, and marketing, waste and disease monitoring). ○ Improvement in supply chain monitoring through digitization and sharing data for better resource planning. ○ Strengthening of sustainable fisheries and aquaculture management practices to ensure the long-term productivity. ○ Expansion of integrated fish farming to efficient the utilization of available resources, recycling waste, and saving energy while maintaining the ecological balance. 	<ul style="list-style-type: none"> ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Education, Culture, Research and Technology ● Ministry of Manpower ● Ministry of Trade ● Ministry of Tourism and Creative Economy ● Ministry of Investment ● Ministry of Finance ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Public Works and Housing ● Ministry of Environment and Forestry ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable mariculture systems technology, such as integrated multitrophic aquaculture. ○ Improvement in the Integrated multi-trophic aquaculture and coastal farming to diversify income sources and increase productivity. ○ Improvement in the use of sustainable and climate-smart pest and disease management practices. ○ Improvement in aquatic animal disease preparedness and response systems to support sustainable cultivation. ○ Improvement of good handling practices, quarantine and quality assurance of fishery and other coastal and ocean products. ○ Quality investment for seafood and seaweed production and processing, shipbuilding, ports, and logistic system including in cold chain storage and logistic services. ○ Promotion of sustainable seafood processing and value-added industries to increase the value and strengthen competitiveness of Indonesian seafood products. ○ Expansion of sustainable seaweed farming and processing industries to tap into the growing global demand for seaweed-based products, and its potential roles for climate change mitigation and adaption. ○ Expansion of the Tropical Seaweed Innovation Network to increase productivity, the application of low-carbon seaweed cultivation, etc. ○ Strengthening of the downstream of fisheries and aquaculture products supported by developing a resilient supply chain. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable coastal and marine manufacturing industries, including shipbuilding, marine equipment manufacturing, and marine bioproducts, to stimulate economic growth and innovation. ○ Strengthening of an inclusive, quality and sustainable blue food. ○ Improvement in the resilient blue food value chain based on coastal and marine resources. ○ Improvement in business development in producing nutrition from the ocean. ○ Improvement of sustainable and efficient energy use in blue food production and processing. ○ Improvement of sustainable marine biotechnology industries, including the extraction of bioactive compounds from marine organisms for pharmaceutical and nutraceutical applications. ○ Expansion of salt production for industry supported by new investment and the application of advanced production techniques, such as using saltwater-tolerant crops, hydroponics, pharmaceuticals, renewable energy, automated systems, precision cultivation, sustainable irrigation methods, etc. ○ Strengthening of salt production clusters in coastal areas to leverage synergies supported by better access to finance, technology application, efficient and sustainable production. ○ Development of salt production diversification, such as specialty salts or salt-based food products with high value-added, such as gourmet salts or salt-based cosmetics, to diversify market offerings. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Foster partnerships and knowledge exchange between salt producers, researchers, and industry associations. ○ Continuous research and development in salt-related technologies, such as salt processing, product diversification, and salt-derived products to drive innovation and create new opportunities for the salt industry. ○ Promotion of sustainable salt farming practices to minimize environmental impacts, use eco-friendly fertilizers, efficient water management systems, and proper waste disposal methods. ○ Improvement in the capacity in fulfilling domestic salt needs and expansion of salt exports to global markets with a good quality product. ○ Establishment of certification and labelling schemes for sustainably produced salt to enhance market competitiveness in the global market. ○ Strengthening of the coastal community businesses based on geographic indications, intellectual property, and community development principles. ○ Strengthening of data-driven marine research strategy on maritime technology that focuses on commercialization-ready outcomes. ○ Expansion of technology application and innovation for productivity and diversification in marine-based manufacturing. ○ Establishment of a regional technology platform for aquaculture, to improve access to technology solutions. ○ Development of incentive schemes to support the growth of high-tech-based blue economy sectors and new sectors such as shipbuilding, renewable energy, bioeconomy, and biotechnology. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of the marine innovation hubs and incubators development to nurture entrepreneurship and accelerate the development of blue economy start-ups. ○ Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. ● Development of regenerative tourism to support sustainable coastal and marine environment. <ul style="list-style-type: none"> ○ Expansion of an inclusive and sustainable coastal and marine tourism including in protected areas involving local communities and businesses. ○ Improvement in sustainable amenities, accessibility, and transportation in coastal and marine-based tourism destinations, including marinas, ports, jetties, docking facilities, and coastal resorts, to enhance accessibility and connectivity to popular tourist destinations. ○ Increase in quality investment to support sustainable coastal and marine tourism destinations. ○ Strengthening of the competitive and sustainable yachting sector. ○ Strengthening of capacity in managing cruise tourism, such as marine tourism and the marine environment. ○ Expansion of low carbon and zero waste transport and access to the tourism destination. ○ Implementation of responsible tourism guidelines to promote waste management and recycling, and educate tourists and local communities on the importance of conservation and minimizing environmental impact. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. <ul style="list-style-type: none"> ○ Improvement of offshore renewable energy investment activities (wind and ocean currents) based on feasibility studies in areas with the highest energy generation potential and demand, supported by public-private partnerships. ○ Strengthening of the regulatory frameworks that incentivize the deployment of ocean-based renewable energy technologies and ensure fair market competition. ○ Expansion for the development of hybrid energy system development which combines ocean-based renewable energy with other renewable sources, such as solar or geothermal energy. ○ Expansion for the integration of ocean-based renewable energy into national energy grids by developing offshore transmission infrastructure and smart grid technologies to efficiently transport electricity generated from ocean-based renewable energy sources to onshore grid connections. ○ Improvement in the integration of offshore wind farms along the potential coast that is interconnected with ports and utilized by industries along the coast. ○ Strengthening of international collaboration in standardization efforts for ocean-based renewable energy technologies, ensuring interoperability and reducing costs. ○ Development of local supply chains and manufacturing capabilities for ocean-based renewable energy technologies to foster domestic industry growth and job creation. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of research and new and renewable energy upgrading sourced from offshore & ocean currents (manufacturing floating offshore wind turbines). ○ Adoption of energy storage systems, such as batteries or hydrogen storage, to enhance ocean-based renewable energy's reliability and grid integration. ○ Support for the industrialization of renewable energy sourced from offshore & ocean currents (floating offshore wind power) in funding support and mentoring. ○ Expansion of innovative offshore infrastructure development, such as subsea power cables or floating substations, to facilitate the integration of ocean-based renewable energy into the grid. ○ Monitor and evaluate ocean-based renewable energy projects to assess their performance, impact, and contribution to the blue economy. ● Development of blue economy product and service quality assurance. <ul style="list-style-type: none"> ○ Expansion of technology solutions for the implementation of standards in blue economy priority sectors to ensure inclusivity, quality assurance and sustainability. ○ Improvement of supply chain certification and regulatory infrastructure for the maritime industry. ○ Strengthening of good manufacturing practices in the production and processing of seafood and seaweed for food products and pharmaceutical. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable seafood certification and labelling programs and identifying international standards and certification requirements for blue economy sectors. ○ Improvement in traceability systems to ensure transparency and legality in seafood supply chains. ○ Strengthening of capacity building for food safety and quality assurance. ○ Strengthening of the facility and infrastructure for food safety and quality assurance. ● Strengthening of export potentials. <ul style="list-style-type: none"> ○ Increase in export volume and earning from high value products from marine capture fisheries, aquaculture, seaweed farming, and marine-based manufacturing. ○ Improvement in the efficacy of export promotion for blue economy products. ● Development of competitive logistics, transportation and ports. <ul style="list-style-type: none"> ○ Development of Indonesia as a global hub through strengthening shipping liners, ports, and logistics management. ○ Strengthening maritime connectivity by enhancing maritime routes and establishing new shipping lanes. ○ Expansion of digital technologies adoption and data-sharing platforms to improve efficiency and transparency in maritime trade and logistics. ○ Improvement of climate-resilient infrastructure for food storage and processing, including cold chain infrastructure to reduce post-harvest losses. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of advanced logistics technologies and systems to optimize supply chain management and reduce transportation costs. ○ Strengthening of the provision, quality, and integration of port and maritime infrastructures. ○ Improvement of efficient and sustainable maritime transport systems to facilitate the movement of goods and services. ○ Improvement of port infrastructure such as container terminals, dry ports, intermodal facilities, and hinterland connections to improve connectivity and efficient ride and supply chain interisland. ○ Modernization of marine infrastructure and logistics facilities to accommodate increased trade volumes and larger vessels to improve cargo handling and transportation efficiency. ○ Development of new port facilities in strategic locations to cater to emerging trade routes and market demands. ○ improvement of intensive monitoring, control, and surveillance measures using satellite imagery data to capture real-time images of fishing vessels at sea. ○ Enhancement of maritime safety and security measures, including vessel tracking systems, surveillance technologies, and anti-piracy measures. ○ Application of spatial monitoring and surveillance instruments and strengthening intermodal traffic/combined transport (waterways, railways). ○ Improvement of port audit and "port risk assessment" and related facilities according to internationally recognized safety standards and rules. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Research and development of autonomous shipping and unmanned maritime systems to increase efficiency and safety. ○ Strengthening of maritime services, such as ship repair and maintenance, maritime insurance, and maritime law services. ● Promotion of capacity building partnerships with multiple benefactors across blue economy sectors. ● Development of circular economy as a source of value creation in blue economy sectors. <ul style="list-style-type: none"> ○ Expansion of a circular economy to reduce environmental damage and create added value, including from marine debris, with the support of bioeconomy and biotechnology. ○ Development of various higher-value products from fish waste. ○ Expansion of the salt producers' contribution by adopting circular economy principles by utilizing salt by-products for other purposes or recycling waste materials. ○ Expansion of technology and innovation commercialization for the development of new materials from marine debris or other waste for providing various development solutions (manufacturing, construction, etc.). ○ Expansion in the benefit from circular economy application in the tourism supply chain. 	



Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 3</p> <p>Increasing equality and welfare the blue economy stakeholders to achieve just transition</p>	<ul style="list-style-type: none"> ● Promotion of an inclusive stakeholders’ participation in blue economy. <ul style="list-style-type: none"> ○ Expansion of education and awareness programs to enhance ocean literacy among coastal communities. ○ Strengthening of the role of community and indigenous people in the blue economy value chain. ○ Strengthening of the participation of indigenous and marginalized communities in decision-making processes related to the blue economy. ○ Strengthening of gender equality and women's empowerment in the blue economy sector. ○ Improvement of coastal communities during the project planning and development of offshore renewable energy. ● Skills development in blue economy. <ul style="list-style-type: none"> ○ Development of Indonesia as a centre for world maritime education. ○ Development of employment occupancy and talent mapping in the blue economy sector. ○ Strengthening of the education system, particularly related to science, technology, engineering, arts and mathematics, including curricula, teachers, capacity, facilities and infrastructure, supported by cooperation between educational institutions and industry. ○ Expansion of the integrated study programs (formal and informal) related to the blue economy. ○ Improvement of standards and certification of human resource competencies in the blue economy sector. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Human Development and Culture ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Education and Culture ● Ministry of Manpower ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Energy and Mineral Resources ● Ministry of Women's Empowerment and Child Protection ● Ministry of Youth and Sports ● Ministry of Social Affairs ● Ministry of Home Affair



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Provision of competent assessors for worker competency certification in the blue economy sector. ○ Strengthening in skills related to marine-based research and development, manufacturing, port operation, engineering services, and logistics. ○ Re-training or skill transformation for workers in coastal and marine tourism: to expand more active science-based tourism products such as marine wildlife safaris, eco-tourism, and citizen science. ○ Skills development in ocean renewable energy. ○ Improvement of training, competency certification and job placement of workers in the blue economy sector. ● Development of decent work in blue economy. <ul style="list-style-type: none"> ○ Strengthening of policies related to social security and the formalisation of worker arrangements in the blue economy sector. ○ Strengthening of the alignment between corporate support programs and blue economy workforce cooperative partnerships. ○ Expansion of decent work supported by healthy and safe working environment in the priority blue economy sectors. ○ improvement in workforce transformation scheme to allow talent movement to higher skills or more productive type of jobs across priority sectors, particularly in responding to investment and emerging blue economy sectors. ○ Expansion of the blue economy workforce supports programs that can increase productivity. ● Strengthening of community empowerment in blue economy. 	<ul style="list-style-type: none"> ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of social capital including in the forms of local/grassroot/ community organization in managing the business, conservation and social wellbeing in small islands and the coastal areas. ○ Strengthening of small and medium industry cluster development, cooperatives and village-owned businesses in the coastal areas to strengthen community-based businesses in blue economy sectors. ○ Expansion of aquaculture production to meet the growing demand for aquatic food and enhance inclusive livelihoods. ○ Improvement of business development services for new entrepreneurs and micro and small enterprises in the coastal areas and small islands. ○ Skills improvement for local facilitators with scientific and business expertise to leverage local/community knowledge for advancing local businesses. ○ Strengthening of financial literacy and management, and implementation geographical indications to help local entrepreneurs expand their businesses. ○ Increased access to affordable finance, training, technology and innovation, and market support for local entrepreneurs. ○ Expansion of community-based fisheries management to empower local fishing communities. ○ improvement of community-based fisheries co-management initiatives. ○ Improvement of sustainable community-based marine and coastal tourism supported by community access to coastal areas. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion on the empowerment of youth, women and people with disabilities in priority blue economy sectors through capacity buildings, entrepreneurship and employment opportunities. ○ Expansion of microfinance initiatives specifically tailored for women in coastal communities to promote their engagement in sustainable blue economy activities. ○ Improvement of appropriate technology adoption and innovation among communities in coastal areas, involving youth, women and people with disabilities. ○ Development of programs that support improving the local community's standard of living stemming from involvement in implementing offshore renewable energy projects. ● Strengthening of communities' resilience in blue economy. <ul style="list-style-type: none"> ○ Expansion of basic infrastructure and connectivity in coastal areas and small islands, including to support integrated food-energy-water systems in these areas. ○ Improvement of saltwater treatment in small and remote islands supported by sustainable operation and management for the facilities by local communities. ○ Expansion of community movement to increase consumption of good nutritious food derived from sustainable marine food. ○ Expansion in the availability of access and sustainable marine commodity production facilities to support public health. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement of a social protection scheme for fishers and maritime workers supports productivity improvement. ○ Improvement of social safety nets to support vulnerable communities affected by environmental changes, supported by possible development of climate-resilient insurance or risk-sharing mechanism to protect coastal farmers and small-scale fishers financially due to seasonality or in case of unforeseen events or disasters. ○ Strengthening of literacy and capacity to respond to drought and water scarcity mapping. ○ Development of sustainable and climate-resilient seed varieties for coastal agriculture. ○ Strengthening of sustainable and climate-resilient coastal food production hubs. ○ Expansion of technical assistance and financial support to promote the transition of fishers and coastal communities to alternative livelihoods that are less dependent on marine resources, such as ecotourism or sustainable agriculture. ○ Improvement of local communities and local industries to work together to solve environmental and sustainable development issues in the vicinity 	



Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 4</p> <p>Strengthening the enabling ecosystem including governance, financing, and infrastructure</p>	<ul style="list-style-type: none"> ● Development of effective blue economy policies, planning, programs and procedures. <ul style="list-style-type: none"> ○ Integration of blue economy agenda in the planning and implementation of policies in relevant government institutions. ○ Improvement in blue economy related policy soundness and synergies in policy and program implementation involving public and private collaboration. ○ Support for policies promoting potential blue economy sectors at regional level. ○ Promotion of the blue economy roadmap in bilateral and multilateral forums. ○ Strengthening of collaboration between the public and private sectors in marine resource management dan blue economy data at national and provincial levels. ○ Improvement of marine data repositories and open-access platforms to facilitate knowledge sharing. ○ Strengthening of a comprehensive marine spatial planning framework (land and sea) to promote harmony between protection mechanisms for the marine and coastal environment and human activities at the national and regional levels.. ○ Development of clear guidelines and criteria for issuing permits and licenses for marine resource utilization, processing, and trade, as well as ensuring transparency and accountability in establishing marine protected areas to conserve critical habitats and biodiversity. ○ Improvement in the utilization of the Indonesian Archipelago Sea Lanes (ALKI) in blue economy priority sectors, supported by sound regulatory framework 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Coordinating Ministry for Human Development and Culture ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Home Affairs ● Ministry of Foreign Affairs ● Ministry of Education, Culture, Research and Technology ● Ministry of Telecommunication and Informatics



Strategic actions	Action plans	Relevant institutions
	<p>and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional, and global cooperation frameworks using ALKI.</p> <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Support for the growth of sustainable coastal and marine consulting and advisory services, providing expertise on environmental impact assessments, sustainable business practices, and policy development. ● Investment promotion for blue economy sectors. <ul style="list-style-type: none"> ○ Simplification of regulations to increase of investment and local business' participation in the blue economy. ○ Regular reviews and evaluations of permit and license issuance procedures to identify areas for improvement and enhance efficiency. ○ Capacity-building to enhance the skills and knowledge of government officials involved in issuing and managing permits and licenses for marine resource utilization and trade. ○ Ease of permits and tax relief policy for those who invest part of their capital for R&D in the blue economy sector. ○ Identification of high-tech-based investment potentials, including biotechnology and marine bioeconomy. ○ Facilitation of investment in blue food value chain. ○ Facilitation of investment in the development of eco-friendly marine biotechnology. 	<ul style="list-style-type: none"> ● Ministry of Energy and Mineral Resources ● Ministry of Manpower ● Ministry of Trade ● Ministry of Investment ● Ministry of Transportation ● Ministry of Industry ● Ministry of Tourism and Creative Economy ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement in the readiness of business facilities, investment, and supporting infrastructure in developing the central and regional blue economy. ○ Establishment of maritime hubs and free trade zones to attract investment and facilitate trade activities. ○ Development of mechanisms for public feedback related to the issuance of permits and licenses, allowing affected communities and stakeholders to voice their concerns and seek resolution. ● Strengthening of the role of science and technology in blue economy. <ul style="list-style-type: none"> ○ Strengthening of the role of science and technology, research, and marine information systems. ○ Strengthening of the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and technology/patent commercialization. ○ Development of an integrated plan for expanding technology development, modification, transfer and adoption supported by collaboration, licensing, reverse engineering, and procurement. ○ Development of marine centre of excellence (centre of excellence), and research centers to promote scientific knowledge and innovation on blue economy. ○ Development of sustainable coastal and marine research parks and innovation clusters, facilitating collaboration and knowledge exchange between academia, industry, and government. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Facilitation of basic research and improvement in priority sectors in the blue economy. ○ Expanding bioprospecting to supply the most potential bioresources for creating added value. ○ Supporting the growth of sustainable coastal and marine information and communication technology solutions such as smart fishing technologies and marine spatial planning tools. ○ Identification of the potential to research and develop technology based on underwater and seabed mapping. ○ Development of research framework and implementation on hydro-oceanography. ○ Promotion of community based science based on coastal and marine resources. ● Development of just energy transition in blue economy. <ul style="list-style-type: none"> ○ Expansion of renewable energy use in blue economy sectors. ○ Strengthening of regulatory mandates of agencies relating to the energy sector and marine mining (e.g. offshore petroleum). ○ Strengthening of policy coordination and cooperation between government agencies responsible for energy, environment, and maritime affairs to enable the sustainable growth of ocean-based renewable energy. ○ Development of the enabling factors for feasible offshore energy generation, including relevant regulation and policies, research and development, 	



Strategic actions	Action plans	Relevant institutions
	<p>feasibility studies for offshore energy projects, and provision of incentives for offshore energy investment.</p> <ul style="list-style-type: none"> ○ Involvement of financial institutions and investors to create dedicated funding mechanisms and investment vehicles for ocean-based renewable energy projects. ○ Facilitation of investment in sustainable marine renewable energy projects (such as offshore wind farms and tidal energy installations) to reduce dependence on fossil fuels and create green jobs. ○ Improvement in the readiness of leveraging investment from multipurpose infrastructures (including supporting offshore energy supply for greening of transportation, shipping, ports, and logistics services). ○ Strengthening the utilization of energy and mineral resources in accordance with blue economy principles by paying attention to environmentally friendly technology ○ Establishment of local initiatives in the sub-national governments, such as 100% renewable energy islands, provinces, and cities. ● Development of sustainable blue finance. <ul style="list-style-type: none"> ○ Strengthening of collaboration in various blue finance schemes to support blue economy activities, i.e: <ul style="list-style-type: none"> ■ Blue bond for fisheries management projects and ocean renewable energy projects, ■ Blended finance for marine resource and waste management, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Revolving loan funds for small-scale fishers to invest in sustainable fishing practices and equipment, ■ Impact investment funds to support the growth of sustainable marine-based businesses and start-ups, ■ Blue carbon funds to finance projects that protect and restore coastal ecosystems, such as mangroves and seagrasses, for carbon sequestration, ■ Trust funds mechanism to support the long-term management and conservation of marine protected areas, ■ Grants and seed funding for research and development projects focused on innovative solutions for sustainable fisheries and marine resource management, ■ Grants and seed funding for start-ups engagements in the blue economy and business incubation, ■ Blue Investment Bank approaches as complementary to Public–Private Partnerships (PPP), ■ Project-based Blue Financing, etc. <ul style="list-style-type: none"> ○ Increasing awareness of financing and development mechanisms/thematic investment platform related to blue economy. ○ Expansion in the implementation of the Blue Action Fund: protect the biodiversity and environment in coastal and ocean area. ○ Expansion of the implementation of marine insurance and risk management services, providing coverage and support to businesses operating in the blue economy. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Impact measurement and reporting systems to track blue finance investments' environmental and social outcomes. ● Strengthening of disaster resilience and mitigation capacity. <ul style="list-style-type: none"> ○ Research and development to understand the impacts of climate change on marine ecosystems and development of adaptation strategies. ○ Improvement in disaster resilience and mitigation capacity to supported by a management plan of ecosystem-based marine resources. ● Development of Blue Carbon. <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Implementation of the Indonesia Blue Carbon Strategic Framework. ○ Establishment of carbon market to optimize the benefits from blue carbon ecosystem potentials. ● Improvement in the Indonesia Blue Economy Index and monitoring of its progress. <ul style="list-style-type: none"> ○ Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ○ Development of collaboration schemes in the blue economy database between public and private stakeholders at national and provincial levels. ○ Capacity building and development of monitoring assessments using space technology/real-time monitoring systems. 	



Table 19. Strategic Action Plans: Phase V 2040-2045: Advance and Sustainable Indonesia Blue Economy

Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 1</p> <p>Improving health, resilience, and productivity of maritime resources, including in climate change mitigation and adaptation</p>	<ul style="list-style-type: none"> ● Strengthening of coordination, harmonization and synergy in managing marine resources, marine protected areas and marine capture fisheries zoning among different levels of authority. ● Expansion of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ● Strengthening of the benefits from international cooperation in achieving Net Zero Emission and other environmental commitments. ● Strengthening of and expansion of resource and environment data management, research and development. <ul style="list-style-type: none"> ○ Highly integrated access to quality information and data related to marine resources for stakeholders. ○ Strengthening of community scientist on marine resources management. ○ Expansion of research and development of marine resources. ● Strengthening of marine resources and marine protected area management. <ul style="list-style-type: none"> ○ Expansion of public awareness of the importance of the ocean and its resources and the protection of the coastal and marine ecosystem.. ○ Strengthening of policy on other effective area-based conservation measures in conjunction with traditional/ locally managed management area. ○ Strengthening of locally-managed resource schemes supported by stakeholders’ participation. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Industry ● Ministry of Education, Culture, Research and Technology ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Agrarian Affairs



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of the benefits from the implementation of policies based on ocean and ecosystem services accounting, particularly in blue economy sectors. ○ Strengthening of standardization, infrastructure and management capacity of ecosystems and marine protected areas. <ul style="list-style-type: none"> ■ Improvement of measurement tools for the effectiveness of conservation area management. ■ Strengthening of surveillance and marine security systems for the use of maritime resources, supported by cutting-edge technology in monitoring and controlling marine resources, and better risk management. ○ Strengthening of the benefits from the expansion of marine protected areas. ○ Strengthening of marine protected area and biodiversity networks. ○ Expansion of global blue economy cooperation and knowledge. ○ Improvement in the quality of reporting and verification systems to track the utilization of marine resources. ○ Expansion of the incentives and disincentives to promote stakeholders' participation in marine resource management. <ul style="list-style-type: none"> ■ Improvement of market-based incentives, such as eco-certifications, to encourage sustainable practices in blue economy sectors. ■ Implementation of ecosystem service payment schemes with area management planning, e.g. payment for ecosystem services schemes that reward communities and individuals for the conservation and sustainable use of marine resources, marine polluter pays schemes policy, etc. 	<p>and Spatial Planning</p> <ul style="list-style-type: none"> ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Meteorological and Geophysical Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Improvement of financial incentives to encourage the adoption of sustainable aquaculture practices, fishing gear and techniques that minimize bycatch and habitat damage: <ul style="list-style-type: none"> ⇒ affordable and flexible credit for coastal communities engaged in sustainable aquaculture practices such as recirculating aquaculture systems, ⇒ grants and subsidies to support implementing sustainable fishing and aquaculture certification programs, such as Marine Stewardship Council or Aquaculture Stewardship Council certification, and ⇒ low-interest loans for implementing sustainable coastal infrastructure projects, such as coral reef restoration and mangrove rehabilitation. ■ Expansion of carbon removal and offset for achieving net-zero company pledges, followed by renewable energy use and energy efficiency improvements. ■ Implementation of carbon tariff and tax in all blue economy sectors. ● Strengthening of law enforcement at sea. <ul style="list-style-type: none"> ○ Strengthening of the maritime authorities' capacity to enforce regulations and ensure compliance with international maritime standards and procedures. ○ Strengthening enforcement and monitoring capabilities to prevent illegal, unreported, and unregulated (IUU) fishing practices through issuing permits and licenses that promote transparency and traceability in the fisheries sector. ○ Improvement in the monitoring and law enforcement at sea schemes. ○ Strengthening environmental court and laws 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Strengthening of the realization of Indonesia's National Determined Contribution to climate change mitigation. ● Strengthening of policies and program implementation of marine debris management to maintain a healthy marine ecosystem for sustainable fisheries. <ul style="list-style-type: none"> ○ Strengthening of central and regional policies and planning, institutions, protocols and measurement in reducing, handling and promoting recycling of marine waste/debris and waste on land and coastal areas. ○ Development of Marine Plastics Innovation Hub by supporting start-ups to design and deliver in-depth technology solutions on plastic and paper alternatives from bio-compostable and biodegradable materials, and waste collection. ○ Improvement in waste management system on land and marine through <ul style="list-style-type: none"> ■ Improved data, governance and monitoring, ■ Strengthening of the benefits to restore river and ocean health. ■ Strengthening of the role of local waste management system, supported by effective policy, sustainable funding, and better institutional capacity. ■ Strengthening of waste collection and processing at community-based facilities, coastal facilities and ports. ○ Significant reduction of undegradable plastic production and consumption through: <ul style="list-style-type: none"> ■ Strengthening of collaboration with industry to develop and implement industry's transition roadmap to reduce producers' plastic footprint by utilizing environmentally friendly materials, production processes and 	



Strategic actions	Action plans	Relevant institutions
	<p>waste handling/processing including with the use of circular economic approach,</p> <ul style="list-style-type: none"> ■ Expansion of technology and innovation on alternative environmentally friendly materials, production processes and plastic recycle, ■ Improvement of incentives for producers' performance in extended producer responsibility for the collection and recycling of specified volumes of plastic packaging, ■ Strengthening and expansion of eco-design standards and recyclable plastics, ■ Expansion of consumers' participation to make careful choices to reduce plastic use and to manage waste disposal through increasing their awareness, expansion of single-used plastic ban, and provision of incentives for better practice of waste disposal, and ■ Expansion of waste management (collection and processing) and its linked with energy production and circular economy. <ul style="list-style-type: none"> ○ Acceleration in the reduction of micro and macro plastics on ecosystems and marine organisms. ● Improvement in the coastal areas and small islands management. <ul style="list-style-type: none"> ○ Revitalization of coastal areas and small islands. ○ Support and facilitation to safeguard critical resources for coastal livelihoods, climate change mitigation, and resilience. ○ Expansion of capacity building and technical assistance for strengthening coastal resilience. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of policies for mangrove, sea grasses and coral reef rehabilitation management. ○ Support and facilitation for the expansion of community-based monitoring and management for mangroves, sea grasses, and coral reef restoration. ○ Expansion in the plantation and rehabilitation of mangroves, seagrasses, and coral reefs. ● Improvement in relevant sectors to support the resilience and sustainability of marine resources <ul style="list-style-type: none"> ○ Expansion of the improved forest management schemes. ○ Expansion of the use of sustainable and climate-smart agricultural extension services. ○ Enforcement and monitoring of regulation related to mooring buoy points to support tourism and marine transportation to reduce environmental damage. ○ Expansion of the application and expansion of the renewable energy transition in coastal and marine activities (fishery, tourism, transportation, trade). ○ Strengthening of greening transportation, shipping, ports, and logistics services to reduce carbon emissions. <ul style="list-style-type: none"> ■ Expansion of green transportation, shipping, ports, and logistics services to reduce carbon emissions. ■ Improvement in the management of fishing vessels, fishing equipment, and crewing fishing vessels to maintain efficiency and reduce greenhouse gas emission. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Expansion of sustainable marine transportation practices, such as using fuel-efficient vessels and adopting clean propulsion technologies, to reduce carbon emissions and improve economic efficiency. ■ Investments in new ships that reduce greenhouse gas emissions. ■ Improvement in sustainable shipping practices, such as slow steaming and emission reduction measures, to minimize the environmental footprint of maritime transportation. ■ Expansion of changes in transportation modes through automation (digitalization and automation of intermodal traffic, data, and water). ■ Improved implementation of an integrated policy framework around marine conservation and climate change mitigation. ■ Expansion of ballast water wastewater treatment technology at ports and maritime industry services. 	
<p>Strategic actions 2</p> <p>Uplifting sustainable economic growth of the traditional sectors and emerging sectors in the blue economy</p>	<ul style="list-style-type: none"> ● Strengthening of blue economy statistics (e.g., development of blue economy monitoring indicators, as well as direct and indirect GDP contributions of the blue economy sectors), employment, and social and environmental data sets. ● Strengthening of the resilience and sustainability of seafood production, seaweed farming, marine-based manufacturing supply chain, tourism supply chain, tourism destination management, and maritime transportation and logistics systems, supported by transparency, traceability and fair-trade practices. ● Improvement of blue economy sectors' productivity and resilience through sustainable and practices. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Industry ● Ministry of National Development Planning



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of Indonesian brands for blue economy products and services, including sustainable coastal and marine fashion and lifestyle brands with environmentally friendly materials and manufacturing processes. ○ Development of investment potentials mapping in the blue economy sector. ○ Development of competitive blue economy clusters for marine-based manufacturing, tourism, marine biotechnology and bioeconomy, port and trade. ○ Development of an inclusive supply chain of fisheries and aquaculture products, upstream to downstream products, through fair and feasible partnerships between small-scale fishers and medium-large industries. ○ Strengthening of blue economy products and services (seed management, licensing, and marketing, waste and disease monitoring). ○ Improvement in supply chain monitoring through digitization and sharing data for better resource planning. ○ Development of digital platforms on aquatic biosecurity surveillance and launched mobile apps on farm-level management and product traceability (supply chain). ○ Strengthening of sustainable fisheries and aquaculture management practices to ensure the long-term productivity. ○ Expansion of integrated fish farming to efficient the utilization of available resources, recycling waste, and saving energy while maintaining the ecological balance. 	<ul style="list-style-type: none"> ● Ministry of Education, Culture, Research and Technology ● Ministry of Manpower ● Ministry of Trade ● Ministry of Tourism and Creative Economy ● Ministry of Investment ● Ministry of Finance ● Ministry of Transportation ● Ministry of Energy and Mineral Resources ● Ministry of Public Works and Housing ● Ministry of Environment and Forestry ● National Standardization Agency ● National Research and Innovation Agency ● Statistics Indonesia ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable mariculture systems technology, such as integrated multitrophic aquaculture. ○ Improvement in the Integrated multi-trophic aquaculture and coastal farming to diversify income sources and increase productivity. ○ Improvement in the use of sustainable and climate-smart pest and disease management practices. ○ Improvement in aquatic animal disease preparedness and response systems to support sustainable cultivation. ○ Improvement of good handling practices, quarantine and quality assurance of fishery and other coastal and ocean products. ○ Quality investment for seafood and seaweed production and processing, shipbuilding, ports, and logistic system including in cold chain storage and logistic services. ○ Promotion of sustainable seafood processing and value-added industries to increase the value and strengthen competitiveness of Indonesian seafood products. ○ Expansion of sustainable seaweed farming and processing industries to tap into the growing global demand for seaweed-based products, and its potential roles for climate change mitigation and adaption. ○ Expansion of the Tropical Seaweed Innovation Network to increase productivity, the application of low-carbon seaweed cultivation, etc. ○ Strengthening of the downstream of fisheries and aquaculture products supported by developing a resilient supply chain. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable coastal and marine manufacturing industries, including shipbuilding, marine equipment manufacturing, and marine bioproducts, to stimulate economic growth and innovation. ○ Strengthening of an inclusive, quality and sustainable blue food. ○ Improvement in the resilient blue food value chain based on coastal and marine resources. ○ Improvement in business development in producing nutrition from the ocean. ○ Improvement of sustainable and efficient energy use in blue food production and processing. ○ Improvement of sustainable marine biotechnology industries, including the extraction of bioactive compounds from marine organisms for pharmaceutical and nutraceutical applications. ○ Expansion of salt production for industry supported by new investment and the application of advanced production techniques, such as using saltwater-tolerant crops, hydroponics, pharmaceuticals, renewable energy, automated systems, precision cultivation, sustainable irrigation methods, etc., to increase productivity and lead the global market. ○ Strengthening of salt production clusters in coastal areas and value chain to leverage synergies supported by better access to finance, technology application, infrastructure, efficient and sustainable production. ○ Development of salt production diversification, such as specialty salts or salt-based food products with high value-added, such as gourmet salts or salt-based cosmetics, to diversify market offerings. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Foster partnerships and knowledge exchange between salt producers, researchers, and industry associations. ○ Continuous research and development in salt-related technologies, such as salt processing, product diversification, and salt-derived products to drive innovation and create new opportunities for the salt industry. ○ Expansion of sustainable salt farming practices to minimize environmental impacts, use eco-friendly fertilizers, efficient water management systems, and proper waste disposal methods. ○ Improvement in the capacity in providing salt to domestic market and expansion of salt exports to global markets with a good quality product. ○ Establishment of certification and labelling schemes for sustainably produced salt to enhance market competitiveness in the global market. ○ Strengthening of the coastal community businesses based on geographic indications, intellectual property, and community development principles. ○ Strengthening of data-driven marine research strategy on maritime technology that focuses on commercialization-ready outcomes. ○ Expansion of technology application and innovation for productivity and diversification in marine-based manufacturing. ○ Establishment of a regional technology platform for aquaculture, to improve access to technology solutions. ○ Development of incentive schemes to support the growth of high-tech-based blue economy sectors and new sectors such as shipbuilding, renewable energy, bioeconomy, and biotechnology. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of the marine innovation hubs and incubators development to nurture entrepreneurship and accelerate the development of blue economy start-ups. ○ Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. ● Development of regenerative tourism to support sustainable coastal and marine environment. <ul style="list-style-type: none"> ○ Expansion of an inclusive and sustainable coastal and marine tourism including in protected areas involving local communities and businesses. ○ Improvement in sustainable amenities, accessibility, and transportation in coastal and marine-based tourism destinations, including marinas, ports, jetties, docking facilities, and coastal resorts, to enhance accessibility and connectivity to popular tourist destinations. ○ Increase in quality investment to support sustainable coastal and marine tourism destinations. ○ Strengthening of the competitive and sustainable yachting sector. ○ Strengthening of capacity in managing cruise tourism, such as marine tourism and the marine environment. ○ Expansion of low carbon and zero waste transport and access to the tourism destination. ○ Implementation of responsible tourism guidelines to promote waste management and recycling, and educate tourists and local communities on the importance of conservation and minimizing environmental impact. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ● Development of sustainable offshore energy and mineral industries, supported by environmentally friendly technology. <ul style="list-style-type: none"> ○ Improvement of offshore renewable energy investment activities (wind and ocean currents) based on feasibility studies in areas with the highest energy generation potential and demand, supported by public-private partnerships. ○ Strengthening of the regulatory frameworks that incentivize the deployment of ocean-based renewable energy technologies and ensure fair market competition. ○ Expansion for the development of hybrid energy system development which combines ocean-based renewable energy with other renewable sources, such as solar or geothermal energy. ○ Expansion for the integration of ocean-based renewable energy into national energy grids by developing offshore transmission infrastructure and smart grid technologies to efficiently transport electricity generated from ocean-based renewable energy sources to onshore grid connections. ○ Improvement in the integration of offshore wind farms along the potential coast that is interconnected with ports and utilized by industries along the coast. ○ Strengthening of international collaboration in standardization efforts for ocean-based renewable energy technologies, ensuring interoperability and reducing costs. ○ Development of local supply chains and manufacturing capabilities for ocean-based renewable energy technologies to foster domestic industry growth and job creation. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of research and new and renewable energy upgrading sourced from offshore & ocean currents (manufacturing floating offshore wind turbines). ○ Adoption of energy storage systems, such as batteries or hydrogen storage, to enhance ocean-based renewable energy's reliability and grid integration. ○ Support for the industrialization of renewable energy sourced from offshore & ocean currents (floating offshore wind power) in funding support and mentoring. ○ Expansion of innovative offshore infrastructure development, such as subsea power cables or floating substations, to facilitate the integration of ocean-based renewable energy into the grid. ○ Development of ocean thermal energy conversion systems that generate power from temperature differences in ocean water. ○ Monitor and evaluate ocean-based renewable energy projects to assess their performance, impact, and contribution to the blue economy. ● Development of blue economy product and service quality assurance. <ul style="list-style-type: none"> ○ Expansion of technology solutions for the implementation of standards in blue economy priority sectors to ensure inclusivity, quality assurance and sustainability. ○ Improvement of supply chain certification and regulatory infrastructure for the maritime industry. ○ Strengthening of good manufacturing practices in the production and processing of seafood and seaweed for food products and pharmaceutical. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of sustainable seafood certification and labelling programs and identifying international standards and certification requirements for blue economy sectors. ○ Improvement in traceability systems to ensure transparency and legality in seafood supply chains. ○ Strengthening of capacity building for food safety and quality assurance. ○ Strengthening of the facility and infrastructure for food safety and quality assurance. ● Strengthening of export potentials. <ul style="list-style-type: none"> ○ Increase in export volume and earning from high value products from marine capture fisheries, aquaculture, seaweed farming, and marine-based manufacturing. ○ Improvement in the efficacy of export promotion for blue economy products. ● Development of competitive logistics, transportation and ports. <ul style="list-style-type: none"> ○ Development of Indonesia as a global hub through strengthening shipping liners, ports, and logistics management. ○ Strengthening maritime connectivity by enhancing maritime routes and establishing new shipping lanes. ○ Expansion of digital technologies adoption and data-sharing platforms to improve efficiency and transparency in maritime trade and logistics. ○ Improvement of climate-resilient infrastructure for food storage and processing, including cold chain infrastructure to reduce post-harvest losses. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of advanced logistics technologies and systems to optimize supply chain management and reduce transportation costs. ○ Strengthening of the provision, quality, and integration of port and maritime infrastructures. ○ Improvement of efficient and sustainable maritime transport systems to facilitate the movement of goods and services. ○ Improvement of port infrastructure such as container terminals, dry ports, intermodal facilities, and hinterland connections to improve connectivity and efficient ride and supply chain interisland. ○ Modernization of marine infrastructure and logistics facilities to accommodate increased trade volumes and larger vessels to improve cargo handling and transportation efficiency. ○ Development of new port facilities in strategic locations to cater to emerging trade routes and market demands. ○ improvement of intensive monitoring, control, and surveillance measures using satellite imagery data to capture real-time images of fishing vessels at sea. ○ Enhancement of maritime safety and security measures, including vessel tracking systems, surveillance technologies, and anti-piracy measures. ○ Application of spatial monitoring and surveillance instruments and strengthening intermodal traffic/combined transport (waterways, railways). ○ Improvement of port audit and "port risk assessment" and related facilities according to internationally recognized safety standards and rules. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Research and development of autonomous shipping and unmanned maritime systems to increase efficiency and safety. ○ Strengthening of maritime services, such as ship repair and maintenance, maritime insurance, and maritime law services. ● Promotion of capacity building partnerships with multiple benefactors across blue economy sectors. ● Development of circular economy as a source of value creation in blue economy sectors. <ul style="list-style-type: none"> ○ Expansion of a circular economy to reduce environmental damage and create added value, including from marine debris, with the support of bioeconomy and biotechnology. ○ Development of various higher-value products from fish waste. ○ Expansion of the salt producers' contribution by adopting circular economy principles by utilizing salt by-products for other purposes or recycling waste materials. ○ Expansion of technology and innovation commercialization for the development of new materials from marine debris or other waste for providing various development solutions (manufacturing, construction, etc.). ○ Expansion in the benefit from circular economy application in the tourism supply chain. 	



Strategic actions	Action plans	Relevant institutions
<p>Strategic actions 3</p> <p>Increasing equality and welfare the blue economy stakeholders to achieve just transition</p>	<ul style="list-style-type: none"> ● Promotion of an inclusive stakeholders' participation in blue economy. <ul style="list-style-type: none"> ○ Expansion of education and awareness programs to enhance ocean literacy among coastal communities. ○ Strengthening of the role of community and indigenous people in the blue economy value chain. ○ Strengthening of the participation of indigenous and marginalized communities in decision-making processes related to the blue economy. ○ Strengthening of gender equality and women's empowerment in the blue economy sector. ○ Improvement of coastal communities during the project planning and development of offshore renewable energy. ● Skills development in blue economy. <ul style="list-style-type: none"> ○ Development of employment occupancy and talent mapping in the blue economy sector. ○ Strengthening of the education system, particularly related to science, technology, engineering, arts and mathematics, including curricula, teachers, capacity, facilities and infrastructure, supported by cooperation between educational institutions and industry. ○ Expansion of the integrated study programs (formal and informal) related to the blue economy. ○ Improvement of standards and certification of human resource competencies in the blue economy sector. 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Human Development and Culture ● Coordinating Ministry for Economic Affairs ● Ministry of Marine Affairs and Fisheries ● Ministry of Education and Culture ● Ministry of Manpower ● Ministry of Industry ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Energy and Mineral Resources ● Ministry of Women's Empowerment and Child Protection ● Ministry of Youth and Sports



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Provision of competent assessors for worker competency certification in the blue economy sector. ○ Strengthening in skills related to marine-based research and development, manufacturing, port operation, engineering services, and logistics. ○ Re-training or skill transformation for workers in coastal and marine tourism. ○ Skills development in ocean renewable energy. ○ Improvement of training, competency certification and job placement of workers in the blue economy sector. ● Development of decent work in blue economy. <ul style="list-style-type: none"> ○ Strengthening of policies related to social security and the formalisation of worker arrangements in the blue economy sector. ○ Strengthening of the alignment between corporate support programs and blue economy workforce cooperative partnerships. ○ Expansion of decent work supported by healthy and safe working environment in the priority blue economy sectors. ○ improvement in workforce transformation scheme to allow talent movement to higher skills or more productive type of jobs across priority sectors, particularly in responding to investment and emerging blue economy sectors. ○ Expansion of the blue economy workforce supports programs that can increase productivity. ● Strengthening of community empowerment in blue economy. 	<ul style="list-style-type: none"> ● Ministry of Social Affairs ● Ministry of Home Affairs ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Strengthening of social capital including in the forms of local/grassroot/ community organization in managing the business, conservation and social wellbeing in small islands and the coastal areas. ○ Strengthening of small and medium industry cluster development, cooperatives and village-owned businesses in the coastal areas to strengthen community-based businesses in blue economy sectors. ○ Expansion of aquaculture production to meet the growing demand for aquatic food and enhance inclusive livelihoods. ○ Improvement of business development services for new entrepreneurs and micro and small enterprises in the coastal areas and small islands. ○ Skills improvement for local facilitators with scientific and business expertise to leverage local/community knowledge for advancing local businesses. ○ Strengthening of financial literacy and management, and implementation geographical indications to help local entrepreneurs expand their businesses. ○ Increased access to affordable finance, training, technology and innovation, and market support for local entrepreneurs. ○ Expansion of community-based fisheries management to empower local fishing communities. ○ improvement of community-based fisheries co-management initiatives. ○ Improvement of sustainable community-based marine and coastal tourism supported by community access to coastal areas. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Expansion on the empowerment of youth, women and people with disabilities in priority blue economy sectors through capacity buildings, entrepreneurship and employment opportunities. ○ Expansion of microfinance initiatives specifically tailored for women in coastal communities to promote their engagement in sustainable blue economy activities. ○ Improvement of appropriate technology adoption and innovation among communities in coastal areas, involving youth, women and people with disabilities. ○ Development of programs that support improving the local community's standard of living stemming from involvement in implementing offshore renewable energy projects. ● Strengthening of communities' resilience in blue economy. <ul style="list-style-type: none"> ○ Expansion of basic infrastructure and connectivity in coastal areas and small islands, including to support integrated food-energy-water-waste management systems in these areas, , including clean and potable water, quality energy supply for every household, and good waste treatment and management. ○ Improvement of saltwater treatment in small and remote islands supported by sustainable operation and management for the facilities by local communities. ○ Expansion of community movement to increase consumption of good nutritious food derived from sustainable marine food. ○ Expansion in the availability of access and sustainable marine commodity production facilities to support public health. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement of a social protection scheme for fishers and maritime workers supports productivity improvement. ○ Improvement of social safety nets to support vulnerable communities affected by environmental changes, supported by possible development of climate-resilient insurance or risk-sharing mechanism to protect coastal farmers and small-scale fishers financially due to seasonality or in case of unforeseen events or disasters. ○ Strengthening of literacy and capacity to respond to drought and water scarcity mapping. ○ Development of sustainable and climate-resilient seed varieties for coastal agriculture. ○ Strengthening of sustainable and climate-resilient coastal food production hubs. ○ Expansion of technical assistance and financial support to promote the transition of fishers and coastal communities to alternative livelihoods that are less dependent on marine resources, such as ecotourism or sustainable agriculture. ○ Improvement of local communities and local industries to work together to solve environmental and sustainable development issues in the vicinity 	



Strategic actions	Action plans	Relevant institutions
Strategic actions 4 Strengthening the enabling ecosystem including governance, financing, and infrastructure	<ul style="list-style-type: none"> ● Development of effective blue economy policies, planning, programs and procedures. <ul style="list-style-type: none"> ○ Integration of blue economy agenda in the planning and implementation of policies in relevant government institutions. ○ Improvement in blue economy related policy soundness and synergies in policy and program implementation involving public and private collaboration. ○ Support for policies promoting potential blue economy sectors at regional level. ○ Promotion of the blue economy roadmap in bilateral and multilateral forums. ○ Strengthening of collaboration between the public and private sectors in marine resource management dan blue economy data at national and provincial levels. ○ Improvement of marine data repositories and open-access platforms to facilitate knowledge sharing. ○ Strengthening of a comprehensive marine spatial planning framework (land and sea) to promote harmony between protection mechanisms for the marine and coastal environment and human activities at the national and regional levels. ○ Development of clear guidelines and criteria for issuing permits and licenses for marine resource utilization, processing, and trade, as well as ensuring transparency and accountability in establishing marine protected areas to conserve critical habitats and biodiversity. ○ Improvement in the utilization of the Indonesian Archipelago Sea Lanes (ALKI) in blue economy priority sectors, supported by sound regulatory framework 	<ul style="list-style-type: none"> ● Coordinating Ministry of Maritime Affairs and Investment ● Coordinating Ministry for Economic Affairs ● Coordinating Ministry for Politics, Law, and Security ● Coordinating Ministry for Human Development and Culture ● Ministry of Marine Affairs and Fisheries ● Ministry of Environment and Forestry ● Ministry of Agrarian Affairs and Spatial Planning ● Ministry of National Development Planning ● Ministry of Finance ● Ministry of Home Affairs ● Ministry of Foreign Affairs ● Ministry of Education, Culture, Research and



Strategic actions	Action plans	Relevant institutions
	<p>and diplomatic efforts in responding to the geopolitical dynamics of water borders through bilateral, regional, and global cooperation frameworks using ALKI.</p> <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Support for the growth of sustainable coastal and marine consulting and advisory services, providing expertise on environmental impact assessments, sustainable business practices, and policy development. ● Investment promotion for blue economy sectors. <ul style="list-style-type: none"> ○ Simplification of regulations to increase of investment and local business' participation in the blue economy. ○ Regular reviews and evaluations of permit and license issuance procedures to identify areas for improvement and enhance efficiency. ○ Capacity-building to enhance the skills and knowledge of government officials involved in issuing and managing permits and licenses for marine resource utilization and trade. ○ Ease of permits and tax relief policy for those who invest part of their capital for R&D in the blue economy sector. ○ Identification of high-tech-based investment potentials, including biotechnology and marine bioeconomy. ○ Facilitation of investment in blue food value chain. ○ Facilitation of investment in the development of eco-friendly marine biotechnology. 	<p>Technology</p> <ul style="list-style-type: none"> ● Ministry of Telecommunication and Informatics ● Ministry of Energy and Mineral Resources ● Ministry of Manpower ● Ministry of Trade ● Ministry of Investment ● Ministry of Transportation ● Ministry of Industry ● Ministry of Tourism and Creative Economy ● National Standardization Agency ● National Research and Innovation Agency ● Local Governments



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Improvement in the readiness of business facilities, investment, and supporting infrastructure in developing the central and regional blue economy. ○ Establishment of maritime hubs and free trade zones to attract investment and facilitate trade activities. ○ Development of mechanisms for public feedback related to the issuance of permits and licenses, allowing affected communities and stakeholders to voice their concerns and seek resolution. ● Strengthening of the role of science and technology in blue economy. <ul style="list-style-type: none"> ○ Strengthening of the role of science and technology, research, and marine information systems. ○ Strengthening of the innovation ecosystem related to talent development, funding, research and innovation infrastructure, and technology/patent commercialization. ○ Development of an integrated plan for expanding technology development, modification, transfer and adoption supported by collaboration, licensing, reverse engineering, and procurement. ○ Development of marine centre of excellence (centre of excellence), and research centers to promote scientific knowledge and innovation on blue economy. ○ Development of sustainable coastal and marine research parks and innovation clusters, facilitating collaboration and knowledge exchange between academia, industry, and government. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Facilitation of basic research and improvement in priority sectors in the blue economy. ○ Expanding bioprospecting to supply the most potential bioresources for creating added value. ○ Supporting the growth of sustainable coastal and marine information and communication technology solutions such as smart fishing technologies and marine spatial planning tools. ○ Identification of the potential to research and develop technology based on underwater and seabed mapping. ○ Development of research framework and implementation on hydro-oceanography. ○ Better management practice in community based science based on coastal and marine resources. ● Development of just energy transition in blue economy. <ul style="list-style-type: none"> ○ Expansion of renewable energy use in blue economy sectors. ○ Strengthening of regulatory mandates of agencies relating to the energy sector and marine mining (e.g. offshore petroleum). ○ Strengthening of policy coordination and cooperation between government agencies responsible for energy, environment, and maritime affairs to enable the sustainable growth of ocean-based renewable energy. ○ Development of the enabling factors for feasible offshore energy generation, including relevant regulation and policies, research and development, 	



Strategic actions	Action plans	Relevant institutions
	<p>feasibility studies for offshore energy projects, and provision of incentives for offshore energy investment.</p> <ul style="list-style-type: none"> ○ Involvement of financial institutions and investors to create dedicated funding mechanisms and investment vehicles for ocean-based renewable energy projects. ○ Facilitation of investment in sustainable marine renewable energy projects (such as offshore wind farms and tidal energy installations) to reduce dependence on fossil fuels and create green jobs. ○ Improvement in the readiness of leveraging investment from multipurpose infrastructures (including supporting offshore energy supply for greening of transportation, shipping, ports, and logistics services). ○ Strengthening the utilization of energy and mineral resources in accordance with blue economy principles by paying attention to environmentally friendly technology ○ Establishment of local initiatives in the sub-national governments, such as 100% renewable energy islands, provinces, and cities. ● Development of sustainable blue finance. <ul style="list-style-type: none"> ○ Strengthening of collaboration in various blue finance schemes to support blue economy activities, i.e: <ul style="list-style-type: none"> ■ Blue bond for fisheries management projects and ocean renewable energy projects, ■ Blended finance for marine resource and waste management, 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ■ Revolving loan funds for small-scale fishers to invest in sustainable fishing practices and equipment, ■ Impact investment funds to support the growth of sustainable marine-based businesses and start-ups, ■ Blue carbon funds to finance projects that protect and restore coastal ecosystems, such as mangroves and seagrasses, for carbon sequestration, ■ Trust funds mechanism to support the long-term management and conservation of marine protected areas, ■ Grants and seed funding for research and development projects focused on innovative solutions for sustainable fisheries and marine resource management, ■ Grants and seed funding for start-ups engagements in the blue economy and business incubation, ■ Blue Investment Bank approaches as complementary to Public–Private Partnerships (PPP), ■ Project-based Blue Financing, etc. <ul style="list-style-type: none"> ○ Increasing awareness of financing and development mechanisms/thematic investment platform related to blue economy. ○ Expansion in the implementation of the Blue Action Fund: protect the biodiversity and environment in coastal and ocean area. ○ Expansion of the implementation of marine insurance and risk management services, providing coverage and support to businesses operating in the blue economy. 	



Strategic actions	Action plans	Relevant institutions
	<ul style="list-style-type: none"> ○ Impact measurement and reporting systems to track blue finance investments' environmental and social outcomes. ● Strengthening of disaster resilience and mitigation capacity. <ul style="list-style-type: none"> ○ Research and development to understand the impacts of climate change on marine ecosystems and development of adaptation strategies. ○ Improvement in disaster resilience and mitigation capacity to supported by a management plan of ecosystem-based marine resources. ● Development of Blue Carbon. <ul style="list-style-type: none"> ○ Strengthening of coordination and synergy between government institutions at central and regional levels in blue carbon policies and management. ○ Implementation of the Indonesia Blue Carbon Strategic Framework. ○ Establishment of carbon market to optimize the benefits from blue carbon ecosystem potentials. ● Improvement in the Indonesia Blue Economy Index and monitoring of its progress. <ul style="list-style-type: none"> ○ Strengthening of blue economy data related to the environmental, economic and social pillars, spatial data and priority sectors in terms of data collection, analysis, methodology, and reports to help monitor the progress of blue economy development. ○ Development of collaboration schemes in the blue economy database between public and private stakeholders at national and provincial levels. ○ Capacity building and development of monitoring assessments using space technology/real-time monitoring systems. 	



CHAPTER 5

Supporting Mechanism



Chapter 5. Supporting Mechanism

5.1 Institutional Arrangement

The implementation of Blue Economy Roadmap will involve communication, collaboration, and coordination between all ministries with responsibilities which relate to the marine area. Indonesia has a large government that contains many ministries with a marine competence (Table 18). The remit for some of these ministries focuses exclusively on the marine area (e.g., Ministry of Marine Affairs and Fisheries), while for others the marine area is a subsection of their focus (e.g. Ministry of Industry and Ministry of Environment and Forestry). Strong collaboration and coordination among lines ministries is expected to result in effective delivery of the Blue Economy Roadmap.

Table 20. Ministries within the Government of Indonesia with Competence Relevant to the Blue Economy

Ministry	Competence Relevant to Blue Economy
Ministry of National Development Planning/National Development Planning Agency (Bappenas)*	<ul style="list-style-type: none"> • Multisector national long-term, medium-term and annual development planning, including the area of maritime, fisheries and aquaculture, manufacturing, energy, trade, investment, transportation, and services. • Co-coordinator with Ministry of Finance for development funding, including government budget, budget transfer for local government, international development funding cooperation, and public-private partnership. • National coordinator for SDGs, economic transformation, and Low Carbon Development Initiative. • Prepare Blue Economy Development Framework, Blue Finance Instruments Development Guideline, and Blue Economy Roadmap.
Coordinating Ministry of Maritime Affairs and Investment	Coordinate, synchronize and control the affairs of the maritime and investment sector, by providing support, implementing initiatives, and controlling policies based on the national development agenda and assignments from the President.
Ministry of Marine Affairs and Fisheries	<ul style="list-style-type: none"> • Policies and programs related to fisheries and aquaculture, coastal regions and small islands, marine protected areas, marine services, and marine/fisheries product added value. • Fisheries resource surveillance.
Ministry of Energy and Mineral Resources	Policies and programs related to offshore oil and gas, and marine energy development, including renewable energy.
Ministry of Transportation	Policies related to shipping, navigation, and ports.
Ministry of Environment and Forestry	<ul style="list-style-type: none"> • Policies and programs related marine conservation (some marine protected areas) and reduction of marine pollution.



Ministry	Competence Relevant to Blue Economy
	<ul style="list-style-type: none"> ● Mangrove ecosystem data custodian.
Ministry of Public Works and Housing	Programs supporting coastal development.
Ministry of Tourism and Creative Economy/ Tourism and Creative Economy Agency	Programs supporting marine tourism.
Ministry of Investment/ Indonesian Investment Coordinating Board (BKPM)	Policies and programs related to planning, promotion and facilitation of investment on blue economy sectors.
Coordinating Ministry for Political, Legal, and Security Affairs	Coordinate, synchronize and control the affairs of the politics, legal, and security affairs, by providing support, implementing initiatives, and controlling policies based on the national development agenda and assignments from the President.
Ministry of Defence	Policies and programs related to maritime defence policy and navy.
Ministry of Foreign Affairs	Policies and programs related to diplomacy, protection and advancing of Indonesia's maritime interests.
Ministry of Home Affairs	<ul style="list-style-type: none"> ● Policies and programs related to coordination among provincial and municipal governments that support maritime affairs. ● Management and supervision of state boundaries (province and region/municipality).
Ministry of Law and Human Rights	Policies and regulations related to regulatory governance, including ocean-related legislations, human rights, immigration and intellectual property.
The Maritime Security Agency (Bakamla)	Security and safety patrols in Indonesian waters.
Coordinating Ministry for Economic Affairs	Coordinating, synchronizing and controlling the affairs in the fields of economic affairs, by providing support, implement initiatives and control policies based on the national development agenda and assignments from the President.
Ministry of Finance	<ul style="list-style-type: none"> ● National coordinator for fiscal policy. ● Co-coordinator with Bappenas for development funding, including government budget, budget transfer for local government, international development funding cooperation, and public-private partnership. ● Policy and implementation of custom and excise, fees and taxes.



Ministry	Competence Relevant to Blue Economy
	<ul style="list-style-type: none"> ● Policies and allocation of subsidies. ● Policies on carbon related mechanisms.
Ministry of Industry	<ul style="list-style-type: none"> ● Policies and programs related to processing industry (shipbuilding, fish and seaweed processing, salt, food and beverages industry, chemical industry, pharmaceutical industry, metal industry, green industries, industrial estate, standardization and certification, etc.). ● Small and medium industries, including in the blue economy sectors.
Ministry of Trade	<ul style="list-style-type: none"> ● Policies and programs related to trade and logistics (domestic market development, export, import, trade promotion, trade diplomacy and negotiation, tariff and non-tariff, e-commerce, consumer protection, commodity market, and warehouse receipt).
Ministry of Cooperatives and Small and Medium Enterprises	Policies and programs related to the promotion of cooperatives and SMEs, including in the blue economy sectors.
National Research and Innovation Agency (BRIN)	Policies, programs and implementation of ocean related research (basic and applied research).
Coordinating Ministry for Human and Culture Development	Coordinating, synchronizing and controlling the affairs in the fields of human and culture development, by providing support, implement initiatives and control policies based on the national development agenda and assignments from the President.
Ministry of Education, Culture, Research and Technology	Policies and programs related to education, culture, research and technology, including in the areas related to blue economy.
Ministry of Manpower	<ul style="list-style-type: none"> ● Policies and programs related to skills development of workers and talents, and skills competence standard, including in the areas related to blue economy. ● Policies and programs related to labor market development, labor social protection, working conditions and industrial relations, including in the areas related to blue economy.
National Standardization Agency	Coordination of product and process standardisation.
Statistics Indonesia	Coordination of national statistics, including in the areas related to blue economy.

*Ministry of National Development Planning (BAPPENAS) will lead the initial consolidation



Effective communication, collaboration, and co-ordination between ministries at the national level and local governments also determine the success implementation of the Blue Economy Roadmap. Under the decentralization policy, Indonesia currently has 38 provinces, 416 regencies and 98 municipalities that have received increasing levels of power, responsibilities and autonomy over the last two decades, making Indonesia one of the largest decentralised countries in the world. Central government has retained responsibilities for areas of national security, foreign and monetary policy, justice, governance and planning, and religious affairs. Competencies for public works, healthcare, education, cultural and social affairs, labour, environmental protection, land citizenship and investment are devolved to local governments. The fragmentation of local jurisdictions in Indonesia (provinces, regencies and municipalities) has led to potential conflicting and overlapping laws and regulations across the different levels of government, which bear a challenge for the Blue Economy Roadmap implementation.

Following the emphasis placed on the ocean economy, the challenge is tackled through the establishment of the Coordinating Ministry of Maritime Affairs and Investments with the tasks to coordinate, synchronize and control the affairs of the maritime and investment sector, by providing support, implementing initiatives, and controlling policies based on the national development agenda and assignments from the President. The coordinating function is managed to cover several line ministries, including Ministry of Marine Affairs and Fisheries, Ministry of Energy and Mineral Resources, Ministry of Transportation, Ministry of Environment and Forestry, Ministry of Public Works and Housing, Ministry of Tourism and Creative Economy, and Ministry of Investment/Indonesian Investment Coordinating Board (BKPM). Coordination and synergies with other ministries are also encouraged and strengthened. These indicate positive steps to increase coordination and enhance policy coherence in the current condition of complex institutional-and policy-structure both horizontally and vertically.

The Law No. 6 year 2023 concerning Job Creation has also provided a more streamlined structure for division of labor among different ministries as well as local governments, and how they can work together to deliver proper and effective policies, programs and procedures. Further efforts in strengthening communication, collaboration and co-ordination in blue economy among stakeholders at national and local levels are expected to be guided through the implementation of this Blue Economy Roadmap. Better coordination, harmonization and synergy are also expected as two major laws are currently being revised. The revision of Law No. 26 year 2006 concerning Spatial Planning will integrate spatial planning on land and at the sea allowing better management of ocean resources. The revision of Law No. 32 concerning the Sea will provide a better division of labor among government institutions at different levels (national, provincial and local levels) particularly related to marine captured fisheries. The two revisions will also strengthen the regulatory framework needed to support the implementation of blue economy roadmap. Some existing regulations relevant to blue economy are briefly outlined next.

5.2 Regulatory Framework

There are several existing regulatory frameworks related to the blue economy that provide references and support for the implementation of blue economy in Indonesia. The primary regulations are Law No. 26 year 2006 concerning Spatial Planning; Law No. 45 of 2009 concerning Fisheries, amending Law No.31 of 2004; Law No. 1 year 2014 concerning the Management of Coastal Area and Small Islands,



amending Law No. 27 year 2007; Law No. 32 year 2014 concerning the Sea; and Law No. 7 year 2016 concerning Protection and Empowerment of Fishers, Fish Cultivators, and Salt Farmers. Other laws that provide the legal framework for the development of priority blue economy sectors include, among others, Law No. 5 year 1990 concerning the Conservation of the Living Natural Resources and Its Ecosystem; Law No. 30 year 2007 concerning Energy; Law No. 10 year 2009 concerning Tourism, Law No. 3 year 2014 concerning Industry, and Law No. 23 year 2014 concerning Local Government.

The laws are further elaborated into some government regulations and presidential regulations outlining the legal framework for promoting the priority sectors at the operational level, including in the area of sectoral development, policy and planning, zoning and area management, resource utilization and management, the processing of commodities from fisheries and aquaculture, quality assurance, human development, trade, empowerment of small-scale fisheries, etc. Efforts to improve the efficacy of the regulations and to fill in some gaps in the regulatory landscape are continuously undertaken. For example, the Government of Indonesia enacted an omnibus law in 2020, which is the Law No. 6 year 2023 concerning Job Creation with the aim to improve the business ecosystem to become more conducive in promoting investment, new enterprise development, business empowerment, reduce cost, etc. The scope of Law No. 6 year 2023 includes the streamlining of some existing regulations that have been enacted before. Better laws and regulations are expected to provide a robust ecosystem for an inclusive, advanced and sustainable blue economy development in Indonesia.

Regulatory review will be continuously conducted to respond to the thriving blue economy development in Indonesia. New regulations, including on renewable energy, are expected to provide sound legal basis for promoting the provision and consumption of renewable energy, and accelerating the just energy transition, including renewables energy from ocean.

5.3 National Blue Agenda Actions Partnership (NBAAP)

The Coordinating Ministry of Maritime Affairs and Investment with the support by the United Nation launched the National Blue Agenda Actions Partnership (NBAPP) during the G20 Summit in November 2022. The NBAAP was established as a platform to bring together the Government of Indonesia, eight United Nations agencies and several international development partners to support the sustainable development according to the blue agenda, which comprises four pillars of blue health, blue food, blue innovation, and blue finance. The goal is to accelerate the achievement of Indonesia's relevant development targets in RPJMN 2020-2024, and SDGs. The partnerships focus on sustainable growth of marine and maritime sectors and, at the same time, ensure the wellbeing of Indonesia's marine environment based on the four blue agenda pillars, as follows:

1. **Blue Health** that covers blue conservation and biodiversity, restoration, ecosystem management, and coastal spatial planning, etc.
2. **Blue Food** that covers production, consumption, marine and aquaculture, market expansion and access to supply chain, food security system, empowerment of small-scale producers, sustainability and product competitiveness certification, innovation and investment, etc.
3. **Blue Innovation** that covers science and technology applications, human development, capacity building, employment, livelihood, and e-application, etc.



4. **Blue Finance** that covers creative finance, payment for ecosystem services, blue economy, blue bond, Islamic blue bond, and start up incubation/development.

Some works are underway under NBAAP to identify relevant programs to provide baseline data for monitoring and evaluation so that the implementation of the programs can be improved to secure the highest achievement of their targets. The success of NBAAP is expected to provide the foundation for sustaining stakeholders for the implementation of this blue economy roadmap.

5.4 Blue Finance

In May 2023, Indonesia has successfully issued its first Blue Bond in 7-year and 10-year tenors in total of JPY 20.7 billion through the Samurai Bond market. It is expected to create a positive precedence and show a strong commitment of Indonesia in advancing its blue economy, and simultaneously a significant accomplishment for blue financing. The blue bond is prepared using the success cases of Indonesia's first green Islamic bond and first SDGs bond. These efforts have been the result from a learning process for the last five years guided by several documents that provide references in developing sustainable financing.

Supported by the Coordinating Ministry of Maritime Affairs and Investment, the Ministry of National Development Planning/National Development Planning Agency (Bappenas) and the United Nations Development Programme (UNDP), the issuance of blue Samurai bond was made possible based on several references. In 2018, the Government of Indonesia published **the Republic of Indonesia Green Bond and Green Sukuk Framework** to provide a reference in preparing and issuing sovereign green bonds and sukuk to support eligible green sectors and projects. The document was updated in 2021 to **the SDGs Government Securities Framework** which outlines social, green, and blue eligible sectors and enables different thematic bonds to be issued in the future, including blue bonds/sukuk.

The eligible blue project as listed in the SDGs Government Securities Framework was informed by the **Blue Financing Strategic Document** published by the United Nation Development Program (UNDP) and the Coordinating Ministry of Maritime Affairs and Investment in 2021, supported by the Archipelagic and Island States (AIS) Forum and Innovative Financing Lab. The later document provides several financial measures potentially support the development sustainable blue economy based on its diverse marine resources. The strategies outlined in the document guide on how to finance blue economy key sector development while complying with sustainable development principles. The document presents the possible way to balance the supports aiming at optimally creating added value and prosperity based on marine resources and, at the same time, ensure that the health of environment is put as priority. This document becomes the first reference to define the scope of blue sectors that are eligible to receive financial support.

The estimation about the size of investment that Indonesia needs to provide a balance support is also presented in the Blue Financing Strategic Document, together with different financial instruments potentially utilized by Indonesia to achieve the desired investment. The strategy used scenario-based analysis to estimate that Indonesia needs additional investment of between IDR 3.64 to 1,392.22 trillion per year to reach a 15 percent contribution of the blue economy to GDP by 2045. It also provides guideline on how to select a "blue project" to be prioritized in receiving budget allocation or funding, with the main criteria of producing the most significant benefits based on the three dimensions of sustainable development — economic, social, and environmental.



Another reference being used to develop the first blue bond is **the Blue Finance Policy Note** developed by the Indonesia Climate Change Trust Fund (ICCTF)-Bappenas with support from the World Bank's PROBLUE⁶⁵. This document presents two broad recommendations to encourage the crowding in of finance to the blue economy sector. First, blue finance requires the government to improve its spending and policy alignment to strengthen the enabling environment for mobilisation, management, and utilisation of finance. Second, it recommends collaboration with Bappenas and Ministry of Finance based on the SDG Government Securities Framework to prepare blue finance instruments, with a particular focus on financing strategies for the operating and capital expenditure for MPA, investments in public infrastructure (e.g. fish landing sites, jetties, roads), and financing for small and medium enterprises (SMEs) and community-based investments to enhance value chain performance.

The Blue Finance Policy Note becomes the basis for the Ministry of National Development Planning/National Development Planning Agency in collaboration with relevant Ministries/Institutions and development partners to prepare **the Blue Finance Instruments Development Guidelines**. The guideline aims to provide implementation steps in developing funding instruments such as blue bonds or blue *sukuk* that could be used to finance the marine sector and fisheries sector. Although it shows a wide range of potential instruments, the guideline puts more emphasis on using blue bonds and blue *sukuk* as the primary financial instruments example in establishing blue finance. The document particularly outlines the process of blue bond/sukuk issuance, projects categorised as eligible projects on blue bond/sukuk issuance, and benefits of blue bond/sukuk issuance are outlined in this document.

The potential of optimizing different sources of blue financing instruments in Indonesia is also confirmed by other studies, including the one conducted by **The Spectrum Solution Group (TSSG)**, which promotes the use of the Blue Finance mechanisms for fostering the balance between a healthy marine ecosystem and economic benefits from coastal and marine resources. The mechanism includes alternative forms of financing that will help increase investment in sustainable blue economy projects, as well as market-based solutions to address issues such as environmental externalities and governance challenges. Blue funding can facilitate innovation in established and growing blue industries, boosting investors' growth and return on investment. Investing in the blue economy can have a long-lasting impact on society and the environment and generate potentially lucrative returns.

Based on all references described above, Indonesia has the potential to develop blue bond/blue sukuk. In the future, Indonesia also needs to explore other financing schemes based on different blue projects, including (i) debt based; (ii) other types of bond; (iii) other schemes of sharia financing; (iv) trust funds; (v) capital markets; (vi) impact investments; (vii) philanthropy; (viii) development partners; (ix) blended finance; (x) debt for nature swaps; (xi) insurance; and (xii) ecological fiscal transfers.

⁶⁵ <https://www.worldbank.org/en/programs/problue>



5.5 Blue Carbon

The implementation of this Blue Economy Roadmap also covers strategies for Indonesia to take advantage from blue carbon potentials. Blue carbon refers to the carbon stored in coastal and marine ecosystems such as mangroves, seagrasses, and tidal marshes. These ecosystems play a crucial role in mitigating climate change by sequestering carbon dioxide from the atmosphere and storing it in their vegetation and sediments. Indonesia is home to rich blue carbon ecosystems, including 3,3 million hectares of mangrove forests - the largest in the world, and 1,8 million hectares of seagrass meadows⁶⁶. These ecosystems provide important ecosystem services such as acting as nursery ground for marine life, protecting coastlines by reducing wave energy and controlling erosion, providing raw materials for processing, and purifying water. Mangroves and seagrass also store significant amounts of carbon as much as 950 Mg C ha⁻¹ in mangroves and 119.5 Mg C ha⁻¹ in seagrass.

The conservation and restoration of blue carbon ecosystems are important for the development of the blue economy. This is due to some of Indonesia's blue carbon ecosystems currently under threat, from illegal logging, deforestation for land conversion (e.g. unsustainable aquaculture/fishing, human settlement, etc.), coastal reclamation, sedimentation, and pollution. To address these challenges, Indonesia aims to conserve and restore its coastal and marine ecosystems through various programs including the development of Indonesia Blue Carbon Strategy Framework as a platform to synchronise actions and aims to integrate blue carbon within its National Climate Commitment. Other complementary efforts being put forward to deal with the challenges include ensuring effective governance and monitoring of these ecosystems, and engaging with local communities to ensure their participation in conservation efforts. Additionally, there is a need for more funding and technical support to scale up blue carbon activities and ensure their long-term sustainability.

The protection and restoration of blue carbon ecosystems Indonesia need to become one of the core implementation mechanisms in supporting the blue economy by preserving the valuable ecosystem services that these ecosystems provide. More works still need to be done to institutionalized blue carbon, including on how to develop and manage the market for blue carbon, and how it will contribute to the achievement of Indonesia's NDC.

5.6 Indonesia's Blue Economy Index

Indonesia Blue Economy Index (IBEI) is developed with the support from ARISE+ Indonesia in 2022 with the aim to provide a monitoring tool for measuring the progress of blue economy implementation in various regions in Indonesia. IBEI comprises three pillars of SDGs which are environment, economy, and social pillars to support several aspects of SDGs, described as follows:

1. **Economic pillar** covers the contribution of ocean sectors (fisheries and aquaculture, marine-based manufacturing and tourism) towards the Indonesian economy. This pillar supports SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure).
2. **Environmental pillar** addresses the quality of coastal and marine ecosystems which will become the proxy for sustainable ocean economy. A well-preserved environment will support viable long-term economic growth. This pillar supports several SDGs, such as SDG 6 (Clean Water and

⁶⁶ Ministry of Marine Affairs and Fisheries. 2023. Draft Dokumen Inventarisasi GRK, Serapan Karbon dan Potensi Mitigasi GRK di Padang Lamun.



Sanitation), SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water).

3. **Social pillar** focuses on inclusiveness. It measures how the ocean sectors can support the creation of welfare for Indonesian people. Welfare encompasses both income as well as the quality of life (healthcare). This pillar supports SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), and SDG 10 (Reduced Inequalities).

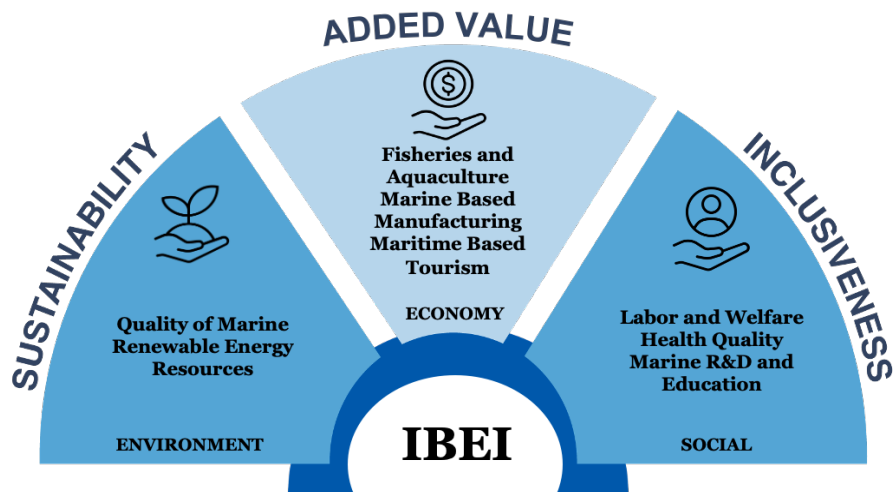


Figure 14. Indonesian Blue Economy Index (ARISE+ Indonesia)

In general, IBEI serves the following purposes:

1. IBEI serves as an instrument to monitor the performance of blue economy sectors as assets to support Indonesia's economic transformation toward the achievement of Indonesia's 2045 vision.
2. IBEI, which is built based on the dashboard of selected macroeconomic indicators, highlights Indonesia's economic, social and environmental progresses associated with the blue economy sectors. A specific policy can then be established to meet certain levels of development for each indicator.
3. IBEI encourages better coordination among government institutions engaging in blue economy sectors, such as fishery, tourism, marine-based manufacturing, marine conservation, maritime services, energy, research and education.
4. IBEI can also provide insights on which provinces to focus on to overcome inequality issues or other policy targets.

The structure of IBEI is outlined as follows. IBEI applies a weighing system to emphasize the relatively more important indicators as compared to others. A weight measures the importance of one pillar relative to the other pillar. For each province, the achievement of each pillar is calculated from the performance of each pillar times its weight. By taking the average of each of these calculations, the average performance for each pillar in Indonesia can be compared.

The results from IBEI calculation in 2022 shows that the value of IBEI at the national level is 40,43 on average. There are 13 out of 34 provinces have scores above the average national score, but only 8



out of 34 provinces have scores above 50. Among the three pillars, the social pillar is the dominant contributor to index calculation, representing 45.8 percent or scoring 57.85 for the average by province. The average scores for environment and economic pillars are 28.42 and 19.13, respectively. This shows on one side that the Indonesian population relies on marine resources for their livelihood, while on the other side the focus of blue economy development in Indonesia has not yet been optimal in resource management and value creation. This is confirmed by the scores of the environmental pillar, where 1 out of 34 provinces have scores above the national average in the environment pillar. In addition, only 3 out of 34 provinces have scores exceeding the national average in the economic pillar. In contrast, 24 out of 34 provinces have indexes more than 50 in the social pillar. Based on these results, further efforts are needed to improve the economic and environment pillars for blue economy sector’s improvement in the future. The complete list of IBEI’s indicators is provided in Appendix 1.

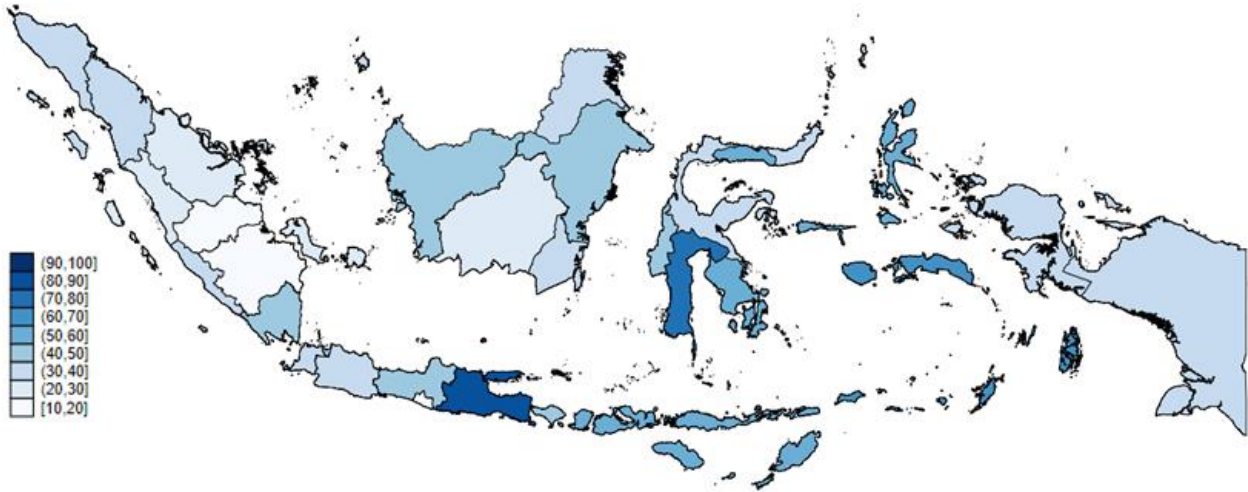


Figure 15. Indonesia Blue Economy Index by Province in 2022

Based on the province level results, the development of the blue economy in Indonesia has certain patterns. From a geographical point of view, the higher index spreads around the centre of Indonesian archipelago. This development pattern signals the need to realise better connectivity through the Indonesian ocean. This insight is in line with the economic theory suggesting connectivity is one of the important factors for growth. The middle and eastern parts of Indonesia tend to have higher IBEI scores than the western part of Indonesia. The highest score of IBEI is in the East Java Province with a score of 87.36, while the lowest score is the Special Province of Yogyakarta at 10.37. A contrast condition can also be observed as the western part of the country is less performing, possibly due to its highly focus on the utilization, while less developed regions are relatively well-preserved and have a more environmentally-friendly development.

In summary, the structure and design of IBEI enable the health of the blue economy to be compared across provinces, allowing for a clearer understanding of the scale and distribution of marine resource utilisation and guiding support/management to where it is most needed. The scores of IBEI are expected to prompt public discourse and continuous improvement supported by public and private collaborations.

IBEI also informs the development of this Blue Economy Roadmap particularly about the long-term target projection based on the current state of the blue economy at national and regional levels. The projection shows that by 2045, the Blue Economy Index is expected to fold between eight times up to



twelve times of the score in 2022, depending on the policy scenario. The projection is generated by several approaches, including the indicators' historical trend, proxy variables, other countries' benchmarking, specific targeting based on international targets, and the government's aspiration/vision. Despite the robustness of the projection, the IBEI calculation acknowledges some limitations, which mainly lie in data availability, both in terms of data variation and data breakdown by provinces. Further revision of the IBEI is anticipated.

The update on IBEI will depend on the availability and quality of data. Most data for IBEI come from Statistics Indonesia and line ministries such as the Ministry of Marine Affairs and Fisheries, the Ministry of Industry, the Ministry of Environment and Forestry, as well as regional governments. This Roadmap also proposes the development of additional data related to some indicators for measuring the achievement of the blue economy development outcomes (Chapter 3). The development of these indicators are expected to enrich the range of data that can be provided to describe the progress of blue economy development in Indonesia. Any government institutions that collect and manage data can use Presidential Regulation Number 39 year 2019 concerning One Data Indonesia as a reference on data governance and management. Once data on the proposed indicators are developed, together with the existing data used for calculating IBEI, they need to be continuously collected, maintained and improved in order to support better blue economy development policies both at national and local levels.

5.7 International Cooperation in Supporting Blue Economy Development

Indonesia will continue to promote bilateral, regional and global cooperation for blue economy development. This effort contributes to optimally utilising Indonesia's blue economy modality effectively and efficiently to generate economic, social and environmental benefits. This effort is also part of the Indonesia's contribution for the sustainability of resources owned by the world. The cooperation is directed at improving resource governance, research and innovation, environmental conservation, and the development of financing innovations. In this case, international cooperation between Indonesia and international partners is directed at priority sectors that require more vital collaboration, such as the marine capture fisheries and aquaculture, marine-based industry, coastal tourism, R&D and education, renewable energy, marine conservation, and maritime services.

The work of Indonesia's Blue Economy Roadmap is an output of international collaboration with multi-stakeholders. The roadmap was successfully made possible with the support from the OECD, UNRC, Arise+ Indonesia, UNEP, ILO, UNDP, SwAM, and Econusa Foundation, who contributed analytical essays on the blue economy development and initiatives. This roadmap has also benefited from the constructive inputs from the local stakeholders, academicians, business actors, coastal communities, civil society organizations, international development partners, and other multi-stakeholders, who actively participated in the process of this study through focus group discussion and public consultation activities. The continuous international collaborations on the blue economy reflect the recognition of the importance of the sustainable use of ocean resources for global economic growth, social development, and environmental conservation. The knowledge and experience sharing from international partners stimulates innovation and creates new opportunities for economic growth and prosperity while safeguarding the health and integrity of the ocean ecosystem through collaboration and cooperation.



The Indonesia Blue Economy Roadmap also recognises the importance of the ASEAN Blue Economy framework as a geo-strategy that will serve as a foundation for ASEAN to collaborate in increasing productivity and added value. The roadmap promotes the blue initiatives, such as Blue Food and Blue Economy Index, which are relevant to be adopted at the ASEAN regional level. Such initiatives of Blue Economy in Indonesia are expected to inspire other ASEAN Member States to adopt and implement them into the current sustainable marine development plans or further cultivate other applicable development plans that make the maritime sector prosper. Similarly, the spirit to inspire is also evident in the Archipelagic and Island States (AIS) Forum, covering 51 participating countries, that was initiated by the Government of Indonesia in 2017 and supported by the UNDP. The AIS Forum has consistently pursued to advance blue economy in various areas despite geographical areas, size and economic status. Paved by the publication of Blue Financing Strategic Document that provides informed policy management regarding Indonesia's marine life, the AIS Forum has put forward actions on smart and innovative to strive sustainable blue economy and address ocean mitigation and adaptation actions, marine plastic pollution and good maritime governance.



An aerial photograph of a tropical bay with several forested islands. A speedboat is visible in the lower left, leaving a white wake. The water is a deep blue, and the sky is a lighter blue. The text 'CHAPTER 6' is overlaid in the center in a large, white, sans-serif font.

CHAPTER 6

Way Forward

Chapter 6. Way Forward

The Blue Economy Roadmap Indonesia is an important vehicle for the blue economy's stakeholders to reach the same goals and missions with clear targets and directions. The roadmap shall be an important document, showing the high commitment of Indonesia to bring the 2045 agenda into the next development plan and reality. The roadmap also represents Indonesia's best effort to take actions on developing the blue economy into its development policies and targets, and to ensure its implementation on the ground. Despite the remaining issues in its hands, Indonesia is eager to achieve such targets, which still need to be addressed carefully. The achievement of the targets requires and entails the active involvement among stakeholders, i.e., government bodies (national and local government), the academic and research community, the business community, professional associations, civil society organisations and collective entities.

The linkages of blue economy targets and indicators presented in the roadmap will become the basis for policymakers and stakeholders to prioritise their interventions. In addition, it is important to ensure that the achievement of certain blue economy targets will leverage the achievement of other targets. Therefore, each target and indicator cannot be treated individually but requires a comprehensive policy intervention framework. Bappenas will coordinate the implementation of the blue economy mandated roadmap with the assistance of other ministries/government institutions and local governments following the priority sectors. The next task is to carry out monitoring of the implementation of this Blue Economy Roadmap based on the progress of Indonesia Blue Economy Index.

Indonesia is fully aware that implementing the Blue Economy Roadmap needs huge sources of financing. A magnificent financing strategy is necessary, while supporting creative and innovative funding to be developed is also essential. Financing resource mobilisation will also be the key to successfully implementing the 2045 agenda.

It is envisaged that this document will serve as reference material for preparing the national medium-term government plan (RPJMN) every five years and as reference material for preparing the Annual Government Work Plan (RKP) each year. Therefore, the funding pattern for the roadmap implementation will be based on the planning basis outlined in the RPJMN and RKP, which refer to this roadmap. It is further hoped that this document can be reviewed periodically so that the policies, targets and indicators contained therein remain relevant to the changes and needs of Indonesia. Apart from that, Indonesia will always put its best to the successful achievement of the Blue Economy Roadmap 2023-2045 agenda.



Appendix 1

Indonesia Blue Economy Index (IBEI)

Introduction

IBEI consists of three pillars representing the main components of sustainable development. First, Economic Pillar reflects the contribution of ocean sectors, including fisheries and aquaculture, marine-based manufacturing, and tourism, towards the Indonesian economy. Second, Environment Pillar addresses the quality of marine ecosystems which will become the proxy for sustainability to achieve sustainable ocean economy. Third, Social Pillar represents inclusiveness.

IBEI serves some purposes, which are: (i) IBEI serves as an instrument to monitor the performance of blue economy sectors as assets to support Indonesia's economic transformation toward the achievement of 2045 Indonesian Vision; (ii) IBEI is built based on the dashboard of selected macroeconomic indicators, which can highlight Indonesia's economic, social, and environmental progress associated with the blue economy sectors. A specific policy can then be established to meet certain targets for each indicator; (iii) IBEI encourages better coordination among government institutions engaging in blue economy sectors, such as tourism, fishery, and transportation; and (iv) IBEI can provide insights on which provinces to focus on to overcome inequality issues or other policy targets.

As Blue economy is associated with many Sustainable Development Goals (SDGs), particularly Life Below Water (SDG 14); each or some IBEI indicators also support many SDGs such as SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), SDG 12 (Responsible Production and Consumption), and SDG 13 (Climate Action). SDGs are one of the main instruments in the quest to realise Indonesia's 2045 vision. Thus, IBEI calculation and SDGs can complement each other.

Indicators and Data Analyses

Economic Pillar

The economic pillar of IBEI, as noted, is an element of blue economy that addresses the significance, or the importance, of what ocean or marine sector to the overall Indonesian economy. This sector consists of the following broad sectors, for example: (i) fishery and aquaculture, (ii) marine-based manufacturing, and (iii) marine tourism. Each of these broad sectors defines several indicators that are chosen to cover as much as possible the wide spectrum of the industries (as in the fishery and aquaculture) or simply to improve the quality of proxy of a sector (as in the marine tourism whereby it is very challenging to disentangle various services operation in one marine tourism destination or activities). The rest of this subsection presents the final chosen indicators that are used for scenario setting and calculation.



1. Fishery and Aquaculture

The set of indicators under this sector aims at covering the size and significance of the sector to the overall economy, including its contribution for export. Indicators defined under this sector covers not only the wild (captured) fishery sector but also the farmed (aquaculture) sector. Fishery and aquaculture are important elements as they provide key products coming from Indonesia as a maritime country. The following lists the indicators chosen to represent the size and importance of this sector, all of which are drawn from IBEI's economic pillar indicators:

1. Contribution of fishery sector to GDP (%)
2. Captured fish (volume, tons)
3. Productions in fishery sector (volume, tons)
4. Marine aquaculture production (volume, tons)
5. Pond cultivation fishery production (volume, tons)
6. Salt production (volume, tons)
7. Export of fishery products (volume, tons)
8. Share of export of fishery products in total exports (%)
9. Captured fish and aquaculture exports (volume, tons)

In addition, salt production is also used as another indicator fishery and aquaculture sector because it falls as activities of extraction from the ocean resources. The benchmark is the past performance of the production in Indonesia because it is almost impossible to find comparable sector at global level.

2. Marine-based Manufacturing

The set of indicators defined in this sector aims to measure the scale, including exports, and the competitiveness of marine-based industries in Indonesian manufacturing. Competitiveness in this study is defined to consist of productivity and technology adoption. Marine-based manufacturing is defined to consist of the following three industries at three-digit ISIC, namely:

- ISIC 1512: Processing and preserving of fish and fish products.
- ISIC 3511: Building and repairing of ships.
- ISIC 3512: Building and repairing of pleasure and sporting boats.

While the indicators considered are provided below, along with their unit of measurement and the source of the data used for projection:

- Output produced (value added, in USD. Source UNIDO).
- Exported output (value, USD. Source: UNCOMTRADE).
- Labour productivity (LP) (value added/labour, in USD/labour. Source UNIDO).
- Technology (proxied by share of R&D expenditure in total cost, Statistic Industry – SI).

3. Marine Tourism

The indicator for marine tourism aims at providing information about the size, performance, and the degree of importance of marine tourism. The following lists the indicators chosen to represent the size and importance of this sector, one of which is drawn from IBEI set of indicators:

- Share of maritime tourism in maritime tourism GDP (Maritime GDP, BPS).
- Share of tourist arrival in maritime destination to total (% , BPS).



Environment Pillar

IBEI has two elements in Environment Pillar, i.e., resource quality and ocean renewable energy. Resource quality has eight indicators; meanwhile, ocean renewable energy has two indicators (see Table 8). The calculation employs those eight indicators of resource quality; and aggregates ocean renewable energy into one indicator. Therefore, the coverage of ocean energy is more extensive, not just limited to solar power. In addition, aggregating the indicators also has an advantage in the benchmarking process to other countries, as each country has different sources of renewable energy.

Table 21. Summary of Indicators Projection of Environment Pillar

Indonesia Blue Economy Index	Unit	Reference Year	Current Value	2045 Projection
A. Resource quality				
1. Good quality of coral reef	% (of total area)	2013-2017	29.5	60
2. Good quality of seagrass	% (of total area)	2019	25.7	60
3. Good quality of mangrove forest	% (of total area)	2021	30.3	60
4. Total coastal village with garbage disposal	No. of village	2021	2321	12510
5. Total coastal village by defecation site and sewerage	No. of village	2021	1511	12510
6. Rehabilitation of <u>Mangrove forest</u> , swamp, and peat area rehabilitation	Growth rate (%)	2015-2019	6	6
7. <u>Average sea</u> surface temperature	Growth of Degree Celsius	1981-2010, and 2020	26.7	Less than 2%
8. Waste disposal at sea	kg/person	2019	0.21	0.1
B. Ocean renewable energy				
	Ratio of total energy supply	2015-2021	15.6	60
1. Installed capacity of solar power plant	-	-	-	-
2. Electricity generated by solar power plant	-	-	-	-

Source: ARISE+'s compilation

The proportion of good quality marine resources should dominate in the ecology to ensure conservation and other marine resources sustainability. Thus, the target is 60 percent of good quality resources for each indicator; this is in line with Statistics Indonesia's category, where 'less healthy' marine resources condition occurs if the percentage of good quality is less than 60 percent. The indicators selected for good quality of marine resources based on national data available are:

- Good quality of coral reef (in %)
- Good quality of seagrass (in %)
- Good quality of mangrove forest (in %)



As one important aspect of environment conservation, waste management issues should be managed properly on land. The estimation of the total amount of garbage in the archipelago's seas has reached 5.75 million tons. Moreover, 10,683 villages suffered water contamination in 2021 (BPS, 2021) due to the limited availability of wastewater treatment tanks/installations as final excrement disposal sites. As part of waste and sanitation management on land, all villages or at least coastal villages, should have some facilities for garbage disposal, defecation sites and sewerage. The total number of villages in Indonesia is 84,096 villages (Statistics Indonesia, 2020), and the total number of coastal villages is 12,510 villages (Statistics Indonesia, 2020). Thus, the target for 2045 is 12,510 or all coastal villages. Currently, both proportions are still less than 20 percent. The indicators selected, hence, are:

- Number of coastal villages by garbage disposal (th)
- Number of coastal villages by defecation site and sewerage (th).

For the ocean renewable energy, Indonesia introduced the National Grand Energy Strategy (GSEN) in the G20 forum, which covers plans to transition from fossil to renewable energy. The GSEN has set a 100 percent target of renewables portion in the energy mix by 2060. Pegged at a capacity of 587 Gigawatt (GW), it comprises solar power plants (361 GW), hydropower plants (83 GW), wind farms (39 GW), nuclear power plants (35 GW), bioenergy power plants (37 GW), geothermal power plants (18 GW), and currents power generation systems (13.4 GW). Thus, the indicator selected for IBEI is the proportion of renewable energy to total energy generated; where the target is 60 percent in 2045, and 100 percent in 2060, as mentioned by the GSEN.

Social Pillar

Social pillar in IBEI discusses more on welfare (SDG 8: Decent Work and Economic Growth), health (SDG 3: Good Health and Well-being) and education (SDG 4: Quality Education) of people engaged in the fishery sector. There is a close interaction between social, economy and environment pillar. In general, the higher the income generated by fishers, the more attractive the sector for younger generation or new entrants in the labour market, and a higher employment in the fisheries sector which will support a higher volume of fish production. However, a higher volume of fish production couldn't be created without proper knowledge about how to preserve the environment. This can be done through trainings or seminars about sustainable fishing (SDG 12. Responsible consumption and production). The income generated by fishers should not only rely on capture fisheries. Livelihood strategies need to be developed to deal with low fishing season. This can be covered by engaging into aquaculture business.



Table 22. Summary of Social Pillars' Indicators

	Unit	Year of reference	Value in Index	2045 Projection
Employment and welfare				
Number of fisherman and fish farmers	people	2020	5.088.490	9.568.800
Number of capture fisheries HH	RTP	2019	897.114	1.704.244
Avg monthly income of fisheries industries	IDR	2022	1.937.650	32.940.175
Fisherman's exchange rate		2020	100	598
Income per capita in fishery sector	IDR	2020	52.158.191	
Modified - USD		2019	3158	60.010
Quality of health				
Fish consumption	kcal	2021	51,84	
Modified	kg / capita	2019	38	46
Protein consumption	kcal	2021	8,74	
Modified	gram / capita	2019	67	103
Education				
Number of graduates from fisheries school	people	2020	2.538	153.101
Number of fisheries training participants	people	2020	12120 *)	488.000

Calculation Procedure

As IBEI aims to monitor the performance of the blue economy of various regions/provinces in the country, there is a need to construct a national-level index besides the provincial-level index. Moreover, the national index should be able to represent the dispersion of the index at the provincial level. Currently, the index involves 20 indicators aggregated to eight sub-pillars and three pillars, in 34 provinces. Each indicator has its own specific characteristics regarding aggregation from the provincial level toward the national level, specifically summation or averaging.

Table 23. IBEI Indicators and Aggregation Type

Var. Name	Variable Description	Agg. Type
Blue Economy Index	Blue Economy Index	
Economic Pillar	Economic Pillar	average
Environment Pillar	Environment Pillar	average
Social Pillar	Social Pillar	average
si_cap_aqua	Subpillar Capture Aquaculture	
econ_1	Economic_Fishery sector contribution to GDP	average
econ_2	Economic_Fish production (billion tons)	sum
econ_3	Economic_Export of fishery products (volume in th tons)	sum
econ_4	Economic_Export (% to total export)	average
econ_5	Economic_Marine aquaculture production (million tons) - volume	sum



Var. Name	Variable Description	Agg. Type
econ_6	Economic_Pond cultivation siehry production (mn tons)	sum
econ_7	Economic_Value of fish and aquaculture export (th tons)	sum
si_marine_manuf	Subpillar Marine Related Industries	
econ_8	Economic_Value of fish processing export (th tons)	sum
econ_9	Economic_Value of maritime freight - export + import (millions)	sum
econ_10	Economic_Value of maritime passenger transport (mln)	sum
econ_11	Economic_Value of maritime passenger (domestic + international) (millions)	sum
econ_12	Economic_Salt production (th tons)	sum
econ_13	Economic_Value of ship building export (tons)	sum
econ_15	Economic_Number of Fishing Boats/Vessels (th)	sum
si_marine_tour	Subpillar Marine Tourism	
econ_14	Economic_Number of marine tourism per province	sum
si_res_qual	Subpillar Resource Quality & Marine Conservation	
enviro_1	Environment_Area of Coral Reef categorized as Good condition	average
enviro_2	Environment_Area of Sea Grass categorized as Good condition	average
enviro_3	Environment_Area of Mangrove Forest categorized as Good condition	average
enviro_4	Environment_Number of coastal villages by garbage disposal (th)	sum
enviro_5	Environment_Number of coastal villages by defecation site and sewerage (th)	sum
enviro_8	Environment_Mangrove Forest, Swamp & Peat Area	average
enviro_9	Environment_Reversed Average Celcius Sea Surface Temperature	average
enviro_10	Enviroment_ Reversed Amount of Waste Disposed to the Sea (gr/m2)	average
si_renew_energy	Subpillar Renewable Energy	
enviro_6	Environment_Installed capacity of solar power plant by province (MW)	sum
enviro_7	Environment_Electricity generated by solar energy power plant (GWH)	sum
si_employ	Subpillar Employment	
social_1	Social_Number of fishers and fishfarmers (th ppl)	sum
social_2	Social_Number of captured fisheries Households (th RTP)	sum
social_3	Social_Average monthly income in fishery industries (IDR mln)	average
social_8	fisher terms of trade	average
social_9	Social_Income per cap fishery sector (mln)	average
si_health	Subpillar Health	



Var. Name	Variable Description	Agg. Type
social_4	Social_Average daily calorie consumption per capita of fish (rural + urban) kca	average
social_5	Social_Average daily protein consumption per capital of fish (rural + urban) kc	average
si_rdeduc	Subpillar R&D or education	
social_6	Social_Number of graduates from fisheries school - senior high school and university	sum
social_7	Social_Number of fisheries training participants (ppl)	sum
social_10	Social_Number of fisheries and independent training center	sum

Based on the above table, a score for each indicator can be calculated for the data in the national level indexing. To calculate the national level index, there are three steps of calculation: (i) generating subindexes per pillar based on the indicators that are multiplied by coefficient loadings that were gained from the IBEI of 2022 (step 1); (ii) calculating a standardized-aggregation score for each pillar using the result from step 1 calculation (step 2); and (iii) calculating the National Blue Economy Index as a weighted-average from the pillar's scores (step 3). The results are presented in Chapter 5.





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INDONESIA BLUE ECONOMY ROADMAP

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