



ROADMAP

PREPARATION OF INDONESIA OCEAN ACCOUNTS



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Citation

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List of Acronyms

BAPPENAS	<i>Badan Perencanaan Pembangunan Nasional</i> ; Ministry of National Development Planning
BIG	<i>Badan Informasi Geospasial</i> ; Geospatial Information Agency
BRIN	<i>Badan Riset dan Inovasi Nasional</i> , National Research and Innovation Agency
FMA	Fisheries Management Area
GOAP	Global Ocean Accounts Partnership
IGT	<i>Informasi Geospasial Tematik</i> ; Thematic Geospatial Information
IPB	<i>Institut Pertanian Bogor</i> ; IPB University
KBLI	<i>Klasifikasi Baku Lapangan Usaha Indonesia</i> ; Indonesia Standard Industrial Classification
KKPRL	<i>Kesesuaian Kegiatan Pemanfaatan Ruang Laut</i> ; Suitability of Marine Space Use
MMAF	Ministry of Marine Affairs and Fisheries
MPA	Marine Protected Area
NGO	Non-Government Organization
NSPK	<i>Norma, Standar, Prosedur dan Kriteria</i> ; Norms, Standards, Procedures and Criteria
PKKPRL	<i>Permohonan Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut</i> ; Appraisal on the Suitability of Marine Space Use
PRL	<i>Pengelolaan Ruang Laut</i> ; Marine Spatial Management
RPJMN	<i>Rencana Pembangunan Jangka Menengah Nasional</i> ; Indonesia's National Medium-Term Development Plan
RZKAW	<i>Rencana Zonasi Kawasan Antarwilayah</i> ; Zoning Plan for Inter-Region Seas Area
RZKSN	<i>Rencana Zonasi Kawasan Strategis Nasional</i> ; Zoning Plan for National Strategic Areas
RZKSNT	<i>Rencana Zonasi Kawasan Strategis Nasional Tertentu</i> ; Zoning Plan for Specific National Strategic Areas
RZWP3K	<i>Rencana Zonasi Wilayah Pesisir dan Pulau-Pulau Kecil</i> ; Zoning Plan for Coastal Areas and Small Islands
SNI	<i>Standar Nasional Indonesia</i> ; Indonesian National Standard

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ROADMAP FOR THE PREPARATION OF INDONESIA OCEAN ACCOUNTS

1. Background

Sustainable ocean development in Indonesia is an agenda that has a very strong mandate, both in laws and regulations, development planning, and sector policies. The sustainability of marine development rests on three pillars or accounts of objectives, namely ecological sustainability, economic growth, and social welfare. These accounts are carried out through the Blue Economy approach. It is expected that by applying the Blue Economy principle, marine resources will become a source of growth, health, sustainability, and national welfare.

In Law 32/2014 on Marine Affairs, "Blue Economy" is defined as an approach to improve sustainable marine management and conservation of marine and coastal resources and their ecosystems, in order to achieve economic growth according to principles such as community involvement, resource efficiency, minimum waste, and multiple revenues. The Blue Economy approach aimed to be implemented in the utilization and exploitation of marine resources.

The performance of Blue Economy implementation is measured by the achievements in the ecological, economic, and social objectives. Consequently, indicators of performance of ocean development must describe these three aspects. Achievements cannot be seen solely from economic performance, such as investment value, tax revenue, and foreign exchange. High economic growth but with ecosystem degradation and social inequality on the other hand, for instance, are not the sustainability as mandated by law. Thus, a comprehensive understanding is needed in terms of the relationships and interrelationships between marine ecosystems, economic utilization, and the socio-cultural life of the people. These relationships and interactions can be described through numbers and data that are integrated, comparable, and obtained on a regular basis. Integrating data from social, environmental, and economic aspects is very important for sustainable ocean development. Thus, the availability of instruments to measure and monitor the impact of ocean development policies on ecological, economic, and social aspects is a prerequisite for the implementation of a Blue Economy in Indonesia.

However, the implementation is not easy, partly because the data are scattered in various ministries/institutions and organizations with different standards. To overcome these problems, one of the tools and instruments available is the Ocean Accounts. Ocean Accounts provide data and information, including maps that depict the interactions of the ocean economy and environment as well as their impacts on ecosystems and society. The description includes spatial and temporal dimensions because the presentation is provided in two measurement periods.

Ocean accounting provides a means to address the fragmentation of ocean data, providing a structure to construct the data in a more coherent and transparent manner. In practice, the government can use the Ocean Accounts to measure, manage and develop the ocean economy in an inclusive and sustainable way. With ocean data growing rapidly, the availability of data, especially those related to the marine ecosystem, social, and economic that describes the welfare of the community will be better in terms of quality and continuity. Therefore, the current Ocean Accounts have the appropriate momentum to map and guide a new direction towards ocean sustainability for the national welfare.

2. Challenges to the Ocean Accounts development

2.1. Marine and fisheries policy

The government through the Ministry of Maritime Affairs and Fisheries is currently consistently encouraging the implementation of the Blue Economy in marine and fisheries development. The Blue Economy, which is explicitly stated in the Law no. 32/2014 concerning Marine Affairs, becomes the principle in the utilization of: (a) fishery resources; (b) energy and mineral resources; (c) coastal and small islands resources; and (d) unconventional resources. These resources are then utilized in the economic activities of: (a) marine industry; (b) marine tourism; (c) marine transportation; and (d) marine construction.

Three main strategies were proposed for the Blue Economy implementation, namely, i) increasing the quality and quantity of conservation areas to maintain marine ecology and fishery resources, ii) ensuring the utilization of resources in accordance with marine spatial planning, and iii) sustainable utilization of capture fisheries and aquaculture.

Conservation areas development is focused on increasing the proportion of access-restricted zones to maintain fish stock and marine biodiversity. As compensation, the government seeks investments aimed at providing financial support for communities around conservation areas. Marine spatial planning allocates sector and community utilization as well the

control. For fishery resources utilization, three breakthrough programs have been launched, namely: i) quota-based capture fishery in accordance with its ecological potential, ii) aquaculture for highly commercial commodities, and iii) aquaculture village to preserve local fish and develop the local economy.

2.2. Medium- and long-term projects

The development of new conservation areas will be carried out in locations that are targeted for fisheries management, or fisheries management areas (FMAs), particularly those which will implement quota-based fishing. In addition to establishing new protected areas, the implementation of zonation in the existing marine conservation areas will be evaluated. The proportion of no-take and no-go areas will be increased by focusing on locations with high ecological value and environmental services. Evaluation of the existing conservation areas will be carried out in the short term until the end of the National Medium-Term Development Plan (RPJMN) of 2024, while the establishment of new conservation areas and changes to the zoning of existing areas will be completed in the medium-term period of the RPJMN 2025 – 2029.

For the Quota-based Fisheries Program, the development of FMAs for industrial fishing will be carried out, especially in terms of improving port infrastructure, fishery products processing plants, fishing vessels, and other supporting economic activities. Fishing zones for these industries are FMA 572, 573, 711, 715, 716, and 718 (Figure 1).

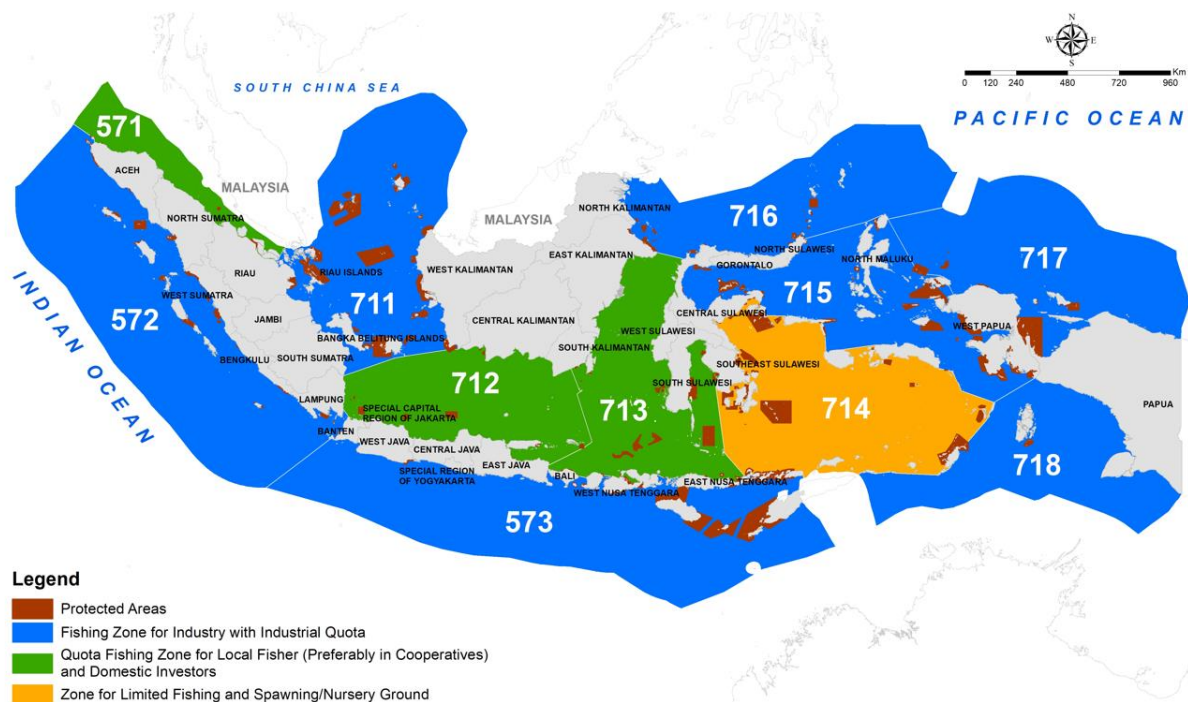


Figure 1. Implementation of quota-based fishing in the FMAs

Three FMAs, i.e., FMA 571, 712, and 713, are designated for local fishers, while FMA 714 will be focused on protecting fish spawning areas and limited fishing activities. For aquaculture, the development of new sites will be carried out in several locations. Integrated shrimp farming will be built in several areas, including Kebumen Regency (Central Java) and Sumbawa Regency (West Nusa Tenggara).

2.3. Accounts needs to support priority policies and projects

To support the implementation of the Blue Economy in the utilization of marine and fishery resources, it is necessary to develop instruments to measure the performance and achievement. Aspects that must be monitored and evaluated include changes in the extent and condition of marine ecosystems, the flow of resources to economic activities, the impact of socio-economic utilization on the quality of resources, and resource governance. Data and information related to these matters must be available at the beginning and at the end of the activity's implementation, for instance, the initial and final periods of the RPJMN. Therefore, measurements conducted for both periods can illustrate the interaction of resources with economic activities as well as the impact of the management policies.

These changes will subsequently become the input for improving policies and rules for resource utilization. In more detail, this information will also be used as a recommendation in granting permits for marine resources utilization. Locations with declining ecosystem conditions both in extent and quality must have their utilization permit reduced. Activities with significant backflow to marine ecosystems should be accompanied with more frequent monitoring and reporting and prepare for impact mitigation of the activities.

2.4. Priority accounts needs to be compiled

There are at least four accounts or modules that must be prepared to support the implementation of Blue Economy in Indonesia (Table 1). The accounts or modules are (1) ecosystem extent accounts (including the area, condition, and monetary value of the resources), (2) flow to the economy, (3) flow the environment, and (4) governance accounts.

Table 1. Priority for accounts/module preparation

No.	Accounts/Module	Priority		Technical Considerations
		Short – Medium Term	Medium – Long Term	
1.	Extent of area, condition, and monetary values of marine resources	√		<ul style="list-style-type: none"> - Secondary data is obtained from institutions and global datasets (satellite images). - Accounts on fish resources will be prepared as an individual ecosystem asset.
2.	The flow of goods and services into the economy	√		Focus on the standard industrial classification of (KBLI) as supported by the MMAF
3.	Flow of residuals (waste/pollution) into marine environment from economic activities	√		Secondary data will be relatively used, except for certain locations (ex. intensive use)
4.	Ocean economy		√	The economic sector is very large and beyond the MMAF authority
5.	Ocean governance	√		Involve policies and budgeting for marine spatial planning, conservation areas, species protection, FMA management planning, fisheries management plans, other sector regulations, and local/customary practices and rules.
6.	Combined presentation (summary tables)		√	Can only be compiled after all accounts or modules are completed
7.	Ocean wealth		√	

The accounts/modules are based on the guidelines provided by the Global Ocean Account Partnership (GOAP).

3. Strategy 1: Filling the gaps and overcoming challenges

3.1. Availability of data and information

Data and information are important elements in preparing the Ocean Accounts. Three important challenges that must be overcome include: i) regular provision of data and information, ii) standardization of data and data collection methods, and iii) management and utilization of cross-ministerial data and information. However, problems on data and information should not be a reason to delay the preparation of the Ocean Accounts.

Ocean Accounts can be prepared using available secondary data and information. In addition, location selected for Ocean Accounts implementation can also be adjusted to the availability of existing data and information, thus it does not have to cover a wide scale as in national scope. Areas with significant activities in both extent and intensity can be prioritized for preparation of initial and final accounts.

3.1.1. Action plan

To resolve the problems and challenges in data and information availability, the following activities will be carried out:

1. Collecting secondary data and information in the scope of:
 - MMAF, ministries/institutions (data authors), NGO partners, universities, and research institutes.
 - Activities of bilateral and multilateral cooperation projects.
 - Environmental impact, the results of marine spatial utilization appraisals (PKKPRL).
 - National and regional marine spatial planning (Zoning Plan for Coastal Areas and Small Islands/ RZWP3K document).
2. Provision of relevant primary data through routine activities conducted by the MMAF, ministries/institutions, and NGOs.
3. Preparation of standard methods for Ocean Accounts.
4. Preparation of thematic geospatial information of Ocean Accounts to facilitate data access and exchange.

3.1.2. Primary output

Important results expected from the implementation of strategies and action plans to overcome problems on data and information are: i) Ocean Accounts database for primary and secondary data, ii) dashboard for accounts visualization and the changes over time, iii) Indonesian National Standard for Ocean Accounts, iii) thematic geospatial information for Ocean Accounts.

3.2. Challenges to resources

The preparation of Ocean Accounts requires a large number of resources, especially for data collection and analysis. Specifically for a country like Indonesia which has vast marine areas and high diversity of biological and non-biological resources as well as immense economic utilization. Financial resources and human capacity are the two main obstacles in the compilation of Ocean Accounts.

3.2.1. Action plan

To tackle the problems of the availability of financial resources and human capacity in the preparation of the Ocean Accounts, the following activities will be carried out:

1. Establish site priorities and accounts according to national and local contexts.
2. Establish cooperation with local, national, and international stakeholders.
3. Assign data and information accounts as one of the requirements for the use of marine space and its resources.
4. Develop general and technical guidelines.
5. Develop competency standards
6. Implementation of training on a regular basis.

3.2.2. Primary output

Important results from the implementation of strategies and action plans to address resource problems (financial and human resources) include: i) implementation of accounts sheet preparation activities/projects, ii) data and information for preparing accounts sheets of marine space utilization activities, iii) general and technical guidelines preparation of the Ocean Accounts sheet, iii) work competency module, and iv) trained human resources in the preparation of the Ocean Accounts sheet.

3.3. Stakeholder engagement

The involvement of government institutions, universities, NGOs, private sector, and the community is one of the challenges in developing the Ocean Accounts in Indonesia. Currently, the understanding on the importance of Ocean Accounts in national and regional development as well as sustainable investment/business activities is still lacking. The awareness of stakeholders towards the potential use of Ocean Accounts as an instrument for determining incentives and disincentives needs to be continually raised.

3.3.1. Action plan

To increase stakeholder understanding and participation, the following activities will be carried out:

1. Mainstreaming the preparation and utilization of Ocean Accounts
2. Establish a national communication/coordination forum as a medium for discussion and dissemination of information on Ocean Accounts.
3. Establishing a network of data collection, especially for coastal, marine, and small island ecosystems.

3.3.2. Primary output

Expected results from the implementation of strategies and action plans to increase stakeholder participation are: i) recommendations and input from stakeholders, ii) publication/dissemination materials, iii) nodes of network for data collection/monitoring of coastal, marine, and small islands ecosystems.

4. Strategy 2: Establishment of a cross-stakeholder task force

Regarding challenges on the provision of data and information which are scattered across various institutions, the preparation of the Ocean Accounts must also involve various ministries/agencies, including universities and NGOs. This cross-stakeholder task force is expected to be able to resolve the challenges related to: i) coordination across different sectors/organizations, ii) division of roles and responsibilities, and iii) political support, policy, and budgeting.

4.1. Structure and organization of the task force

Management of marine resources cannot be carried out by the Ministry of Marine Affairs and Fisheries alone. Many other sectors also have strategies and interests in utilizing marine space and resources. This cross-sector interest is also reflected in the variety of data and information, regulations, institutions, and permits for marine resources utilization. However, for the permanent use of marine resources, all actors must obtain permission from the Ministry of Marine Affairs and Fisheries in the form of Suitability of Marine Space Use (KKPRL). This instrument will later become one of the tools to ensure the Ocean Accounts become one of the inputs in granting permission.

Preparation of Ocean Accounts, in particular, ministries/institutions being the part of the core cross-ministerial team are the MMAF, Ministry of National Development Planning (BAPPENAS), Ministry of Finance, Statistics

Indonesia, and Geospatial Information Agency (BIG) (see Table 2). In addition to the five agencies, the team will also involve ministries/agencies acting as data authority for marine ecosystems and resources. Currently, the data authority for mangroves is at the Ministry of Environment and Forestry and the guardian for coral reefs and seagrass is at the National Research and Innovation Agency (BRIN).

Table 2. Roles and authorities of ministries/agencies

No.	Ministry/ Agency	Roles and authorities
1.	MMAF	Undertake government affairs in the field of marine and fisheries which include, among others, management of marine space, management of marine biodiversity and conservation, management of coastal and small islands, management of capture fisheries, management of aquaculture, strengthening competitiveness and logistics system for marine and fishery products, increasing the sustainability of marine and fishery businesses, and oversees the management of marine and fishery resources.
2.	Ministry of Finance	Undertake government affairs in the field of state finance and assets which include, among others, budgeting, non-tax state revenues, taxes, customs and excise, state treasury and assets, financial accounts, and management of budget financing and risks.
3.	Statistics Indonesia	Undertake government duties in the field of statistics which include, among others, assessment, preparation and formulation of policies in the field of statistics; coordinating national and regional statistical activities; determination and implementation of basic statistics; and the establishment of a national statistical system.
4.	Bappenas	Administering government affairs in the field of national development planning which includes, among others, coordination and formulation of national development planning policies in the fields of themes, targets, policy directions for national development priorities, regulatory frameworks, institutional frameworks, funding frameworks, public service and investment frameworks, macroeconomic frameworks, framework, regional development policy, international cooperation, and national priority infrastructure project plan framework.
5.	BIG	Undertake government duties in the field of geospatial information which includes, among others, the

No.	Ministry/ Agency	Roles and authorities
		implementation of basic geospatial information which includes data collection and processing, data and information management, the use of basic geospatial information, integration of thematic geospatial information organized by government agencies and/or local governments in accordance with statutory regulations.

4.2. Scope of duties and functions

The cross-ministerial/institutional task force will be established through the Decree of the Minister of Marine Affairs and Fisheries. The task force consists of: i) Director, ii) Person in Charge, iii) Task force, and iv) Expert Team. In carrying out its activities, the Task force will be assisted by the secretariat. In order to work optimally, the designation of working fields or subjects is adjusted to the duties and functions of the work units that represent the ministries/agencies (Table 3).

Table 3. Title of task forces in the cross-ministry/agency task force

No.	Title	Ministries/ Institutions	Task
1.	Thematic Geospatial Information for Ocean Accounts	Center for Spatial Mapping and Atlas - BIG	Leading, formulating, coordinating, and aligning the preparation of the Account 1 - Extent and Conditions through activities: <ul style="list-style-type: none"> ● primary and/or secondary data and information collection in strategic mapping ● compilation and tabulation of data and accounts information in the strategic mapping/IGT sector ● conduct the analysis and present the results in the form of tables, maps, and/or infographics for

No.	Title	Ministries/ Institutions	Task
			strategic mapping <ul style="list-style-type: none"> ● preparation of norms, standards, procedures, and criteria (NSPK)
2.	Marine and Fishery Resources Assessment	Directorate of Appraisal – Ministry of Finance	Leading, formulating, coordinating, and aligning the preparation of the Account 1 – Monetary Value through the following activities: <ul style="list-style-type: none"> ● collection of primary and/or secondary data and information required for the assessment ● compilation and tabulation of data and accounts information on the resource’s evaluation ● undertake analysis and present the results in the form of tables, maps, and/or infographics ● preparation of NSPK
3.	Implementation of Environmental Account System into Ocean Accounts	Directorate of Production Accounts – Statistics Indonesia	Leading, formulating, coordinating, and aligning the preparation of the Account 2 – Flow to the Economy and Account 3 – Flow to the Environment through the following activities: <ul style="list-style-type: none"> ● collection of primary and/or secondary data and information on the implementation of the environmental accounting system in the Ocean Accounts ● review of supporting materials and information

No.	Title	Ministries/ Institutions	Task
			<p>related to the implementation of the environmental accounting system in the marine resources account</p> <ul style="list-style-type: none"> ● preparation of data compilation and tabulation on the environmental accounting system in the Ocean Accounts ● analyze and present the results in the form of tables, maps, and/or infographics ● dissemination of results ● preparation of NSPK
4.	Governance and Policy Adoption	<p>2. Directorate of Marine Affairs and Fisheries – Bappenas</p> <p>3. Directorate of Marine Biodiversity and Conservation – MMAF</p>	<p>Leading, formulating, coordinating, and aligning the preparation of Account 5 – Ocean Governance through the following activities:</p> <ul style="list-style-type: none"> ● collection of primary and/or secondary data and information on ocean governance and policy ● compilation and tabulation of data on ocean governance and policy ● analysis and presentation of the results in the form of tables, maps, and/or infographics ● evaluation and formulation of recommendations for adoption of accounts into the development-related

No.	Title	Ministries/ Institutions	Task
			policy <ul style="list-style-type: none"> • preparation of NSPK
5.	Expert Group	1. Department of Resources and Environmental Economics, Faculty of Economics and Management, IPB University 2. REKAM Foundation	Provide scientific input and considerations related to the preparation of the Ocean Accounts
6.	Secretariat	Directorate of Marine Biodiversity and Conservation – MMAF	Assisting the coordination, communication, and implementation of task force activities.

4.3. Expected results from the task force

In accordance with its duties and responsibilities, the task force will produce accounts output in the form of: i) ecosystem extent accounts, ii) flow to the economy accounts, iii) flow to the environment accounts, and iv) ocean governance accounts. In addition to the accounts, the task force also formulates standards methods to be adopted in the Indonesian National Standard (SNI) for Ocean Accounts, dissemination materials, and recommendations for policy adoption in the resource utilization permission, performance of institutions, and accommodation in the national development documents (medium- and long-term national development and strategic plan).

5. Strategy 3: Preparation of the priority accounts

Priority accounts that have been decided are then compiled by the task force. Each account has certainly different challenges and problems in terms of data availability, standard methods, technical capacity in its preparation, and the complexity of the issues. Approach that will be used is to maximize the best available data and anticipate when more up-to-date data and information will be available.

5.1. Ecosystem extent accounts (national/Fisheries Management Areas scale)

Ecosystem extent accounts are the first priority accounts that must be prepared. These accounts play a very important role in the management of marine resources, especially regarding to the process of resource utilization and its impact on the ecosystem within a certain period of time.

The action plan for the preparation of ecosystem extents includes the following activities: i) secondary data collection on a national scale, ii) primary data collection for priority locations, iii) data analysis and presentation, and iv) result dissemination.

5.2. Fisheries accounts (selected species)

Fisheries account is part of the ecosystem extent accounts and is methodically included in the individual ecosystem asset. Fisheries account can help evaluate changes in ecosystem extent to changes in stock of fish resources. In addition, considering that fish resources are one of the most important parts of ecosystem services, the impact of economic utilization on fish stocks and population health need to be evaluated.

The action plan for preparing fisheries account includes the following activities: i) secondary data collection on national production, ii) primary data collection on priority species, iii) data analysis and presentation, iv) results dissemination.

5.3. Flow to the economy accounts

Accounts of the flow of goods and services from marine resources to economic activities are a tool to evaluate the benefits of the ecosystems for local and national economy. The value of economic benefits is also determined by the ecosystem quality. Therefore, there is a reciprocal relationship between the ecosystem extent accounts and the flow to the economy accounts in terms of the quantity and quality of the supply of goods and services.

The action plan for preparing flow to the economy accounts includes the following activities: i) secondary data collection on a national scale, ii) primary data collection on the activities under the qualification of KBLI of the MMAF, iii) data analysis and presentation, and iv) results dissemination.

5.4. Flow to the environment accounts

The backflow accounts from economic activities to marine ecosystems as emissions and pollutants are a tool to evaluate the impact of local and national economic activities on the ecosystem quality. The value of economic benefits is also determined by the quality of the ecosystem. Therefore, there is a reciprocal relationship between the ecosystem extent accounts and the flow to environment accounts in terms of the quantity of emission or pollutant flowing from economic activities to the environment.

The action plan for preparing the flow to the environment accounts includes the following activities: i) secondary data collection on a national scale, ii) primary data collection for priority pollutants (waste from fisheries, industry, and tourism) in priority locations under the MPA management (fishery centers, coastal industrial areas, and marine tourism destinations), iii) analysis and presentation of data, iv) results dissemination.

5.5. Ocean governance accounts

Governance accounts are one of the most important accounts to prepare. Management of marine space and resources governance involves all rules, norms, policies, and financial aspects that take place at the site. Ocean governance will have a direct influence on ecosystem extent condition, economic activity, and pollution control. Thus, ocean governance needs to respond to conditions and changes of other accounts. Most times, knowing the conditions and changes in the accounts can tell how well the policies and rules that have been implemented to manage marine space and resources are.

The action plan for preparing the ocean governance accounts includes the following activities: i) secondary data collection on a national scale, ii) primary data collection for priority locations (areas with high use intensity, conservation areas, and customary areas), iii) data analysis and presentation, iv) results dissemination.

6. Strategy 4: Integration of accounts in the policy implementation

The preparation of Ocean Accounts will not have real benefits if it is not adopted in the formulation and implementation of marine management policies. Policies that have the potential to be improved through the preparation of Ocean Accounts include those related to spatial planning, resource utilization, environmental conservation, and fisheries. However, adoption into policy will not be possible without the integration of accounts in the performance of institutions and national development planning.

6.1. Marine spatial planning

The most fundamental policy that requires Ocean Accounts is marine spatial planning. In Indonesia's laws and regulations, marine spatial planning is the very basic position before utilization activities are carried out by the sector, industry, and the community. The Ocean Accounts not only provide baseline information for granting permits, but also summarizes ecosystem changes and their benefits based on the interactions with social and economic activities (Table 4).

Table 4. Adoption of Ocean Accounts in marine spatial planning

Present condition	Ocean Accounts Support
Marine spatial planning instruments, such as RZWP3K, RZKAW, RZKSN, and RZKSNT, encourage the increase of investment in marine space utilization in Indonesia	<ul style="list-style-type: none"> ● Minimize the impact of investment and resource utilization on the marine environment ● Ensuring the sustainable use of resources ● Recognize the current and future impacts of marine space utilization ● Monitor the changes in quantity and quality of marine resources ● Recognize the effectiveness of marine spatial planning implementation
Data on ecosystem and resources become input in preparing marine spatial planning	<ul style="list-style-type: none"> ● Baseline information on the status/condition of resources ● Changes in resources status/conditions from baseline within a certain period (e.g. the RPJMN period)

Present condition	Ocean Accounts Support
The Directorate General of PRL facilitates the preparation of provincial marine spatial planning	Increase the effectiveness of coaching in marine space management for local governments

The action plan to adopt Ocean Accounts in marine spatial planning includes: i) preparation of the Ocean Accounts in areas with intensive marine space utilization (extent and investment value), ii) application of the accounts for the assessment of the Suitability of Marine Space Use (PKKPRL), iii) the use of Ocean Accounts for baseline and spatial use evaluation tool.

6.2. Management of marine protected areas

Management of conservation areas highly requires Ocean Accounts, starting from the identification process, area determination, to assessment of its effectiveness. Areas with good ecosystem extent conditions and high monetary value are priority areas to be protected. The impact of management can be seen from changes in the Ocean Accounts. Conservation areas with stable or increasing accounts means that the management is sufficiently effective (Table 5). In addition, the Ocean Accounts will practically help conclude matters related to: i) estimation of payments for the use of conservation areas (payments for environmental services), ii) providing incentives and disincentives to area managers, particularly local governments, iii) feasibility assessment of conservation activities by comparing the value of protected objects with the conservation costs.

Table 5. Adoption of Ocean Accounts in the management of marine protected areas

Present condition	Ocean Accounts Support
Conservation management to preserve the ecosystem/habitat and its biodiversity	Assess the effectiveness of ecosystem/habitat conservation and biodiversity with the allocated inputs (costs and human resources)
Directorate General of PRL provides guidance on conservation management in preserving the ecosystem/habitat and biodiversity	Increase the effectiveness of coaching in the management of MPA for local governments

Present condition	Ocean Accounts Support
Utilization of marine biodiversity and conservation areas is subject to a levy as non-tax state revenue	Ensuring the value of non-tax state revenue is equivalent to the economic value of the use of conservation areas and marine biodiversity

The action plan to adopt the Ocean Accounts in the MPA management includes: i) preparation of Ocean Accounts in areas with high biodiversity), ii) preparation of baseline information of marine conservation areas, iii) the use of Ocean Accounts to assess the impact of area management, iv) the use of Ocean Accounts for zoning revision.

6.3. Coastal and small islands management

The challenge in implementing habitat rehabilitation or restoration is determining the performance indicators. This is important to measure whether ecosystem services are properly restored. In addition, small islands are vulnerable to environmental changes, thus require an instrument as a tool to monitor and assess the impact of activities (Table 6).

Table 6. Adoption of Ocean Accounts in coastal and small island management

Present condition	Ocean Accounts Support
Environmental rehabilitation/ restoration for coastal and small islands	Assess the effectiveness of ecosystem/habitat rehabilitation/restoration with the allocated inputs (costs and human resources)
Encouraging investment and sustainable use of coastal and small islands	Ensure that economic benefits do not adversely affect the ecosystem quality of coastal and small islands Assess environmental degradation and damages in the coastal and small islands
Pollution control includes efforts in pollution recovery	Information on the degradation scale and level compared to the initial value Determine the compensation value

The action plan to adopt a marine resource account in the management of coastal and small islands includes: i) preparation of a marine resource account in rehabilitation or restoration areas), ii) preparation of changes to rehabilitation or restoration areas in the form of a resource account iii) use resource accounts to assess the impact of rehabilitation or restoration.

6.4. Utilization of marine services

Utilization of marine services is currently being the priority for marine development, especially in utilizing marine space and resources. Marine services comprise the provision of goods and services and are primarily related to non-extractive uses. Ocean accounts play an important role in managing and monitoring the impacts of marine ecosystem service utilization (Table 7).

Table 7. Adoption of Ocean Accounts in the utilization of marine services

Present condition	Ocean Accounts Support
Utilization of marine services is very dependent on the quality of resources	Maintain resources quality to support sustainable use
Utilization of marine services has a socio-economic impact on the community as economic growth and the provision of employment	<ul style="list-style-type: none"> • To ensure that economic benefits do not cause a negative impact on ecosystem quality • Assess the environmental damages in marine resources
Utilization of marine services is subject to a levy as non-tax state revenue	<ul style="list-style-type: none"> • Ensuring the value of non-tax state revenue is equivalent to the economic value of resources utilization • Support the preparation of the gross regional domestic product of the marine environment

The action plan to adopt the Ocean Accounts in marine services utilization includes: i) preparation of the Ocean Accounts in the area or location of marine service utilization), ii) preparation of baseline information as Ocean Accounts iii) the use of Ocean Accounts to assess the impact marine services utilization, iv) the use of Ocean Accounts to determine tariffs for marine services utilization.

6.5. Strengthening the regulations and policies

Adoption in development policy cannot be carried out properly if preparing the Ocean Accounts is not included as the mandate and performance indicators. Considering that the collection of data and information on coastal and marine resources has so far been carried out through various activities (e.g., field surveys for spatial planning and surveys for conservation reserves), it is necessary to have an additional mandate that suggest the use of data and information as material in preparing Ocean Accounts.

The action plans that will be carried out include: i) evaluation of regulations and mandates for preparing the current Ocean Accounts, ii) formulation of the Ocean Accounts into norms of legislation, iii) evaluation of integrating Ocean Accounts in development planning (strategic planning of ministries/agencies and RPJMN).

6.6. Preparation of the dashboard for Ocean Accounts visualization

Visualization of the Ocean Accounts is important to disseminate the information to decision makers and stakeholders. The Ocean Accounts visualization dashboard enables all parties to monitor and find out changes in each account according to the preferred location or activity. In order to be optimally used, general criteria that a dashboard needs to have must be accomplished, including: i) easy to use and user-friendly appearance, ii) having inter-operability with the existing systems, iii) being connected to the information system in the main ministries/agencies (MMAF, Ministry of Finance, Statistics Indonesia, Bappenas, and BIG).

The action plans to be carried out include: i) preparation of a database system, ii) dashboard development, iii) connection and updating with the primary information system at each ministry/agency.

6.7. Incorporating the mandate of Ocean Accounts preparation in the RPJMN

Implementing national development for five years is carried out in accordance with the 2020-2024 RPJMN. The provision of the new RPJMN is undertaken at the end of the governmental period prior to the presidential election. Therefore, now is the right time to formulate and include the narrative content of the Ocean Accounts in the process of RPJMN provision for the next period. The Ocean Accounts is important to be included in government programs in the next RPJMN with the consideration that the RPJMN i) becomes the basis for ministries/agencies in organizing activities and budget allocations, and ii) synergize and provide a reference for all sectors and local governments. Therefore, the mandate for Ocean Accounts

preparation will be settled for five years and integrated at the sector and government level.

The action plans that will be carried out include: i) formulation of the narrative mandate for Ocean Accounts preparation, ii) conducting public consultations at national and local level, iii) formulation of five-year performance targets and indicators.

7. Timeline of implementation

The implementation for the Roadmap for Ocean Accounts Preparation in Indonesia is divided into three periods, i.e., short, medium, and long term. The time span of each period is adjusted to the cycle of the national development planning.

7.1. Short-term target

Short-term targets include outputs to be accomplished in 2022:

1. Availability of secondary data for preparing the accounts.
2. Compilation of a national scale ecosystem extent accounts.
3. Draft Indonesian National Standard for preparing Ocean Accounts.
4. Draft input for the RPJMN 2025–2029.
5. Draft material content for the mandate of preparing the Ocean Accounts in the laws and regulations

7.2. Medium-term target

The medium-term targets include outputs to be achieved in 2022 until the end of the 2020-2024 RPJMN:

1. Completeness of secondary data for Ocean Accounts preparation.
2. The preparation of an economic flow accounts and accounts of waste flows to the marine environment on a priority location scale.
3. Compilation of national governance accounts sheets and priority locations
4. Determination of the Indonesian National Standard for preparing the Ocean Accounts.
5. Establishment of general guidelines and technical guidelines
6. Work competency standard design
7. Accommodating the preparation of the accounts of marine resources in the Final Draft of the RPJMN 2025–2029.

8. Dissemination and socialization materials
9. Data visualization dashboard and accounts information

7.3. Long-term target

Long-term targets include outputs to be achieved during the period of RPJMN 2025–2029:

1. Primary data update
2. Periodic updating of the accounts sheet (beginning, middle, and end of the RPJMN).
3. Implementation of accounts sheet adoption in implementing marine and fisheries development policies.
4. Capacity building of human resources through regular training.

