Global Ocean Accounts Partnership

Summary Guidance for Decision Makers

Exported on 08/21/2025

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Summary

Highlights

Ocean accounts:

- Organise ocean data (social, environmental, economic) into a common framework using the same structure as national accounts maintained by National Statistical Offices or Finance Ministries.
- Provide countries with the means to go beyond Gross Domestic Product (GDP), to measure progress towards growth and sustainability of the ocean economy in line with Sustainable Development Goals 14, 15.9 and 17.19.
- Provide a common information infrastructure for ocean development policy, marine spatial planning, integrated environmental management, and international reporting. Pilot projects initiated by at least [n] countries suggest that they can be compiled incrementally using existing data, with modest investment in cross-government collaboration and international sharing of lessons learned.

What are ocean accounts?

- *National accounts influence public policy* — All countries maintain systems of national accounts, which inform and justify decision-making about economic policy and development. The accounts are generally maintained by National Statistical Offices or Finance Ministries, based on the international standard System of National Accounts 2008 (SNA). They are used to regularly produce and report the headline indicator of Gross Domestic Product (GDP).
- *Ocean accounts organise ocean data in a common framework, integrated with existing national accounts* — Ocean accounts are simply integrated records of economic activity (e.g. sale of fish), social conditions (e.g. coastal employment and poverty), and environmental conditions (e.g. extent / condition of mangroves) that are compiled on a regular basis (e.g. annually) and are compatible with international statistical standards. They are based in particular on the SNA, and System for Environmental Economic Accounting 2012 which is now used by at least 80 countries to account for policy-relevant environment<– >economy relationships on land. As noted in Briefing Note 2, at least 14 countries are actively developing ocean accounts, and national accounts in all HLP countries have some ocean-related coverage.

Why are ocean accounts useful?

- *Reporting of progress of the ocean economy towards growth, well-being and sustainability* — A comprehensive sequence of ocean accounts enables countries to monitor three critical trends: (1) changes in ocean wealth, including produced assets (e.g. ports) and non-produced assets—e.g. mangroves, coral reefs; (2) ocean-related income and welfare for different groups of people—e.g. income from fisheries for local communities; (3) ocean-based economic production—e.g. GDP from ocean- related sectors. Change in ocean wealth, not GDP, is the most important indicator of sustainability.
- *A common information infrastructure for ocean policy and reporting* — Many ocean policy shortcomings arise from isolated information—e.g. coastal development decisions that don't consider impacts on fisheries. Ocean accounts are designed to function as a common reference point for diverse policy questions, related to: (1) Ocean development—e.g. GDP in the shipping sector and associated GHG emissions; value-added in fisheries exports versus stock health and employment; (2) Marine spatial planning and protection—e.g. changes in biodiversity or flows of ecosystem services like carbon storage or flood risk regulation; (3) International reporting—e.g. integrated progress reports for the SDGs, Paris Agreement, CBD, and other commitments.

Lessons learned from pilot experiences

- It is important that the topic, geographical location and data integration focus of ocean accounts are grounded in a *well consulted scoping assessment* taking into consideration policy needs and data availability. The Diagnostic Tool is useful in guiding the scoping process through structured dialogue among data holders, compilers and users.
- *Active engagement of users* early in the process is critical. Not only does it facilitate understanding of policy relevance and the intended use of ocean accounts, but it also ensures pathways from integrated evidence to policy use.
- *Implementing ocean accounts does not require complete information*. Experiences show that partially compiled accounts based on limited data or small geographical scope can provide valuable information for policy action so long as the accounts or parts of the accounts produced are fit for purpose. It also helps identify important data gaps needed to support decision-making. Thus, key is to identify main areas of policy priorities, initiate the compilation and make incremental progress over time.
- *Communicating preliminary results early* to stakeholders — with documentation of limitations and challenges – assists in improving validation and engagement.
- *Collaboration is key*. Ocean accounts is a multidisciplinary framework. The success of its implementation and eventual use rests on involvement and collaboration of stakeholders with diverse yet complementary knowledge and expertise from statistical, scientific and policy domains. At the national level, collaboration across different government agencies including but not limited to statistics, environment, marine and coastal resources, science, and finance and planning is vital.

1. The urgent need to account for the ocean

The ocean is a vital source of livelihood, employment, nutrition and economic growth. Healthy ocean ecosystems contribute to poverty reduction, climate regulation, and are essential for a more sustainable future. Ocean-based sectors are regarded among the fastest growing economic sectors in both developed and developing countries is no surprise. Under a "business-as-usual" scenario, the ocean economy has been projected to worth over USD 3 trillion by 2030. However, these benefits have been hindered by rampant marine pollution, ocean acidification and warming, depletion of fish stocks and species, destructive fishing practices, and unsustainable trade and transport—most of which are caused by human activities and furthered by inadequate ocean governance.

Building back blue during and post COVID-19 — The COVID-19 pandemic has shaken livelihoods and put economies on the back foot, with countries in both the Global South and North navigating through uncertainty. The pandemic is laying bare the existential threats and impacts that have befallen the ocean ecosystem even before the pandemic (e.g., overfishing, pollution, loss of biodiversity, etc), as well as the stark inequities in our society. As demand for safety net services in ocean sectors such as shipping, tourism, fishing, etc in this pandemic skyrockets, there is the urgent need to build sustainability into the recovery of the ocean sectors, while providing long-term funding for the critical marine resources that remain at risk. In many quarters, this line of thinking has been referred to as "building back blue." But if we are to build back blue, marine resilience in the face of climate and social emergencies will require the development of an integrated ocean accounting system for marine ecosystems and their services and associated data sets. This is to offer a multi-purpose tool that can be utilised to enhance effective decision making for a range of policies, at different stages of the blue recovery cycle, and that national authorities and other stakeholders.

Supporting planning and policy design for the blue economy — A growing range of policy options and implementation frameworks for the "ocean" or "blue" economy—such as the World Bank's Blue Economy Development Framework (BEDF)—respond to growing demand at a national level for ambitious reform to align ocean development objectives with sustainable development outcomes. The BEDF is driven by a commitment to the overall development of a country "roadmap" toward a more efficient, sustainable national marine economy. This sustainability includes the support of marine policy decisions which promote cleaner and more attractive coasts, increased fish stocks and fisheries performance, better jobs for people living along the coasts, and new ocean sectors. Achieving these goals is challenged by a number of factors organized under each of the three BEDF core components: *(1)* Data, Analysis and Dissemination; *(2)* Policy, Institutional and Fiscal Reforms; and *(3)* Fostering Investment.

Many of the challenges presented within the core components of the BEDF align with decision-making tools provided by ocean accounting (**Table 1.1**). The challenges associated with each core can, in many cases, can be addressed by or exist in parallel with the Ocean Accounting framework. **Table 1.1** describes a some of the challenges identified by the BEDF, a synopsis of how Ocean Accounting can address these challenges and where this document discusses guidance toward decision making for these or similar challenges.

Table 1.1: Comparison of Blue Economy Development Framework (BEDF) challenges and Ocean Accounting capabilities

BEDF Core Component	BEDF Identified Challenges	Ocean Accounting Solution	Document Section

1. Data, Analysis, and Dissemination	Design and support development of Blue Natural Capital Accounting	Extends international standards (System of National Accounts and the System of Environmental-Economic Accounting) to organize ocean data into a common framework	Section 3. Building Ocean Accounts
1. Data, Analysis, and Dissemination	Identify capacity for integrated planning using the latest technology	Creation of online visual tools (dashboards) which provide a coherent integration of statistics across a range of selectable marine and coastal economic sectors	Section 4.9 Connecting ocean science with policy
1. Policy, Institutional and Fiscal Reforms	Help countries apply decision support tools for blue growth	The Diagnostic Tool is a means of facilitating a structured conversation among stakeholders to identify topics of policy concern and assess relevant data.	Section 5. Next steps for developing ocean accounts
1. Policy, Institutional and Fiscal Reforms	Analyse key government institutions and fiscal reforms	Ocean Accounts provides a standardised and integrated statistical time-series that cover connections between a wide range of social, economic and environmental circumstances	Section 4.8 Finance and investment decisions

3.Fostering Investment	Offer assistance to development of financial sector standards	Develop financial sector standards by analysing the economic relevance of the ocean's environmental assets, the environmental implications of ocean-based economic activity,	Section 4.1 Strategic development planning

Integrating ocean resources into the economic analysis: catching the real wealth of nations — The quest for alternative indicators to complement or replace GDP as a means of measuring national wealth has gained traction at local, national and international levels. Considering that the ocean covers more than 70 percent of the surface of our planet and borders about 257 countries, it is useful to integrate ocean resources into economic analysis to provide a broader picture of development progress and the real wealth of our country and to measure what counts for socio-economic and environmental performance. Therefore, the imperative for embedding Ocean Accounts into the System of Environmental-Economic Accounts "Central Framework" (SEEA-CF) and the System of National Accounts. Ocean Accounts will allow policymakers and the general public benefit significantly from improvements in the ability to assess the well-being of people and the health of the ocean ecosystem beyond GDP.

Measurement of ocean capital asset prices to maintain opportunities for the future generation — From a capital perspective, the ocean contributes to human welfare through the provision of both material and service flows. These material and service flow contributes to the set of ocean capital assets that are passed from generation to generation and ensuring sustainability. However, the marginal value of natural capital is often generally revealed by markets. Ocean Accounts provide the opportunity to assess marginal social worth or price of ocean assets based on an intertemporal exchange of actual allocations and societal trade-offs society in the context of wealth-based sustainability metrics.

Constructing an innovative narrative for stakeholder participation debate in ocean management and governance — Given the many limitations of GDP as well as the environmental and social crises, the uptake of ocean accounts opens the way for constructing an innovative narrative and giving fresh impetus for stakeholder participation in ocean governance and management decision making. The nature of Ocean Accounts approach provides stakeholders with a standardised framework to provide their input into the process of measuring and valuing relevant ocean capital impacts and/or dependencies. It also enables stakeholders to supply data that are necessary to develop beyond GDP-indicators for implementation, monitoring and review of ocean policy decisions.

2. Measuring what matters about the ocean

- An integrated set of accounts should contain data concerning ocean assets, ocean services, the ocean economy, flows to the environment and ocean governance.
- The aggregation of data towards economic, social and environmental indicators provides an overview of the performance of economic sectors, the beneficiaries of ocean wealth and the state of the environment over time.
- Multiple indicators provide a holistic understanding of sustainability, including ocean health and wealth, and its flows to society and the economy.

Data foundation for ocean accounts

The value of an ocean account lies in its ability to aggregate a diverse range of data to produce indicators, which inform decision-makers on a range of policy issues. An integrated set of accounts should contain data concerning ocean assets (ecosystem and individual assets) and ocean services. Environmental data could then be related to sectors within the ocean economy. Sustainable development contains multiple dimensions, and decision-makers should account for both flows from the ocean to society and the economy, and flows back to the environment (waste and emissions).

Economic indicators

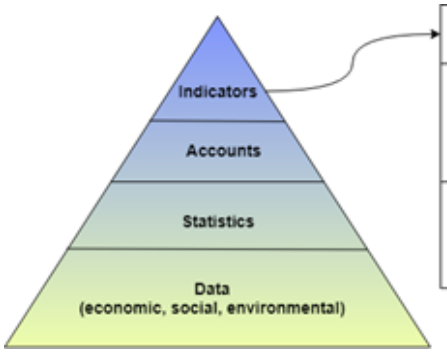
Ocean accounts facilitate the production of ocean-related economic indicators, answering questions such as the performance of ocean sectors, contribution of ocean processes to the economy, the sustainability of the ocean economy and evaluate the impacts of policy changes on the ocean economy. The ocean must be fully accounted for to balance between using the ocean today and conserving, restoring or enhancing it to strengthen future productivity, create jobs and reinforce food security and regional stability. Economic indicators derived from conventional balance sheets within the Ocean accounts, such as Gross Value Added (GVA) and Gross Domestic Product (GDP) provide a measure of 'outputs' of human efforts regarding the ocean to provide 'means' or 'inputs' into achieving other social and economic goals. Monetary components of the ocean product account aggregate to ocean GDP.

Social indicators

Society receives both social and economic benefits from the ocean, which can be measured through 'income' and its distribution or related more broadly through metrics of social welfare and economic well-being derived from the Ocean. Ocean income may be measured through benefits to nationals (people of a nation) from the ocean through income accounts, which aggregate to net national income (NNI). Income measures can be disaggregated to show the importance of the ocean for different segments of the population. Social indicators identify the outcomes of policy and enable the informed discussion of distributional concerns of benefits associated with the ocean.

Environmental indicators

The development of the Ocean economy is based on the ability of the Ocean to continue its provision of goods and services. Environmental indicators allow decision makers to draw relationships between the environment and the economy, including the extent and condition of ocean assets and the ecosystem services they provide. Measured changes to ecosystems, and their services, provides an indicator for sustainability. With the growing intensity and diversity of Ocean activities, indicators on pressures on the environment, highlighting the environmental impacts of activities in both physical and monetary terms.



	Ocean product	Ocean wealth	Ocean income
Description	A measure of production, economic or otherwise.	A change in ocean assets and flows provides an indicator for sustainability. The balance sheet should be stable or increasing for sustainability.	a measure of real income and its distribution, or the benefits to society
Examples of informative indicators	Gross Value Added (GVA); Physical flows from the environment	Changes to natural assets, and flows of benefits (ecosystem services)	Net national income (NNI); Income can also be non-monetary.

Figure 2.1: Data Foundation for Ocean Accounts

3. Building ocean accounts

Ocean accounts extend existing international standards such as the System of National Accounts (SNA) and the System of Environmental-Economic Accounting (SEEA) to organize these ocean data into a common framework – integrable with national accounts – needed to compile a coherent and holistic set of indicators to inform ocean decision making, reporting and assessment beyond Gross Domestic Product (GDP). An ocean accounts framework (**Figure 3.1**) provides guidance that enables decision-makers to monitor (I) *ocean assets* which are marine and coastal natural capital (II) *ocean services* used in the economy including ocean ecosystem services (III) *impacts of economic activities* to the ocean environment including marine debris (IV) ocean-based economic production or an *ocean economy* (V) changes in *how oceans are governed and managed* (VI) key information on *benefits and costs* of the ocean and (VII) changes in *ocean wealth* which is the most important indicator of sustainability. The ocean accounts framework is flexible and modular in its implementation. Its spatial integration focus allows tailoring of the accounts to suit a country's specific circumstances and policy needs such as the identification of high-risk areas of over tourism carrying capacity in Southern Thailand (**Figure 3.2**) or comprehensive mapping of land-ocean interactions for ecosystem-based marine spatial planning in Quang Ninh, Viet Nam (**Figure 3.3**).

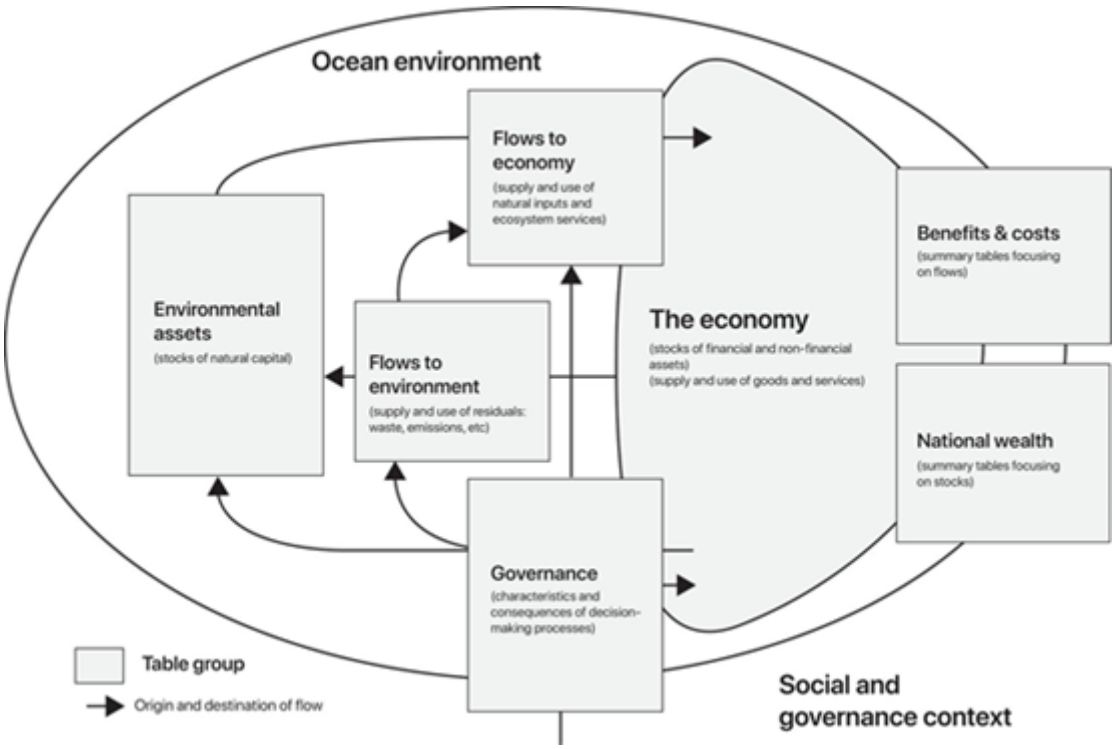


Figure 3.1: Ocean accounts framework

National ocean account pilots initiated the compilation process by targeting key policy priority areas and utilizing existing data and capacity. These accounts, albeit with limited data, provided useful information for policy action (such as Thailand and Viet Nam) and yet progress as well as completeness of accounts can evolve over time. Standardizing information through ocean accounts also reduces reliance on ad hoc and unintegrated data for critical decisions and helps identify important knowledge gaps such that investments to close the gaps can be prioritized to ensure highest added value. Ocean accounts once initiated and updated regularly will serve as a common and multipurpose information infrastructure, in place of disconnected and partially produced datasets, for the assessment, monitoring and reporting of ocean-related commitments, policies and plans.

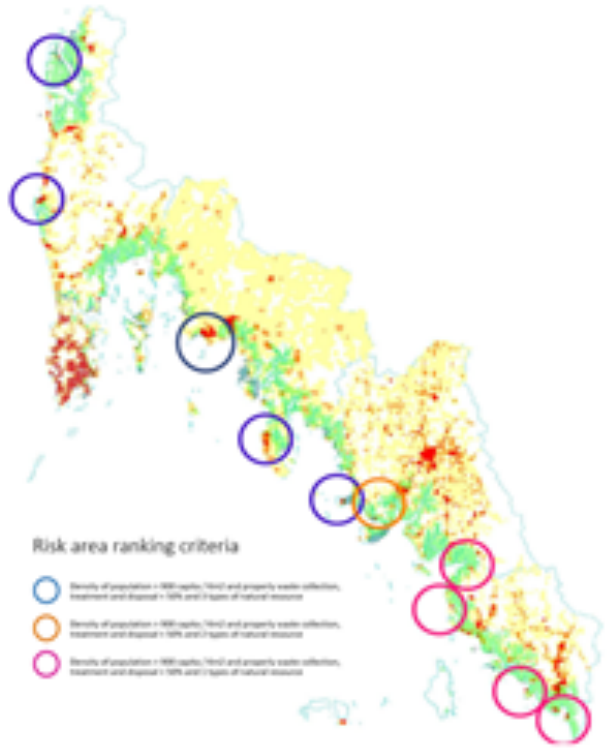


Figure 3.2

Identification of high-risk areas of over tourism carrying capacity in Southern Thailand

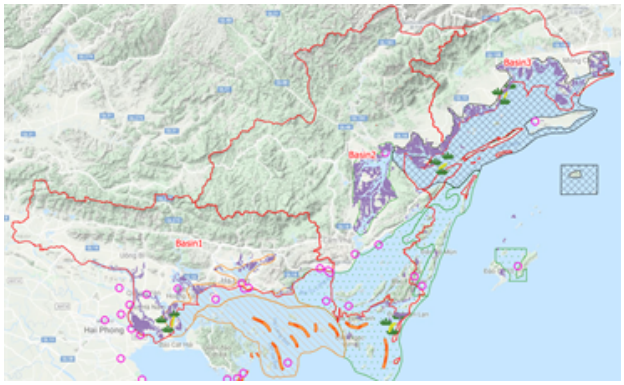


Figure 3.3

Comprehensive mapping of land-ocean interactions for ecosystem-based marine spatial planning in Quang Ninh, Viet Nam

4. Policy applications of ocean accounts

Decision-making about the ocean is increasingly informed by a range of laws, policies, and processes designed to pursue defined strategic objectives, and/or plan use of ocean space in an integrated manner. Prevalent features of ocean policy and governance in this context include several policy applications guided by Ocean Accounts detailed below.

4.1 Strategic development planning

Strategic development plans for the ocean economy, including the proliferating range of national "Blue Economy", "Ocean Economy" and "Blue Growth" plans that establish multi-sectoral development objectives and targets aligned with diverse guiding principles. A regionally representative list of examples includes the European Union's Blue Growth Strategy, South Africa's Operation Phakisa Oceans Economy strategy, Fiji's National Ocean Policy, and Chapter 41 of China's 13th Five-Year Plan for Economic and Social Development focusing on "widening space" for the Blue Economy.. Ocean Accounts can perform several support functions for strategic and planning decisions that may justify a decision to invest effort and resources to compile them. By virtue of their holistic and integrated structure, Ocean Accounts can be used as a basis for analysing the economic relevance of the ocean's environmental assets, the environmental implications of ocean-based economic activity, and a wide range of other relationships that impact on the ability of countries to achieve sustainable development. This analysis supports the identification and evaluation of policy response options, in terms of their impacts on assets (environmental, social, economic) that underpin development, and on the flows of services and benefits from these assets.

More specifically, the Ocean Accounts Framework provides a basis for compiling three broad domains of aggregate indicators that are directly relevant to performance monitoring of ocean development strategy:

- *Ocean product*, focusing on the economic outputs of human activity regarding the ocean, with monetary components aggregating to ocean Gross Domestic Product or net domestic product (NDP),
- *Benefits received by nationals from the ocean*, including physical measures of ecosystem services, and monetary measures of ocean income that can be aggregated to net national income (NNI) and gross national income (GNI). Income measures can be (and benefit from being) disaggregated to show the importance of the ocean for different segments of the population, for example women, indigenous peoples, and other marginalised groups.
- *Change in the ocean balance sheet*, which provides an important sustainability indicator when the balance sheet is sufficiently comprehensive including both environmental assets and other subcomponents of national wealth (e.g. SNA 2008 produced assets) recognised in the Ocean Accounts Framework.

4.2 Sector development planning

Sectors of the ocean market economy include, for example, capture fisheries and aquaculture, shipping/transport, offshore energy (both renewable and non-renewable), mineral extraction, freshwater extraction (desalination), recreation and tourism, and marine construction/coastal property. The Ocean Accounts framework can support decision-making processes and development planning within sectors (e.g., tradeoffs within the fisheries sector associated with commercial fishing regulations) and the ability for intercomparisons between sectors (e.g., tradeoffs between tourism and coastal property sectors associated with coastal development planning). To achieve development planning for an ocean-economy sector, the Ocean Accounts framework advocates for the creation of "ocean economy satellite accounts" which record the economic performance of each individual ocean-related industry sector. **Table 4.1** below provides a basic structure and measures of

an ocean economy satellite account. The rows are characteristic ocean economy sectors, the columns represent the measures used to assess their performance. Performance can be measured in terms of Gross Value Added (GVA), Gross Output (GO) and employment. All three can be stated in terms of direct, indirect and induced impacts.

Table 4.1: Ocean Economy Satellite Account

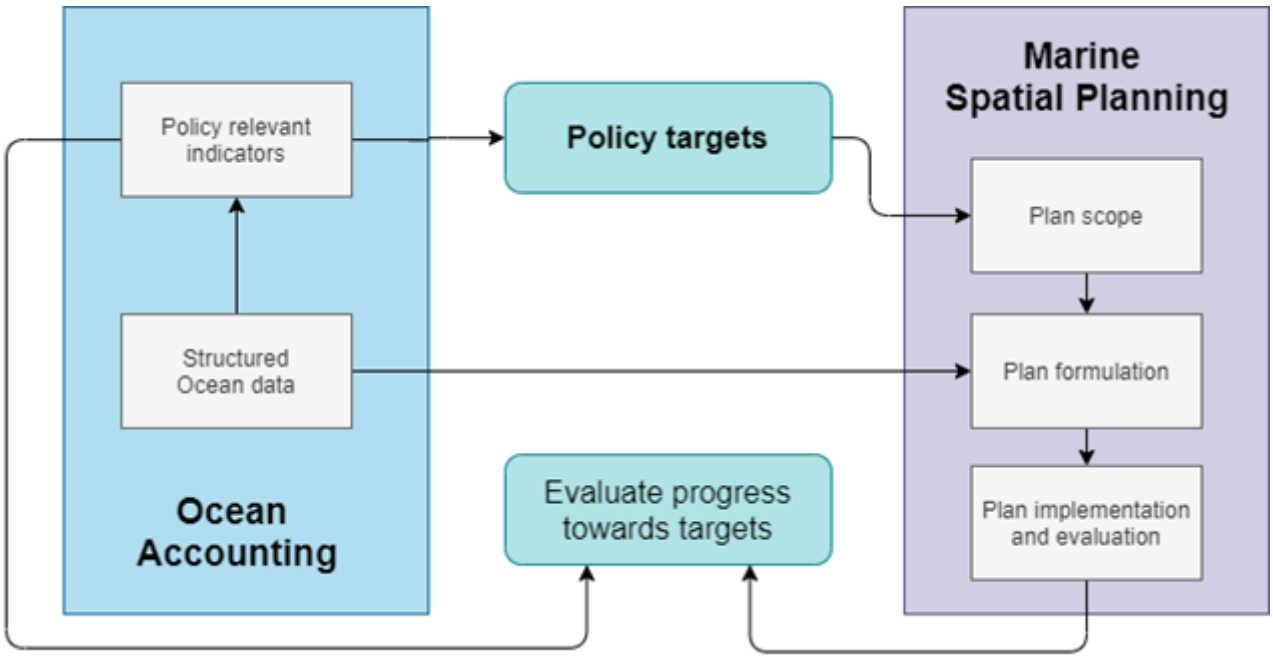
Sector	**GVA (currency units constant)**				**Employment (thousands)**			
	Direct	Indirect	Induced	**Total**	Direct	Indirect	Induced	**Total**
Fisheries and Aquaculture								
Offshore Energy								
Mineral Extraction								
Freshwater Extraction								
Marine construction / Coastal Property								
Shipping and Transport								
Marine tourism & recreation								
Total								
Growth from previous period (%)								

Whole economy (value)								
Whole economy (% in ocean economy)								

4.3 Marine spatial planning

Marine spatial planning (MSP) is a prominent framework within ocean governance, that analyses and allocates the human activities within the marine space to achieve ecological, economic and social objectives. It has been implemented by more than 70 countries across all major regions and endorsed by IOC-UNESCO. MSP is used to manage conflicts for resources and space between maritime sectors, and manage pressures from human activities on the environment, supporting the growth and development of the Ocean economy.MSP requires a diverse range of data to establish the state of the environment, and its flows both to and from society and the economy. Ocean Accounts provide a holistic and coherent "*common set of facts*" consistent with the MSP framework, through the integration and consideration of (1) governance data to define MSP targets, (2) socio-economic data to define human activities and the relationships of environmental goods and services with society and (3) environmental and biophysical data inform the context of the area in which the plan will be implemented. Another key synergy between MSP and Ocean accounts is the ability to monitor and evaluate progress towards the goals of the spatial plan.

Pilot studies have been performed to link Ocean accounts to different aspects of spatial planning. Thailand identified tourism potential and sites for conservation through Ocean accounting. Viet Nam and China have combined ecosystem mapping, population densities and tourism activities to identify spatial areas, at risk of improper waste collection, treatment and disposal, or high water use, or high energy use.



4.4 Integrated ocean management

Integrated Ocean Management (IOM) provides an understanding of all ocean uses and pressures, and prioritises among these various uses. As a dynamic process, IOM builds upon existing holistic or integrated frameworks (e.g. Marine Spatial Planning), providing a set of comprehensive tools which include Integrated Coastal Zone Management, Ecosystem Based Management, Adaptive Ocean Management and area-based management. These approaches help balance competing interests to ensure the health and resilience of ecosystems, which underpin the Ocean economy. IOM engages relevant actors from government, business and civil society, from all human ocean activities, to collaborate toward a sustainable future.

New analysis commissioned by the High Level Panel for a Sustainable Ocean Economy identifies the challenges in implementing IOM, several of which may be addressed through compiled and standardised data within an Ocean Account. IOM is founded upon local context, which is key to understanding the economic activities and associated environmental pressures that should be managed. Information is critical and stakeholder engagement is necessary for successful implementation. Understanding the local context, including the necessary ecological and socio-economic data, in addition to the identification of relevant actors and levels of governance could be extracted from an ocean account. The account can further assist in ensuring data continuity and maximise quality through standardisation.

4.5 Regulatory decisions and impact assessment

Regulatory decisions concerning the ocean include the issuing of permits and licences to authorize otherwise prohibited marine activities—such as pollution within defined limits, extraction of resources, or the construction of infrastructure. In many countries legislation or policy requires that regulatory decisions should be made in accordance with an overarching spatial plan or set of strategies priorities, unless particular circumstances indicate otherwise. The information considered by regulatory decision-makers is often collected on an ad hoc basis by the individual or organisation seeking permission to undertake an activity. Proponents of activities with potential impacts on the environment are commonly required to complete and submit an:

- Environmental Impact Assessment, in accordance with procedures that ensure that the environmental implications of decisions are taken into account before the decisions are made.
- Social Impact Assessment, in accordance with equivalent procedures focusing on social issues.
- Integrated risk assessment, for example those aligned with the World Bank's Environmental and Social Framework focusing on environmental and social risks and impacts, labor and working conditions, resource efficiency and pollution prevention and management, community health and safety, land acquisition, restrictions on land use and involuntary settlement, biodiversity conservation and sustainable management of living natural resources, indigenous peoples and certain traditional local communities, cultural heritage and financial intermediaries.

In this context all relevant stakeholders (including the general public) commonly do not have access to the best available data concerning the impacts and development implications of regulated activities. This can result in suboptimal decision-making, inefficiency, additional costs for those seeking regulatory approval, and poor public transparency. Ocean Accounts can contribute to overcoming these shortcomings by providing a common, quality-controlled and standardised data reference point for regulatory decision-makers, project proponents and other interested stakeholders. Being a retrospective information system, they do not provide direct insights related to the consequences of proposed activities. However the information contained in a sufficiently comprehensive ocean account provides the data inputs needed for modelling and other prospective assessments undertaken as part of a regulatory decision-making process.

Box focusing on results of Australian independent review of EPBC Act.

Key issues identified by the Australian independent review of the EPBC Act which can be solved through Ocean Accounting

- The collection of data and information is fragmented and disparate. *Ocean Accounting can provide a single national source of truth that people can rely on.*
- Information is skewed towards western environmental science and does not adequately consider Indigenous knowledge of the environment, or social, economic and cultural information. This broader set of information is not clearly integrated to inform decisions that deliver ecologically sustainable development (ESD). *Ocean Accounting frameworks solve this issue through the equal incorporation of cultural values (e.g., indigenous value systems) alongside socioeconomic and ocean science data.*
- The Department's systems for information analysis and sharing are antiquated. Cases cannot be managed effectively across the full life cycle of a project, and the user experience is clunky and cumbersome for both proponents and members of the community interested in a project. *The main outputs of Ocean Accounting seek to provide interactive online "dashboards" which allow policy makers to visualize tradeoffs associated with specific decision making processes.*

4.6 Disaster preparedness and response

Disaster preparedness and response (DPR) includes a range of activities including review and updating of contingency plans and programmes, investment in forecasting and early-warning systems and emergency communications, maintaining resilient critical infrastructure, training, risk mitigation, etc. DPR from both a management standpoint and an economic viewpoint are essential to help maintain the stability and sustainability of a disaster-prone area, such as a coastal community or small islands. Ocean Accounting addresses DPR needs through the identification and reporting of relevant risks, and impacts of disasters on social, economic and environmental phenomena within scope of the Ocean Accounts Framework.

Ocean accounting provides a structure and approach to measuring and accounting for ecosystem services in relation to disaster risk reduction using nature-based solutions. The European Union defines nature-based solutions as solutions that are "inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions." There are several examples of nature-based solutions to disaster risk reduction with respect to the ocean. For instance, healthy coral reefs act as natural breakwaters that significantly reduce wave energy and mangroves provide cost-effective coastal protection services from strong wind and waves resulted from hydro-meteorological disasters such as storms, cyclones and tsunamis; they are also essential habitats for aquatic resources which help improve lives and livelihoods of coastal communities.

4.7 International reporting on climate change, biodiversity and sustainable development

Reporting on the up-take and implementation of various international commitments, be it climate change, biodiversity or overall sustainable development would benefit from the information and

processes of the Ocean Accounts (OA) Framework. This may relate to Climate Change adaptation policies aiming for reducing economic damages from coastal erosion or ocean acidification, biodiversity policies on marine ecosystem restoration or marine litter flow from land-based sources, etc. Depending on the issue areas and ocean sector to be tackled, relevant data may come from the land, forest, aquatic, energy (asset) or environmental accounts based on the OA central Framework and asset accounts. Integrated national/regional OA reporting can be used to develop an Ocean Capital Indicator Framework (OCIF) crucial to inform implementation, progress monitoring as well as accountability regarding issues of climate change, biodiversity and sustainable development. The flexibility of OA can help to expand the scope of traditional climate change, biodiversity and sustainable reporting such as:

- The Intended Nationally Determined Contribution (INDC) to the UN Framework Convention On Climate Change (UNFCCC).
- National Biodiversity Action Plan to implement the Convention of Biological Diversity
- The mechanisms to monitor the progress of the UN 2030 Agenda including indicators for each target, and the voluntary national reports that countries prepare to exchange good practices.

Not only will the OA system provide information for monitoring greenhouse gas emissions, biodiversity gain/loss, sustainable development targets that are consistent with stock and flow in the natural oceanic system and economic sectors, they can also be used for assessing the impacts on households, the economy and ecosystems, and for informing sector-specific strategies. Interestingly, Article 13 of the UNFCCC Paris Agreementthe recognizes the importance of "a robust transparency and accounting system…, reporting information on mitigation, adaptation and support". Therefore, many of the indicators needed for the Paris Agreement can be obtained from the OA accounts (see: a reference to AO Guideline and framework). In furtherance, several elements necessary for ocean accounts are embedded in the UN Convention on Biological Diversity's (CBD) framework. Out of the 20 Aichi Biodiversity Targets of the Convention, as identified in its Strategic Plan for Biodiversity 2011-2020, two are aimed at mainstreaming biodiversity in policies and national accounts. The OA framework in alignment with the SEEA can provide information for at least seven Aichi Targets lacking indicators, while it is also in direct and indirect consonance with 61 of the current Aichi Target indicators. Though OA is driven specifically by the following Goal 14, 15 and 17 of the UN Agenda 2030, they are technically in consonance with all 17 overarching goals. To achieve these SDGs, Ocean Accounts aim to provide three key high-level indicators including Ocean product, Change in the ocean balance sheet and Ocean income.

4.8 Finance and investment decisions

Finance and investment decisions involve[MB1] the allocation of monetary resources from the public or private sector to maximise value, where the prioritisation of such values may be economic, environmental and/or social in nature. These abilities rely on good data management—ranging from data collection to analysis and proper and secure storage. Without effective data management, it becomes nearly impossible to predict how much return on investment a project is likely to generate, and therefore what sort of investor to try to attract, or how to structure an investment proposition. Ocean Accounts support finance and investment decisions by providing standardised and integrated statistical time-series that cover connections between a wide range of social, economic and environmental circumstances, and provide the basis for generating relevant indicators and analyses. More specifically, they provide a reporting system that is thematically aligned with the growing range of criteria frameworks for public and private sector investment, including:

- *Finance ministry appraisal and evaluation criteria:* for example those documented in the UK Government HM Treasury Green Book concerning natural capital and accounting for environmental impacts in policy appraisal, and the New Zealand Living Standards Framework which benchmarks policy impacts against 12 domains of well-being, four capital stocks, and risk and resilience.

- *Sustainable finance principles:* for example, the Sustainable Blue Economy Finance Principles, and Global Reporting Initiative suite of Standards.
- *Sustainability certifications:* for example those maintained by the Marine Stewardship Council which require detailed information concerning the status of fisheries resources and associated management measures.

4.9 Connecting ocean science with policy

The Ocean Accounts Framework provides a holistic structure that can be used to organise the information required for integrated reporting of social, economic and environmental conditions related to oceans. This includes reporting of progress towards national ocean-based and general development objectives, and international commitments including the Paris Agreement on Climate Change, Sendai Framework for Disaster Risk Reduction, Convention on Biological Diversity, and the Sustainable Development Goals (**SDGs**). In particular, Ocean Accounts facilitate the structuring of information relevant to SDG 14 and its ten associated Targets, which call on all countries and stakeholders to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

The Ocean Accounts Framework facilitates achieving these international commitments and objectives by connecting ocean science with policy creation. Modern ocean science is characterised by increasing reliance on complex and large-scale data inputs, and by a proliferation of distinct expert communities operating within and between the broad domains of physical, biological, and social research. In this context, the Ocean Accounts Framework can provide a useful means to:

- *Integrate data and statistics across disciplines*—it provides a conceptual structure for the integration and/or coherent presentation of data and statistics concerning marine and coastal environments, social circumstances, and economic activity.
- *Provide a more holistic understanding of complex systems*—The integrated and coherent nature of information within the framework provides a foundation for holistic analysis of complex and interlinked social, environmental, and economic phenomena and trends.
- *Communicate science to decision-makers*—As noted previously, Ocean Accounts are specifically intended to inform and enable public policy decision-making about oceans, and related analysis and research. They present multiple outputs of ocean-related scientific research within an overarching structure that is compatible with existing national accounting processes and standards. This supports *(1)* communication with a wider range of decision-makers (for example macro-economic decision-makers who do not typically engage directly with environmental science), and *(2)* the public legitimacy of scientific information by subjecting it to the rigour of national statistical processes and accounting principles.

5. Next steps for developing ocean accounts

Ocean accounts can be compiled incrementally using existing data with modest investment in cross-government collaboration and international sharing of knowledge and lessons. The following recommendations draw from national experiences in piloting ocean accounts, and SEEA implementation more broadly, as a practical guide for initiating the development of ocean accounts.

- *Begin with key policy priorities and available data* — Determining the scope of ocean accounts development is vital. The Diagnostic Tool is a means of facilitating a structured conversation among stakeholders to identify topics of policy concern and assess relevant data. Experiences show that the initial compilation is best focused on a key priority topic with sufficient levels of data availability to test the framework's implementation within national contexts and circumstances. Accounts don't need to be complete to be useful and incremental progress can be made over time. Key is to ensure that accounts or parts of the accounts produced respond to the intended use.
- *Form a multidisciplinary team* — Ocean accounts apply concepts and methods from many disciplines such as statistics, national accounts, economics, geography, oceanography, and environmental science. Hence, it is important that an interdepartmental team comprising members with complementary knowledge, expertise and policy use perspectives be formed to collaborate on ocean accounts under the guidance and support of a high-level committee. Specific skill sets and technical expertise required will be subject to the scope and focus of the accounts.
- *Leverage existing mechanisms and capacity for collaboration* — Each government department has unique expertise and holds different sets of information that could be valuable in different parts of ocean accounts. Where there are ongoing institutional mechanisms, they could be the main means of engaging stakeholders throughout the process from deciding on the priority topic, contributing expertise and data during the compilation process, to using the results
- *Use technology and global datasets to fill gaps* — Satellite imagery and other remote sensing technologies can assist the collection, harmonization and processing of earth observation data, particularly when relevant statistics or government-generated administrative data are not available. There are also a wide range of global ocean datasets and data products that could be utilized to fill important data gaps (e.g., ESCAP community).
- *Consult experts and partners* — Ocean accounting is a new concept. Efforts in developing ocean accounts will greatly benefit from experiences and lessons from countries that have experimented with the framework such as Australia, Canada, China, Malaysia, Samoa, Thailand and Viet Nam. In this regard, international partners play a crucial role. Not only do they facilitate international sharing of knowledge, they can support ocean accounts development particularly at the national level. The Global Ocean Accounts Partnership (GOAP) provides a community of practice as well as technical assistance, policy advisory and strategic support to countries and institutions interested in developing ocean accounts for sustainable development.