



LARGE MARINE ECOSYSTEMS

IDENTIFYING COMMON LME INDICATORS

*Towards common reporting and
comparability between LMEs*



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List of Acronyms

BIP	Biodiversity Indicators Partnership	IW:LEARN	International Waters Learning Exchange and Resource Network
DIM WG	IW:LEARN Data and Information Working Group	IWRM	Integrated Water Resource Management
DIN	Dissolved Inorganic Nutrients	LBS	Land Based Sources (of pollution)
DPSIR	Driver-Pressure-State-Impact-Response	LME	Large Marine Ecosystem
EEZ	Exclusive Economic Zone	LME:LEARN	Large Marine Ecosystems Learning Exchange and Resource Network
FAO	Food and Agricultural Organization of the United Nations	MPA	Marine Protected Area
GDP	Gross Domestic Product	NOAA	National Oceanic and Atmospheric Administration
GEF	Global Environment Facility	OECD	Organization for Economic Co-operation and Development
GIS	Geographical Information System	POPs	Persistent Organic Pollutants
GOOS	Global Ocean Observing System	RFMO	Regional Fisheries Management Organization
HELCOM	Baltic Marine Environment Protection Commission - Helsinki Commission	RS	Regional Seas Conventions
HLPF	High-Level Political Forum	SAP	Strategic Action Programme
IAEG-SDGs	Inter-Agency and Expert Group on Sustainable Development Goal Indicators	SDG	Sustainable Development Goal
ICZM	Integrated Coastal Zone Management	TDA	Transboundary Diagnostic Analysis
IOC-UNESCO	Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization	TWAP	Transboundary Waters Assessment Programme
IODE	International Oceanographic Data and Information Exchange	UN	United Nations
IW	International Waters	UNDP	United Nations Development Programme
IWC	International Waters Conference	UNEP	United Nations Environment Programme
		VNR	Voluntary National Reports (SDG)
		WCMC	UNEP World Conservation Monitoring Centre

1. Review of possible common LME indicators in line with the SDGs

In light of many global indicator initiatives and the adoption of the SDG indicators, as well as the progress achieved by Large Marine Ecosystem (LMEs) projects to define their priorities, targets and indicators as part of the Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP) process, further consideration should be given to the development of a common set of indicators relevant to the LMEs. Each LME has its own indicators for the purpose of monitoring SAP and other strategic documents' implementation, as well as assessing the state of the marine and coastal environment. Commonly, data for these indicators is provided either through national monitoring programmes or national reporting to the relevant regional organizations, combined with the use of global datasets where appropriate. Data is then either made available in national and regional databases and Geographical Information System (GIS), and analysed in state of environment or thematic assessments reports.

Given the common challenges and issues between LMEs, a common set of indicators can be integrated as appropriate into LME reporting in line with the Sustainable Development Goals (SDGs) and other global reporting obligations that would allow future comparability between regions. The initial proposal will be reviewed by the LMEs for further revision and inclusion sources of data for each indicator, and relevance for each LME. This work compliments the LME Management Effectiveness Scorecard developed for LME:LEARN by Conservation International¹.

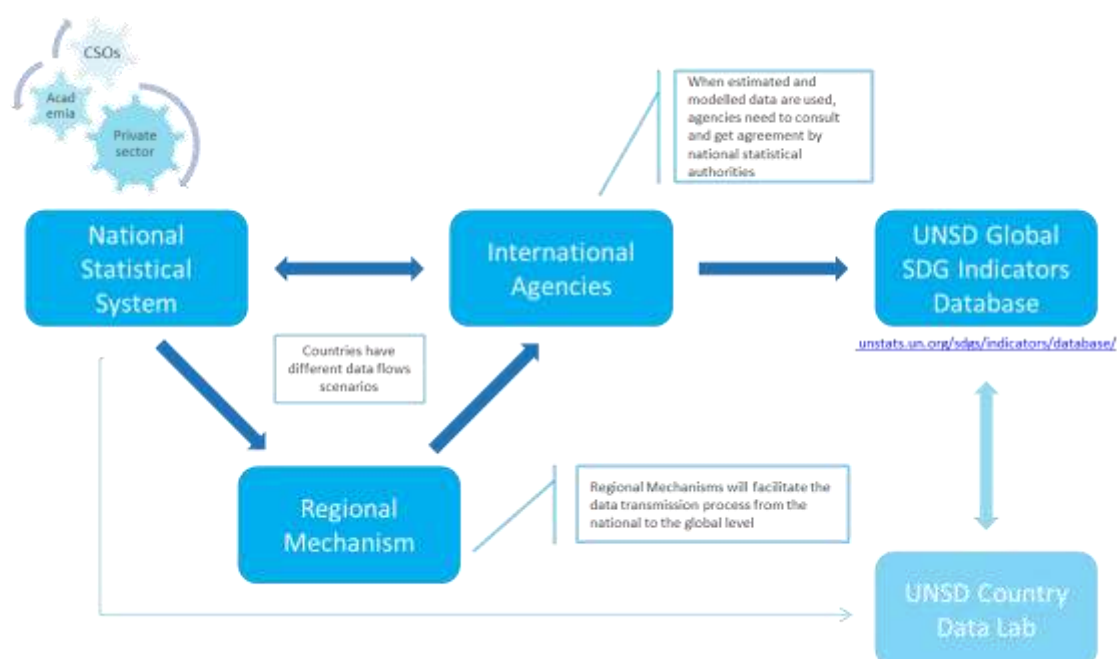
1.1 SDG Targets and Indicators

Cooperation on data and information management is especially relevant in light of the adoption in 2015 of the 2030 Agenda for Sustainable Development, the 17 SDGs, 169 targets and 232 indicators. The main responsibility for the follow-up and review is with member states with Voluntary National Reports (VNR) for 2016 onwards presented at the high-level political forum (HLPF), and which are available at <https://sustainabledevelopment.un.org/vnrs/>. The 2030 Agenda recognises “*the importance of building on existing follow-up and review mechanisms at the regional level and allowing adequate policy space*” and the key role of regional organizations for SDG reporting. There are several goals and targets that are relevant to the LMEs (see **Annex 1**), in particular the Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development. It is one of the least reported in VNR reports, and also given the transboundary nature of SDG 14, the GEF LME projects and related organizations can contribute significantly to the reporting of SDG 14 and several other SDGs.

At the global level, in the context of the SDGs follow-up and review process, international agencies (also referred to as “custodian agencies”) are requested to compile global and regional aggregates of data on the SDG indicators based on their respective existing mandates and/or expertise, following quality standards and best practices, and depending on the status of development (data availability) of those indicators.

¹ <https://iwlearn.net/manuals>

Figure 1. Guidelines on data flows and global data reporting (5th Meeting of the IAEG-SDGs, 30-31 March 2017, Ottawa)



To facilitate the implementation of the SDG global indicator framework, all indicators are classified by the IAEG-SDGs into three tiers on the basis of their level of methodological development and the availability of data at the global level², as follows:

- Tier I: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant;
- Tier II: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries; and
- Tier III: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested.

Tier I and II indicators' metadata (as of 4 April 2019) are available in the metadata repository. Tier III indicators require work plans to be developed outlining the methodological development of the indicators for approval by the IAEG-SDGs and are available as of March 2017.

With regards to the SDG 14, **Table 1** presents the Tier Classification of SDG Indicators and Custodian Agencies.

² <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/>

Table 1. Tier Classification of SDG Indicators (as of 4 April 2019) for Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Target	Indicator	Custodian Agency(ies)	Partner Agency(ies)	Tier
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density	UNEP	IOC-UNESCO, IMO, FAO	Tier III
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches	UNEP	IOC-UNESCO, FAO	Tier III
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	IOC-UNESCO	UNEP	Tier II
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels	FAO		Tier I
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas	UNEP-WCMC, UNEP	Ramsar	Tier I
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation[b]	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	FAO		Tier II
14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	14.7.1 Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	FAO, UNEP-WCMC"		Tier II

Target	Indicator	Custodian Agency(ies)	Partner Agency(ies)	Tier
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	IOC-UNESCO	UNEP	Tier II
14.b Provide access for small-scale artisanal fishers to marine resources and markets	14.b.1 Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries	FAO		Tier II
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of “The future we want”	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	"UN-DOALOS, FAO, UNEP, ILO, other UN-Oceans agencies"		Tier III

There are many SDG data portals and data initiatives that have been developed since 2015, and many more are under development, at the regional level, and thematic portals at the global level which include:

- **The SDG National Reporting Initiative** - <http://SDGreporting.org>. Launched in October 2017 to support government reporting on the SDGs for data-driven policymaking. This initiative, led by the Center for Open Data Enterprise (CODE) and funded by the William and Flora Hewlett Foundation, is a two-year effort to facilitate greater information-sharing around SDG reporting by leveraging international, regional, and local learned lessons.
- **The global Partnership for Sustainable development data** - <http://www.data4sdgs.org/> which supports action at the local, national, and global level to ensure the new opportunities of the data revolution are used to achieve the Sustainable Development Goals
- **The Sustainable Development Goals indicators database** - <https://unstats-undesa.opendata.arcgis.com/>. The database contains data on the global Sustainable Development Goal indicators used in the Sustainable Development Goals Report 2017 and includes country-level data as well as regional and global aggregates.
- **IISD data portal on indicators for the Sustainable Development Goals (SDGs)**. <https://sustainable-development-goals.iisd.org/country-data> which provides visualizations of the indicators that countries are choosing to report on for the SDGs: a bottom-up view of national indicator reporting, based on the top-down indicators selected by the United Nations (UN). The indicator data is compiled, as it becomes available, based on reviews of countries' voluntary reports to the UN High-Level Political Forum.

Given the unique role of LME organizations and GEF projects in data and information management, each region can consider aligning reporting with the SDG targets and indicators, so as to support countries in their reporting, coordinate with relevant organizations at the regional level, and also contribute to global reporting through UN custodian agencies and global databases.

1.2 Global Environment Facility monitoring, reporting and indicators

The **Global Environment Facility (GEF)** ensures regular reporting of results from its portfolio of projects through the reporting of indicators. The GEF 6 (2014-2018) Focal Areas Strategy for IW includes a number of outcomes and indicators (see [Annex 2](#) for GEF 6 Indicators). The GEF 7 Focal Areas Strategy ([GEF, 2018](#)) for IW is focussed on the following strategic objectives:

- **Strategic Objective 1. Strengthening Blue Economy opportunities**, which includes strategic action: 1) sustaining healthy coastal and marine ecosystems; 2) catalyzing sustainable fisheries management; and, 3) addressing pollution reduction in marine environments.
- **Strategic Objective 2. Improve management in the Areas Beyond National Jurisdiction (ABNJ)**
- **Strategic Objective 3. Enhance water security in freshwater ecosystems**, which includes strategic action: 1) advance information exchange and early warning; 2) enhance regional and national cooperation on shared freshwater surface and groundwater basins; and, 3) invest in water, food, energy and environmental security.

To monitor the results of the GEF 7 strategic objectives there are a number of core indicators and sub-indicators (GEF, 2018b), summarized in Table 2. Whilst indicators 2 (marine protected areas), 5 (marine habitats), 7 (water ecosystems) and 8 (fisheries) are related to the International Waters Focal Area, other indicators may also be relevant depending on the project.

Table 2. GEF-7 Core Indicators and Sub-Indicators

GEF 7 Core Indicator	GEF 7 Sub-Indicators
1. Terrestrial protected areas created or under improved management for conservation and sustainable use (hectares)	<ul style="list-style-type: none"> • Terrestrial protected areas newly created • Terrestrial protected areas under improved management effectiveness
2. Marine protected areas created or under improved management for conservation and sustainable use (hectares)	<ul style="list-style-type: none"> • Marine protected areas newly created • Marine protected areas under improved management effectiveness
3. Area of land restored (hectares)	<ul style="list-style-type: none"> • Area of degraded agricultural lands restored • Area of forest and forest land restored • Area of natural grass and shrublands restored • Area of wetlands (including estuaries and mangroves) restored
4. Area of landscapes under improved practices (hectares; excluding protected areas)	<ul style="list-style-type: none"> • Area of landscapes under improved management to benefit biodiversity (qualitative assessment, noncertified) • Area of landscapes that meet national or international third-party certification and that incorporates biodiversity considerations • Area of landscapes under sustainable land management in production systems • Area of High Conservation Value forest loss avoided
5. Area of marine habitat under improved practices to benefit biodiversity (hectares; excluding protected areas)	<ul style="list-style-type: none"> • Number of fisheries that meet national or international third-party certification that incorporates biodiversity considerations • Number of Large Marine Ecosystems with reduced pollution and hypoxia
6. Greenhouse gas emissions mitigated (metric tons of carbon dioxide equivalent)	<ul style="list-style-type: none"> • Carbon sequestered or emissions avoided in the sector of Agriculture, Forestry and Other Land Use • Emissions avoided • Energy saved (megajoules) • Increase in installed renewable energy capacity per technology (megawatts). Repeat for each technology (drop-down list)
7. Number of shared water ecosystems (fresh or marine) under new or improved cooperative management	<ul style="list-style-type: none"> • Level of Transboundary Diagnostic Analysis and Strategic Action Program formulation and implementation • Level of regional legal agreements and regional management institution(s) to support its implementation • Level of national/local reforms and active participation of Inter-Ministerial Committees • Level of engagement in IW:LEARN through participation and delivery of key products
8. Globally over-exploited fisheries moved to more sustainable levels (metric tons)	
9. Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials, and	<ul style="list-style-type: none"> • Solid and liquid Persistent Organic Pollutants (POPs) and POPs containing materials and products removed or disposed (POPs type) • Quantity of mercury reduced • Hydrochlorofluorocarbons reduced/phased out

GEF 7 Core Indicator	GEF 7 Sub-Indicators
products (metric tons of toxic chemicals reduced)	<ul style="list-style-type: none"> • Number of countries with legislation and policy implemented to control chemicals and waste • Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing, and cities
10. Reduction, avoidance of emissions of POPs to air from point and non-point sources (grams of toxic equivalent gTEQ)	<ul style="list-style-type: none"> • Number of countries with legislation and policies implemented to control emissions of POPs to air • Number of emission control technologies/practices implemented
11. Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment	

1.3 LME Management Effectiveness Scorecard

The Large Marine Ecosystem (LME) Management Effectiveness Scorecard (see <https://iwlearn.net/manuals/>) provides LME managers and stakeholders with a tool to quickly evaluate management effectiveness to help improve decision making in LME implementation. Once completed by users, the scorecard will provide basic guidance that allow users to prioritize their efforts and determine tools to improve towards management targets.

The goal of the scorecard is to provide LME managers and stakeholders with a dynamic approach for assessing their management performance against conservation and sustainable use standards, anchored on ecosystem-based management principles. The tool is tailored to relate with the ecological, governance, and social context of LMEs. The tool can be applied both at national, subnational scales, and at LME level, allowing the tool to provide a regional vision for effective management according to regional and national goals.

The scorecard should be completed by the LME manager either with a core set of relevant actors, or with comprehensive group representative of all the stakeholders within the LME area. The application of this tool not only allows LME stakeholders to consolidate a baseline of the current management status of the area and to monitor management effectiveness over time, but also provides a vehicle to strengthen stakeholder engagement and participation to strengthen integrated and effective management of an LME.

The scorecard includes four key sections:

1. LME Data Sheet: Description and Characteristics of the LME
2. LME Management Effectiveness Scorecard: A Rapid Evaluation of LME Progress
3. Summary Assessment Results: A Summary of Relative Progress on Each LME Management Modules
4. Priority Actions Based on Results: Identifying Actions to Fill Gaps and Strengthen Management
5. Multi country average results

The scorecard indicators are summarized in **Annex 3**.

1.4 Other relevant global and regional indicators

There are numerous indicators (and indices) developed for the purpose of assessing and reporting on the marine and coastal environment and LMEs, from global, regional and national indicators that can be considered. Below are some examples of the global and regional indicator and indices relevant to LMEs.

The **GEF Transboundary Waters Assessment Programme (TWAP)** project assessed a number of indicators for transboundary water system categories (groundwater, lakes/reservoirs, rivers, large marine ecosystems) as part of the [global-scale assessment](#). The TWAP indicators and data can be accessed on the [One Shared portal](#), and the LME assessment, following the 5-Modules approach, is based on the agreed indicators is presented in **Table 3** (IOC-UNESCO and UNEP, 2016).

Table 3. TWAP LME Indicators and indices³

Module	Indicators
Socio-economics	<ul style="list-style-type: none"> • Coastal population and area of country segment within 100 km coastal zone • Coastal population by elevation up to 10 m and by distance from shore up to 50 km • Coastal poor • Fisheries revenues • Fish contribution to animal protein consumption • Tourism revenues • Tourism contribution to GDP • Night Light Development Index • Human Development Index • Projected Human Development Index 2100 • Present-day Climate-related Extreme Events Index • Sea-level Rise Threat Index 2100 • Contemporary Threat Index (includes measures of ecosystem state, socio-economic dependence, climate event risk, and capacity to adapt)
Governance	Governance arrangements or architecture related to fisheries, pollution, and biodiversity (including habitat destruction): <ul style="list-style-type: none"> • Completeness of the structure of arrangements to address a given issue or issues • Integration of institutions involved in addressing identified transboundary issues • Engagement of countries participating in arrangements
Productivity	<ul style="list-style-type: none"> • Average annual primary productivity, 1998– 2013 • Chlorophyll a concentrations and trends, 2003–2013 • Sea surface temperature trends, 1957– 2012
Fish and Fisheries	<ul style="list-style-type: none"> • Ratio of capacity-enhancing subsidies to value of landed catch • Primary production required (ecological footprint of fisheries) • Marine Trophic Index • Fishing-in-Balance Index • Stock status by number of stocks and catch biomass of exploited stocks • Catch from bottom-impacting gear types

³ For data sources of all indicators see <http://onesharedocean.org/data>

Module	Indicators
	<ul style="list-style-type: none"> Fishing effort Change in catch potential under global climate change (2050s) Fishery production potential
Pollution and Ecosystem Health	<ul style="list-style-type: none"> Relative abundance of floating micro- and macro-plastics Concentrations of three types of persistent organic pollutants (POPs) in plastic resin pellets washed up on shore Indicator of coastal eutrophication based on two sub-indicators: nitrogen input from rivers and nutrient ratios Extent of mangrove Reefs at Risk Index2 Extent of warm-water coral reefs Changes in the areas protected in LMEs between 1983 and 2014 Cumulative Human Impacts Index – CHI (incorporating data layers for ocean acidification and sealevel rise, commercial and artisanal fishing, land-based pollution, oil rigs, light pollution, invasive species, commercial shipping, and direct human impact on sensitive ecosystems) Ocean Health Index (measuring progress on ten widely-agreed public goals for healthy oceans, including food provision, carbon storage, coastal livelihoods and economies, and biodiversity)

The **Regional Seas Programme** covers 18 regions of the world, several of which have adopted a convention and associated thematic protocols, along with numerous strategic documents. Whilst the geographic areas of the Regional Seas and LMEs are not exactly the same (with some exceptions such as the Caspian, Baltic, Mediterranean and Black Sea) there is close coordination between SAP development and implementation and the Regional Seas Secretariats and their strategies. The Regional Seas established an Indicator Working Group in 2015 which resulted in the adoption of a core set of 22 indicators related to SDG 14 (**Table 4**), and an initial analysis of synergies between the Regional Seas core indicator set, SDGs and Aichi Biodiversity Targets (UNEP, 2016). Methodologies for these indicators are currently under development, and in 2018 Guidelines were published for the “*Regional Seas Follow Up and Review of the Ocean Related Sustainable Development Goals* (UNEP, 2018).

Table 4. Regional Seas Core Indicators Set

Category of Indicator	Possible regional Seas Coordinated Indicator	SDG 14 target
1. Total inputs of nitrogen and phosphorus from agriculture, sewage and atmospheric nitrogen	Chlorophyll a concentration as an indicator of phytoplankton biomass	14.1
2. Inputs of marine chemical pollution Trends for selected priority chemicals	Trends for selected priority chemicals including POPs and heavy metals	14.1
3. Overall levels of marine litter Quantification of beach litter items	Quantification and classification of beach litter items	14.1
4. Ocean warming	Annual mean sea surface temperature (25m below the surface)	14.3
5. Fish landings	Fish catches within EEZs (tonnes) – total capture production	14.4
6. Aquaculture	Application of risk assessment to account for pollution and biodiversity impacts	14.4

Category of Indicator	Possible regional Seas Coordinated Indicator	SDG 14 target
7. Aquaculture	Destruction of habitat due to aquaculture	
8. Population pressure / urbanization	Length of coastal modification and km ² of coastal reclamation	14.2
9. Eutrophication status	Locations and frequency of algal blooms reported	14.1
10. Pollution hot spots⁴	1) Concentration of Status of selected pollutant contamination in biota and sediments and temporal trends 2) Number of hotspots	14.1
11. Ocean acidification	1) Aragonite saturation 2) pH 3) Alkalinity	14.3
12. Level of exploitation of commercial fisheries	FAO stock status: % stocks overfished compared to MSY	14.4
13. Species replacement as a consequence of capture fisheries	Marine trophic index	14.5
14. Endangered species	Distribution of Red List Index species	14.5
15. Loss of critical habitat	Trends in critical habitat extent and condition	14.5
16. National Action Plans to reduce input from LBS	% National action plans ratified / operational	14.1
17. Waste water treatment facilities	1) % coastal urban population connected to sewage facilities 2) % of waste water facilities complying with adequate standards 3) % of untreated waste water	14.1
18. Incentive to reduce marine litter at source	1) % port waste reception facilities available 2) Incentives to reduce land-based sources ⁵ 3) Amount of recycled waste on land (%)	14.1
19. Climate change adaptation	1) % national adaptation plans in place 2) Sector based national adaptation plans 3) Number of existing national and local coastal and marine plans incorporating climate change adaptation	14.3
20. Fish harvested within safe ecological limits	Fisheries measures in place (by-catch limits, area-based closures, recovery plans, capacity reduction measures) and multilateral/bilateral fisheries management arrangements	14.4
21. Critical marine habitat under protection	% Marine protected areas designated	14.5
22. National ICZM in place	National ICZM guidelines and enabling legislation adopted	14.2

The **Organisation for Economic Co-operation and Development (OECD)**, which includes data on several sectors including the environment (<https://data.oecd.org/>) conducted a preliminary assessment of indicators for SDG 14 on “Oceans” in 2017 and identified SDG 14 and examples of relevant OECD work on data and indicators, as well as recommendations for the future (Virto, 2017), as summarized in **Table 5**.

⁴ Actual pollution hotspot and source of hotspot

⁵ In monetary terms

Table 5. SDG 14 and examples of relevant OECD work on data and indicators

SDG 14 Target	Existing OECD data and indicators	Data and indicators that the OECD could develop
14.1 marine pollution	Nutrient N, P balance Air emissions of nitrogen oxides, sulphur oxides, particulate matter Water quality River quality Wastewater treatment (% of population connected) Standards- nitrogen oxides, sulphur oxides, particulate matter Taxes – nitrogen oxides, sulphur oxides, pesticides, fertilizers	Nitrogen effluents from wastewater Micro-pollutants Plastic waste generation and recycling % of coastal urban population connected to a wastewater treatment system (cf. “Marine Environment” section of the State of the Environment Questionnaire) Expenditures and policies on prevention of pollutant infiltration, cleaning up of soil and water bodies
14.2 marine ecosystems	Number of threatened species (% of known species) based on an OECD questionnaire in line with the Red List of threatened species	Length of coastal modification Extent of coastal reclamation Direct social and economic costs in coasts and the oceans caused by (natural) disasters Number of countries having adopted and implementing maritime spatial plans Number of countries applying the ecosystem-based management approach Marine relevant policy response indicators based on the OECD Policy Instruments for the Environment database.
14.3 ocean acidification	CO2 emissions (Production-based CO2 productivity Consumption-based CO2 productivity) SOx emissions (total, shipping) Fuel consumption or sales in shipping Tax revenue (% gross domestic product) - all CO2 emissions Effective carbon rates Fossil fuel support	Policy instruments directed at emissions from shipping Effective carbon rates and fossil fuel support accounting for maritime transport
14.4 IUU fishing		Indicators to monitor expenditures to fight IUU fishing, subsidies that potentially benefit IUU activities, and adoption of best management practices - forthcoming
14.5 conservation	Marine Protected Areas by IUCN management category, based on United Nations Environment World Conservation Monitoring Centre data	Land cover in coastal areas (wetlands, mangroves, ...)
14.6 subsidies	Total budgetary support provided to the fishing sector	Change in composition of support to fishers—share of most harmful forms of support in total—forthcoming
14.7 development	Official development assistance (ODA) flows to fisheries and tourism sectors	ODA to sustainable fisheries, aquaculture and tourism as well as ocean conservation and sustainable use Existing data collected on ODA for tourism data could be filtered for marine relevance

SDG 14 Target	Existing OECD data and indicators	Data and indicators that the OECD could develop
14.a science	Fisheries: Technology development and diffusion (based on patent data) Fisheries: R&D spending Shipbuilding: R&D spending Research networks Official development assistance to waste management and disposal; to flood prevention/ control; to fishery research + ocean conservation and sustainable use	Environmentally-relevant marine technology development and diffusion Environmentally-relevant R&D spending in marine sectors
14.b research		Small-scale fishers in seafood value chains Fish-related non-tariff measures for small-scale fishers
14.c technology		Participation rate in international and regional marine agreements

UNEP World Conservation Monitoring Centre (UNEP WCMC) in addition to developing [Ocean+](#) portal, including a GIS and library of relevant meta-data, also hosts the [Biodiversity Indicators Partnership \(BIP\)](#), a global initiative to promote and coordinate the development and delivery of biodiversity indicators and includes a list of relevant indicators in relation to marine and freshwater habitats, pollution as well as in relation to the SDGs.

UNEP DHI recently developed a [Water Indicator Builder](#). It is an online tool that enables users to explore and create indicator frameworks to support management and decision-making for improved water resources management. It offers a comprehensive, built-in indicator framework that users can modify and build on, as well as a growing library of indicators for creation of new, customized indicator frameworks.

The [World Bank - World Development Indicators](#) is a compilation of relevant, high-quality, and internationally comparable statistics about global development and the fight against poverty. The database contains 1,600 time series indicators for 217 economies and more than 40 country groups, with data for many indicators going back more than 50 years.

At the regional or LME level, regional organizations have developed monitoring and assessment programs and indicators in order to track progress in the achievement of agreed regional level targets. Some examples of these include:

- The [Strategic Action Programs](#) developed through GEF LME projects. Out of the 66 LMEs globally, GEF has supported 24 of these LME's over the last 25 years. This has resulted in the development of SAPS in 18 LME's, which were adopted by the countries and outline the targets and actions and indicators to achieve sustainable management of the marine and coastal environment of the LME;
- The majority of the [Regional Seas Program](#) have developed several strategies and thematic plans for the protection and sustainable use of the marine and coastal environment, including indicators, and in some cases monitoring and assessment programs with agreed indicators. A review of Regional Seas objectives, targets and indicators is included in the Regional Seas Follow Up and Review of the Sustainable Development Goals (UNEP, 2018) and detailed case studies (UNEP, 2018b);

- The **UN Regional Commissions** include the Economic Commission for Africa (UNECA); Economic Commission for Europe (UNECE); Economic Commission for Latin America and the Caribbean (UNECLAC); Economic and Social Commission for Asia and the Pacific (UNESCAP). The member states are supposed to translate global commitments into regional transformative strategies and agendas by driving the integration and inclusivity considerations in national policies, programmes and budgets, and by piloting the 2030 Agenda implementation. Since the 2030 Agenda recognized the significance of the regional dimension of development and the important role of regional organizations and platform in the implementation, follow up and review, many of the Regional Commissions have aligned their assessment and reporting (and associated indicators) with the SDGs;
- **Regional Fisheries Management Organization (RFMOs)** are responsible for the management of fishery resources in a particular region of international waters or of highly migratory species. Many of these RFMOs cooperate closely with LME projects, Regional Seas etc., for the monitoring and assessment of the marine ecosystem, including joint indicators and assessments (such as the Mediterranean cooperation between the Mediterranean Action Plan and the General Fisheries Commission for the Mediterranean);
- Other Regional bodies such as the European Commission which adopted indicators to monitoring the Marine Strategic Framework Directive (MSFD) and coordinated work on indicators in Europe, including the [Wise Marine – Marine and Information System for Europe](#).

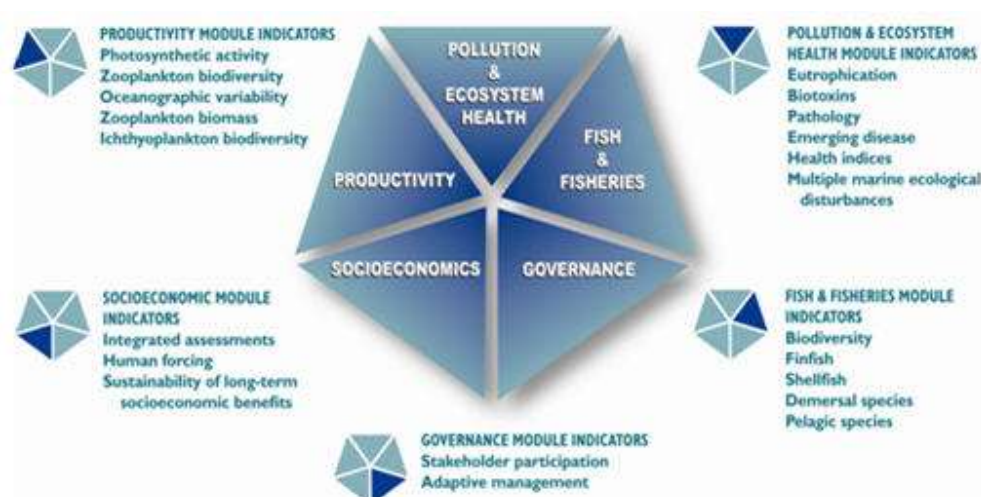
1.5 Approaches and categorization of indicators

Part of the LME approach is the application of a 5-module strategy for measuring the changing states of LMEs, and for taking remedial actions toward the recovery and sustainability of degraded goods and services (**Figure 2**). From a management perspective, it is essential to establish a baseline condition against which to measure the success or failure of actions to recover depleted fish stocks, restore degraded habitats, and reduce and control coastal pollution and nutrient over enrichment. The 5 modules are focused on the application of suites of indicators for measuring LME: (i) productivity and oceanography, (ii) fish and fisheries, (iii) pollution and ecosystem health, (iv) socioeconomics and (v) governance.

Different categorizations of indicators are typically used in LME strategies, which need to be considered in the proposal of a core set of common LME indicators. Overall indicators are developed to report on the progress in achieving the agreed objectives of targets within the LME and to monitor the state of the environment. GEF projects and SAPs typically include:

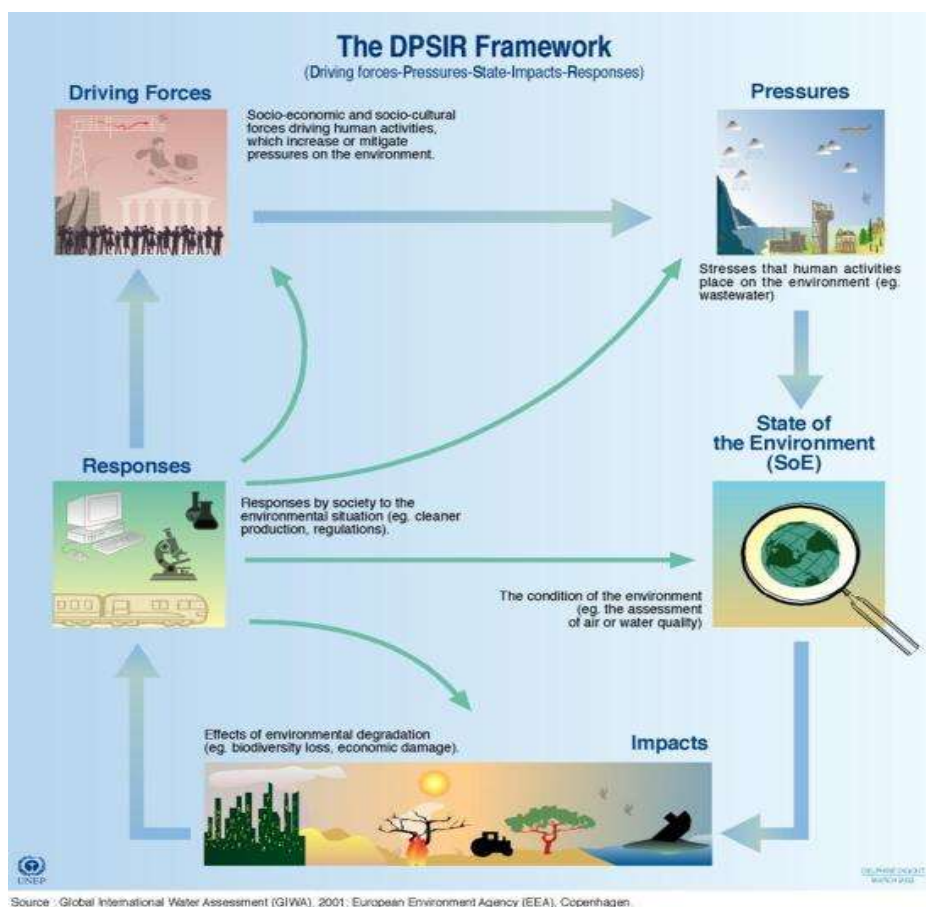
- Process indicators – Adoption of agreed processes and reforms regionally and nationally for particular sector (equivalent to “response” indicators)
- Stress Reduction indicators – Implementation of on-the ground measures leading to reduced stress (equivalent to “pressure” indicators)
- Environmental/Water Resources Status indicators – Actual improvement in water resources/water environment/socioeconomic conditions (equivalent to “state” and “pressure” indicators)

Figure 2. LME 5 Modules



Examples of such indicators are provided in the [IW:LEARN TDA/SAP Manual](#). Another relevant and common approach to the classification of indicators is the Driver-Pressure-State-Impact-Response (DPSIR) approach, which is also useful for assessing the relationship between causes and impacts in an LME (Figure 3), and is a tool that has been used in many of the global and regional state of environment and assessment reports.

Figure 3. DPSIR Framework⁶



⁶ Delphine Digout, UNEP/GRID-Arendal, <https://www.grida.no/resources/5810>

2. Proposal for a common set of LME indicators

2.1 Relevant LME indicators

In order to identify a set of common LME indicators, a review of SAP and other LME indicator frameworks, relevant SDG Indicators (see [Annex 1](#)), Regional Seas indicators, TWAP, BIP, the LME Scorecard and other indicator frameworks was conducted. As a result of this review, the most commonly found indicators and indices for the majority of LMEs are presented in [Table 6](#). It should be stressed that this list of indicators is far from exhaustive, and many LMEs will have access to additional data. This list prioritizes commonly agreed indicators such as the SDGs and GEF 7 Core Indicators and also considers those indicators for which global databases are available in additional national and regional databases (see [Table 7](#)). They are categorized according to the LME 5 modules (with reference to their type according to the DPSIR approach).

- 1) **Productivity and Oceanography.** Data on oceanography and productivity is key to ensuring targeted and sustainable activities to manage marine and coastal resources and the majority of TDAs capture some of this information. Projects however rely on existing data available from national institutions or databases.
- 2) **Fish and Fisheries.** For those LME projects that address fisheries, the majority cooperate with FAO and regional fisheries bodies in terms of data and activities, and indicators are therefore generally in line with FAO fisheries data.
- 3) **Pollution and Ecosystem Health.** All LME projects predominantly focus on assessing and actions to address pollution and ecosystem degradation, in close cooperation with regional and national institutions, scientists and experts to ensure the inclusion of all available scientific knowledge and data is integrated into project activities. There still remains for many regions a lack of pollution and biodiversity monitoring data, and there is therefore a strong reliance on expert knowledge and engagement of local communities, as well as existing regional and global databases and satellite data (i.e. for chlorophyll-a, habitat types and changes etc.)
- 4) **Socioeconomics.** Pollution pressure and unsustainable fishing, agriculture, industry constitute the main causes of degradation to the marine and coastal environment, along with poverty and lack of awareness and education, and therefore LME projects are designed based on socio-economic data and information and also contribute through assessment and economic evaluations.
- 5) **Governance.** Strengthening the regional and national level policy, legislation and institutional framework for the better management of marine and coastal resources and habitats is foundational work of all LMEs, the majority of which have worked towards the development and adoption of regional policy frameworks (such as the LME SAPs), as well as supporting regional governance such as Regional Seas and LME Commissions where relevant. Therefore, the monitoring and reporting of governance agreements and targets within the LME is essential, and will enable future analysis of the impact of improved governance to better management and stress reduction. Whilst the majority of LMEs have adopted SAPs, there are few examples of reporting against these targets.

In addition to the LME 5 modules, a number of other useful LME relevant indices are presented.

Table 6. Common indicators relevant to the LMEs⁷

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
1) PRODUCTIVITY AND OCEANOGRAPHY				
1.	Climate Change/Oceanography	SDG indicator 14.3.1 (see Table 1)	Average marine acidity (pH) measured at agreed suite of representative sampling stations	S
2.	Climate Change/Oceanography	Regional Sea Indicator 11 (see Table 4)	Ocean Acidification: 1) Aragonite saturation; 2) pH; 3) Alkalinity	S
3.	Climate Change/Productivity	Regional Sea Indicator 4 TWAP (see Table 3) /LME Scorecard	Annual mean sea surface temperature and trends	S
4.	Productivity/nutrient pollution	RS Indicator 1 TWAP/LME Scorecard	Chlorophyll a concentration and trends	S
5.	Productivity	TWAP/LME Scorecard	Average annual primary productivity,	S
6.	Productivity	LME	Phytoplankton production (satellite/remote sensing)	S
7.	Productivity	LME	Zooplankton abundance and biomass	S
2) FISH AND FISHERIES				
8.	Overfishing/sustainable fisheries management	SDG indicator 14.4.1, BIP	Proportion of fish stocks within biologically sustainable levels	P
9.	Overfishing/sustainable fisheries management	RS Indicator 5 FAO indicator	Fish catches within EEZs (tonnes) – total capture production	P
10.	Aquaculture	RS Indicator 6	Application of risk assessment to account for pollution and biodiversity impacts (on Aquaculture).	P
11.	Aquaculture	RS Indicator 7	Destruction of habitat due to aquaculture	P
12.	Overfishing/sustainable fisheries management	RS Indicator 12	FAO stock status: % stocks overfished compared to MSY	P
13.	Overfishing/sustainable fisheries management	RS Indicator 20	Fisheries measures in place (by-catch limits, area-based closures, recovery plans, capacity reduction measures) and multilateral/bilateral fisheries management arrangements	P
14.	Biodiversity/Fisheries	RS Indicator 13 TWAP, BIP	Marine trophic index	P

⁷ The proposal of core indicators as per Table 7 are highlighted

⁸ See reference to indicators listed in Table 1, 2, 3 and 4

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
15.	Overfishing/sustainable fisheries management	FAO regional indicators	Size Composition in Fish Communities	S
			Spawning Stock biomass	S
			Fishing Mortality	S
			Total landings	P
3) POLLUTION AND ECOSYSTEM HEALTH				
16.	Wastewater and water resource management	SDG indicator 6.3.1	Proportion of wastewater safely treated	R
17.	Wastewater and water resource management	SDG indicator 6.3.2	Proportion of bodies of water with good ambient water quality	S
18.	Wastewater and water resource management	SDG indicator 6.6.1	Change in the extent of water-related ecosystems over time	P
19.	Wastewater and water resource management	LME	Release of nutrients from municipal wastewater	P
20.	Eutrophication/marine litter	SDG indicator 14.1.1	Index of coastal eutrophication and floating plastic debris density	S
21.	Eutrophication	LMEs, TWAP	Concentrations of key nutrients (DIN, TP, etc)	S
22.	Eutrophication	RS Indicator 9	Locations and frequency of algal blooms reported	S/P
23.	Marine Litter	RS Indicator 3	Quantification and classification of beach litter items	P
24.	Urban solid waste/marine litter	SDG indicator 11.6.1	Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities	P
25.	Urban solid waste/marine litter	LME	No of Uncontrolled dumpsites in Coastal Areas	P
26.	Pollution/Hazardous waste	SDG indicator 12.4.2	Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	P
27.	Pollution	RS Indicator 2 TWAP	Trends for selected priority chemicals including POPs and heavy metals	S/P
28.	Pollution	RS Indicator 10	Pollution hotspots (i) Concentration of Status of selected pollutant contamination in biota and sediments and temporal trends; (ii) Number of hotspots	P
29.	Pollution/industry	LME	Total pollution (BOD, nitrogen, phosphorus, heavy metals, furans and dioxins, PAHs etc) load discharged from industrial installations to the marine environment.	P

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
30.	Pollution/industry	LME	Number of environmental inspections carried out by enforcement authorities in which industrial installations were found to be in breach of laws and regulations relative to the total number of executed inspections.	P
31.	Pollution/oil spills	LMEs	Occurrence, origin and extent of acute pollution events/oil spills from ships	P
32.	Non-indigenous species	LMEs	Trends in marine non-indigenous species	S
33.	Ecosystem/MPA	SDG indicator 14.5.1 RS Indicator 21 GEF 7 Core indicator (see Table 2)	Coverage of protected areas in relation to marine areas	R
34.	Ecosystem/MPA	BIP, GEF 7 Core Indicator	Protected Areas Management Effectiveness	R
35.	Biodiversity/Mangroves	TWAP	Change in extent of mangrove habitat	S
36.	Biodiversity	SDG indicator 15.1.2	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	R
37.	Biodiversity	SDG indicator 15.5.1 RS Indicator 14	Red List Index Distribution of Red List Index species	S
38.	Biodiversity	LMEs	Population trends and/or abundance in key species for marine mammals, seabirds and marine turtles	S
39.	Biodiversity/bycatch	LMEs	Number of drowned mammals and water-birds in fishing gear	S
40.	Biodiversity	RS Indicator 15	Trends in critical habitat extent and condition	P
41.	Coastal ecosystems	RS Indicator 8	Length of coastal modification and km2 of coastal reclamation	P
4) SOCIOECONOMICS				
42.	Socio-Economic Baseline indicators	LME Scorecard	Population living below income poverty line	D
43.	Socio-Economic Baseline indicators	LME Scorecard	Unemployment rate	D
44.	Socio-Economic Baseline indicators	LME Scorecard	Median years of education	D
45.	Socio-Economic Baseline indicators	LME Scorecard	Access to health services per 1,000 inhabitants	D
46.	Socio-Economic Baseline indicators	LME Scorecard	Nutrition - prevalence of anemia	D
47.	Socio-Economic Baseline indicators	LME Scorecard	Child mortality	D
48.	Socio-Economic Baseline indicators	LME Scorecard	% GDP on Fisheries	D
49.	Socio-Economic Baseline indicators	LME Scorecard	% GDP on International tourism	D
50.	Socio-Economic Baseline indicators	LME Scorecard	Urban and Rural Population living within 10m coastal elevation	D
51.	Socio-Economic Baseline indicators	LME Scorecard	Human Development Index	D
52.	Socio-Economic Baseline indicators	LME Scorecard	Deaths per 100,000 caused by climate related natural disasters	D

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
53.	Population pressure	LME	% of population living in Coastal Areas	D
54.	Tourism	LME	% of Tourists in Coastal Areas	
55.	Tourism	SDG indicator 8.9.1	Tourism direct GDP as a proportion of total GDP and in growth rate	D
56.	Tourism	SDG indicator 8.9.2	Proportion of jobs in sustainable tourism industries out of total tourism jobs	D/R
57.	Water and sanitation	SDG indicator 6.1.1	Proportion of population using safely managed drinking water services	D/R
58.	Water and sanitation	SDG indicator 6.2.1	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	D/R
59.	Wastewater/pollution	RS Indicator 17	Waste Water (i) % coastal urban population connected to sewage facilities and (ii) % of waste water facilities complying with adequate standards; (iii) % of untreated waste water	R
60.	Fisheries	SDG indicator 14.7.1	Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	R
61.	Renewable energy	SDG indicator 7.2.1	Renewable energy share in the total final energy consumption	R
62.	Renewable energy	SDG indicator 7.a.1	International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	R
63.	Sustainable Consumption & Production	SDG indicator 12.2.1	Material footprint, material footprint per capita, and material footprint per GDP	D
64.	Sustainable Consumption & Production	SDG indicator 12.2.2	Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	D
65.	Climate Change	SDG indicator 13.1.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	D
66.	Ecosystems/funding	SDG indicator 15.a.1	Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	R
67.	SAP Funding	LME/GEF TT	Amount of leveraged finance for SAP/SAP equivalent implementation from public/public-private partnerships.	R
68.	Monitoring/assessments	LME	National funding to implement monitoring programmes to assess the state of the marine environment and its coastal areas	R
5) GOVERNANCE				
69.	Global/Regional Conventions and instruments	SDG indicator 14.c.1	Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the	R

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
			United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	
70.	Regional Seas Conventions	LME	Number of ratifications and level of compliance as reported by Regional Convention Contracting Parties	R
71.	TDA/SAP	GEF 7 Core Indicator	Level of Transboundary Diagnostic Analysis and Strategic Action Program formulation and implementation	R
72.	SAP implementation	GEF 7 Core Indicator	Level of regional legal agreements and regional management institution(s) to support its implementation	R
73.	SAP Interministerial Committees	GEF 7 Core Indicator	Level of national/local reforms and active participation of Inter-Ministerial Committees	R
74.	IW:LEARN	GEF 7 Core Indicator	Level of engagement in IW:LEARN through participation and delivery of key products	R
75.	SAP relevant National Plans	LME	No and % countries with national plans or strategies in support of SAP implementation (i.e. for marine litter, waste management, marine biodiversity, water resource management, coastal zone management)	R
76.	Environmental Inspections	LME	Number of environmental inspections carried out by enforcement authorities in which industrial installations were found to be in breach of laws and regulations relative to the total number of executed inspections.	R
77.	Awareness raising/education	LME	Number/yr of national awareness campaigns (pollution, marine litter, marine and coastal ecosystems etc) Number of university courses regarding LME's and marine and coastal environment	R
78.	National monitoring and reporting	LME	Number of % of countries with National Monitoring programmes to assess the state of the marine environment and its coastal areas and compliance with domestic standards on releases and/or quality of the marine environment; Number of assessment publications made publicly available	R
79.	Water and sanitation	SDG indicator 6.5.1	Degree of integrated water resources management implementation (0-100)	R
80.	Water and sanitation	SDG indicator 6.5.2	Proportion of transboundary basin area with an operational arrangement for water cooperation	R
81.	Ecosystem/EEZ/ICM	SDG indicator 14.2.1	Proportion of national exclusive economic zones managed using ecosystem-based approaches	R
82.	Fisheries	SDG indicator 14.6.1	Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	R

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
83.	Research	SDG indicator 14.a.1	Proportion of total research budget allocated to research in the field of marine technology	R
84.	Fisheries	SDG indicator 14.b.1	Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries	R
85.	Fisheries	GEF 7 Core Indicator	Number of fisheries that meet national or international third-party certification that incorporates biodiversity considerations	R
86.	Pollution	SDG indicator 12.4.1	Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement	R
87.	Pollution from land-based sources	RS Indicator 16	% Land-based sources- National Action Plans ratified / operational	R
88.	Pollution - LME	GEF 7 Core Indicator	Number of Large Marine Ecosystems with reduced pollution and hypoxia	R
89.	Pollution/Marine Litter	RS Indicator 18	Marine Litter incentives (i) % port waste reception facilities available, (ii) Incentives to reduce land-based sources, (iii) Amount of recycled waste on land (%)	R
90.	Wastewater/pollution	RS Indicator 17	Waste Water (i) % coastal urban population connected to sewage facilities and (ii) % of waste water facilities complying with adequate standards; (iii) % of untreated waste water	R
91.	Natural Disasters/Climate Change	SDG indicator 13.1.2	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	R
92.	Climate Change	SDG indicator 13.1.3	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	R
93.	Climate Change	SDG indicator 13.2.1	Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)	R
94.	Climate Change	SDG indicator 13.3.1	Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula	R

Issue or Theme		Indicator source ⁸	Indicator/Indices title	DPSIR category
95.	Climate Change	SDG indicator 13.3.2	Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions	R
96.	Climate Change	RS Indicator 19	Climate change adaptation: 1) % national adaptation plans in place; 2) Sector based national adaptation plans; 3) Number of existing national and local coastal and marine plans incorporating climate change adaptation	R
97.	Invasive species	SDG indicator 15.8.1	Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	R
98.	Biodiversity	SDG indicator 15.9.1	Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	R
99.	International cooperation on science	SDG indicator 17.6.1	Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation	R
100.	Coastal Zone management	RS Indicator 22	National ICZM guidelines and enabling legislation adopted	R
Other Cross cutting indices and indicators				
101.	Sustainable Consumption and Production	SDG indicator 8.4.1	Material footprint, material footprint per capita, and material footprint per GDP	N/A
102.	Oceans	TWAP, BIP	Ocean Health Index	N/A
103.	Marine biodiversity and ecosystems	TWAP, BIP	Cumulative Human Impact on Marine Ecosystems	N/A
	Biodiversity	SDG indicator 15.5.1 RS Indicator 14	Red List Index Distribution of Red List Index species	N/A
	Biodiversity/Fisheries	RS Indicator 13 TWAP, BIP	Marine trophic index	N/A
104.	Biodiversity	BIP	Living Planet Index (LPI)	N/A
105.	Sustainable Consumption and Production		Ecological footprint	N/A

Table 7. Main databases available

Database	Link	Data available
IUCN Global Ocean Observing System	http://www.goosocean.org/	Ocean Data
IODE Ocean Data Portal	http://www.oceandataportal.org/	Ocean Data
National Oceanic and Atmospheric Administration (NOAA)	https://www.nodc.noaa.gov/	Ocean and atmospheric data
Sea Around Us database	http://www.seaaroundus.org	Fisheries
FAO fisheries and aquaculture	http://www.fao.org/fishery/statistics/en	Fisheries
UN Biodiversity data	https://www.unbiodiversitylab.org/	Marine and land biodiversity data
The Sustainable Development Goals indicators database	https://unstats-undesa.opendata.arcgis.com/	SDGs
UNEP WCMC Ocean+	https://library.oceanplus.org/metadata https://protectedplanet.net/	Oceans, MPAs and habitats
IUCN Red list	https://www.iucnredlist.org/assessment/red-list-index	Biodiversity
World Bank	https://data.worldbank.org/indicator	Socioeconomic data
UNDP Human Development	http://hdr.undp.org/en/data	Socioeconomic data/ Human Development Index (HDI)
Our World in Data	https://ourworldindata.org/natural-disasters	Socioeconomic/Natural disasters
UNEP Situation Room (under development)	http://uneplive.unep.org/wesr/ https://app.mapx.org/	Environment data and GIS

2.2 Initial Proposal of common LME Indicators

Whilst LMEs can consider reporting on as many of these indicators as appropriate (as well as other indicators not reported below), in **Table 8** is an initial proposal for a core set of common indicators that all LMEs should consider integrating into their regular reporting mechanisms. This sub-set of indicators are based on the following criteria:

- ✓ They provide fundamental baseline information in relation to the current status of the LME;
- ✓ They capture the major features related to pollution and biodiversity degradation/loss common to all the LMEs;
- ✓ They include the relevant GEF 7 Core Indicators which projects are obligated to report on;
- ✓ They include the core indicators used for the [TWAP Assessment of LMEs](#) where methodology is defined and data available;
- ✓ They include where relevant SDG and UNEP Regional Seas (RS) indicators. Note however that the methodologies of many of the SDG indicators are still in development (i.e. Tier II and III), and data will not yet be available. Also, the Regional Seas Indicator methodologies and reporting are still in progress. Therefore, the indicators where methodologies have not yet been defined and data is limited, have not been included below. Once data will be available in the future, these indicators should then be added; and
- ✓ They provide information on the status of relevant governance reforms and national management plans.

Table 8. Core Indicators applicable for LME reporting

No	Indicator/Indices title	Indicator Source	Data source	Theme/Purpose of indicators
1) PRODUCTIVITY AND OCEANOGRAPHY				
3	Annual mean sea surface temperature and trends	Regional Sea Indicator 4 TWAP/LME Scorecard	National data Regional and global databases and satellite data	Assesses general trends in oceanography and possible changes as a result of climate change
4	Chlorophyll a concentration and trends	RS Indicator 1 TWAP/LME Scorecard	National data Regional and global databases and satellite data	Ecosystem health, nutrient loading from point/non-point sources and eutrophication
5	Primary production	TWAP/LME Scorecard	National data Regional and global databases	
2) FISH AND FISHERIES				
8	Proportion of fish stocks within biologically sustainable levels	SDG indicator 14.4.1, BIP	National Data & FAO	To monitor status of overfishing and sustainable fisheries management (in line with SDG target 14.4)
12	FAO stock status: % stocks overfished compared to MSY	RS Indicator 12, TWAP	National Data & FAO	
14	Marine trophic index	RS Indicator 13 TWAP, BIP	CBD/The Sea Around Us	Assesses species replacement as a consequence of capture fisheries
3) POLLUTION AND ECOSYSTEM HEALTH				
20	Index of coastal eutrophication and floating plastic debris density	SDG indicator 14.1.1	National Data/ UNEP ⁹	Assesses status and trends in marine pollution from land-based sources (in line with SDG target 14.1)
21	Concentrations of key nutrients (DIN, TP, etc)	LMEs, TWAP	National Data (if available) Regional and global databases	Assesses status and trends of nutrient pollution (in line with SDG target 14.1)
22	Locations and frequency of algal blooms reported	RS Indicator 9	National reporting	Assesses status and trends in algal blooms caused by nutrient pollution (in line with SDG target 14.1)
23	Quantification and classification of beach litter items	RS Indicator 3	National and Regional Databases	Assesses status and trends in marine debris (in line with SDG target 14.1)
27	Trends for selected priority chemicals including POPs and heavy metals	RS Indicator 2 TWAP	National Data (if available)	Assesses status and trends of pollution from land-based sources (in line with SDG target 14.1)

⁹ Methodology for SDG Indicator 14.1.1 still under finalization and data to be reported and available from 2020

No	Indicator/Indices title	Indicator Source	Data source	Theme/Purpose of indicators
			Regional and global databases	
31	Occurrence, origin and extent of acute pollution events/oil spills from ships	LMEs	National Data	Assesses status and trends in accidents, pollution from ships and oil spills
33	Coverage of protected areas in relation to marine areas	SDG indicator 14.5.1 RS Indicator 21 GEF 7 Core indicator	National Data UNEP WCMC	Assesses achievement towards SDG target 14.5, and overall ecosystem health ¹⁰
35	Change in extent of mangrove habitat	TWAP	UNEP WCMC	Assesses status and trends in key habitats (in line with SDG target 14.2)
4) SOCIOECONOMICS				
48	% GDP to Fisheries	TWAP/LME Scorecard	FAO and national databases	Assesses extent to which national economy is dependent on fisheries (in line with SDG target 14.4)
49	% GDP on International tourism ¹¹	TWAP/LME Scorecard	World Bank WDI	Assesses extent to which national economy is dependent on tourism (in line with SDG target 8.9)
50	Urban and Rural Population living within 10m coastal elevation	TWAP/LME Scorecard	SEDAC (Columbia University)/World Bank	Assesses the population pressure in coastal areas that may result in increased pressure on national resources and habitats and increased pollution (in line with SDG target 14.2)
53	OR % of population living in Coastal Areas	LME	National data	
51	Human Development Index	TWAP/LME Scorecard	UNDP Human Development Index	Assesses status and trends in human development (health, education and income)
52	Deaths per 100,000 caused by climate related natural disasters	TWAP/LME Scorecard SDG Indicator 13.1.1	Our World in Data UNSD, UNEP	Assesses impacts of climate related natural disasters (in line with SDG target 13.1)
5) GOVERNANCE				
78	Number of % of countries with National Monitoring programmes to assess the state of the marine environment and its coastal areas and compliance with domestic standards on releases and/or quality of the marine environment; Number of assessment publications made publicly available	LME	National and LME reporting	Assesses the status of national monitoring programs and available data to effectively report on the marine and costal environment (in line with SDG target 17.18)

¹⁰ Further information on the effectiveness and management of MPAs is also recommended.

¹¹ To be replaced with SDG indicator 8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate, when data available.

No	Indicator/Indices title	Indicator Source	Data source	Theme/Purpose of indicators
79	Degree of integrated water resources management implementation (0-100)	SDG indicator 6.5.1	National Data UNEP	Assesses the implementation of integrated water resource management to ensure availability and sustainable management of water resources and sanitation (in line with SDG target 6.5)
85	Number of fisheries that meet national or international third-party certification that incorporates biodiversity considerations	GEF 7 Core Indicator	LME reporting	Captures the number of fisheries that are managed to benefit biodiversity, and which are certified through a third-party
87	% Land-based sources- National Action Plans ratified / operational	RS Indicator 16	LME reporting	Assesses the extent to which countries have committed and adopted national action plans for the reduction of pollution from land-based sources (in line with SDG target 14.1)
102	National ICZM guidelines and enabling legislation adopted	RS Indicator 22	National and LME reporting	Assesses the extent to which countries have committed and adopted national plans for the effective management of coastal zone (in line with SDG target 14.2)

2.3 Next Steps

For the future development of the work towards a common LME reporting the following should be considered:

- ✓ With the support of IW:LEARN and LME:LEARN, ensure regular exchange and virtual meetings of the DIM working group;
- ✓ Each LME to evaluate status of data availability for the agreed indicators, and to identify indicators that can be reported on in the short term, and those that require additional support and capacity building;
- ✓ Next phase of the DIM working group to compile available recommended methodologies including spatial and temporal aspects to support a more comparable approach between the LMEs to monitoring;
- ✓ Next phase of the DIM working group to develop a toolbox of appropriate LME indicators, building upon the current work (and with additional indicators), with methodologies should be developed and made available on-line;
- ✓ Priority should be given to reporting SDG indicators, where relevant through national reporting mechanisms. Tier I indicators have fully developed methodologies and data reporting in place, whereas Tier II and III indicators methodologies are still in development and therefore other indicators should be used in the meantime; and
- ✓ Next phase of the DIM working group to support interested LMEs in developing comparable State of Environment reports, using similar approaches, methodologies and tools.

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ANNEXES

Annex 1. Sustainable Development Goals and Associated Targets Relevant to the LMEs

SDG Target	SDG Indicator	Source/Custodian Agency
Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development		
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density	UNEP in cooperation with IOC-UNESCO
14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches	UNEP in cooperation with IOC-UNESCO
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	IOC-UNESCO in cooperation with UNEP
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels	FAO
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas	UNEP WCMC, UNEP
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation (Footnote 2: Taking into account ongoing World	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	FAO

SDG Target	SDG Indicator	Source/Custodian Agency
Trade Organization negotiations, the Doha Development Agenda and the Hong Kong ministerial mandate)		
14.7 By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	14.7.1 Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	FAO, UNEP -WCMC
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	IOC-UNESCO in cooperation with UNEP
14.b Provide access for small-scale artisanal fishers to marine resources and markets	14.b.1 Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries	FAO
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	UN-DOALOS, FAO, UNEP, ILO, other UN-Oceans agencies

The other targets and indicators that may be considered to be relevant include

SDG Target	SDG Indicator	Source/Custodian Agency
Goal 1. End Poverty in all its forms everywhere		
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population 1.5.2 Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)	UNISDR

SDG Target	SDG Indicator	Source/Custodian Agency
	1.5.3 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030	
	1.5.4 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	
Goal 5. Achieve gender equality and empower all women and girls		
5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	FAO, UN Women, UNSD
	5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control	FAO, World Bank, UN Women
Goal 6. Ensure availability and sustainable management of water resources and sanitation for all		
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services	WHO, UNICEF
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	WHO, UNICEF
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated	WHO, UN-Habitat, UNSD
	6.3.2 Proportion of bodies of water with good ambient water quality	UNEP
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0-100)	UNEP
	6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation	UNESCO-UIS, UNECE
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time	UNEP
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all		
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	"UNSD, IEA, IRENA"

SDG Target	SDG Indicator	Source/Custodian Agency
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and clear fossil-fuel technology, and promote investment in energy infrastructure and clean energy efficiency	7.a.1 International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems	"OECD, IRENA "
Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all		
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small-, and medium-sized enterprises, including through access to financial services	8.3.1 Proportion of informal employment in non-agriculture employment, by sex	ILO
8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP 8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	UNEP
8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate 8.9.2 Proportion of jobs in sustainable tourism industries out of total tourism jobs	UNWTO
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable		
11.6 By 2030, reduce the adverse per capita environmental impacts of cities, including paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	UN-Habitat, UNSD WHO
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	11.b.1 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030 11.b.2 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	UNISDR
Goal 12. Ensure sustainable consumption and production patterns		

SDG Target	SDG Indicator	Source/Custodian Agency
12.2 By 2030 achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	UNEP
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement 12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment	UNEP UNSD, UNEP
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.5.1 National recycling rate, tons of material recycled	UNSD, UNEP
Goal 13. Take urgent action to combat climate change and its impacts		
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population 13.1.2 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030 13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	UNISDR
13.2 Integrate climate change measured into national policies, strategies and planning	13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)	UNISDR
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-	UNFCCC, UNESCO-UIS

SDG Target	SDG Indicator	Source/Custodian Agency
	building to implement adaptation, mitigation and technology transfer, and development actions	
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss		
15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	FAO UNEP WCMC, UNEP
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1 Red List Index	IUCN
15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species	IUCN
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	"CBD-Secretariat, UNEP
15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.a.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems	"OECD, UNEP, World Bank"
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development		
17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	17.6.1 Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation 17.6.2 Fixed Internet broadband subscriptions per 100 inhabitants, by speed	UNESCO-UIS ITU
17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries	17.16.1 Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals	OECD, UNDP"

SDG Target	SDG Indicator	Source/Custodian Agency
17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national context”	17.18.1 Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics	UNSD, PARIS21, Regional Commissions, World Bank
	17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics	
	17.18.3 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding	PARIS21

Annex 2. GEF 6 – Focal Area’s, programs, indicators

Programs	Expected Outcomes and Indicators	Indicators
IW 1: Catalyze sustainable management of transboundary water systems by supporting multi-state cooperation through foundational capacity building, targeted research and portfolio learning.		
PROGRAM 1: Foster cooperation for sustainable use of transboundary water systems and economic growth.	<p>Outcome 1.1: Political commitment/shared vision and improved governance demonstrated for joint, ecosystem-based management of transboundary water bodies.</p> <p>Outcome 1.2: On-the-ground demonstration actions implemented, such as in water quality, quantity, conjunctive management of groundwater and surface water, fisheries, coastal habitats.</p> <p>Outcome 1.3: IW portfolio performance enhanced from active learning/KM/science/experience sharing.</p> <p>Outcome 1.4: Targeted research influences global awareness upcoming critical global concerns.</p>	<ul style="list-style-type: none"> - Indicator 1.1.1.: # of SAPs endorsed at ministerial level; - Indicator 1.1.2: Capacity of transboundary cooperation/ institution built and degree of active participation in national inter-ministry as per IW tracking tool score card - Indicator 1.1.3: Type and degree of involvement of civil society in transboundary dialogue and formulation of TDA and SAP –incl. NGOs, CSOs, academia, women groups, and private sector players; Public awareness of transboundary cooperation benefits (survey). - Indicator 1.2.1: # and type of investments at demonstration scale (as reported in IW tracking tool score card.) - Indicator 1.3.1: Active platform for learning and experience sharing across GEF-IW portfolio and with other GEF-6 relevant transboundary initiatives; - Indicator 1.3.2. Positive feedback from stakeholders/participants, including civil society representatives and women groups. - Indicator 1.4.1: Reports and publications and/or uptake of results into GEF IW projects.
PROGRAM 2 - Increase the Resilience and Flow of Ecosystem Services in the Context of Melting High Altitude Glaciers	Outcome 2.1: Adaptive management measures identified, agreed and tested in limited transboundary basins/sub-basins with high-altitude melting ice to inform future GEF replenishments.	<ul style="list-style-type: none"> - Indicator 2.1.1: Ministerial agreed transboundary action programs or sub-basin IWRM plans for demonstration basin testing of adaptive management strategies
IW 2: Catalyze investments to balance competing wateruses in the management of transboundary surface and groundwater and enhance multi-state cooperation.		
PROGRAM 3. Advance Conjunctive Management of Surface and Groundwater Resources	<p>Outcome 3.1 Improved governance of shared water bodies, including conjunctive management of surface and groundwater through regional institutions and frameworks for cooperation lead to increased environmental and socio-economic benefits.</p> <p>Outcome 3.2 Increased management capacity of regional and national institutions to incorporate climate variability and change, including improved</p>	<ul style="list-style-type: none"> - Indicators 3.1.1. Level of capacity and sustainability of regional institutions as reported in GEF 6 IW tracking tool. - Indicator 3.1.2: Functioning inter-ministerial committees at national level as reported in GEF IW tracking tool score card. - Indicator 3.1.3: # and type of national/local reforms implemented. - Indicator 3.2.1: Degree to which climatic variability and change in transboundary surface water basins and aquifers is incorporated into updated SAPs as reported in GEF IW tracking tool score card.

Programs	Expected Outcomes and Indicators	Indicators
	capacity for management of floods and droughts.	
PROGRAM 4. Water/Food/Energy/ Ecosystem Security Nexus	Outcome 4.1 Increased water/food/energy/ecosystem security and sharing of benefits on basin/sub-basin scale underpinned by adequate regional legal/institutional frameworks for cooperation.	<ul style="list-style-type: none"> - Indicator 4.1.1: #, results and type of investments within basin/sub-basin Strategic Action Programs or equivalent development plans balancing competing water uses, climate change and promoting conjunctive use of surface and groundwater implemented. - Indicator 4.1.2: Amount of leveraged finance for SAP/SAP equivalent implementation from public/public-private partnerships. - Indicator 4.1.3: Measurable water & natural resources related results and socio-economic benefits for target population, both women and men, on basin/sub-basin/ or areas of investments as reported in GEF IW tracking tool score card.
IW 3: Enhance multi-state cooperation & catalyze investments to foster sustainable fisheries, restore & protect coastal habitats, reduce pollution of coasts & LMEs		
PROGRAM 5. Reduce Ocean Hypoxia	Outcome 5.1 Elimination or substantial decrease in frequency and extend of “dead zones” in sizeable part of developing countries’ LMEs.	<ul style="list-style-type: none"> - Indicator 5.1.1: #, result and type of investments and reforms for nutrient reduction; demonstration of innovative policy, economic and financial tools and functioning national inter-ministry committees.
PROGRAM 6. Prevent Loss & Degradation of Coastal Habitats	Outcome 6.1: Coasts in globally most significant areas protected from further loss and degradation of coastal habitats while protecting and enhancing livelihoods	<ul style="list-style-type: none"> - Indicator 6.1.1: Adoption and implementation of ICM plans and reforms to protect coastal zones in LMEs (% of country coastline under ICM, # of countries adopting and applying ICM) as reported in GEF IW tracking tool score card.

Annex 3. LME Management Effectiveness Scorecard – Summary of Indicators

Scorecard Section		LME SCORECARD INDICATORS
LME DATA SHEET INDICATORS		
Socio-Economic Baseline indicators	-	<ul style="list-style-type: none"> Population living below income poverty line Unemployment rate Median years of education Access to health services per 1,000 inhabitants Nutrition - prevalence of anemia Child mortality % GDP on Fisheries % GDP on International tourism Urban and Rural Population living within 10m coastal elevation Human Development Index Deaths per 100,000 caused by climate related natural disasters
Other LME relevant indicators	-	<ul style="list-style-type: none"> Primary Productivity Chlorophyll A Sea Surface temperature
LME MODULE INDICATORS		
Section 1 Governance		
1.1. Adaptive management: strategies, plans	CORE INDICATORS	<ul style="list-style-type: none"> Coastal management strategy with long term objectives, including defining spatial scales of management with defined boundaries (Strategy based for LME) Annual work plans for implementation of strategies developed at all scales of management (LME (regional), national, subnational, MPA, etc.) Monitoring and evaluations (M&E) system for the strategy implementation Multi-stakeholder Marine Spatial Plan (MSP) Adequate needs assessment systems (capacity, policies, operational) in place Integrated and adaptive ocean management (IAOM) plans take into account various spatial scales (policies at the seascapes level: national, subnational)

Scorecard Section	LME SCORECARD INDICATORS
1.2 Regulatory frameworks: policies and legislation	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Ocean management policies are adequately integrated to allow for achievement of LME objectives <p>INDICATORS BASED ON LME</p> <ul style="list-style-type: none"> - Policy target #1 Adequacy of commercial fisheries policies to achieve food security targets (including permits, bi-catch, gear, seasonality, fleet size, quotas, eliminate subsidies, monitoring and enforcement mechanisms.) - Policy target #2 Adequacy of artisanal fisheries commercial policies to achieve food security targets (including permits, bycatch, gear, seasonality, fleet size, quotas, eliminate subsidies, monitoring and enforcement mechanisms.) - Policy target #3 Adequacy of mariculture commercial policies to achieve food security targets (including permits, bi-catch, gear, seasonality, fleet size, quotas, eliminate subsidies, monitoring and enforcement mechanisms.) - Policy target #4 Adequacy of policies with environmental standards for extractive industries (non-food natural products, oil & gas, minerals) - Policy target #5 Adequacy of policies for ocean and coastal protected areas following best practices (e.g. habitat representation, replication, minimum 30% no-take) - Policy target #6 Adequacy of policies to enable achievement of conservation objectives to protect priority biodiversity (habitats and species) - Policy target #7 Adequacy of policies to safeguard cultural practices (e.g. rights of indigenous peoples, protection of areas and species of cultural importance, perpetuation of cultural practices) - Policy target #8 Adequacy of policies with environmental standards for ocean and coastal economic activities (tourism, seafood supply chains, shipping & transportation, ports & harbors, renewable energy, ship & boat building) - Policy target #9 Adequacy of policies for watershed management following best practices - Policy target #10 Adequacy of policies for mitigating pollution (sanitation, chemical dumping) - Policy target #11 Adequacy of policies for climate change adaptation following best practices (eg. zoning, ecosystem protection, water management, food security - agriculture and fisheries) - Policy target #12 Adequacy of policies for achieving other LME objectives (specify)
1.3 Institutions and institutional arrangements	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Existence of a regional coordinating mechanism (multi-institutional arrangement): What kind of mechanism is in place for coordinating the activities of multiple partners toward a shared vision? - Presence and adequacy of national institutions engagement in LME processes - established institutions with clear mandates to support meeting of LME objectives with funded plans and goals (responsibilities and the institutions with the authority and mandate to regulate and manage living and non-living ocean and coastal resources, including extraction, conservation, and management, as well as the mandate to address stressors on the resources themselves)
1.4 Operational effectiveness	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Sufficient marine management personnel in the institutions that impact LME objectives - Adequate capacity needs assessment system in place - Capable marine management personnel in the institutions that impact LME objectives

Scorecard Section	LME SCORECARD INDICATORS
	<ul style="list-style-type: none"> - Mechanism is in place for sustained training of marine management personnel on issues related to LME management (e.g. MPAs, enforcement, fisheries, management skills, etc) - Adequate operating budget for program implementation including management, infrastructure, activities, and equipment within the LME institutions - Adequate inclusion of science and fact-based decision making applied to LME objectives - Enforcement systems adequate to support LME objectives (related to compliance of regulation on Fisheries, pollution, invasive species, habitat destruction, industries, etc)
1.5 Stakeholder participation, equity and support	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Stakeholder assessment - are the needs, concerns, preferences, and priorities of various stakeholders well understood? - Stakeholder involvement and participation - Are stakeholders (government agencies, civil society, communities, private sector, research/science/academia) involved in decision-making, governance, and management of the LME - Culture - Governing bodies, public institutions, and private entities undertake activities in a manner that is sensitive to different cultural and customary practices - Gender - Governing bodies, public institutions, and private entities undertake activities in a manner that is sensitive to gender - Effectiveness of a mechanism to address conflicts between stakeholders - Human rights - Governing bodies, public institutions, and private entities undertake activities in a manner that is sensitive to fundamental human rights (labor rights are protected, and decent working conditions and safety standards are provided, particularly for at-risk groups) - Stakeholder support - Are stakeholders supportive of, and/or involved in the conservation activities to achieve LME objectives? - Political support - Are the governing bodies supportive of, and/or involved in, the implementation of conservation activities to achieve LMSA objectives
1.6 Stakeholder Outreach and Awareness	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Stakeholders and governance bodies have adequate access to data and information on LME conservation measures <p>INDICATORS BASED ON LME</p> <ul style="list-style-type: none"> - Development and existence of a program to create awareness on LME conservation measures - Communications - Stakeholders and the general public are educated on and made aware of LME conservation measures
2. Socioeconomics	
2.1 Human Well-being (socio-economic status)	<p>CORE INDICATORS</p> <ul style="list-style-type: none"> - Percentage of people dependent on LME for their primary livelihoods living above poverty line (according to national definitions) - Percentage of marine resources contribution to animal protein in residents of coastal communities' daily diet - Percentage of coastal community residents in the LME that have received adequate training in marine related natural resource management <p>INDICATORS BASED ON LME</p> <ul style="list-style-type: none"> - All components of water quality (chemicals, pathogens, trash, and nutrients) in coastal communities meet established health standards - Percentage of coastal community residents that report perceived improvements in or maintenance of marine related livelihoods (this can be based on increased or maintained catch per unit effort).

Scorecard Section		LME SCORECARD INDICATORS
		<ul style="list-style-type: none"> - Mariculture - sustainable mariculture production per coastal inhabitant (without habitat destruction or introduction of invasive species) - Others (referred to LME data sheet for targets)
2.2 Ocean-dependent economic activities	INDICATORS BASED ON LME	<ul style="list-style-type: none"> - Tourism - Adoption and effective implementation of sustainable tourism best practices - Ports & shipping - Adoption and effective implementation of sustainable port and shipping best practices - Renewable energy production - Adoption and effective implementation of renewable energy production best practices - Extractive industries - Adoption and effective implementation of oil, gas, mineral extraction following best practices - Others (referred to LME data sheet)
2.3 Long-term Sustainability	CORE INDICATORS	<ul style="list-style-type: none"> - Sustainable financing mechanism (e.g. trust fund, annual government allocations, market-based mechanism, park fees, PES, etc.) for LME that distributes annual recurring funds for conservation measures - What percentage of conservation measures have sustainable sources of funding? - Sociocultural and economic - Is there adequate data and/or expert knowledge for sociocultural and economic factor to inform activities and decision-making to achieve LME objectives?
3. Fish and Fisheries		
3.1 Information inventory, status and monitoring	INDICATORS BASED ON LME	<ul style="list-style-type: none"> - Fisheries - Is there adequate data and/or expert knowledge for priority fishery species to inform activities and decision-making to achieve LME objectives? - Overall status of economically important fisheries species populations - Fisheries management - Conservation measures are actively managing and protecting priority fisheries for long-term availability of the resources, overall ecosystem health, and resilience; and measures complement and reinforce efforts towards improving other ecosystem components - Fisheries - Compliance, monitoring, enforcement, and penalties are preventing IUU fishing (ex. licensing, zoning, gear, species, season closures, boat size, etc.)
4. Ecosystem Health and Pollution		
4.1 Information inventory and monitoring		<ul style="list-style-type: none"> - Habitats - Is there adequate data and/or expert knowledge for priority habitat ecosystems (mangroves, reefs, seagrasses, marshes, seabed's, etc.) to inform activities and decision-making to achieve LME objectives? - Biophysical - Is there adequate data and/or expert knowledge on biophysical factors (productivity, pH, salinity, sea temperature, etc.) to inform activities and decision-making to achieve LME objectives? - Coastal water quality - Is there adequate data and/or expert knowledge for coastal water quality to inform activities and decision-making to achieve LME objectives? - Monitoring and evaluation system with agreed upon indicators and methodologies to measure and report change related to habitat, species, fisheries and human well-being outcomes within the LME
4.2 Ecosystem status-Refer to the LME	CORE INDICATORS	<ul style="list-style-type: none"> - Ecosystem Functions - status of ecosystem functionality

Scorecard Section	LME SCORECARD INDICATORS
targets and indicators detailed in the LME datasheet	INDICATORS BASED ON LME <ul style="list-style-type: none"> - Habitats - condition of priority coastal habitats (ex. mangroves, reefs, seagrasses, wetlands, marshes, estuaries, etc.) - Priority Species- average conservation status of priority species (IUCN red list) - Coastal water quality for the protection and propagation of fish, shellfish and wildlife, recreation, and traditional cultural uses - Trophic Structure - Status of relative proportion of different levels in the trophic or feeding structure (primary producers, herbivores, carnivores, predators, apex predators)
4.3 Conservation measures for overall ecosystem health and resilience (measures complement and reinforce efforts towards improving other ecosystem components)	<ul style="list-style-type: none"> - Conservation measures integrate information from monitoring and evaluation system to guide adaptive management decision-making - Conservation measures apply the precautionary principle and acknowledge for uncertainty - Conservation measures are managing and protecting priority species - Habitats conservation measures are avoiding degradation, actively managing and protecting priority habitats for overall ecosystem health and resilience - Invasive species - Measures are avoiding and control the impact of invasive species, which complement and reinforce efforts towards improving other ecosystem components - Water quality - Conservation measures are actively managing and maintaining adequate water quality to support overall ecosystem and human health (ballast waters, wastewaters/sewage, nutrients, trash, chemicals/POPs) - Human well-being - management actions and strategies are improving overall human well-being in the LME? - Climate change adaptation - Are climate adaptation strategies incorporated into conservation measures ecosystem components (species, habitats, fisheries, livelihoods)? - Natural disaster risk mitigation - Are natural disaster risk mitigation strategies incorporated into conservation measures ecosystem components (species, habitats, fisheries, livelihoods, infrastructure)? - Terrestrial and Marine Management – Management of Terrestrial and marine areas is integrated in a manner that recognizes the interconnectivity of ecosystems. - Multiple-use MPAs and MPA networks- Adoption and effective implementation to protect habitats and their connectivity following best-practices (e.g. habitat representation, replication, minimum 30% no-take)
4.4 Compliance and Enforcement	<ul style="list-style-type: none"> - Marine pollution - Compliance, monitoring, enforcement, and penalties are maintaining water quality regarding the management of municipal and commercial wastes (trash and residual waters) in coastal waters - Invasive species - Compliance, monitoring, enforcement, and penalties to prevent the introduction of non-native species through commercial activities such as aquaculture, shipping, transportation, etc. - Habitat destruction - Compliance, monitoring, enforcement, and penalties to safeguard protected areas and priority biodiversity regarding coastal zone development, construction, and conversion - Ocean industries - compliance monitoring and penalties to safeguard water quality (including pollution from ships), biodiversity, habitats, and human well-being