

Experience in Compiling GBF Indicator A.2 (Extent of Natural Ecosystems)

Indonesia – BPS Statistics Indonesia



Expert Group Meeting on SEEA-Related Indicators for the Global
Biodiversity Framework (GBF), 10 to 12 February 2026

Cambridge, February 2026



Efi Yuliani

Senior Statistician

BPS – Statistics Indonesia



Indonesia as a Pilot Country – Preparing for SEEA-Related Indicator for GBF

Under the UNSD project “**Monitoring Framework for the Kunming–Montreal Global Biodiversity Framework**”, **Indonesia** has been invited, alongside **Colombia** and **Uganda**, to participate as a **pilot country** to test the compilation of SEEA-based headline indicators, in particular Indicator A.2 and Indicator B.1

At this stage:

- ❖ *Indonesia has not yet produced Indicator A.2 under the SEEA Ecosystem Accounting framework;*
- ❖ *Indonesia is currently in the preparatory and testing phase, focusing on testing the draft **Compilation Guidelines**, assessing data readiness, and technical feasibility; and*
- ❖ *The experience generated through this pilot will contribute to the **refinement and finalization of global Compilation Guidelines**.*



Institutional Arrangements: Meeting with CBD Focal Point

- ✂ An initial coordination meeting **with Indonesia's CBD Reporting Focal Point**, the Ministry of Environment (MoE), was held on **17 December 2025**.
- ✂ The meeting served as a **formal kick-off** for Indonesia's engagement as a **pilot country** for testing the SEEA-related GBF Indicators **A.2 and B.1**.



Courtesy Call and
Initial Coordination with CBD Focal Point



Location: Ministry of Environment (MoE)

Key Outcomes:

- 1 Confirmation of **MoE's role** as the **national focal point** for GBF reporting and biodiversity policy.
- 2 Agreement on **close collaboration** between MoE, BPS–Statistics Indonesia, and UNSD.
- 3 Alignment on the use of **SEEA Ecosystem Accounting** as the statistical framework to bridge biodiversity data and official statistics.

Institutional Arrangements: Inception Workshop

 **Inception Workshop: High-Level Commitment for SEEA-based GBF Indicators**
Jakarta, 18-19 December 2025

Invited Ministries, Agencies, and Institutions:

- ✓ BPS – Statistics Indonesia
- ✓ MoE – Ministry of Environment (CBD Focal Point)
- ✓ MoFor – Ministry of Forestry
- ✓ MMAF – Ministry of Marine Affairs and Fisheries
- ✓ Bappenas – Ministry of National Development Planning
- ✓ MoF – Ministry of Finance
- ✓ BIG – Geospatial Information Agency
- ✓ BRIN – National Research and Innovation Agency
- ✓ KOBI – Indonesian Biology Consortium

International Partners: UNSD, UNSIAP, UNRCO, and GIZ.



The Inception Workshop was **officially opened by the Chief Statistician of BPS–Statistics Indonesia.**

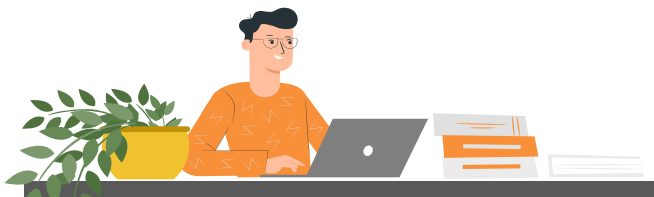


She expressed strong institutional support for the development of SEEA-based biodiversity and ecosystem accounts.



Strategic Significance of the Workshop

- The workshop served as a **high-level national commitment** to strengthen how biodiversity is **measured, integrated, and used** in decision-making and development planning;
- It reinforced BPS's role as the **national coordinator**, ensuring cross-ministerial collaboration and alignment between biodiversity policy, ecosystem accounting, and official statistics.



Institutional Arrangements: Inter-Ministerial Collaboration

Inter-ministerial collaboration provides a strong institutional foundation to move from discussion to action, supporting Indonesia's role as a global pilot country for testing the Compilation Guidelines for GBF Indicators

Institution and Strategic Role:

BPS – Statistics Indonesia

National coordinator; ensuring SEEA-based indicators are institutionalized within official statistics

CBD National Focal Point; biodiversity policy alignment and ecosystem-related data

Ministry of Environment

Ministry of Forestry

Forest ecosystem data, land cover information, forest classification, and long-term forest monitoring

One Map Policy, base maps, and geospatial standards as the spatial backbone

Geospatial Information Agency

National Research and Innovation Agency

Scientific evidence, research support, and methodological inputs

Integration of indicators into national development planning and policy use

Ministry of National Development Planning

Ministry of Marine Affairs and Fisheries

Marine and coastal ecosystem data and long-term monitoring

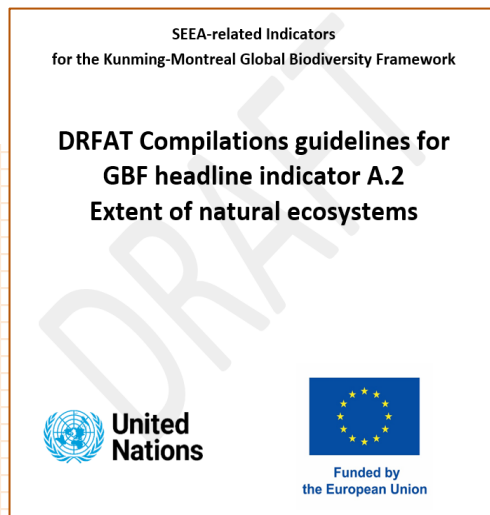
Linking ecosystem accounts to fiscal policy, valuation, and financing instruments

Ministry of Finance

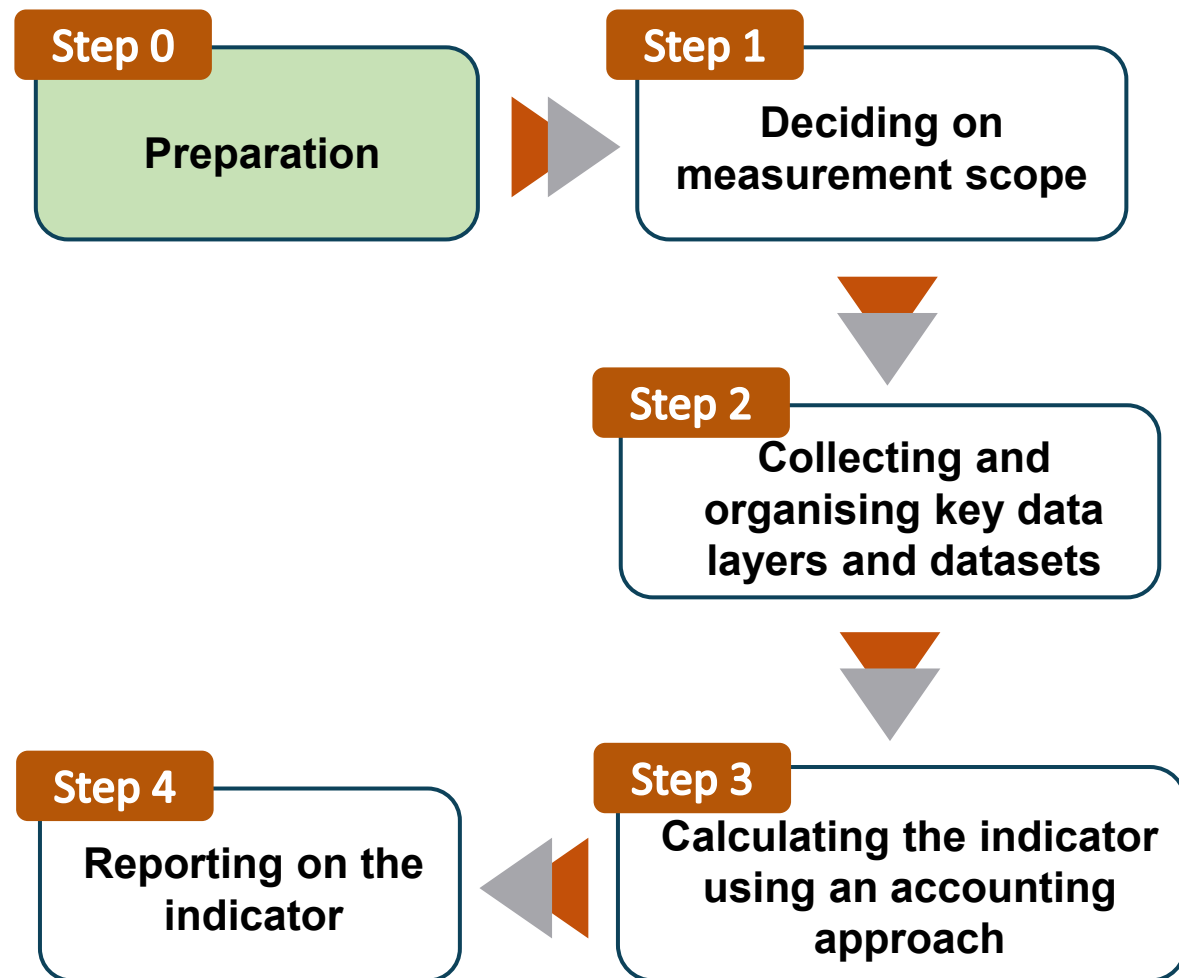
Indonesian Biology Consortium

Biodiversity expertise, species data, and ecological perspectives

Current Status: Step 0 (Preparation) Completed



“ According to the DRAFT Compilation Guidelines for Indicator A.2, the compilation process is designed as a stepwise and iterative approach, starting from preparation, followed by decisions on measurement scope, data compilation, calculation, and reporting.



At this stage, Indonesia has completed **Step 0 (Preparation)**, with the necessary institutional arrangements and initial assessments in place.

Current Status: Step 0 (Preparation) Completed

Step 0: Preparation

- ✓ **Initial coordination** with the national CBD Focal Point, followed by a high-level inception meeting **to initiate and formalise inter-ministerial collaboration** on SEEA-based GBF indicators.
- ✓ An inter-ministerial team established through a **Decree of the Chief Statistician (BPS)**, comprising a **steering committee** and a **technical working group**, to ensure institutional commitment and a clear coordination structure.
- ✓ Identification of **key institutions and experts** holding ecosystem, spatial, and biodiversity data and expertise.
- ✓ **A dedicated technical coordination mechanism**, including a technical WhatsApp group, established to support continuous communication, data exchange, and issue-by-issue technical discussion.
- ✓ **National self-assessment** conducted using **IBSAP 2025–2045** and the **Status Kekinian Keanekaragaman Hayati Indonesia 2024** to:
 - ❖ identify nationally recognised natural ecosystem types;
 - ❖ map available data sources and responsible institutions; and
 - ❖ flag initial data and capacity gaps for Indicator A.2 compilation.



Step 1

Deciding on measurement scope

Step 2

Collecting and organising key data layers and datasets

Step 3

Calculating the indicator using an accounting approach

Step 4

Reporting on the indicator

Key Results: from National Self-Assessment (Step 0 – Preparation)

National ecosystem type reference identified

Based on *IBSAP 2025–2045 and the Status Kekinian Keanekaragaman Hayati Indonesia 2024*, Indonesia has identified nationally recognised natural ecosystem types, reflecting how ecosystems are officially classified and described within the national biodiversity policy framework.



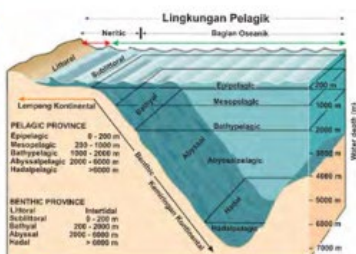
This national classification:

- ❖ Identifies 22 nationally recognised natural ecosystem types, structured across marine, freshwater, terrestrial, and transitional realms.
- ❖ Confirms the set of natural ecosystem types that are *ideally within the scope of the Indicator A.2 numerator*, subject to data availability and spatial representation.
- ❖ Establishes the national reference point before technical cross-referencing to the IUCN Global Ecosystem Typology (GET).

National ecosystem type reference identified

Ekosistem Marin

1



Mintakat Neritik

Terbentang di sepanjang pantai dangkal yang masih dapat ditembus cahaya matahari. Pada mintakat ini dapat ditemukan keberadaan pantai berpasir, pantai berbatu, pantai berkarang, padang lamun, dan terumbu karang.

Mintakat Oseanik

Mencakup mintakat di wilayah perairan laut dalam, yang sudah tidak mendapat cahaya matahari dan mengandung lebih sedikit oksigen.

2



Ekosistem Lamun

Hamparan tumbuhan lamun pada laut dangkal dengan substrat pasir atau lumpur hingga karang yang berarus tenang.

3



Ekosistem Terumbu Karang

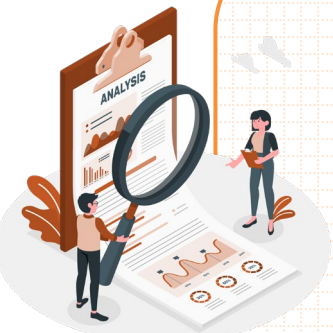
Habitat biota laut yang berasosiasi dengan beragam tipe karang, seperti karang keras (hermatipik), karang lunak (ahermatipik), dan gorgonian. Terumbu karang menyediakan habitat bagi berbagai macam kehidupan laut. Lebih dari 2.200 spesies ikan, moluska, krustasea, serta berbagai flora⁴⁶.

4

Issues in national ecosystem classification:

- ❖ **Conceptual overlap** exists between biophysical zones and habitat-based ecosystem types.
- ❖ In Indonesia, oceanographic zones (e.g. **neritic**) are **defined alongside habitat ecosystems** (e.g. seagrass meadows and coral reefs).
- ❖ **Example from the marine realm:** Seagrass meadows and coral reefs **are entirely located within the neritic zone**, which functions as a biophysical context, not a distinct ecosystem extent.
- ❖ **Implication for Indicator A.2:** If both zones and habitats are treated as ecosystem units, **spatial overlap and double counting may occur**, highlighting the need to **distinguish context layers vs ecosystem extent units**.

Initial Mapping of Data Availability by Ecosystem Type

- 
- ▶ Initial mapping of data availability conducted using the **National Thematic Map Inventory (IGT)** under Indonesia's **One Map Policy**, with **BIG** mandated as the national geospatial information authority.
 - ▶ BIG provides the **official spatial reference framework**, including thematic map standards, scale specifications, update cycles, and designated data custodians (**Wali Data IGT**).
 - ▶ Data inputs were compiled through the **inception workshop** process with line ministries and agencies responsible for **terrestrial, freshwater, coastal, and marine** ecosystems **including land cover datasets**.
 - ▶ The mapping assesses which ecosystem types are supported by **nationally recognised spatial datasets**, and where data are **partial, proxy-based, or unavailable**.
 - ▶ Results indicate **uneven data availability across ecosystem types and realms**, with gaps in **ecosystem-specific thematic maps** and inconsistencies in **spatial resolution and time-series comparability**.
 - ▶ This process identifies **data-ready ecosystem types** and highlights priority **data and capacity gaps** that need to be addressed prior to **compiling Indicator A.2**.

Key Results: from National Self-Assessment (Step 0 – Preparation)

Summary of Data Availability by Ecosystem Type

Realms	No	Biophysical / Ecological Zone	Main IGT Dataset	IGT Data Custodian	Recommendations from Inception Data Review
Ekosistem Marin (Air Asin) / Marine Ecosystems (Saltwater)	1	Zona Neritik / Neritic Zone	Not available as a standalone thematic IGT dataset	-	No information available
	2	Terumbu Karang / Coral Reefs	Coral Reef Map, scale 1:50,000	MMAF	Coral reef data from MMAF/ MoE. Spatial and ecological data on coral reef extent, condition, and biodiversity.
	3	Padang Lamun / Seagrass Meadows	Seagrass Map, scale 1:50,000	MMAF	Indonesian Seagrass Mapping Partnership (ISMP), involving MMAF, UGM, BRIN, BIG, academia, and NGOs. Provides spatial data on coral reefs and seagrass areas. Coral reef and seagrass areas are derived from satellite imagery (available nationwide). Coral types are aggregated into two classes: hard corals and other corals. Data available in tabular and map formats.
	4	Zona Oceania / Oceanic Zone	Not available as a standalone thematic IGT dataset	-	No information available

Key Results: from National Self-Assessment (Step 0 – Preparation)

Summary of Data Availability by Ecosystem Type

Realms	No	Biophysical / Ecological Zone	Main IGT Dataset	IGT Data Custodian	Recommendations from Inception Data Review
Ekosistem Limnik (Perairan Tawar) / Limnic Ecosystems (Freshwater)	5	Ekosistem Sungai / River Ecosystems	River Basin (Watershed) Map, scale 1:50.000	MoE/ MoFor	River Basin (Watershed) data Source: https://data.pu.go.id/dataset/wilayah-sungai (Ministry of Public Works and Housing). Data include the number of river basins within Indonesia and the name of the location (Province/District/City) where the river crosses.
	6	Ekosistem Danau / Lake Ecosystems	Lake, Reservoir, and Small Waterbody Location Map	PUPR	SIMONTANA (https://nfms.menlhk.go.id) Directorate of Forest Resource Inventory and Monitoring (IPSDH). Data available in tabular and map formats. Land cover data available at national to district level. Time series data available (continuous): 2011–2024, 2009, 2006, 2003, 2000, 1996, 1990.
Ekosistem Semi Terrestrial / Semi-Terrestrial Ecosystems	7	Ekosistem Mangrove / Mangrove Ecosystems	Mangrove Map, scale 1:250,000	MoE	National Mangrove Map and Mangrove data from MoE / MMAF Data include: • Area of existing mangroves (by province) • Area of potential mangrove habitat (by province) Available in tabular and map formats. Time series information requires further confirmation. Data available annually since 2019.
	8	Ekosistem Riparian / Riparian Ecosystems	Not available as a standalone thematic IGT dataset	-	No information available

Key Results: from National Self-Assessment (Step 0 – Preparation)

Summary of Data Availability by Ecosystem Type

Realms	No	Biophysical / Ecological Zone	Main IGT Dataset	IGT Data Custodian	Recommendations from Inception Data Review
Terrestrial Ecosystems – Lowland Forest	9	Hutan Pantai / <i>Coastal Forest</i>	Land Cover Map, scale 1:250,000	MoFor	SIMONTANA (https://nfms.menlhk.go.id) Data available in tabular and map formats. Land cover data available at national to district level. Time series data available (continuous): 2011–2024, 2009, 2006, 2003, 2000, 1996, 1990.
	10	Hutan Dipterokarpa / <i>Dipterocarp Forest</i>	Land Cover Map, scale 1:250,000	MoFor	
	11	Hutan Kerangas / <i>Kerangas (Heath Forest)</i>	Land Cover Map, scale 1:250,000	MoFor	
	12	Hutan Rawa / <i>Swamp Forest</i>	Land Cover Map, scale 1:250,000	MoFor	
	13	Hutan Rawa Gambut / <i>Peat Swamp Forest</i>	Peat Ecosystem Function Map, scale 1:50.000	MoE	Peatland data Source: https://www2.cifor.org/origin-toolbox/wp-content/uploads/pdf/AI.pdf (CIFOR).
	14	Karst / <i>Karst</i>	Karst Landscape Area Map, scale 1:50.000	MEMR	Indonesia Karst Map Source: https://caves.or.id/peta-karst (Indonesian Speleological Society). Karst location data can be used as a spatial overlay to identify natural and semi-natural ecosystems occurring within karst landscapes. The dataset may not represent complete national coverage, as it is based on community-led karst documentation undertaken independently within specific regions.
	15	Savana / <i>Savanna</i>	Land Cover Map, scale 1:250,000	MoFor	SIMONTANA (https://nfms.menlhk.go.id) – same as above
	16	Padang Rumput / <i>Grasslands</i>	Land Cover Map, scale 1:250,000	MoFor	
17	Ultrabasik / <i>Ultramafic Ecosystems</i>	Not available as a standalone thematic IGT dataset	-	No information available	

Key Results: from National Self-Assessment (Step 0 – Preparation)

Summary of Data Availability by Ecosystem Type

Realms	No	Biophysical / Ecological Zone	Main IGT Dataset	IGT Data Custodian	Recommendations from Inception Data Review
Terrestrial Ecosystems – Montane Forest	18	Hutan Pengunungan Bawah / <i>Lower Montane Forest</i>	Land Cover Map, scale 1:250,000	MoFor	SIMONTANA (https://nfms.menlhk.go.id) Data available in tabular and map formats. Land cover data available at national to district level. Time series data available (continuous): 2011–2024, 2009, 2006, 2003, 2000, 1996, 1990.
	19	Hutan Pegunungan Atas / <i>Upper Montane Forest</i>	Land Cover Map, scale 1:250,000	MoFor	
	20	Hutan Sub Alpin / <i>Sub-Alpine Forest</i>	Land Cover Map, scale 1:250,000	MoFor	
	21	Hutan Alpin / <i>Alpine Forest</i>	Land Cover Map, scale 1:250,000	MoFor	
	22	Nival	Not available as a standalone thematic IGT dataset	-	No information available



The initial data review confirms that while several ecosystem types are supported by established national thematic datasets, others lack dedicated spatial data, highlighting priority data and capacity gaps for Indicator A.2 compilation



Summary of Data Availability by Ecosystem Type

Issues in Data Availability:

- ❖ **Gaps in ecosystem-specific thematic maps:** Several nationally recognised ecosystem types do not yet have standalone IGT thematic datasets, including Neritic Zone, Oceanic Zone, Riparian ecosystems, Ultramafic ecosystems, and Nival ecosystems, requiring the use of proxy layers.
- ❖ **Reliance on land cover as proxies:** For many terrestrial ecosystems, ecosystem extent is currently inferred from land cover maps, rather than from ecosystem-specific maps, which limits ecological specificity.
- ❖ **Inconsistent spatial resolution across datasets:** Spatial resolution varies substantially across IGT datasets (e.g. 1:25,000 to 1:250,000), and in some cases within the same ecosystem type, affecting comparability of extent estimates.
- ❖ **Uneven temporal coverage and update cycles:** Some datasets are available as long time series (e.g. land cover), while others are updated irregularly or available for a single year only, complicating change analysis.
- ❖ **Limited attributes to distinguish ecosystem status:** Several datasets do not explicitly encode natural, semi-natural, or anthropogenic status, making consistent classification and conversion tracking challenging.

National ecosystem classification to IUCN GET

Operational notes from national mapping to IUCN GET EFGs:

❖ Case 1 – Coral reef mosaics

Implementation notes:

- Reef polygons often contain mixed components (live/dead coral, rubble, sand) within one unit.
- MPA zoning and restoration layers may overlap with reef polygons.
- For GET crosswalk, heterogeneous reef polygons are treated as a single coral reef ecosystem unit based on ecosystem type.

National ecosystem classification to IUCN GET

Operational notes from national mapping to IUCN GET EFGs:

❖ Case 2 – Mangroves (natural regeneration vs. planted mangroves)

Implementation notes:

- National maps do not consistently separate planted vs naturally regenerated mangroves.
- In GET crosswalk, both are classified as mangrove ecosystems (by ecosystem type, not origin).
- Information on planting/restoration is relevant for complementary indicators (e.g. 2.1), not A.2.

National ecosystem classification to IUCN GET

Operational notes from national mapping to IUCN GET EFGs:

❖ Case 3 – Savanna ecosystems vs. livestock pastures

Implementation notes:

- Natural savannas and lightly grazed pastures may look similar in land cover data.
- Data on grazing intensity or management is often missing in national layers.
- Crosswalk to GET relies on observable ecosystem characteristics, with assumptions documented in metadata.

National ecosystem classification to IUCN GET

Operational notes from national mapping to IUCN GET EFGs:

❖ Case 4 – Riverine and riparian ecosystems embedded in broader land cover

Implementation notes:

- River channels and riparian zones are often embedded within broader land cover polygons.
- Linear freshwater ecosystems may be under-represented in polygon-based maps.
- Crosswalk to GET should ensure consistent treatment of embedded freshwater ecosystems to avoid omission or double counting.



CONCLUSION

- 1** **Conceptual overlaps exist between bio-physical zones and ecosystem types** (e.g. the neritic zone encompassing seagrass and coral reef ecosystems), and are further amplified during crosswalk to IUCN GET, requiring clear spatial rules to avoid double counting in Indicator A.2.
- 2** **Several ecosystem types do not yet have dedicated national thematic spatial datasets**, including: Neritic zone, Oceanic zone, Riparian ecosystems, Ultramafic ecosystems, and Nival ecosystems.
- 3** For many terrestrial ecosystems, **ecosystem extent is currently inferred from land cover datasets as proxies**, which complicates crosswalk to IUCN GET EFGs.
- 4** **Spatial resolution varies substantially across datasets**, with scales ranging from 1:25,000 to 1:250,000, potentially affecting the consistency of ecosystem extent estimates.
- 5** **Temporal coverage is uneven**, with some datasets available as long time series, while others are only available for single years or irregular updates.
- 6** **Ecosystem definitions and attributes differ across data sources**, limiting consistent crosswalk to IUCN GET EFGs, particularly for borderline and mosaic ecosystems, where classification decisions require explicit methodological guidance.

Top 3 Challenges



Conceptual overlap and risk of double counting in Indonesia's ecosystem mapping

- ❖ In Indonesia, national references (IBSAP and Status Kekinian) describe **oceanographic zones** (e.g. Neritic and Oceanic zones) alongside **habitat-based ecosystem types** (seagrass, coral reefs, mangroves).
- ❖ During initial mapping, the **neritic zone spatially overlaps** with seagrass, coral reef, and mangrove ecosystems, creating a risk of **area inflation and double counting** if treated as parallel ecosystem extent units.



Uneven availability of dedicated ecosystem thematic maps in Indonesia

- ❖ Several nationally recognised ecosystem types in Indonesia **do not yet have standalone IGT thematic datasets**, including Neritic Zone, Oceanic Zone, Riparian ecosystems, Ultramafic ecosystems, and Nival ecosystems.
- ❖ As a result, ecosystem extent for these types is currently **derived indirectly from proxy layers** (e.g. land cover maps), rather than ecosystem-specific spatial datasets.



Data comparability issues across Indonesian spatial datasets

- ❖ **Spatial resolution varies** substantially across national datasets, ranging from 1:25,000 to 1:250,000, and some ecosystems are represented at multiple resolutions over time.
- ❖ Ecosystem attributes **are not consistently encoded** across datasets, particularly for distinguishing natural, semi-natural, and anthropogenic ecosystems, complicating harmonisation and trend analysis.

Top 3 Lessons Learned



Ecosystem extent units must be clearly separated from contextual layers

- ❖ Indonesia's experience shows that **oceanographic zones** (e.g. neritic/oceanic zones) need to be treated as **context layers**, not ecosystem extent units.
- ❖ Perhaps the Compilation Guidelines need to clearly **specify which spatial layers define ecosystem extent** and which should be used only as supporting context, to avoid overlap and double counting in Indicator A.2



Provide a standard crosswalk from national classifications to IUCN GET

- ❖ Translating policy-anchored national ecosystem lists (e.g. IBSAP) into IUCN GET requires **explicit methodological guidance**.
- ❖ Particular attention is needed for **heterogeneous or mosaic mapping units**, where national datasets provide limited information to support ecosystem-type assignment during the crosswalk.



Targeted Technical Assistance (TA) is needed to operationalize country's preparation work

- ❖ Indonesia's Step 0 work highlights the need for **hands-on GIS and methodological support** to operationalise agreed concepts, including the **application of overlay and hierarchy rules** (e.g. freshwater > transitional > terrestrial, and coastal/transitional handling).
- ❖ TA is also needed to support **data gap filling, time-series harmonisation, and QA/QC and sensitivity analysis** where ecosystem extent estimates are affected by resolution differences or proxy-based datasets.

THANK YOU

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