

OA and Project-Level Finance

Helps conservation finance practitioners and project developers use Ocean Accounts to structure, verify, and report on project-level finance instruments.

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RECOMMENDED CITATION

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<https://guidance.oceanaccounts.org/circulars/section-1/1.8-project-finance/>

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Decision Use Cases

Project-level finance decisions supported by Ocean Accounts include:

1. Cost-benefit analysis for restoration projects – Using ecosystem service values from Ocean Accounts to assess whether expected benefits of mangrove restoration, seagrass rehabilitation, or coral reef protection exceed project costs over the relevant time horizon.
2. TNFD-aligned impact reporting – Demonstrating changes in ecosystem condition, extent, and service provision resulting from financed activities, meeting TNFD disclosure requirements for nature-related impacts and dependencies.
3. Project ROI assessment – Calculating return on investment for blue economy projects by quantifying multiple ecosystem service benefits (carbon sequestration, coastal protection, fisheries habitat, tourism amenity) using comparable monetary valuation methods from [TG-2.4 Environmental \(including Ecosystem\) Goods and Services](#) Section 3.10.
4. Baseline and counterfactual scenarios – Establishing pre-project conditions and projected no-action baselines against which project impacts can be measured, enabling additional demonstration required by carbon credit standards and impact investors.

This Circular is relevant to project developers, conservation finance practitioners, sovereign debt managers, development finance institutions, and account compilers supporting sustainable ocean finance initiatives. The guidance builds on the multilateral finance context described in [TG-1.7 OA and Multilateral Development Finance](#), the valuation methods in [TG-2.4](#) Section 3.10 and the guidance on whether and when to value in [TG-1.9 Safe Usage of Monetary Valuation](#), and the ecosystem asset foundations in [TG-3.1 Assets](#). It also supports the ecosystem-specific accounting methodologies in [TG-6.2 Mangrove and Coastal Wetland Accounting](#) and [TG-6.3 Seagrass Ecosystem Accounting](#), which provide blue carbon measurement foundations relevant to many of the finance instruments discussed here.

1. Outcome

¶1 After reading this Circular, conservation finance practitioners and project developers will be able to use Ocean Accounts to structure, verify and report on project-level finance instruments – blue bonds and sustainability-linked securities, debt-for-nature swaps, payments for ecosystem services, blue carbon instruments, parametric insurance and blended finance. For each, Sections 3.1 to 3.4 state which account entries supply the baseline, which supply the KPIs, and which support verification; Table 0 summarises the field. Section 3.7 works a mangrove restoration cost-benefit analysis and Section 3.8 gives a seven-step procedure for a project developer.

¶2 Country-level readiness to support these instruments – whether the evidence base, counterfactual, targets and monitoring commitment are in place – is assessed in **TG-0.8 Implementation Readiness Assessment** Section 3.8 rather than here, and disclosure-framework mapping in **TG-1.11 OA and the Private Sector** Section 3.3.

¶3 The 2025 System of National Accounts recognises sustainable finance as a measurement domain, defining ESG (Environmental, Social, Governance) finance and green finance as components of financial instruments that sustain or improve environmental and social conditions.¹ Ocean Accounts operationalise these concepts for marine contexts by providing the structured data needed to assess ocean-related risks, dependencies, and opportunities. Sustainable ocean finance directly supports SDG 14 (“Life Below Water”) targets, including Target 14.7 on increasing economic benefits from sustainable use of marine resources.² The Kunming-Montreal Global Biodiversity Framework Target 15 calls on businesses and financial institutions to regularly monitor, assess, and transparently disclose their nature-related risks, dependencies, and impacts, a requirement that Ocean Accounts can support.³

¶4 Decision Use Cases

¶5 Project-level finance decisions supported by Ocean Accounts include:

1. ¶6

Cost-benefit analysis for restoration projects – Using ecosystem service values from Ocean Accounts to assess whether expected benefits of mangrove restoration, seagrass rehabilitation, or coral reef protection exceed project costs over the relevant time horizon.⁴

2. ¶7

TNFD-aligned impact reporting – Demonstrating changes in ecosystem condition, extent, and service provision resulting from financed activities, meeting TNFD disclosure requirements for nature-related impacts and dependencies.⁵

3. ¶8

Project ROI assessment – Calculating return on investment for blue economy projects by quantifying multiple ecosystem service benefits (carbon sequestration, coastal protection, fisheries habitat, tourism amenity) using comparable monetary valuation methods from **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10.⁶

4. ¶9

Baseline and counterfactual scenarios – Establishing pre-project conditions and projected no-action baselines against which project impacts can be measured, enabling additionality demonstration required by carbon credit standards and impact investors.⁷

¶10 This Circular is relevant to project developers, conservation finance practitioners, sovereign debt managers, development finance institutions, and account compilers supporting sustainable ocean finance initiatives. The guidance builds on the multilateral finance context described in **TG-1.7 OA and Multilateral Development Finance**, the valuation methods in **TG-2.4** Section 3.10 and the guidance on whether and when to value in **TG-1.9 Safe Usage of Monetary Valuation**, and the ecosystem asset foundations in **TG-3.1 Assets**. It also supports the ecosystem-specific accounting

methodologies in **TG-6.2 Mangrove and Coastal Wetland Accounting** and **TG-6.3 Seagrass Ecosystem Accounting**, which provide blue carbon measurement foundations relevant to many of the finance instruments discussed here.

2. Requirements

¶1 Essential prerequisites:

- ¶2 **TG-0.1 General Introduction to Ocean Accounts** – for the conceptual framework and key components of Ocean Accounts
- ¶3 **TG-1.7 OA and Multilateral Development Finance** – for the multilateral finance context and how development finance institutions engage with ocean accounting

¶4 Helpful background:

- ¶5 **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10 – for valuation methodology selection and the exchange value hierarchy
- ¶6 **TG-3.1 Assets** – for ecosystem asset accounting foundations and natural capital measurement
- ¶7 **TG-2.6 Ocean-related Investment** – for investment indicator compilation using the GFCF framework
- ¶8 **TG-6.2 Mangrove and Coastal Wetland Accounting** – for blue carbon accounting in mangroves and coastal wetlands
- ¶9 **TG-6.3 Seagrass Ecosystem Accounting** – for seagrass carbon and ecosystem services measurement
- ¶10 **TG-6.9 Offshore Energy Thematic Methods** – for project-level accounting in offshore renewable energy developments

¶11 Readers approaching Section 1 for the first time should begin with **TG-1.0 Ocean Accounting and the Blue/Ocean Economy**, the framing circular for the section, which sets out the ocean economy terminology used throughout, what an ocean account can and cannot certify about a blue economy claim, and the map from a policy question to the circular that answers it. It is recommended reading, not a prerequisite.

¶12 ⓘ Framework Position

¶13 This Circular addresses how ocean accounts support project-level ocean finance by quantifying asset-level monetary flows, project contributions to social conditions, and ecosystem service returns on investment. In the Ocean Accounts Framework (TG-0.1 Figure 0.1.2):

Edge	Direction	Description
E3	FG1 ↔ SG1	Monetary flows between assets and economic sectors
E5	FG1 → SG2	Economic contributions to social conditions
E9	SG3 → FG1	Ecosystem services to economy

3. Guidance Material

3.1 Blue Bonds and Ocean-Linked Securities

¶1 Ocean-linked finance instruments differ in risk profile, tenor and the account inputs they require. Table 0 summarises the field; Sections 3.1 to 3.4 treat each instrument in turn.

¶2 Table 0: Ocean finance instruments and their account inputs

Instrument	Risk Profile	Typical Tenor	Key Account Inputs	Primary Outcome Metric
Blue bond	Low-medium	5-15 years	Monetary asset accounts, service flow accounts	Use-of-proceeds verification, KPI achievement
Parametric insurance	Event-driven	Annual renewal	Condition accounts, service flow baselines	Trigger parameter exceedance
Blue carbon credit	Medium	20-30 years	Carbon stock accounts, extent accounts	Verified emission reductions (tCO ₂ e)
Blended finance	Varies by tranche	5-20 years	Full suite of accounts	Development impact indicators
Debt-for-nature swap	Sovereign	10-20 years	Extent accounts, condition accounts	Conservation commitment compliance

¶3 **Parametric insurance.** Parametric (or index-based) insurance instruments provide rapid payouts when predefined environmental parameters are triggered, without requiring traditional loss assessment. For ocean contexts, parametric insurance can cover coral reef damage from hurricanes (with payouts triggered by storm intensity thresholds), fisheries losses from harmful algal blooms (triggered by chlorophyll concentration), or coastal flood damage (triggered by sea level or storm surge measurements). Ocean Accounts contribute to parametric insurance design by:

- ¶4 Providing historical baseline data on ecosystem condition that informs the selection of trigger parameters
- ¶5 Quantifying the economic value of ecosystem services at risk, which determines appropriate coverage levels
- ¶6 Documenting the relationship between ecosystem condition changes and economic losses through supply and use table analysis
- ¶7 Supporting post-event assessment of ecosystem recovery using time-series condition accounts

¶8 **Blended finance structures.** Blended finance uses catalytic capital from public or philanthropic sources to mobilise additional private capital for sustainable development. In ocean contexts, blended finance structures typically involve concessional debt or first-loss guarantees from MDBs or philanthropic foundations, combined with commercial investment from private investors. Ocean Accounts support blended finance by providing the common evidence base that all parties in the capital stack can reference: concessional providers use account data to justify the development rationale, whilst commercial investors use the same data for risk assessment and return estimation.

¶9 Blue bonds are debt instruments where proceeds are earmarked for ocean conservation, sustainable marine resource management, or ocean-based climate adaptation.⁸ Ocean Accounts provide the foundational information architecture needed to structure, monitor, and verify blue bond instruments.

¶10 Structuring Blue Bonds with Account Data

¶11 Ocean Accounts support blue bond structuring in several ways:

1. ¶12

Baseline establishment. Ecosystem extent and condition accounts establish pre-project baselines for marine natural capital assets such as mangroves, seagrass meadows, coral reefs, and fish stocks. These baselines are essential for defining conservation targets and measuring additionality.⁹

2. ¶13

Service quantification. Ecosystem service flow accounts quantify the value of services such as coastal protection, carbon sequestration, and fisheries production that blue bond proceeds aim

to protect or enhance. The SEEA EA provides internationally recognised methodologies for valuing these services using exchange value concepts consistent with national accounts.¹⁰

3. ¶14

Verifying use of proceeds. Physical supply and use tables track how marine resources and ecosystem services are used, supporting verification that bond proceeds support intended ocean-positive activities.

4. ¶15

Measuring outcomes. Time-series account data records changes in ecosystem extent, condition, and service delivery, providing the basis for impact reporting to bondholders and regulators.

¶16 Sustainability-Linked Bond Structures

¶17 Beyond use-of-proceeds bonds, Ocean Accounts support sustainability-linked bonds (SLBs) where bond characteristics such as coupon rates are tied to achieving pre-defined sustainability performance targets.¹¹ Account data can inform key performance indicators (KPIs) for ocean-linked SLBs, including:

- ¶18 Changes in marine protected area extent (from extent accounts)
- ¶19 Improvements in reef or mangrove ecosystem condition scores (from condition accounts)
- ¶20 Sustainable fisheries catch rates relative to maximum sustainable yield (from flow accounts)
- ¶21 Blue carbon sequestration rates (from carbon accounts)

¶22 In the Ocean Accounts Framework (TG-0.1), these project-level monetary flows correspond to Edge E3 (monetary flows between assets and economic sectors). The 2025 SNA recommends compilation of supplementary measures for sustainability-linked debt securities as “of which” items within the financial accounts framework, which facilitates monitoring of these instruments.¹² For the multilateral finance context of SLBs and the blue bond KPI framework, see **TG-1.7 OA and Multilateral Development Finance**, Section 3.6.

¶23 Blue Bond KPI-Account Mapping

¶24 **Table 1: Blue Bond KPI-Account Mapping**

KPI Category	Example KPI	Account Source	Measurement Frequency
Biodiversity	Coral cover (%)	Condition accounts	Annual
Water quality	Nutrient loading	Residual flow accounts	Quarterly
Carbon	Blue carbon sequestration	Carbon stock accounts	Annual
Livelihood	Fishing employment	Economic accounts	Annual

¶25 This mapping enables issuers to draw directly on compiled Ocean Accounts when preparing bondholder impact reports. For guidance on compiling the underlying condition and extent accounts referenced in Table 1, see **TG-3.1 Assets**.

3.2 Debt-for-Nature Swaps

¶1 Debt-for-nature swaps involve the restructuring of sovereign debt in exchange for commitments to conservation investments and outcomes. Ocean Accounts provide the technical foundation for quantifying conservation commitments, monitoring implementation, and verifying outcomes in marine debt swaps.

¶2 Quantifying Conservation Commitments

¶3 When structuring debt-for-nature swaps, parties must agree on the nature and scale of conservation commitments that justify debt relief. Ocean Accounts support this process by providing:

1. ¶4

Asset Valuation: Monetary ecosystem asset accounts estimate the present value of expected ecosystem service flows from marine natural capital.¹³ These valuations inform negotiations over the conservation value being exchanged for debt relief. For guidance on appropriate valuation methods, see **TG-1.9 Safe Usage of Monetary Valuation**.

2. ¶5

Spatial prioritisation: Spatially explicit extent and condition accounts help identify priority areas for conservation investment, so that debt swap proceeds target areas of highest ecological and economic value.

3. ¶6

Commitment Specificity: Account structures provide the precision needed to define specific, measurable, achievable, relevant, and time-bound (SMART) conservation commitments, such as protecting a defined area of mangroves or achieving specified improvements in reef condition scores.

¶7 Monitoring and Verification

¶8 Post-swap monitoring requires systematic tracking of conservation outcomes over time. Ocean Accounts provide:

- ¶9 **Physical Accounts:** Track changes in ecosystem extent (hectares of seagrass protected), condition (coral cover percentage), and flows (fish biomass sustained)
- ¶10 **Monetary Accounts:** Quantify the economic value of ecosystem services protected or restored, enabling comparison with the cost of debt relief
- ¶11 **Governance Accounts:** Document changes in protected area designation, management effectiveness, and enforcement capacity

¶12 Recent Debt-for-Nature Swap Experience

¶13 Recent debt-for-nature swaps demonstrate the growing scale and sophistication of these instruments, and the extent to which their design relies on systematic environmental data. The Seychelles debt-for-nature swap (completed 2015–2016) restructured approximately USD 21.6 million of sovereign debt in exchange for marine protected area commitments covering 30 per cent of the country's exclusive economic zone. Belize (2021) completed a debt conversion that retired USD 553 million of sovereign debt (repurchased at a discount) and refinanced through a USD 364 million blue bond, committing the country to expanding marine protection to 30 per cent of its ocean area and maintaining a marine conservation endowment fund. Ecuador (2023) executed the largest debt-for-nature swap to date, repurchasing approximately USD 1.6 billion (face value) of commercial bonds through a new USD 656 million loan, with conservation commitments for the Galapagos Islands marine reserve. In each case, the structuring and ongoing monitoring of conservation commitments relied on systematic spatial and biophysical data that Ocean Accounts produce: ecosystem extent baselines, condition indicators, and protected area management effectiveness metrics.

¶14 Example: Blue Carbon in Debt Swaps

¶15 Coastal and marine ecosystems including mangroves, seagrass meadows, and salt marshes store large quantities of carbon in biomass and sediments.¹⁴ Debt-for-nature swaps increasingly incorporate blue carbon commitments, where Ocean Accounts track:

- ¶16 Extent of blue carbon ecosystems protected (extent accounts)
- ¶17 Carbon stock density and sequestration rates (carbon accounts)
- ¶18 Avoided emissions from prevented ecosystem degradation (flow accounts)
- ¶19 Economic value of carbon storage services (monetary accounts)

¶20 For detailed methodology on blue carbon accounting, see **TG-6.2 Mangrove and Coastal Wetland Accounting** and **TG-6.3 Seagrass Ecosystem Accounting**.

3.3 Payments for Ecosystem Services

¶1 Payments for Ecosystem Services (PES) schemes create financial incentives for maintaining or enhancing ecosystem service provision. In marine and coastal contexts, PES schemes may target services including coastal protection, water quality regulation, fisheries habitat, and carbon sequestration.¹⁵ Ocean Accounts provide the measurement foundation for designing and operating effective ocean PES schemes.

¶2 Valuation Foundations for PES

¶3 The SEEA EA establishes a hierarchy of valuation methods appropriate for accounting purposes, with a preference for methods based on observable market prices or revealed preferences.¹⁶ For ocean PES schemes, relevant valuation approaches include:

1. ¶4

Directly Observable Prices: Where ecosystem services are already traded in markets (e.g., recreational fishing licences, dive permits), observed prices provide exchange values for accounting and PES pricing.

2. ¶5

Resource Rent Methods: For provisioning services like fisheries, resource rent calculations estimate the ecosystem contribution to production by deducting labour, capital, and intermediate input costs from gross output value.¹⁷

3. ¶6

Replacement Cost Methods: For regulating services like coastal protection, replacement costs estimate what it would cost to provide equivalent protection through engineered infrastructure.¹⁸

4. ¶7

Productivity Change Methods: For supporting services that enhance economic production (e.g., nursery habitat supporting commercial fisheries), production function approaches estimate the marginal contribution of ecosystem inputs.¹⁹

¶8 For valuation methodology selection, see **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10; **TG-1.9 Safe Usage of Monetary Valuation** covers whether and when to value at all.

¶9 Designing Account-Based PES Schemes

¶10 Ocean Accounts support PES scheme design by:

1. ¶11

Identifying Beneficiaries: Supply and use tables identify economic units that benefit from marine ecosystem services, informing who should pay for service provision.

2. ¶12

Quantifying Services: Physical ecosystem service flow accounts measure the quantity of services provided (e.g., tonnes of carbon sequestered, hectares of shoreline protected), informing payment amounts.

3. ¶13

Targeting Payments: Spatial accounts identify where ecosystem services are produced and consumed, enabling geographic targeting of payments to providers.

4. ¶14

Monitoring Outcomes: Time-series accounts track whether service provision is maintained or enhanced under PES schemes.

¶15 Limitations and Considerations

¶16 Account compilers should note that the SEEA EA cautions against using PES payment data directly to estimate ecosystem service prices in accounts (para 9.31). In practice, many PES payments

function as income support or restoration funding rather than as price signals for specific services, which further limits their direct use in accounting.²⁰

3.4 Carbon and Blue Carbon Finance

¶1 Blue carbon ecosystems, particularly mangroves, seagrass meadows, and tidal marshes, sequester carbon at higher rates per unit area than many terrestrial ecosystems. Kelp forests are also highly productive, whilst their role in long-term carbon sequestration remains under active investigation.²¹ Carbon finance mechanisms including voluntary carbon markets, compliance markets, and results-based climate finance increasingly target blue carbon. Ocean Accounts provide essential measurement infrastructure for blue carbon finance.

¶2 Account-Based Carbon Quantification

¶3 Carbon accounts within the Ocean Accounts framework measure:

1. ¶4

Carbon Stocks: Total carbon stored in ecosystem biomass and sediments, measured in tonnes of carbon per ecosystem type and location.

2. ¶5

Sequestration Flows: Annual carbon uptake and storage by blue carbon ecosystems, providing the basis for calculating annual carbon credits.

3. ¶6

Emission Flows: Carbon releases from ecosystem degradation or destruction, informing avoided deforestation/degradation (REDD+) style crediting approaches.

4. ¶7

Net Carbon Balance: The difference between sequestration and emissions, indicating whether an ecosystem is a net carbon sink or source.

¶8 Verification Requirements

¶9 Carbon credit issuance requires measurement, reporting, and verification (MRV). Ocean Accounts contribute to MRV by:

- ¶10 Establishing baselines against which additionality can be assessed
- ¶11 Providing standardised methodologies for carbon quantification aligned with IPCC guidelines
- ¶12 Enabling independent verification through transparent, replicable account compilation
- ¶13 Supporting permanence monitoring through time-series tracking of carbon stocks

¶14 When selecting a crediting standard, project developers should ensure that the chosen methodology aligns with the carbon quantification approaches used in the underlying Ocean Accounts. Several major voluntary carbon market standards have developed or are developing blue carbon methodologies, including the Verified Carbon Standard (VCS, administered by Verra), the Gold Standard, and the American Carbon Registry. These standards differ in their requirements for baseline setting, additionality demonstration, permanence buffers, and leakage assessment. Account compilers can support project developers by ensuring that the physical carbon stock and flow data compiled in Ocean Accounts are structured to meet the data requirements of the relevant crediting standard, whilst maintaining the methodological consistency needed for national-level reporting.

¶15 Integration with Ecosystem Service Accounts

¶16 Blue carbon ecosystems provide multiple ecosystem services beyond carbon sequestration, including coastal protection, fisheries habitat, and water quality regulation.²² Ocean Accounts enable integrated valuation across multiple services, informing decisions about:

- ¶17 Stacking carbon credits with payments for other services

- ¶18 Prioritising restoration investments based on total service value
 - ¶19 Avoiding perverse incentives that might optimise carbon at the expense of other services
- ¶20 For ecosystem-specific carbon accounting guidance, see **TG-6.2 Mangrove and Coastal Wetland Accounting**.

3.5 Disclosure and Verification Requirements

¶1 The mapping between ocean account outputs and the TNFD, IFRS S1 and CSRD disclosure requirements is set out in **TG-1.11 OA and the Private Sector** Section 3.3, which is the single owner of disclosure-framework mapping in this publication. Two requirements are specific to instrument-level finance and are stated here.

¶2 **Verification requires a method a third party can re-run.** Assurance of an impact claim rests on the underlying data being transparent, sourced, time-series consistent and spatially precise enough to tie to the project boundary. Accounts compiled to international statistical standards satisfy this in a way that bespoke project monitoring generally does not, which is the practical reason to build instrument KPIs on account definitions rather than on project-specific metrics.

¶3 **Covenant metrics must be defined against a compilation cycle, not a calendar.** An instrument that requires an annual condition figure from an account compiled triennially will breach on timing rather than on performance. KPIs should name the account, the table, the indicator and the compilation cycle they depend on, and the reporting schedule should be set to follow that cycle. Section 3.6 below sets out which account each instrument type draws on.

3.6 Downward Connections to Accounts, Indicators, and Data

¶1 Account Components Supporting Project Finance

¶2 Project finance instruments draw on multiple Ocean Account components:

¶3 **Ecosystem Condition Accounts:** Provide baseline and monitoring data for ecosystem health indicators referenced in bond covenants, PES agreements, and debt swap commitments. Condition indicators include species richness, structural complexity, water quality parameters, and functional state metrics. For methodology, see **TG-3.1 Assets**.

¶4 **Ecosystem Extent Accounts:** Track changes in spatial coverage of marine habitats resulting from conservation or restoration investments. Extent changes enable verification of protection commitments in debt-for-nature swaps and blue bonds. Spatial data should be compiled in formats compatible with project boundaries defined in finance agreements.

¶5 **Ecosystem Service Flow Accounts:** Quantify physical and monetary flows of provisioning, regulating, and cultural services. Service flow accounts provide the basis for valuing project benefits in cost-benefit analysis and for structuring PES payment schedules.

¶6 **Asset Accounts:** Record opening stocks, additions, reductions, and closing stocks of marine ecosystem assets. Asset accounts enable net present value calculations used in restoration project appraisal and in valuing conservation commitments for debt swaps.

¶7 Key Indicators for Project-Level Decisions

¶8 Table 2: Project Finance Indicators from Ocean Accounts

Indicator	Account Source	Application	Typical Unit
Mangrove extent baseline	Extent accounts	Debt swap commitment definition	Hectares
Coral condition trend	Condition accounts	Blue bond KPI monitoring	Index (0-1 or 0-100 depending on national convention)

Indicator	Account Source	Application	Typical Unit
Blue carbon sequestration rate	Carbon flow accounts	Carbon credit issuance	tCO ₂ e/year
Coastal protection value	Service flow accounts (monetary)	Restoration project CBA	Currency/year
Fishery resource rent	Provisioning service accounts	PES payment calculation	Currency/tonne
Tourist expenditure (marine)	Cultural service accounts	Tourism concession valuation	Currency/year
Water quality (nutrient load)	Residual flow accounts	Pollution control bond KPI	kg N, P/year

¶9 Data Requirements and Sources

¶10 Effective project-level application requires fit-for-purpose data at appropriate spatial and temporal resolution:

- ¶11
Spatial resolution: Project boundaries typically range from <1 km² (local restoration sites) to 10,000s km² (large marine protected areas). Account data should be compiled at Basic Spatial Unit (BSU) resolution that enables aggregation to project scales.
- ¶12
Temporal frequency: Finance instruments require baseline measurements (pre-project), implementation monitoring (annual or more frequent), and ex-post evaluation (typically 3–10 years post-project). Account compilation cycles should align with financing instrument reporting requirements.
- ¶13
Data sources: Combining remote sensing (for extent and some condition indicators), field surveys (for detailed biophysical parameters), administrative data (for economic activity and regulatory enforcement), and scientific studies (for service flow quantification and valuation coefficients).

3.7 Worked Example: Mangrove Restoration Project Cost-Benefit Analysis

¶1 This section presents a synthetic worked example demonstrating how Ocean Accounts data support cost-benefit analysis for a coastal mangrove restoration project. The example is entirely illustrative and uses simplified assumptions to demonstrate accounting logic. Actual project appraisals would draw on site-specific biophysical and economic data.

¶2 Project Context

¶3 A coastal state proposes to restore 200 hectares of degraded mangrove habitat in a coastal lagoon system. The restoration involves hydrological reconnection, seedling planting, and management of invasive species over a 5-year implementation period. Project costs are estimated at USD 3 million (capital costs) plus USD 200,000 per year (ongoing management) over a 20-year evaluation horizon.

¶4 Account-Based Baseline

¶5 Ocean Accounts provide pre-project baseline data:

Account Component	Baseline Condition	Source
Ecosystem extent	50 ha remnant mangrove (severely degraded); 150 ha former mangrove (mudflat/bare ground)	Extent accounts, BSU aggregation
Ecosystem condition	Condition index = 25/100 (severely degraded remnant); 0/100 (lost areas)	Condition accounts, field surveys

Account Component	Baseline Condition	Source
Carbon stocks	20 tC/ha in remnant (below reference of 150 tC/ha); 0 tC/ha in lost areas	Carbon accounts
Coastal protection service	Limited wave attenuation; property at risk from storm surge	Service flow accounts (physical)
Fisheries nursery service	Low juvenile fish density (10% of reference condition)	Service flow accounts (biological surveys)

¶6 Project Scenario: Ecosystem Changes

¶7 Post-restoration trajectory based on comparable restoration projects (Years 0–20):

Metric	Year 0 (Baseline)	Year 5	Year 10	Year 20 (Mature)
Restored extent	0 ha	180 ha	195 ha	200 ha
Condition index (restored area)	0	40	65	85
Carbon stock (restored area, tC/ha)	0	40	80	130
Fisheries nursery service (% reference)	10%	45%	70%	90%

¶8 Ecosystem Service Valuation

¶9 Using the methods in **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10 and the SEEA Valuation Guidelines:

¶10 **Coastal Protection Service** (Avoided Damage Cost Method, Tier 5)

¶11 Mangrove restoration reduces flood risk to 150 coastal properties. Based on flood risk modelling, expected annual damages decline from USD 400,000 (baseline) to USD 100,000 (post-restoration). Annual benefit = USD 300,000/year (reached at Year 10; linear increase Years 0–10).

¶12 **Blue Carbon Sequestration** (Directly Observable Prices, Tier 1)

¶13 Restored mangroves sequester carbon at an average rate of 2.5 tC/ha/year over the 20-year horizon (an optimistic assumption reflecting productive restoration sites, whilst typical rates may be 1.0–2.5 tC/ha/year depending on species and site conditions). At 200 ha and a carbon price of USD 15/tCO₂e (voluntary market), annual carbon benefit = 200 ha × 2.5 tC/ha/yr × 3.67 tCO₂e/tC × USD 15/tCO₂e = USD 27,500/year (Years 5–20, zero Years 0–5 due to establishment lag).

¶14 **Fisheries Productivity Enhancement** (Productivity Change Method, Tier 3)

¶15 Production function analysis indicates that each 10% improvement in nursery habitat quality increases local fishery catch value by USD 25,000/year. From baseline (10%) to mature condition (90%), the fishery benefit reaches USD 200,000/year (linear increase over 20 years).

¶16 Cost-Benefit Analysis Results

¶17 **Table 3: Project CBA Summary (20-year horizon, 4% discount rate)**

Item	Total (NPV, USD millions)	Annualised (USD/year)
Costs		
Capital costs (Years 0–5)	3.00	–
Management costs (Years 0–20)	2.72	200,000
Total Costs	5.72	–
Benefits		
Coastal protection (avoided damages)	2.90	300,000
Blue carbon revenue	0.25	27,500
Fisheries productivity	1.25	200,000

Item	Total (NPV, USD millions)	Annualised (USD/year)
Total Benefits	4.41	–
Net Present Value	-1.31	–
Benefit–Cost Ratio	0.77	–

¶18 Interpretation

¶19 On the benefit streams stated above, the NPV is negative (–USD 1.3 million) and the benefit–cost ratio is 0.77: the monetised benefits do not cover the costs over the 20-year horizon. This is not unusual for ecosystem restoration, where non-monetised co-benefits (biodiversity, cultural services, resilience) are material but not captured in exchange-value-based CBA, but it means the monetised result alone does not establish that the project is economically viable.

¶20 ⓘ Corrected 24 September 2026

¶21 Table 3 previously reported an NPV of +USD 0.5 million and a benefit–cost ratio of 1.09, which the stated benefit streams do not reproduce; discounted at 4% they give an NPV of –USD 1.3 million, so the table, this interpretation and the sensitivity results have been recomputed.

¶22 Sensitivity to Valuation Assumptions

¶23 Project viability is sensitive to key assumptions. Sensitivity results reflect re-discounting all benefit and cost streams at the alternative rate:

- ¶24 **Discount rate:** At 3% (lower rate reflecting long-term social preference), NPV improves to –USD 1.0 million. At 6% (higher rate), NPV falls to –USD 1.8 million. The NPV is negative at all three rates.
- ¶25 **Carbon price:** At USD 30/tCO₂e (premium voluntary market), carbon benefit doubles to USD 0.5 million, increasing BCR to 0.81.
- ¶26 **Coastal protection:** If storm surge damages are underestimated and true baseline risk is USD 600,000/year, coastal protection benefit increases to USD 4.4 million, yielding NPV of USD 0.1 million.

¶27 Account Integration

¶28 This CBA draws entirely on Ocean Accounts components:

- ¶29 Extent and condition baselines establish the “no action” counterfactual.
- ¶30 Carbon accounts provide sequestration rates consistent with IPCC methodologies.
- ¶31 Service flow accounts (coastal protection, fisheries nursery) provide the physical and monetary valuation basis.
- ¶32 Spatial accounts enable allocation of benefits to specific beneficiary groups (coastal property owners, fishing communities).

¶33 Project developers preparing finance proposals for multilateral development banks or impact investors can reference this account-based CBA structure to demonstrate alignment with international statistical standards whilst meeting MDB economic analysis requirements described in **TG-1.7 OA and Multilateral Development Finance**.

3.8 Application Procedure for Project Developers

¶1 Step 1: Define Project Scope and Boundaries

¶2 Identify the geographic extent, temporal horizon, and intended outcomes of the financed activity:

- ¶3 Map project boundaries to Ocean Accounts spatial units (Basic Spatial Units or aggregated zones)
- ¶4 Specify project timeline (implementation period, monitoring duration, benefit accrual period)

- ¶5 List intended conservation, restoration, or sustainable use outcomes in measurable terms

¶6 **Step 2: Establish Account-Based Baselines**

¶7 Extract pre-project baseline data from Ocean Accounts or compile project-specific accounts:

- ¶8 Ecosystem extent and condition for relevant habitat types (mangroves, seagrass, coral reefs, etc.)
- ¶9 Current ecosystem service flows (provisioning, regulating, cultural services)
- ¶10 Economic activity levels (fisheries extraction, tourism, coastal development)
- ¶11 Carbon stocks and sequestration rates (for blue carbon projects)

¶12 Consult **TG-3.1 Assets** for extent and condition account methodology and relevant ecosystem-specific circulars (e.g., **TG-6.2 Mangrove and Coastal Wetland Accounting**) for detailed measurement guidance.

¶13 **Step 3: Define Counterfactual and Project Scenarios**

¶14 Develop “without project” and “with project” scenarios:

- ¶15 **Counterfactual (baseline)**: Project ecosystem trajectories under business-as-usual (e.g., continued degradation, stable but low condition, regulatory-driven slow improvement)
- ¶16 **Project scenario**: Project ecosystem trajectories with intervention (e.g., extent increase from restoration, condition improvement from management, service flow enhancement)

¶17 Scenario development should be grounded in scientific evidence from comparable projects and ecological understanding of recovery trajectories.

¶18 **Step 4: Value Ecosystem Service Changes**

¶19 Apply the valuation methods in **TG-2.4 Environmental (including Ecosystem) Goods and Services** Section 3.10 to quantify project benefits:

- ¶20 Identify ecosystem services affected by the project (e.g., coastal protection, carbon sequestration, fisheries habitat)
- ¶21 Select appropriate valuation methods following the SEEA preference order (directly observable prices > resource rent > replacement cost > avoided damage)
- ¶22 Calculate annual ecosystem service values under counterfactual and project scenarios
- ¶23 Compute incremental benefits as the difference between scenarios

¶24 For project-level cost-benefit analysis submitted to multilateral development banks, supplement exchange values from accounts with welfare values as described in **TG-1.7 OA and Multilateral Development Finance** Section 3.2.

¶25 **Step 5: Structure Finance Instrument**

¶26 Design the finance instrument drawing on account data:

¶27 For **blue bonds**:

- ¶28 Define KPIs linked to account indicators (e.g., extent protected, condition index change, service flow targets)
- ¶29 Establish KPI measurement protocols consistent with account compilation cycles
- ¶30 Specify reporting frequency and verification mechanisms

¶31 For **debt-for-nature swaps**:

- ¶32 Quantify conservation commitments using monetary ecosystem asset accounts (NPV of service flows)
- ¶33 Translate commitments into SMART targets (e.g., “protect 10,000 hectares of mangrove with condition index >60 by Year 5”)
- ¶34 Define monitoring frameworks using account structures

¶35 For **PES schemes**:

- ¶36 Identify service beneficiaries using supply and use table structures
- ¶37 Set payment levels based on ecosystem service values from accounts
- ¶38 Design payment triggers linked to account-measurable outcomes (extent maintained, condition improved, service delivery verified)

¶39 **Step 6: Establish Monitoring and Reporting Framework**

¶40 Align project monitoring with Ocean Accounts compilation:

- ¶41 Schedule monitoring activities to coincide with national account compilation cycles where feasible
- ¶42 Use consistent methodologies for extent, condition, and service flow measurement
- ¶43 Adopt spatial data formats compatible with national Ocean Accounts (enable aggregation of project data into national totals)
- ¶44 Prepare for third-party verification by documenting data sources, methods, and quality indicators

¶45 **Step 7: Prepare Disclosure Documents**

¶46 Prepare project disclosure materials aligned with TNFD and IFRS standards:

- ¶47 Location disclosure: Map project area in relation to priority biomes and protected areas
- ¶48 Dependency disclosure: Identify and quantify project dependencies on marine ecosystem services using supply and use table logic
- ¶49 Impact disclosure: Quantify positive impacts (ecosystem extent increase, condition improvement) using account metrics
- ¶50 Target disclosure: Specify quantitative targets for ecosystem outcomes using account-derived indicators

¶51 Consult TNFD sector guidance for ocean industries to identify sector-specific disclosure metrics relevant to the project.

3.9 From ground-level projects to investor due diligence

¶1 A persistent challenge in ocean finance is the gap between ground-level project development and the information requirements of institutional investors. Ocean Accounts bridge this gap by providing a common measurement framework across project stages.

¶2 **Pipeline development.** The project pipeline for ocean finance typically follows a progression from concept to bankability:

1. ¶3

Concept stage: Ocean Accounts establish the baseline extent and condition of the target ecosystem and quantify the ecosystem services at stake.

2. ¶4

Feasibility stage: cost-benefit analysis draws on monetary valuations of ecosystem services, physical flow data for carbon sequestration estimates, and economic activity data for employment and livelihood projections.

3. ¶5

Preparation stage: the impact indicators embedded in financial covenants, the monitoring framework that will verify outcomes, and the baseline data against which performance will be measured all come from compiled accounts.

4. ¶6

Transaction stage: account data are referenced in offering documents, prospectuses, or loan agreements. The readiness diagnostic in **TG-0.8 Implementation Readiness Assessment** Section 3.8 can be used to confirm that the evidence base meets investor requirements.

¶7 **Bankability assessment.** Financial institutions assess bankability against criteria that differ somewhat from development effectiveness criteria. Ocean Accounts contribute to bankability by:

- ¶8 Providing auditable baseline data that reduces information asymmetry between project developers and investors
- ¶9 Enabling standardised risk assessment through time-series condition and extent data
- ¶10 Supporting revenue projections for ecosystem service-based revenue streams (e.g., carbon credits, tourism fees, fisheries royalties) using physical and monetary supply and use tables
- ¶11 Creating a monitoring infrastructure that reduces the cost of ongoing investor oversight

¶12 **Aggregation for scale.** Individual ocean projects are often too small to attract institutional investment directly. Ocean Accounts facilitate aggregation by providing a common measurement framework across projects: when all projects in a bundle use the same accounting classifications, spatial definitions, and reporting formats, the aggregated portfolio can be assessed and monitored using consolidated account data.

¶13 **The role of intermediaries.** Project preparation facilities, conservation finance intermediaries, and national development banks can use Ocean Accounts as a quality standard, requiring that projects in their pipeline compile specified account types before proceeding to transaction stage. This approach ensures consistent evidence quality across the pipeline and reduces the risk of project failure due to inadequate environmental data.

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¶1 **Authors:** [To be confirmed]

¶2 **Reviewers:** [To be confirmed]

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