# Assessing the linkages between national indicator initiatives, SEEA Modules and the SDG Targets

## Report of the NCAVES Project


United Nations

System of Environmental Economic Accounting

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# Indicators and Natural Capital Accounting

The Natural Capital Accounting and Ecosystem Service Valuation (NCAVES) project is a joint initiative launched by the United Nations Statistics Division, the United Nations Environment Programme and the Secretariat of the Convention on Biological Diversity and funded by the European Union. NCAVES is working in collaboration with the five participating partner countries, namely Brazil, China, India, Mexico and South Africa, to advance the knowledge agenda on ecosystem accounting.

The indicator workstream of the NCAVES project assesses the linkages of the System of Environmental-Economic Accounting Ecosystem Accounting (SEEA EA) to the existing global monitoring frameworks, such as those used for reporting on the Sustainable Development Goals (SDGs), the Aichi targets and emerging post-2020 Global Biodiversity Framework, as well as the national indicator initiatives from the NCAVES countries. This assessment is summarised in the following reports:

- **Assessing the linkages between global indicator initiatives, SEEA Modules and the SDG Targets (2019):** Presents an assessment of the potential to derive or align key global environmental and development indicators with the SEEA.

- **Assessing the linkages between national indicator initiatives, SEEA Modules and the SDG Targets (2021)**: Presents an assessment of the potential to derive or align national indicator sets of the NCAVES countries with the SEEA.

As part of the activities of the indicator workstream, a set of technical notes were produced to support the NCAVES countries to test the generation of a selected set of SDG indicators using the SEEA. The technical notes describe SEEA based approaches to calculate four of the global SDG indicators from the indicator framework developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs). The technical notes are in alignment with the methods described for calculating these global SDG indicators, as described in their associated metadata sheets.[1] The approach to implementing the technical notes and the countries experiences in testing them are summarised in the following reports:

- **Using the SEEA EA for Calculating Selected SDG Indicators (2020):** Presents a series of *Technical Notes* to support the calculation of 4 priority SDG Indicators using the SEEA EA framework.

- **Using the SEEA EA for Calculating Selected SDG Indicators – Project country testing experiences (2021)**: Summarises the experiences of the NCAVES countries in evaluating and implementing these technical notes.

The indicator workstream confirms the broad potential for the SEEA to support the calculation and mainstreaming of many global indicators. The assessment of linkages with global indicators, identifies that 34 of the 147 Aichi target indicators and 21 of the 230 SDG indicators can be aligned to selected modules of the SEEA. The usefulness of the SEEA as a tool to mainstream the environment and biodiversity into national planning processes is also explicitly recognised via SDG Indicator 15.9.1 and via Aichi Target 2. The potential for the SEEA EA to support other key international environmental conventions and platforms, including the UNCCD, Ramsar and IPBES, is also identified.

The assessments of linkages to national indicators confirms the strong potential for the SEEA to support national reporting on SDGs and the general measurement of national indicators in the

[1] https://unstats.un.org/sdgs/metadata/

NCAVES countries. An important collective observation from the national assessments is that the different SEEA accounting modules can inform on a range of environmental policy objectives, themes, development perspectives and analytical objectives (including indicator gap analysis). This illustrates a key advantage in using the SEEA as an organising framework for indicator calculation, as it is a multipurpose framework with a modular approach, allowing countries to focus on both policy and analytical priorities.

The development of four technical notes provided the opportunity to test the potential of the SEEA EA for SDG indicator generation in practice. Testing the technical notes across four NCAVES countries confirmed the strong potential of the SEEA to support the calculation of SDG Indicators. Most countries were able to generate a national version of SDG 15.1.1 (Forest area as a proportion of total land area), SDG 6.6.1 (Change in the extent of water-related ecosystems over time) and SDG 11.7.1 (Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities). in practice. Calculating SDG 15.3.1 (Proportion of land that is degraded over total land area) was found to be more challenging, typically due to data constraints. However, the potential for the SEEA EA to support the generation of this indicator, in due course, was highlighted by the NCAVES countries.

An important insight from the testing is that there is often a need to tailor global SDG indicator methods to make the indicators meaningful to national circumstances. The flexible nature of the SEEA as an organising framework was highlighted by the NCAVES countries as being very useful to aid calculating these nationally tailored SDG indicators in a rigorous and consistent manner. With regular updates, these can also be matched and integrated into different national policy cycles and planning strategies for various sectors. This will be key for fostering integrated policy making that is built on understanding of the interactions, synergies and trade-offs between the environment and economy. This is fundamental to informing sustainable development that proceeds in balance with nature.

The reports highlighted above are available from the UNSD SEEA webpages at: https://seea.un.org/content/indicators-and-natural-capital-accounting.

# Glossary

There are a number of terms used to inform the analysis of indicators and ecosystem and other environmental accounts in this document that may cause some confusion to readers familiar with their use in different contexts. This glossary sets out these particular terminologies for the avoidance of doubt.

**Global indicator initiative:** A set of indicators for reporting on progress towards global commitments (SDGs, CBD Aichi Targets or the UNCCD) or other global environmental processes (e.g., IPBES).

**National indicator initiative:** A set of indicators for reporting on progress towards national commitments, policies or strategies. For example, indicators for national implementation of global commitments (e.g., as set out in National Biodiversity Strategy and Action Plans), other national commitments (e.g., State of the Environment) and strategies.

**Indicator ID:** The unique alpha numeric identifier for a specific indicator from a global indicator initiative. The ID comprises an alphabetic prefix identifying the indicator initiative and numerical suffix representing the relevant goal or target. For example, SDG 15.1.1 identifies the first SDG indicator for goal 15 and Target 1.

**SDG indicator:** The indicator belonging to the SDG global indicators framework adopted by the General Assembly upon recommendation of the Statistical Commission for measuring progress towards a specific SDG Target.

**Input indicator:** An indicator that can contribute data or information that can be directly integrated into SEEA accounting modules (e.g., data on ecosystem condition). These are identified for some countries but not evaluated in detail in this report.

**Output indicator:** An indicator that can be directly generated from the SEEA accounts.

**Gap Indicators:** Proposed indicator from a national initiative for which there is no agreed methodology for measurement.

**Full Possibilities for Alignment with SEEA:** Output indicators for which the SEEA has clear potential to provide all, or most, of the information required for their calculation and input indicators that provide data for SEEA accounts. Conceptual alignment based on the structure of the SEEA framework is implied.

**Partial Possibilities for Alignment:** Indicators for which the SEEA provide only some of the information for their calculation with substantial information required from other sources.

# 1 Introduction

This document comprises a supplement to the working document: *Assessing the linkages between global indicator initiatives, SEEA Modules and the SDG Targets*, produced by UNEP-WCMC and UNSD in 2019. This supplement complements the assessment of global indicator initiatives by assessing linkages between national indicator sets, initiatives and SDG Targets and the System of Environmental-Economic Accounting (SEEA) Modules, for project countries of the Natural Capital Accounting and Ecosystem Service Valuation (NCAVES) project. The project countries comprise of: Brazil; China, India, Mexico and South Africa. The assessment of linkages presented follows the approach set out in the assessment of global indicators, which should be read in conjunction with this document.

## 1.1 Aims and objectives

The SEEA is a multipurpose, statistical framework that aims to quantify the importance of the relationship between people and their environment. It is designed to allow the integration of information on ecosystems and the services they supply, with information on economic and other human activity. This integration is achieved via the use of common classifications, concepts and accounting structures. This allows the different accounting modules (or the parts of the SEEA information system) to inform different policy objectives and themes in a coherent manner. Further, whilst concepts and classifications remain consistent, the flexibility of the measurement approaches the SEEA provides will support countries to use the most relevant data to generate the most relevant indicators envisaged via their national indicator initiatives. In this way, the SEEA can assist countries in calculating the most appropriate national indicators using the best data for phenomena at national scales. For instance, in the context of generating national SDG Indicators.

Reflecting the aims of the assessment of global indicator linkages, this supplementary working document analyses how the SEEA can be aligned with existing national indicator initiatives and associated data. This includes how different SEEA accounting modules can be used to readily generate a range of indicators to support multiple reporting commitments. The focus of the assessment of national linkages has been on the following relevant SEEA Accounting modules: **Ecosystem Extent (and Land Cover and Use) Accounts; Ecosystem Condition Accounts; Ecosystem Services – Supply and Use (Physical and Monetary) Accounts; Thematic Accounting for Biodiversity and Carbon, SEEA-Central Framework (SEEA-CF) Physical Flow (Supply and Use) Accounts for natural inputs from eh environment, SEEA-CF Physical Asset Accounts** and the **SEEA Water subsystem.** [2] In addition, **'Protected Area' Accounts** have also been included within the analysis. This type of account has been proposed as a useful thematic account to supplement the established modules of the SEEA EA during the course of the NCAVES project. It should be noted the inclusion of this additional accounting module may lead to some small divergences with the findings of the assessment global indicator initiatives for certain indicators.

[2] As per the assessment of global initiatives, whilst the importance of the SEEA Physical Flow Residuals Accounts and the Environmental Protection Expenditure Accounts for integrated environmental-economic analysis are acknowledged, they are considered out of scope of the analysis presented in this report. The exception is for waste water treatment, which is considered to be part of the thematic accounting for water and the SEEA Water Subsystem

There are three specific objectives for the analysis presented in this supplementary document:

1. Which national indicators have the potential to be *generated (or calculated)* using SEEA (e.g., indicators that can be derived directly from the above accounting modules, termed **output indicators**)?

2. More specifically, how can the SEEA support reporting on SDGs and their indicators, as designated at the national level?

3. Assess the potential of SEEA implementation for deriving indicators to support countries' decision-making on environmental policy themes and for addressing related indicator gaps.

Assessing the potential for the SEEA to generate national indicators under objective 1 and 2 is based on first identifying specific indicators in national indicator initiatives that have a clear potential for calculation using SEEA accounting modules described above. The possibilities for aligning the SEEA with each of these specific indicators was then based on a more detailed consideration of the following factors:

- **Full possibilities for alignment:** Specific national indicators for which the SEEA has clear potential to provide all, or most, of the information required for their calculation.
- **Partial possibilities for alignment**: the SEEA can organise some of the information for calculating the indicator. Substantial information is required from other sources to calculate the indicator.

The outline of this reports is as follows: first the results of the assessments of the national linkages are discussed for each of the NCAVES projects in chapters 2-6. Chapter 7 provides a synthesis of results and conclusions with respect to the main findings of the assessment.

# 2 South Africa

## 2.1 Indicator initiatives descriptions

The South African project team from the NCAVES project convened a small stakeholder group to undertake the national indicator inventory (presented in Appendix A). The team comprised representatives from the South African National Biodiversity Institute (SANBI) and Statistics South Africa (Stats SA). Expert judgement was employed by the team to identify the initiatives relevant to the SEEA Accounting modules described in Section 1.1. As highlighted, the South African team included an additional 'Protected Areas Account' in their analysis. Whilst this is not considered a separate type of account in the existing SEEA guidelines, it will be a priority for testing in South Africa as a thematic account as part of the NCAVES project.

Overall indicators from 11 national environmental and development frameworks and initiatives in South Africa were reviewed (see Indicator Initiatives Reviewed sheet, Appendix A - Excel file):

- SDG reporting (SDG)
- National Biodiversity Assessment (NBA)
- Medium Term Strategic Framework (MTSF)
- National Water and Sanitation Master Plan: Call to Action (Water)
- Water Research Development & Innovation (RDI) Roadmap
- National Biodiversity Strategy and Action Plan (NBSAP)
- State of Environment (SoE) Report
- Presidency's National Development Indicators (NDI)
- Department of Energy Indicators (DoE)
- National Protected Area Expansion Strategy (NPAES)
- Department of Environment's Air quality indicators (AQ)

In addition to the above, the South African team identified an additional 12 specific indicators related to natural capital accounts that SANBI and / or Stats SA are (or are in the process of) compiling. These were included to provide a consolidated list of South African indicators more broadly related to natural capital. They comprised indicators that can be calculated from the following SEEA accounts:

- Indicators from Land and Terrestrial Ecosystem Accounting in KwaZulu-Natal, South Africa (from the Advancing Natural Capital Accounting project[3])
- NCAVES National Land and Terrestrial Ecosystem Accounts (NCAVES)
- SEEA CF Mineral accounts (Minerals)
- SEEA CF Fisheries accounts (Fisheries)
- SEEA CF Water accounts (Water)

These 12 specific indicators are not considered in the following analysis. However, they have been assessed from a SEEA perspective in the same manner as indicators from the other indicator initiatives. This assessment is provided as a separate worksheet in Appendix A for completeness (this follows the same methodology set out below, see 'Accounting Indicators Review' tab).

3 https://seea.un.org/https%3A//seea.un.org/content/anca

## 2.2 Methodology for assessing Indicators from a SEEA Perspective

In order to assess the indicators from a SEEA perceptive, the South African team used expert judgement to identify the specific indicators that could be aligned to the SEEA within each of the 11 initiatives listed in Section 2.1. In addition, gaps in indicator initiatives for South Africa have also been identified (termed 'Gap' indicators). These are proposed indicators from a national initiative for which there is no currently agreed methodology for measurement. This assessment is provided in the 'Specific Indicators Reviewed' sheet, in the excel file in Appendix A. Appendix A also provides a detailed description of the methodology employed for the assessment. A clear description of the terminologies employed is presented in the Glossary to this report.

## 2.3 General results of indicator review

The results of the analysis for the South African indicators are presented below. In total 47 individual indicators were assessed from the 11 national indicator initiative's described in Section 2.1 for South Africa, plus the set of 'Gap' indicators. The distribution of the 47 indicators is summarised in Table 1.

**Table 1: Distribution of South African indicators reviewed**

| Indicator Initiative | Number of indicators |
|---|---|
| SDG Reporting Indicator (SDG) | 14 |
| National Biodiversity Assessment (NBA) indicators | 4 |
| Medium Term Strategic Framework (MTSF) Indicator | 8 |
| National Water and Sanitation Master Plan Indicator (Water) | 2 |
| Water Research Development & Innovation (RDI) Roadmap Indicators | 0 |
| National Biodiversity Strategy and Action Plan (NBSAP) Indicators | 0 |
| State of Environment (SoE) Indicators | 3 |
| Presidency's National Development Indicators (NDI) | 2 |
| Dept. of Energy Indicators (DoE) | 3 |
| National Protected Area Expansion Strategy (NPAES) Indicator | 2 |
| Department of Environment's Air quality indicators (AQ) | 3 |
| GAP indicator (GAP) | 6 |
| **Total** | **47** |

The assessment of the 47 indicators identified in Table 1 revealed the following: [4]

- 38 out of 47 indicators are considered full possibilities of alignment with the SEEA
- 9 out of 47 are considered 'None' possibility for alignment with the SEEA
- There were no instances of partial possibilities for alignment with the SEEA.
- Of the 47 indicators considered as full possibilities for alignment with the SEEA:
    - 35 were output indicators (i.e., could be generated using the SEEA accounts)
    - 3 were input indicators (i.e., provided data that could be directly integrated in to the SEEA accounts).

## 2.4 Analysis of All 'Full Possibility' National Output Indicators

Output indicators can be directly generated from the SEEA accounts to inform on multiple national objectives. The 35 output indicators assessed as 'Full Possibilities' for alignment with the SEEA covered a number of environmental themes. These included: forest/woodland, land degradation or change in land cover type, protected areas (e.g. coastal, marine, mountain), water (e.g. use, intensity, efficiency, stress), and fish stocks (biomass, threat, protection level).

### 2.4.1 Matching Full-Possibility Output Indicators to Individual SEEA Accounts

Figure 1 summarises 'scores' for the relative importance of different SEEA Accounts for generating the 35 South African output indicators. The scores in Figure 1 have been calculated by identifying the two most relevant accounts for generating the Output Indicators captured in the 'Specific Indicators Reviewed' spreadsheet in Appendix A. The score is presented as an average across the two most relevant accounts for all 35 output indicators. For example, the Land Cover / Use / Ecosystem Extent Account scores 9.5 out of 35 in Figure 1. This means that across the 35 indicators it featured as one of the 2 most relevant accounts 19 times (i.e., 19 / 2 = 9.5). Where only one accounting module was relevant for an indicator, this was counted as both the first and second most relevant account to reflective its higher, relative, importance.

As Figure 1 reveals, Protected Area Accounts are highly relevant to generating national indicators (scoring 12.5 out of 35). Land Cover / Land Use / Ecosystem Extent Accounts are also found to be particularly relevant for informing on the generation of South African indicators (scoring 9.5

[4] These results differs slightly to that presented by Driver et al., 2019 (see https://seea.un.org/sites/seea.un.org/files/presentation_4_south_africa_pdf.pdf). This is because some minor adjustments were made to make the South African Indicator review consistent with the Assessment of Global Linkages. SDG 15.5.1 (Red List Index) was upgraded to a full possibility for alignment with the SEEA. This is because the Red List provides an input indicator to thematic accounting for biodiversity. This is reflected in a number of thematic accounts on species threat status that have been produced, including the Threatened Species Accounts developed by Brazil as part of the NCAVES project (see https://seea.un.org/sites/seea.un.org/files/images/Brazil/liv101754_folder_especies.pdf). SDG 15.4.2 (Mountain Green Cover Index); SDG 14.4.1 (Proportion of fish stocks within biologically sustainable levels); and, SDG 6.4.2 (Level of water stress: freshwater withdrawal as a proportion of available water resources) were also upgraded to 'Full Possibilities' for alignment. GAP04 (Marine Protected Areas Securing Fisheries Resource Base); and, GAP06 (An indicator to address EI role in water security) were also upgraded to 'Full Possibilities' for alignment as it seemed reasonable to expect these indicators could be produced using the accounting modules listed in Section 1.1, plus Protected Area Accounts. As previously noted, an additional 12 accounts based indicators were identified by the South African team. These were not considered as ''Full Possibilities' for alignment under this assessment in order to retain the focus of the assessment on indicators from defined national initiatives.

out of 35). This general observation matches the findings of the global indicators assessment. The SEEA Water Accounts (8 out of 45) and Ecosystem Condition Accounts (5.5 out of 45) also score relatively highly.

The score for Ecosystem Service Accounts is relatively low (only 0.5 out of 45). None of the South African output indicators matched with biodiversity or carbon thematic SEEA accounting. However, it is noted that these accounts score relatively highly in other countries, notable for China the scores for Ecosystem Services Accounts are high and for Mexico the scores for Thematic Biodiversity Accounting is high

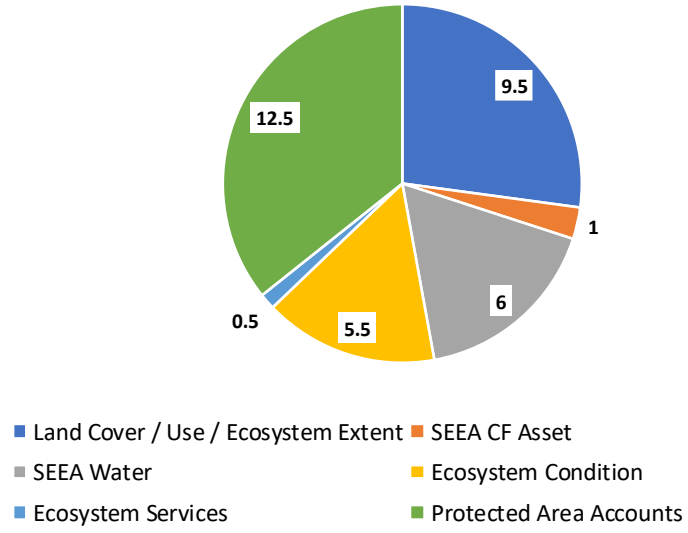


**Figure 1: Accounting modules 'scores' for all South African Output Indicators**

## 2.5 Analysis of National SDG Indicators

Fourteen SDG Baseline Reporting indicators are identified and assessed in Table 1. Of these 11 were considered as 'Full Possibilities' for alignment with the SEEA as output indicators. As such, these SDG Baseline Reporting Indicators represent around a quarter of the output indicators assessed as 'Full Possibilities' for alignment with the SEEA (11 out of 45). This highlights the potential role for the SEEA in organising information for directing sustainable development. The distribution of these output indicators by SDG is presented in Figure 2. Out of these, 2 indicators were related to SDG target 6 (clean water and sanitation), 3 indicators to SDG 14 (life below water) and 6 indicators to SDG 15 (life on land).

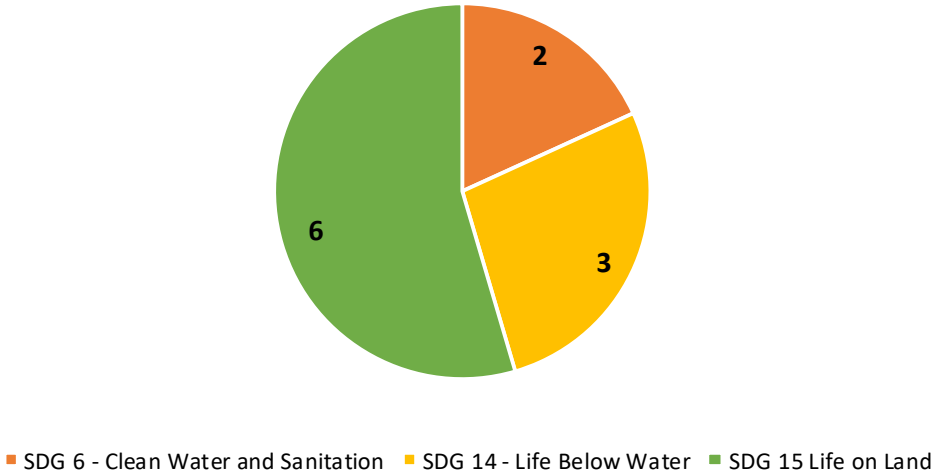


**Figure 2: Output Indicators with Full Possibilities for Alignment with the SEEA by SDG**

Table 2 identifies the most relevant accounts for generating the 11 SDG indicators, which are 'Full Possibilities' for alignment with the SEEA. As Table 2 reveals, the Land Cover / Land Use / Ecosystem Extent Accounts (relevant to 8 SDG Indicators) and the Protected Areas Accounts being compiled for South Africa (relevant to 5 SDG Indicators) have an important role to play in supporting the generation of SDG indicators in South Africa. The Ecosystem Condition, SEEA Water and the SEEA CF Physical Asset Accounts also have a role to play in supporting the generation of at least 1 SDG Indicator each.

**Table 2: Relevant SEEA Accounting Modules for generating South African SDG Indicators**

| Specific SDG Indicator | Relevant Accounts |
|---|---|
| SDG 6.4.2D - Level of water stress: Exploitation of available water resources | SEEA Water |
| SDG 6.6.1 - Change in the extent of water-related ecosystems | Land Cover / Use / Ecosystem Extent and SEEA Water |
| SDG 14.4.1 - Proportion of fish stocks within biologically sustainable levels | SEEA CF Asset |
| SDG 14.5.1A - South African Marine Protected Areas (MPA) as a percentage of total Exclusive Economic Zone | Protected Area Accounts |
| SDG 14.5.1D - Percentage of marine and coastal ecosystem types that are well-represented in protected areas | Protected Area Accounts and Land Cover / Use / Ecosystem Extent |
| SDG 15.1.1D - Natural forest and woodland area as a percentage of total land area | Land Cover / Use / Ecosystem Extent |
| SDG 15.1.2 - Percentage of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem types | Protected Area Accounts and Land Cover / Use / Ecosystem Extent |
| SDG 15.2.1D - Percentage of the natural forest and woodland biomes within formally proclaimed protected areas | Protected Area Accounts and Land Cover / Use / Ecosystem Extent |
| SDG 15.3.1 - Proportion of land that is degraded over total land area | Ecosystem Condition and Land Cover / Use / Ecosystem Extent |
| SDG 15.4.1D - Percentage of mountain ecosystem types that are well-represented in protected areas | Protected Area Accounts and Land Cover / Use / Ecosystem Extent |
| SDG 15.4.2 - Mountain Green Cover Index | Land Cover / Use / Ecosystem Extent and Ecosystem Condition |

## 2.6 NCAVES Project Priority Output Indicators Analysis

The South African team identified those indicators that were priorities for testing under the NCAVES Project. Out of the 35 output indicators considered 'Full Possibilities' for alignment with the SEEA, 12 were identified as priorities for testing under the NCAVES Project (all are identified as currently available and operational). Table 3 matches each of the 12 South African Output Indicators considered priorities for the NCAVES Project to the two most relevant SEEA Modules for their calculation / generation.

As shown in Table 3, the Land Cover / Land Use / Ecosystem Extent Accounts are relevant to the generation of 7 out of 15 output indicators. The Protected Area Accounts are relevant to the calculation of 6 of these indicators. The Ecosystem Condition Accounts are relevant to the generation of 2 output indicators and the SEEA Water Account only 1 SDG Indicator.

**Table 3: South African NCAVES priority output indicators matched to SEEA Accounting Modules**

| Indicator Initiative | Specific Indicator | Relevant Accounts |
|---|---|---|
| SDG Reporting Indicator (SDG) | SDG 15.1.1D - Natural forest and woodland area as a percentage of total land area | Land Cover / Use / Ecosystem Extent Accounts |
| SDG Reporting Indicator (SDG) | SDG 15.3.1 - Proportion of land that is degraded over total land area | Ecosystem Condition and Land Cover / Use / Ecosystem Extent Accounts |
| SDG Reporting Indicator (SDG) | SDG 6.6.1 - Change in the extent of water-related ecosystems | Land Cover / Use / Ecosystem Extent and SEEA Water Accounts |
| SDG Reporting Indicator (SDG) | SDG 14.5.1A - South African Marine Protected Areas (MPA) as a percentage of total Exclusive Economic Zone | Protected Area Accounts |
| State of Environment (SoE) Indicators | SoE 03 - Ecological condition in the coastal, inshore and offshore environment | Ecosystem Condition Accounts |
| Presidency's National Development Indicators (NDI) | NDI 02 - Marine protected area index | Protected Area Accounts |
| National Protected Area Expansion Strategy (NPAES) Indicator | NPAES 01 - Extent (ha) of additional protected areas (by province) declared in the terrestrial 'spatial priority areas for protected area expansion' | Protected Area and Land Cover / Use / Ecosystem Extent Accounts |
| National Protected Area Expansion Strategy (NPAES) Indicator | NPAES 02 - Extent (ha) of additional marine waters declared as marine protected areas | Protected Area and Land Cover / Use / Ecosystem Extent Accounts |
| National Biodiversity Assessment (NBA) indicators | NBA 01 - Rate of decline in natural area (national or sub-national) | Land Cover / Use / Ecosystem Extent Accounts |
| National Biodiversity Assessment (NBA) indicators | NBA 02 - Percentage of historical ecosystem extent remaining | Land Cover / Use / Ecosystem Extent Accounts |
| Medium Term Strategic Framework (MTSF) Indicator | MTSF 02 - Number of biodiversity stewardship sites | Protected Area Accounts |
| Medium Term Strategic Framework (MTSF) Indicator | MTSF 03 - Number of km2 of Marine Protected Areas | Protected Area Accounts |

In addition to the indicators presented in Table 3, the South Africa Team also identified 3 additional priority indicators that could be produced from the accounts being compiled under the NCAVES project but were not currently aligned with national indicator initiatives. All 3 indicators could be calculated directly from the Land Cover / Land Use / Ecosystem Extent Accounts and comprised:

- Percentage land cover unchanged
- Percentage turnover in land cover
- Percentage change in land cover classes with particular socio-economic significance.

## 2.7 Indicator Gap Analysis

Where gaps in the existing Indicator initiatives are known, the SEEA provides a multi-purpose framework that can be used to organise information and generate new indicators to address these gaps. Six indicators were highlighted as indicator gaps by the South African team. These comprised of indicator gaps to represent:

- GAP 01: Total water use
- GAP 02: Water use intensity
- GAP 03: Water efficiency
- GAP 04: Marine Protected Areas Securing Fisheries Resources
- GAP 05: National water quality
- GAP 06: Ecological Infrastructure's role in water security

The potential for the SEEA to address these gaps is shown in Figure 3, which presents the analysis of matching the 6 gap indicators to SEEA modules. As Figure 3 shows, the SEEA Water Accounts would be important for generating indicators to address existing indicator gaps in South Africa (Scoring 3.5 out of 6), followed by Ecosystem Condition Accounts (scoring 1.5 out of 6). Figure 3 suggests, the identified South African indicator gaps were mainly related to water. South Africa doesn't currently have a national water quality indicator, or indicators on total water use, water use intensity and water efficiency.

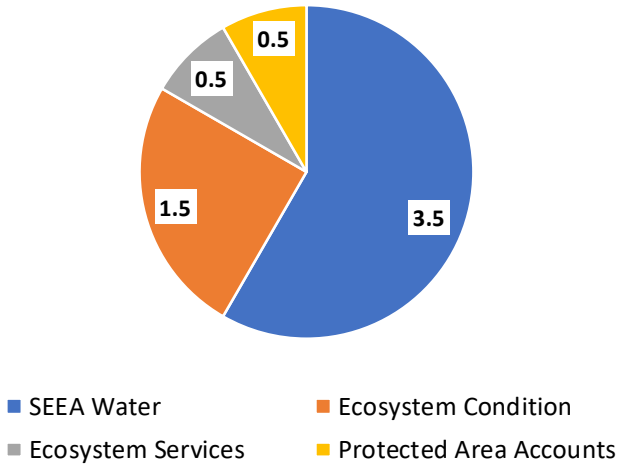


**Figure 3: Accounting modules 'scores' for the 6 South African Gap Indicators**

The South African team also identified a gap existed with respect to an indicator to measure the role of ecological infrastructure in water security and a potential role for Ecosystem Service

Accounts to help inform this (e.g., with respect to provisioning, regulating or purification services). This reflects the score 0.5 out of 6 for Ecosystem Services in Figure 3. There are also gaps in indicators that measure marine protected areas securing fisheries resource base. This is being explored as part of the National Biodiversity Monitoring Framework and reflects that Protected Areas Accounts score 0.5 out of 6 in Figure 3.

## 2.8 Summary of South African Indicators Assessment

Overall 47 Specific Indicators were identified and assessed for alignment with the SEEA. Out of these 37 were considered 'Full Possibilities' for alignment with the SEEA, with 35 of these identified as 'output' indicators (i.e., could be generated by information organised in the SEEA Accounts). 11 of the 35 output indicators identified as 'Full Possibilities' for alignment with the SEEA were also SDG Baseline Reporting Indicators. This illustrates a strong potential for the SEEA to support the generation of national indicators in South Africa and support South Africa's measurement and reporting of national progress towards the SDGs.

Out of the 35 output indicators considered 'Full Possibilities' for alignment with the SEEA, 12 were identified as priorities for evaluation under the NCAVES Project. As identified in Table 3, this included the following 4 SDG indicators:

- SDG 15.1.1D - Natural forest and woodland area as a percentage of total land area
- SDG 15.3.1 - Proportion of land that is degraded over total land area (also a priority from the global analysis)
- SDG 6.6.1 - Change in the extent of water-related ecosystems also a priority from the global analysis)
- SDG 14.5.1A - South African Marine Protected Areas (MPA) as a percentage of total Exclusive Economic Zone

Protected Area Accounts and Land Cover / Land Use / Ecosystem Extent Accounts were identified as priorities for compilation to generate output indicators in South Africa, relevant to 11 out of the 12 indicators identified as priorities under the NCAVES Project. These were also the most relevant accounts for generating the 4 SDG indicators identified above (in addition to Ecosystem Condition Accounts for generating SDG indicator 15.3.1). In addition, SEEA Water Accounts were identified as a priority for development to generate indicators to address 6 priority indicator gaps identified by the South African team.

The utility of the Protected Area Accounts being compiled by South Africa is notable. These accounts are specifically identified as being relevant to the calculation of 5 National SDG indicators and 6 NCAVES project priority indicators. This reflects that there are 2 indicators related to South Africa's National Protected Area Expansion Strategy, 1 for the Presidency's National Development Indicators, 1 for reporting on SDG 14.5.1A and 2 for the Mid-Term Strategic Framework that all have explicit links to protected areas. This illustrates the flexibility in which the SEEA framework can be employed to inform on different topic's or themes. In this case, with respect to areas under a specific management regime to conserve and enhance biodiversity.

# 3 India

## 3.1 Indicator set description

The Ministry of Statistics and Programme Implementation (MOSPI) of the Government of India, have prepared a revised National Indicator Framework (NIF) for monitoring of nationally defined Sustainable Development Goals (SDGs).[5] In March 2020, the National Statistical Office published a report on progress towards the sustainable development goals, which employed this framework.[6] The revised NIF comprises of 297 individual indicators (revised from 306 indicators in the original NIF). The Indian project team for the NCAVES project within the MOSPI reviewed all the 297 indicators in the NIF for possible alignment to the SEEA.

## 3.2 Methodology for assessing Indicators from a SEEA Perspective

Expert judgement was employed by the Indian national project team assess if the specific indicators of the NIF could be generated using the SEEA Accounting modules described in Section 1.1. In addition, the Indian team also included additional SEEA Central Framework Accounts in their assessment. These comprises: Environment Expenditure Accounts (SEEA EPEA); SEEA-Energy subsystem (SEEA Energy); and SEEA CF Physical flow accounts (Emissions, waste, materials). This results in a slightly broader alignment between the Indian National SDG Indicators than identified in the assessment of global indicators report (and for the other project countries in this document).

All 297 of the specific indicators in the revised NIF for the 17 SDGs and their associated targets have been assessed for alignment with the SEEA. A further processing step was undertaken by UNEP-WCMC to disaggregate the NIF indicator for SDG 13.2.2 into three sub-indicators. This is because this NIF indicator is for tracking progress towards achieving the Nationally Determined Contribution in three ways: reducing emissions intensity of GDP; creating a carbon sink via increasing forest and tree cover; and, increasing power generation from non-fossil fuel energy sources. The methodological details of the assessment are provided in Appendix B. Appendix B also presents the results of the assessment in Excel format.

## 3.3 General results of indicator review

The results of the analysis of the SDG National Indicator Framework for India (NIF) are presented below. In total 36 of the specific indicators in the NIF are identified as 'Full Possibilities' for alignment with the SEEA and 4 as partial possibilities (see Figure 4). All of these indicators are output indicators (i.e., indicators that could be generated via the SEEA). This is out of the total 297 specific indicators in the NIF.

The 4 partial possibilities for alignment with the SEEA related to the use of emissions accounts to track urban air quality (SDG Target 11.6.3) and emissions intensity of GDP (SDG 13.2.1 & 13.2.2), as well as the use of Emissions and Energy Accounts for tracking progress towards India's National Determined Contribution for carbon emission abatement (SDG 13.2.2).

[5] http://mospi.nic.in/sites/default/files/National%20Indicator%20Framework%20for%20circulation.pdf
[6] http://mospi.nic.in/sites/default/files/publication_reports/SDGProgressReport2020.pdf

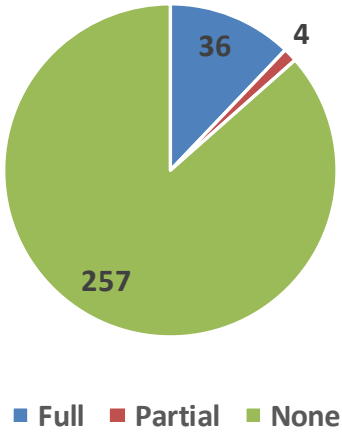


**Figure 4: Alignment with SEEA for Indian indicators.**

## 3.4 Analysis of All 'Full Possibility' National SDG Indicators

Figure 5 disaggregates the 36 national SDG indicators that are full possibilities for generation via the SEEA by SDG. As Figure 5 reveals, the 36 output indicators align, most commonly, with SDG 15 (9 NIF indicators), 6 (8 NIF indicators) and 14 (6 NIF indicators). This also reflects the findings of the assessment of global indicators. However, a number of possibilities are also identified to align the SEEA with indicators for other SDGs. These include a number of SDG targets related to SDG 12 (Sustainable Consumption and Production, 4 NIF indicators) and SDG 9 (Industry, Innovation and Infrastructure, 3 NIF indicators). For other SDGs 1 or 2 NIF indicators are found to align with SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 11 (sustainable cities and communities), SDG 12 Sustainable Consumption and Production) and SDG 13 (Climate Action)

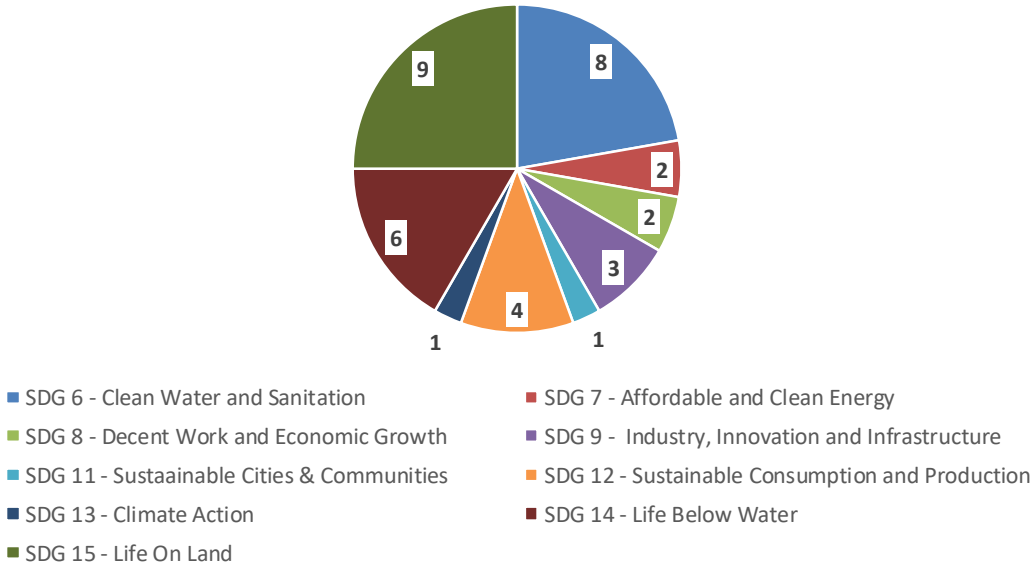


**Figure 5: Indicators with Full Possibilities for Alignment with the SEEA by SDG**

### 3.4.1 Matching 'Full-Possibility' National SDG Indicators to Individual SEEA Accounts

Thirty-six of the Indian National SDG indicators are identified as 'Full Possibilities' for generation via the SEEA (i.e., as output indicators). Table 4 links the 36 specific indicators to the SEEA Accounts most relevant to their calculation. Unlike the global and South African Assessment, the Indian Assessment focuses on identifying the single SEEA Account most relevant for calculating the indicator.

Within the global study, 17 SDG indicators were identified as 'Full Possibilities' for alignment with the SEEA as output indicators. This is substantially lower than the 36 indicators identified in Table 4. As highlighted in Section 3.2, part of this difference is driven the consideration of a wider range of SEEA Central Framework Accounts by the India team. This is notable for the SDG 7, 8, 9, 11 and 12 indicators in Table 4. As Table 4 reveals, the SEEA CF Physical Flow Accounts and SEEA Energy Accounts are relevant to the calculation of all 7 and 5, respectively, of the SDG 7, 8, 9, 11 and 12 Indian National indicators (i.e., 12 of the SDG 7, 8, 9, 11 and 12 NIF indicators in total).

As Table 4 also reveals, the SEEA Water and SEEA CF Physical Flow Accounts are each relevant to the calculation of 4 of the Indian SDG 6 indicators. This is higher than the findings from the assessment of the Global SDG 6 Indicators. This is, in part, due to the national tailoring of SDG indicators to India's circumstances. Specifically, SDG Indicators 6.3.3, 6.4.3, 6.6.2 and 6.6.3 in Table 4 are all additional indicators for their respective SDG Targets for India, which do not have direct equivalents in the global SDG indicator framework.

For the 'Biosphere' focused SDGs (i.e., SDG 13, 14 and 15), Table 4 shows the Land Cover / Land Use / Ecosystem Extent Accounts are relevant to the calculation of 6 NIF indicators. Table 4 also identifies the Indicator for SDG 15.1.1 - Forest cover as a proportion of total geographic area, as an output indicator with a full possibility for generation via the SEEA. This was also identified as a priority indicator for calculation via the SEEA in the assessment of global indicators.

This importance of the Land Cover / Land Use / Ecosystem Extent Accounts highlights a role for the SEEA in supporting national policy objectives related to land use. This could include establishment and management of protected areas (Protected Area Accounts align with 3 NIF indicators). A role for thematic accounting is also identified, with biodiversity accounting being relevant to 2 of these SDG indicators and Carbon accounting for 1. The Ecosystem Condition Accounts are identified as being relevant to the calculation of 2 of these SDG indicators. Compiling 'Any' of the accounts is identified as relevant to the calculation of SDG 15.9.1.

Six further possibilities for alignment with the SEEA also arise for nationally tailored indicators for SDG 13, 14 and 15 for India. The national SDG 14.2.1 and 14.2.2 indicators align with the SEEA, whereas the global indicator for this SDG Target 'Number of countries using ecosystem-based approaches to managing marine areas' does not. For SDG 13.2.2, India adopts a more ecosystem based approach compared to the global SDG Target, this again opens up possibilities for alignment with the SEEA. Additionally, SDG Indicators 14.5.2 and 15.2.3 in Table 4 are all additional indicators for their respective SDG Targets for India that do not have direct equivalents in the global SDG indicator framework. SDG 15.8.1 in Table 4 is based on actual tracking of invasive species trends, whereas the global SDG indicator is around legislation and resourcing the control of invasive species. Conceptually, this also makes the Indian tailoring of the indicator more amenable for possible calculation via the SEEA.

Finally, it is noted that and the Environmental Protection Expenditure accounts from the SEEA Central Framework have been considered by the India team. This allows a possible alignment with SDG 15..b.1 in Table 4.

**Table 4: 36 Indian 'Full-possibility' SDG indicators matched to SEEA Accounting Modules.**

| SDG Indicator | NIF Indicator | Relevant Accounts |
|---|---|---|
| SDG 6.3.1 | Percentage of sewage treated before discharge into surface water bodies | SEEA CF Physical flow accounts |
| SDG 6.3.2 | Percentage of industries (17 category of highly polluting industries/grossly polluting industry/red category of industries) complying with waste water treatment as per CPCB norms. | SEEA CF Physical flow accounts |
| SDG 6.3.3 | Proportion of waste water treatment capacity created vis-à-vis total generation | SEEA CF Physical flow accounts |
| SDG 6.4.1 | Percentage ground water withdrawal against availability | SEEA Water |
| SDG 6.4.2 | Per capita storage of water, (in m3/person) | SEEA Water |
| SDG 6.4.3 | Per capita availability of water, 2011 (in m3/person) | SEEA Water |
| SDG 6.6.2 | Percentage sewage load treated in major rivers | SEEA CF Physical flow accounts |
| SDG 6.6.3 | Biological assessment information of surface water bodies | SEEA Water |
| SDG 7.2.1 | Renewable energy share in the total installed electricity generation | SEEA Energy |
| SDG 7.3.1 | Energy intensity measured in terms of primary energy and GDP, (in mega joules per rupee) | SEEA Energy |
| SDG 8.4.2 | Per capita fossil fuel consumption, (in Kg.) | SEEA Energy |
| SDG 8.4.3 | Proportion of waste recycled vs. waste generated | SEEA CF Physical flow accounts |
| SDG 9.4.1 | CO2 equivalent emission per unit of value added | SEEA Energy |
| SDG 9.4.1 | CO2 equivalent emission per unit of value added | SEEA CF Physical flow accounts |
| SDG 9.4.2 | Energy use intensity of manufacturing value added | SEEA Energy |
| SDG 11.6.2 | Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted) | SEEA CF Physical flow accounts |
| SDG 12.2.1 | Percentage variation in per capita use of natural resources | SEEA CF Physical flow accounts |
| SDG 12.5.1 | Number of waste recycling plants installed | SEEA CF Physical flow accounts |
| SDG 12.5.2 | Number of municipal corporations using waste segregation techniques | SEEA CF Physical flow accounts |

| SDG Indicator | NIF Indicator | Relevant Accounts |
|---|---|---|
| SDG 12.5.3 | Number of municipal corporations banning single use plastic | SEEA CF Physical flow accounts |
| SDG 13.2.2 | Achievement of Nationally Determined Contribution(NDC) Goals in post 2020 period. Sub-indicator: To create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030- forest accounts | Thematic Carbon |
| SDG 14.1.1 | Coastal Water Quality Index | Condition |
| SDG 14.2.1 | Percentage change in area under mangroves | Land Cover / Use / Ecosystem Extent |
| SDG 14.2.3 | Percentage change in Marine Protected Areas (MPA) | Protected Area Accounts |
| SDG 14.3.1 | Average marine acidity (pH) measured at agreed site of representative sampling stations | Condition |
| SDG 14.5.1 | Coverage of protected areas in relation to marine areas. | Protected Area Accounts |
| SDG 14.5.2 | Percentage change in area under mangroves. | Land Cover / Use / Ecosystem Extent |
| SDG 15.1.1 | Forest cover as a proportion of total geographic area | Land Cover / Use / Ecosystem Extent |
| SDG 15.1.2 | Protected areas as proportion of total land area | Protected Area Accounts |
| SDG 15.2.1 | Percentage change in forest cover | Land Cover / Use / Ecosystem Extent |
| SDG 15.2.3 | Tree cover as a percentage of total geographical area | Land Cover / Use / Ecosystem Extent |
| SDG 15.4.1 | Percentage change in forest cover in hill districts | Land Cover / Use / Ecosystem Extent |
| SDG 15.5.1 | Red List Index | Thematic Biodiversity |
| SDG 15.8.1 | Percentage change in prevention and control of invasive alien species | Thematic Biodiversity |
| SDG 15.9.1 | Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategies Plan for Biodiversity 2011-2020 | Any |
| SDG 15.b.1 | Percentage of government spending on environmental protection to total government expenditure | SEEA-EPEA |

## 3.5 Indicator Gap Analysis

Where gaps in the existing indicator initiatives are known, the SEEA provides a multi-purpose framework that can be used to organise information and generate new indicators to address these gaps. The Indian team specifically identified the potential for Thematic Biodiversity Accounting to help in developing new national indicators for measuring progress towards SDG Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

## 3.6 Summary of Indian Indicators Assessment

Overall 40 Specific Indicators were identified and assessed out of the 297 set out in the National Indicator Framework for India for alignment with the SEEA. All 40 Specific indicators measure progress towards stated SDG Targets. Out of these, 36 were considered 'Full Possibilities' for alignment with the SEEA. All of which are characterised as 'output' indicators (i.e., could be generated by information organised in the SEEA Accounts). These indicators were most relevant to SDG 6 (Clean water and sanitation); SDG 14 (Life Below Water) and SDG 15 (Life on Land). A role for the SEEA was also identified for measuring India's progress towards achieving its National Determined Contribution the climate change action under the UNFCCC and via SDG 13.

Land Cover / Land Use / Ecosystem Extent Accounts and Protected Area Accounts were identified as priorities for compilation to generate 9 of the NIF Indicators. In addition, SEEA Water Accounts were identified as a priority for development to generate 4 NIF indicators. Jointly, the Ecosystem Condition Accounts and thematic biodiversity and carbon accounting were found to be relevant to the calculation of 5 of the NIF Indicators. The national team undertaking the assessment identified the potential for thematic biodiversity accounting via the SEEA to generate additional indicators for reporting on SDG 15.4 and the conservation of mountain biodiversity.

The number of Indian SDG indicators considered full possibilities for alignment with the SEEA significantly exceeded that identified in the assessment of global indicators. In part, this is due to the consideration of a wider range of SEEA Central Framework Accounts than in the global analysis. Overall, 17 of the Indian NIF indicators were identified to be amenable to calculation using the SEEA Central Framework Physical Flow (Residuals / Emissions) Accounts, SEEA Energy subsystem and Environmental Protection Expenditure Accounts. However, 6 additional possibilities for alignment with the SEEA also arise for national tailoring of the indicators to India's circumstances, specifically for SDG 13, 14 and 15. This highlights the ability of the SEEA to support countries in organising data in a flexible way to support calculation of nationally tailored indicators for SDG (and other) reporting purposes.

# 4 China

## 4.1 Indicator initiatives description

The Research Center for Eco-Environmental Sciences at the Chinese Academy of Sciences have undertaken the initial assessment of linkages between Chinese national indicator initiative's and the SEEA. Overall indicators from 12 national environmental and development frameworks and initiatives in China were reviewed (see Indicator Initiatives Reviewed sheet, Appendix C - Excel file). These comprised:

- Ecosystem Survey and Assessment
- National Ecological Function Zoning
- Key Ecological Function Zones
- Major Function Oriented Zoning
- Ecological Protection Redline
- Balance sheet of natural resource
- Gross Ecosystem Product (GEP)
- Assessment target system for ecological civilization construction
- Green Development Index System
- Environmental quality standards for surface water
- Ambient air quality standards
- Ecological Transfer Payment

## 4.2 Methodology for assessing Indicators from a SEEA Perspective

In order to assess the indicators from a SEEA perceptive, the Research Center for Eco-Environmental Sciences (RCEES) used expert judgement to identify the specific indicators that could be aligned to the SEEA within each of the 12 initiatives listed above. In total, 28 specific indicators were identified across the indicator initiatives for more detailed assessment.

The more detailed assessment of the possibility to align the specific indicators with the SEEA was undertaken by UNEP-WCMC. This assessment largely followed the methodology previously described for South Africa but only considered those indicators with the possibility to be generated by the SEEA (i.e., 'Output Indicators', as described in the glossary). All 28 of the specific indicators identified have been assessed for alignment with the SEEA Modules described in Section 1.1. Appendix C also presents the results of the assessment in Excel format.

## 4.3 General results of indicator review

The results of the analysis of the 28 specific indicators identified by the RCEES for possible alignment with the SEEA is summarised in Figure 6. Figure 6 identifies that 22 out of the total 28 specific indicators are considered 'Full Possibilities' for alignment with the SEEA modules described in Section 1.1, 5 as partial possibilities, and 1 as no alignment possible. The 5 partial possibilities for alignment with the SEEA related to 3 similar indicators on ecosystem patterns and 2 similar indicators on ecological sensitivity.

With respect to the indicator on ecosystem patterns, whilst the Ecosystem Extent Account would use information relevant to the configuration of ecosystems in the landscape, it does not yield metrics that describe these patterns and further analysis would be needed to derive this. It is possible that these types of indicators could be relevant to accounting for landscape scale

characteristics within Ecosystem Condition Accounting. However, there still remains some debate on how accounting for these types of characteristics will be achieved in practice.

For the indicators on ecological integrity, it was considered that there was an implicit 'scenario' or 'Forecasting' element to these indicators that was only partial supported by the SEEA Accounts. For example, information on sensitivity may be partially informed by future susceptibility of areas of land and ecosystems to modelled future climate change conditions, or increased intensity of local land-use.

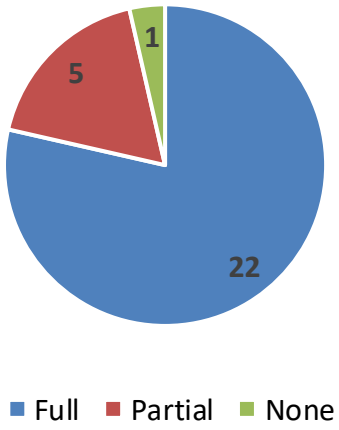


Figure 6: **Alignment with SEEA for Chinese Indicators.**

## 4.4 Analysis of All 'Full Possibility' National Output Indicators

In total, 22 of the specific. Table 5 presents the 22 specific indicators identified as full possibilities for generation via the SEEA (i.e., as output indicators) by the national indicator initiative they are associated with. As Table 5 shows, the 'Ecosystem Survey and Assessment' and 'Gross Ecosystem Product (GEP)' are the two initiatives the SEEA could support most, covering 18 out of 22 of the indicators assessed as full possibilities for alignment with the SEEA.

**Table 5: Chinese 'Full-possibility' output indicators by indicator initiative.**

| Indicator initiative | Number of output indicators |
|---|---|
| Ecosystem Survey and Assessment | 8 |
| National Ecological Function Zoning | 1 |
| Ecological Protection Redline | 1 |
| Gross Ecosystem Product (GEP) | 10 |
| Environmental quality standards for surface water | 1 |
| Ambient air quality standards | 1 |
| **Total:** | 22 |

### 4.4.1 Matching 'Full-Possibility' Output Indicators to Individual SEEA Accounts

In total 22 output indicators are considered 'Full Possibilities' for alignment with the SEEA modules. Figure 7 summarises the most relevant account for calculating these indicators. As per the global and South African Assessment, the scores in Figure 7 have been estimated from the information on the two most relevant accounts for calculating the Output Indicators, as captured in the 'Specific Indicators Reviewed' spreadsheet in Appendix C. The score is presented as an average across the two most relevant accounts for all 22 indicators.

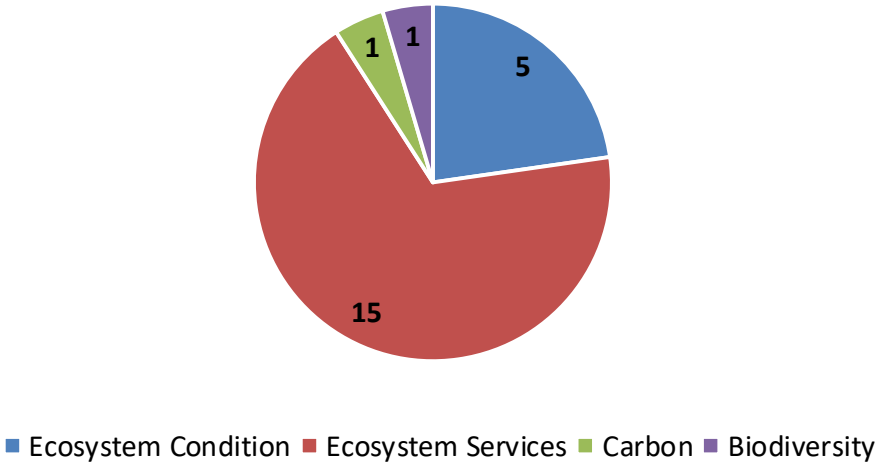


**Figure 7: Relevant SEEA Accounting modules for all China Output Indicators**

As shown in Figure 7, the majority of specific indicators identified for alignment with the SEEA in China could be calculated via the Ecosystem Services Accounts (15 out of 22). This reflects a particular focus of the GEP initiative on ecosystem services supply and use in monetary terms. The Ecosystem Condition Accounts are also identified as being important to the calculation of 5 specific indicators. This also highlights the key role the SEEA could play (or fulfil) in supporting national policy objectives related to maintaining ecological integrity.

Table 6 shows how the specific indicators match to the different SEEA Accounting described in Section 1.1. Table 6 reveals commonality in specific indicators under the Ecosystem Survey and Assessment Initiative and the GEP initiative. Particularly with respect to regulating ecosystem services, such as Carbon Sequestration and Soil Retention. Table 6 also confirms the importance of Ecosystem Services Accounts for generating indicators, being relevant to the calculation of 16 of the specific indicators identified as 'Full-Possibilities' for alignment with the SEEA in China.

Table 6 highlights the potential role of Ecosystem Condition accounting to support indicator calculation. Particularly, with respect to chemical indicators for environmental quality standards, physical indicators for water retention and ecosystem quality generally. Overall, Ecosystem Condition Accounts are found to be relevant to the calculation of 5 specific indicators. Table 6 also identifies a role for thematic accounting for carbon and biodiversity, in generating indicators for carbon sequestration and habitat provision for different elements of biodiversity.

It is noted that none of the specific indicators in Table 6 are supported by the Land Cover / Land Use / Ecosystem Extent Accounts. Whilst not presented here, the Ecosystem Extent Accounts were considered relevant to the calculation of the 5 indicators with partial alignment to the SEEA. As previously noted, these partial indicators provided information on ecosystem pattern and ecological sensitivity.

**Table 6: 22 China 'Full-possibility' output matched to SEEA Accounting Modules.**

| Indicator initiative | Specific indicator | Relevant accounts |
|---|---|---|
| Ecosystem Survey and Assessment | Ecosystem quality | Ecosystem Condition |
| | Food production | Ecosystem Services |
| | Carbon sequestration | Ecosystem Services and Carbon |
| | Soil retention | Ecosystem Services |
| | Sandstorm prevention | Ecosystem Services |
| | Water retention | Ecosystem Condition |
| | Flood mitigation | Ecosystem Services |
| | Provision of habitat for biodiversity | Biodiversity |
| National Ecological Function Zoning | Importance of ecosystem services | Ecosystem Services |
| Ecological Protection Redline | Importance of ecosystem services | Ecosystem Services |
| Gross Ecosystem Product (GEP) | Provisioning services | Ecosystem Services |
| | Water retention | Ecosystem Condition |
| | Soil retention | Ecosystem Services |
| | Sandstorm prevention | Ecosystem Services |
| | Flood mitigation | Ecosystem Services |
| | Air purification | Ecosystem Services |
| | Water purification | Ecosystem Services |
| | Carbon sequestration | Ecosystem Services and Carbon |
| | Climate regulation | Ecosystem Services |
| | Cultural services | Ecosystem Services |
| Environmental quality standards for surface water | Standard of 109 pollutants density | Ecosystem Condition |
| Ambient air quality standards | Standard of 10 pollutants density | Ecosystem Condition |

## 4.5 Summary of China Indicators Assessment

Overall 22 out of Specific Indicators were identified as 'Full Possibilities' for alignment with the SEEA. All of which are characterised as 'output' indicators (i.e., could be generated by information organised in the SEEA Accounts). Ecosystem Services Accounts were identified as priorities for compilation to generate 15 of these specific indicators. In addition, SEEA Ecosystem Condition Accounts were identified as a priority for development to generate 5 specific indicators. A role for thematic accounting for carbon and biodiversity via the SEEA was also identified. Specifically, with respect to generating indicators on carbon sequestration and provision of habitat for biodiversity.

The potential of the Ecosystem Services Accounts to support the China Indicator initiatives is worth highlighting. This reflects the importance of maintaining and enhancing the value of the goods and services supplied by ecosystems that contribute to human well-being at various scales. This illustrates the advantage of the SEEA in providing an integrated picture, not just of natural capital stocks but also the flows of benefits they supply. This aligns very well with the concept of Gross Ecosystem Product (GEP) and the decision-making contexts it will inform. For instance, evaluating government policy and performance, land use and infrastructure planning and payments for ecosystem services at different administrative scales (e.g., national, provincial county, city scale).

# 5 Mexico

## 5.1 Indicator initiatives description

The UNSD Consultant supporting in-country coordination for the NCAVES project completed an initial assessment of linkages between Mexican national indicator initiatives and the SEEA. It is highlighted that this indicator review has not been finalized with the national governmental partners for the project. In light of this, a detailed Excel based assessment of specific national indicators for Mexico is not presented as an Appendix to this report.

Indicators from 2 main national environmental and development frameworks in Mexico were reviewed. These comprised:

- National System of Environmental Indicators – further broken down to:
  - Core set of environmental indicators
  - Key environmental indicators
  - Green growth indicators
- National Strategy for the Implementation of Agenda 2030 in Mexico (Consultation draft as of 2018)

## 5.2 Methodology for assessing Indicators from a SEEA Perspective

In order to assess the indicators from a SEEA perceptive, the UNSD consultant for Mexico used expert judgement to identify the specific indicators that could potentially be aligned to the SEEA within the two main indicator frameworks listed above. In total, 99 specific indicators were identified across the indicator initiatives for more detailed assessment. It is highlighted that the indicators for the National Strategy for Implementation of Agenda 2030 (i.e., the SDGs) is a draft, initial proposal and may have been significantly updated since the initial assessment was complemented.

A more detailed assessment of the possibility to align these 99 specific indicators with the SEEA was performed by UNEP-WCMC. This assessment largely followed the methodology previously described for the other NCAVES countries. All 99 of the specific indicators identified were assessed for alignment with the SEEA Modules described in Section 1.1, including the Protected Area Accounts. In addition the Monetary Ecosystem Asset Accounts were also considered.[7]

## 5.3 General results of indicator review

The results of the analysis of the 99 specific indicators identified by the UNSD Consultant for Mexico for possible alignment with the SEEA is summarised in Figure 8. As shown in Figure 8, there are 79 out of the total 99 specific indicators that are considered 'Full Possibilities' for alignment with the SEEA modules considered in the assessment. These were all considered to be indicators that could be generated via the SEEA (i.e., Output Indicators). It is highlighted that a number of these specific indicators featured more than once across the set of indicator initiative's reviewed. For instance, 'Surface area affected by soil degradation' features as an indicator in both the core and key group of National System of Environmental Indicators.

[7] These accounts were included in the assessment on pragmatic grounds, reflecting that they had tangible applications for generating one of the specific indicators reviewed. It is noted that the Monetary Ecosystem asset accounts have not been included in analyses for the other countries. This reflects that the review of the Mexican Specific Indicators is the only review across the NCAVES counties that suggested a specific indicator could best be generated using information from this account.

'Mexican species at risk' features as an indicator in some fashion across all three sub groups of the core, key and green growth National System of Environmental Indicators, as well as the draft Agenda 2030 / SDGs indicators.

As Figure 8 reveals, 7 specific indicators were identified as partial possibilities for alignment with the SEEA. 3 of these specific indicators were from the National System of Environmental Indicators. These all related to instances where very local management information needed to be integrated with the type of biophysical information on the environment that can be organised via the SEEA. For instance, 'Surface area under forest management', which provides an indication of forest areas under particularly forest management support schemes. The remaining 4 partial possibilities for alignment with the SEEA related to specific indicators from the draft National Priority Goals and Indicators for the Implementation of Agenda 2030. These all related to indicators associated with SDG 6, particularly with respect to coverage and access to potable water and sewage connections for certain community groups. Whilst the SEEA Water could provide some of the information for calculating these indicators, these indicators also likely needed information from local household surveys. Particularly when they link to different subgroups of the population, such as indigenous communities.

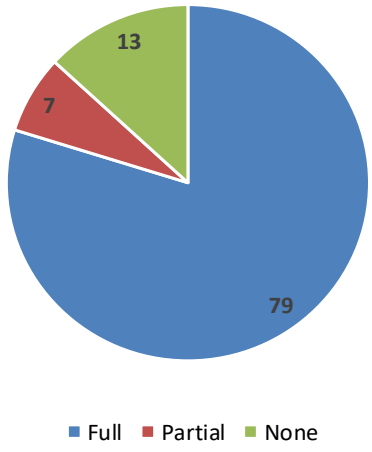


**Figure 8: Alignment with SEEA for Mexico indicators.**

## 5.4 Analysis of All 'Full Possibility' National Output Indicators

As previously highlighted, all the specific national indicators for Mexico considered 'Full Possibilities' for alignment with the SEEA are output indicators (i.e., they could be generated using the SEEA). Table 7 presents these 79 'Full Possibility' output indicators by the national indicator initiative they are associated with, broken down into the three sub-groups for the National System of Environmental Indicators. As shown in Table 7, there is a strong potential for the SEEA to support the generation of indicators in the Core set of environmental indicators from the National System of Environmental Indicators (40 out of the 79 'Full Possibilities' for alignment with the SEEA came from this group). Generally reflecting the assessment of global indicators, Table 7 also confirms the potential for the SEEA to support the generation of output indicators to inform on progress towards the SDGs, with 19 full possibilities identified from Mexico's draft National Priority Goals and Indicators for the Implementation of Agenda 2030.

**Table 7: Mexican 'Full-possibility' output indicators by indicator initiative.**

| Indicator initiative | Number of output indicators |
|---|---|
| National System of Environmental Indicators - Core set of environmental indicators | 40 |
| National System of Environmental Indicators - Key environmental indicators | 7 |
| National System of Environmental Indicators - Green Growth indicators | 13 |
| National Priority Goals and Indicators for the Implementation of Agenda 2030 | 19 |
| **Total:** | **79** |

### 5.4.1 Matching 'Full-Possibility' Output Indicators to Individual SEEA Accounts

In total 79 output indicators are considered 'Full Possibilities' for alignment with the SEEA modules. Figure 9 summarises the most relevant accounts for calculating these indicators. As per the global and China assessments, the scores in Figure 7 have been estimated from the information on the two most relevant accounts for calculating the Output Indicators. The score is presented as an average across the two most relevant accounts for all 79 output indicators.

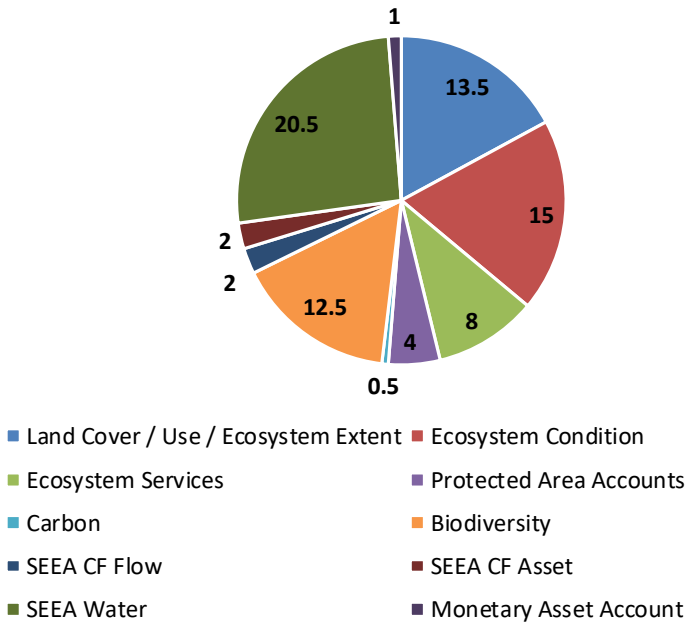


**Figure 9: Relevant SEEA Accounting modules for all Mexico Output Indicators**

As Figure 9 reveals, the SEEA Water Accounts could provide significant support for calculating the specific national indicators for Mexico (scoring 20.5 out of 79). This reflects a particular focus within the indicator initiatives on water supply and waste water treatment.

The Ecosystem Condition Accounts are also identified as being important to the calculation of the specific indicators (scoring 15 out of 79). These indicators were largely associated with monitoring land degradation, including from overgrazing or soil erosion, and the chemical quality of waters (BOD, nitrate loading, etc.). A number of specific indicators were also identified that could be calculated using the Land Cover / Land Use / Ecosystem Extent Accounts (Scoring 13.5 out of 79 in Figure 9). As would be expected, these indicators related to tracking land-use

change, terrestrial ecosystem extent, extent of forests, extent of natural ecosystems and extent of water-related ecosystems.

The relatively high scores of the Land Cover / Land Use / Ecosystem Extent Accounts and Condition Accounts highlights the role the SEEA could play in supporting national policy objectives related to maintaining natural capital stocks in terms of both their quantity and quality (i.e., ecological integrity). Related to this, Figure 9 also reveals an important role for the SEEA in accounting for biodiversity and related indicators (scoring 12.5 out of 79). This reflects that a number of the specific indicators identified focused on species populations, associated extinction risks and biodiversity-related natural capital.

Ecosystem Services Accounts scored 8 out of 79 in Figure 9. This reflects their potential role in calculating indicators for provisioning services, such as fish catch and supply of timber and non-timber products. The Protected Area Accounts proposed by South Africa were also considered to be relevant to the calculation of the draft SDG indicators for Mexico (scoring 4 out of 79).

A role was also identified for the SEEA Central Framework Asset and Physical Flow Accounts for calculating the draft SDG indicators (both scoring 2 out of 79 each). The indicators that could be generated via the Physical Flow Accounts were related to aquaculture production, which is not considered as a natural input from the environment (as would be the case for capture fisheries related flows). As previously noted, a role for the Monetary Ecosystem Asset Accounts was identified, this was for calculating an indicator for "Environmental costs of the change in forest resources amount".

## 5.5 Analysis of SDG Indicators

Table 7 reveals that 19 draft National SDG Indicators are full possibilities for generation via the SEEA. Figure 10 disaggregates these 19 indicators by SDG. As Figure 10 shows, 10 of these draft SDG indicators that could be generated via the SEEA relate to SDG 15 (Life on Land); 6 draft indicators relate to SDG 14 (Life Below Water); and, 3 draft indicators relate to SDG 6 (Clean Water and Sanitation).

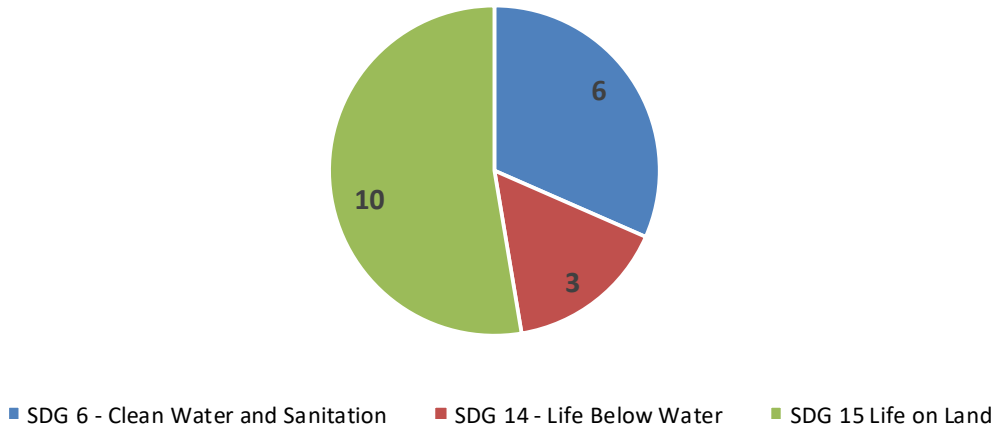


**Figure 10: Draft Mexican SDG Indicators with Full Possibility for Alignment with the SEEA by SDG**

Table 8 presents these 19 indicators linked to the SEEA Accounts most relevant for their calculation. Table 8 generally reflects the results of the full national indicator analysis. It highlights the importance of the SEEA Water (relevant to 6 draft SDG indicators). It also confirms the importance of the Land Cover / Land Use / Ecosystem Extent Accounts (relevant to 6 draft SDG indicators) and Ecosystem Condition Account (relevant to 4 draft SDG indicators) for potentially calculating national SDG indicators for Mexico.

**Table 8: Relevant Accounting Modules for Draft Mexico SDG Indicators**

| SDG Target | Specific Indicator | Relevant Accounts |
|---|---|---|
| SDG6, National Goal 6.1 | Disinfected water as a fraction of total water supply | SEEA Water |
| SDG6, National Goal 6.2 | Wastewater treatment | SEEA Water |
| SDG6, National Goal 6.3 | Pressure on hydric resources | SEEA Water |
| SDG6, National Goal 6.3 | Pressure on groundwaters' | SEEA Water |
| SDG6, National Goal 6.3 | Water use efficiency in the industrial and agricultural sectors | SEEA Water |
| SDG6, National Goal 6.4 | Change in the extent of water-related ecosystems over time | Land Cover / Use / Ecosystem Extent and SEEA Water |
| SDG14, National Goal 14.1 | Invasive species in marine environments | Ecosystem Condition and Biodiversity |
| SDG14, National Goal 14.1 | Mexican marine species at risk | Biodiversity |
| SDG14, National Goal 14.3 | Extent of marine protected areas as a proportion of the Exclusive Economic Zone | Protected Area Accounts |
| SDG15, National Goal 15.1 | Percentage of the national territory included in protected areas | Protected Area Accounts |
| SDG15, National Goal 15.1 | Invasive species in terrestrial environments | Ecosystem Condition and Biodiversity |
| SDG15, National Goal 15.1 | Terrestrial Mexican species at risk | Biodiversity |
| SDG15, National Goal 15.1 | Surface area covered by natural vegetation | Land Cover / Use / Ecosystem Extent |
| SDG15, National Goal 15.2 | Percent coverage of temperate and tropical forests | Land Cover / Use / Ecosystem Extent |
| SDG15, National Goal 15.2 (15.2.1) | Area under sustainable forest management | Land Cover / Use / Ecosystem Extent and Ecosystem Condition |
| SDG15, National Goal 15.2 | Extent of sustainable commercial forest plantations | Land Cover / Use / Ecosystem Extent and Ecosystem Condition |
| SDG15, National Goal 15.2 | Deforestation rate | Land Cover / Use / Ecosystem Extent |
| SDG15, National Goal 15.2 | Forested area under payment for environmental services | Ecosystem Services |
| SDG15, National Goal 15.3 | Environmental costs of the change in forest resources amount | Monetary Asset Account |

As with full national indicator analysis, an important role for Thematic Biodiversity Accounting is also identified (relevant to 4 of the draft SDG indicators). The Protected Areas Accounts to 2 draft SDG indicators. The Ecosystem Services and Ecosystem Monetary Asset also have a role to play in supporting the generation of at least 1 SDG Indicator each.

It is noted that 19 specific Mexican SDG indicators were identified as full possibilities for alignment with the SEEA and this is higher than the 17 identified in the assessment of the global SDG indicators. As with the India analysis, this is influenced by the national tailoring of SDG indicators in the draft Strategy for the Implementation of Agenda 2030. For instance, the Mexican Indicators for SDG, National Goal 14.1 and 15.1 with respect to invasive species do not have direct equivalents in the global SDG indicator framework. Similarly: SDG, National Goal 14.1 for marine species at risk; 15.1 on surface area covered by natural vegetation; and, 15.2 Forested area under payment for environmental services do not have direct equivalents in the global SDG indicator framework.

Table 8 identifies the draft SDG Indicator for National Goal 15.2 'Percent coverage of temperate and tropical forests' and National Goal 6.4 'Change in the extent of water-related ecosystems over time', as output indicators with a full possibility for generation via the SEEA. These were also identified as a priority indicator for calculation via the SEEA in the assessment of global indicators (with respect SDG Indicator 15.1.1 and 6.6.1).

## 5.6 Summary of Mexican Indicators Assessment

Overall 79 out of Specific Indicators were identified as 'Full Possibilities' for alignment with the SEEA. All of which are characterised as 'output' indicators (i.e., could be generated by information organised in the SEEA Accounts). The SEEA Water, Land Cover / Land Use / Ecosystem Extent and Condition Accounts were identified as priorities for compilation of these specific indicators. In addition, and important role for thematic accounting for biodiversity. Largely with respect to organising information on the threat status of species. A role for accounting for ecosystem services via the SEEA was also identified, including via Monetary Ecosystem Asset Accounts.

The importance of the Ecosystem Condition Accounts and Thematic Biodiversity Accounting for potentially calculating indicators from the national initiatives for Mexico reviewed is noted. This highlights the role the SEEA can play in supporting national policy objectives related to ecological integrity and maintaining the quality natural capital stocks. These types of indicators are important for informing sustainable development planning, as many of the benefits biodiversity provides are difficult to quantify as tangible flows.

# 6 Brazil

## 6.1 Indicator Set description

The UNEP Consultant providing in-country coordination for the NCAVES project completed an initial assessment of linkages between the Nationally Adjusted Targets for SDGs in Brazil (Objetivo de Desenvolvimento Sustentável – ODS) and the SEEA. It is highlighted that the indicators reviewed are a set of proposed / suggested indicators to inform progress towards the SDGs in Brazil.

## 6.2 Methodology for assessing Indicators from a SEEA Perspective

In order to assess the Brazilian draft indicators from a SEEA perceptive, the UNEP consultant for Brazil used expert judgement to identify a set of suggested or proposed specific indicators that could be aligned to the SEEA within the ODS. It is also highlighted that there had been no official determination on the adoption of these indicators at the time of the assessment. Consequently, these indicators require validation by the Brazilian Institute of Geography and Statistics (IBGE). As such, an Excel based assessment of specific national indicators for Brazil is not presented as an Appendix to this report. Overall, a set of 33 suggested (or proposed) specific SDG indicators and their associated targets have been assessed for alignment with the SEEA.

## 6.3 General results of suggested SDG indicators review

The results of the analysis of the suggested SDG indicators are presented in Figure 11. In total 19 of the suggested indicators are identified as 'Full Possibilities' for alignment with the SEEA and 5 as partial possibilities. Out of the 19 indicators identified as full possibilities for alignment, 17 indicators were output indicators (i.e., indicators that could be generated via the SEEA) and 2 were input indicators.

One of the partial possibilities for alignment with the SEEA related to the national target for SDG 2.4.1 and the associated SDG target of guaranteeing sustainable food production systems). 3 of the partial possibilities related to SDG 6, such as: 'The proportion of the population with access to safe water for consumption' (SDG 6.1.1); 'Number of days of water stress / shortage per year' (SDG 6.4.2); and, 'Number of people suffering from occasional and chronic water shortages' (SDG 6.4.4).

The final indicator for partial alignment related to 'The provision of access to safe inclusive public spaces in cities' (SDG 11.7.1). The global version of the indicator for this SDG Target is considered to fully align with the SEEA. However, the national indicator is focused on household access and ramps for sidewalks, rather the physical coverage of the urban environment by public open spaces. This makes it less directly suited for calculation via the SEEA using an urban ecosystem accounting approach.

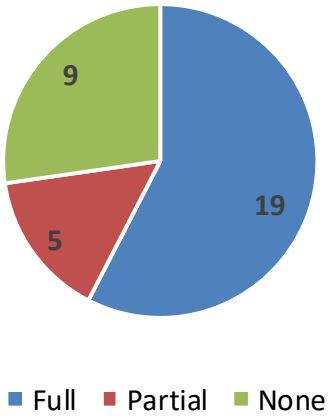


**Figure 11: Alignment with SEEA for Suggested Brazilian SDG Indicators.**

## 6.4 Analysis of All 'Full Possibility' Suggested National SDG Output Indicators

Figure 12 disaggregates the 17 suggested SDG indicators that are 'Full Possibilities' for generation via the SEEA (i.e., output indicators) by SDG. As Figure 12 reveals, 8 of these 17 suggested output indicators relate to SDG 15 (Life on Land). This compares with only 3 for SDG 14 (Life Below Water). Figure 12 also reveals that 5 suggested output indicators relate to SDG 6 (Clean Water and Sanitation), which can be mainly generated via the SEEA Water subsystem. One indicator suggested as a 'Full Possibility' for alignment with the SEEA was relevant for measuring progress towards SDG 8 (Decent Work and Economic Growth).

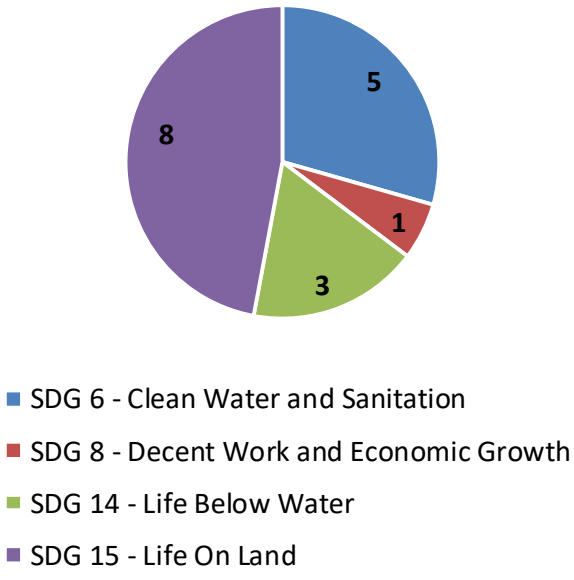


**Figure 12: Suggested Brazil Output Indicators with Full Possibilities for Alignment with the SEEA by SDG**

### 6.4.1 Matching 'Full-Possibility' suggested SDG Output Indicators to Individual SEEA Accounts

Within the global study, only 17 SDG indicators were identified as 'Full Possibilities' for alignment with the SEEA as output indicators. This is the same number as identified for the assessment of the suggested SDG indicators for Brazil. Figure 13 summarises the most relevant accounts for calculating these suggested indicators. As per similar analyses for the other NCAVES countries, the scores in Figure 13 have been estimated from the information on the two most relevant accounts for generating the output indicators. The score is presented as an average across the two most relevant accounts for all 17 Output Indicators.

Figure 13 reveals that there are a broad range of accounts that are relevant to the calculation of the 17 suggested SDG indicators that are 'Full Possibilities' for alignment with the SEEA as output indicators. The SEEA Water Accounts score 4 out of 17, the Land Cover / Land Use / Ecosystem Extent Accounts score 3.5 out of 17 and a range of accounts score between 1 and 2.

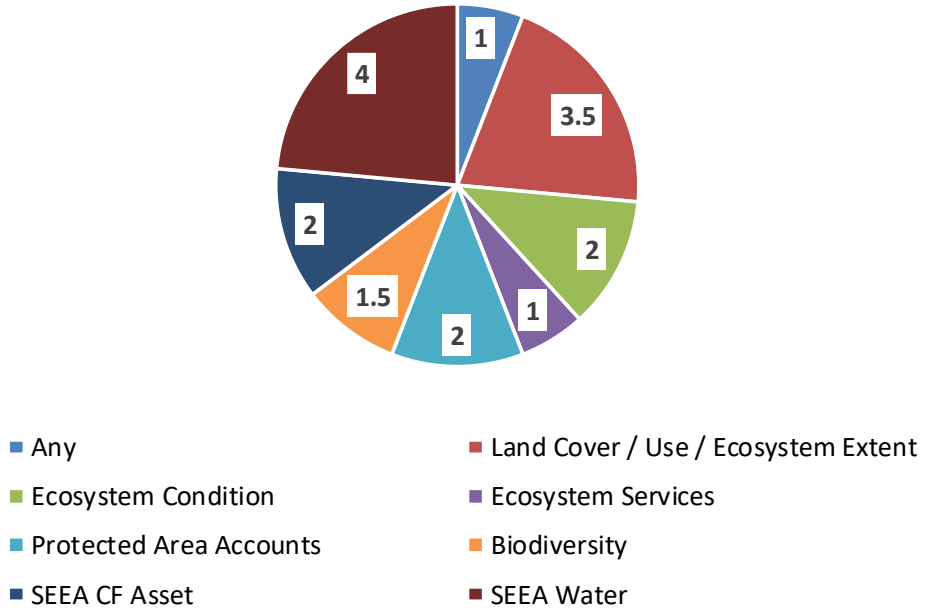


**Figure 13: Relevant SEEA Accounting modules for suggested Brazilian SDG Indicators**

Table 9 provides the detailed breakdown of these 17 suggested national SDG indicators to the SEEA Accounts most relevant to their calculation. Table 9 reveals that the Land Cover / Land Use / Ecosystem Extent Accounts were relevant to the calculation of 6 of the suggested SDG indicators and SEEA Water Accounts to 5 suggested SDG indicators. In combination, these two accounts were relevant to the calculation of 10 of the suggested SDG indicators.

The Ecosystem Condition and Thematic Biodiversity Accounting are also noted to be relevant to 4 and 3 of the suggested SDG indicators, respectively. Again, the potential utility of the proposed Protected Area account is noted, being relevant to the calculation of 3 of the specific indicators in Table 9. Table 9 also reveals a role for the SEEA Central Framework Asset Accounts (relevant to 2 indicators), Ecosystem Services Accounts (Relevant to 1 indicator) and the implementation of the SEEA generally (relevant to Aichi Target 2 and associated SDG 15.9.1).

It is notable that in Table 9 for more than half (8 out of 17) suggested SDG indicators, more than one account is needed to support their calculation. This highlights the importance of the SEEA for integrating information to support regular calculation of indicators that combine different data.

**Table 9: Relevant Accounting Modules for Proposed / Suggested Brazil SDG Indicators**

| SDG Target | Specific Indicator | Relevant Accounts |
|---|---|---|
| SDG 6.3.1 | Proportion of waste water treated safely. | SEEA Water |
| SDG 6.3.2 | Proportion of bodies of water with good ambient water quality | SEEA Water and Ecosystem Condition |
| SDG 6.4.1 | Water stress level - withdrawal of fresh water as a proportion of available freshwater resources | SEEA Water |
| SDG 6.4.3 | Quantity of water used in the production process / physical equivalent | SEEA Water |
| SDG 6.6.1 | Changes in the extent of ecosystems related to water over the time | Land Cover / Use / Ecosystem Extent and SEEA Water |
| SDG 8.9.1 | Number of visitors to National Parks, Sustainable Development Reserves, or Private Natural Heritage Reserves | Ecosystem Services |
| SDG 14.4.1 | Percentage of fish stocks within biologically sustainable levels | SEEA CF Asset |
| SDG 14.5.1 | Coverage of protected areas in relation to the marine area | Protected Area Accounts |
| SDG 14.7.1 | Sustainable fisheries as a percentage of GDP | SEEA CF Asset |
| SDG 15.1.1 | Percentage of forest areas of the total land area | Land Cover / Use / Ecosystem Extent |
| SDG 15.1.2 | Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type | Biodiversity and Protected Area Accounts |
| SDG 15.2.1 | Area of forests under sustainable environmental management | Land Cover / Use / Ecosystem Extent and Ecosystem Condition |
| SDG 15.3.1 | Proportion of land that is degraded over the total land area | Ecosystem Condition and Land Cover / Use / Ecosystem Extent |
| SDG 15.4.1 | Coverage of protected areas of places important to mountain biodiversity | Biodiversity and Protected Area Accounts |
| SDG 15.4.2 | Green mountain cover index | Land Cover / Use / Ecosystem Extent and Ecosystem Condition |
| SDG 15.5.1 | Trends in ecosystem, species and genetic level biodiversity loss | Land Cover / Use / Ecosystem Extent and Biodiversity |
| SDG 15.9.1 | Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020 | Any |

Table 9 identifies the National Indicators for: SDG 15.1.1 'Percentage of forest areas of the total land area'; SDG 15.3.1 'Proportion of land that is degraded over the total land area'; and, SDG 6.6.1 'Changes in the extent of ecosystems related to water over the time' as output indicators with a full possibility for generation via the SEEA. All three of these were considered to be priority indicators for testing calculation via the SEEA in the assessment of global indicators.

## 6.5 Summary of Brazilian Indicators Assessment

Overall 19 suggested SDG Indicators for Brazil were identified as full possibilities for alignment with the SEEA. 17 of these are characterised as 'output' indicators (i.e., could be generated by information organised in the SEEA Accounts). These indicators were most relevant to SDG 15 (Life on Land) and SDG 6 (Clean water and sanitation). A potential role for the SEEA was also identified for calculating indicators for SDG 14 (Life Below Water) and SDG 8 (Decent Work and Economic Growth).

Land Cover / Land Use / Ecosystem Extent Accounts and SEEA Water Accounts were identified as priorities for compilation to generate 10 of the suggested indicators. In addition, Ecosystem Condition and Biodiversity Accounts were identified as a priority for development to generate 4 and 3 suggested SDG indicators, respectively. The utility of applying the SEEA framework for Protected Area Accounting was also demonstrated.

It is noted that the SEEA EA accounts most commonly relevant to generating the suggested SDG indicators, typically, related to measures of natural capital stocks, rather than flows of benefits. A similar observation was also drawn from the assessment of global indicators. A further observation for the analysis was that over half of the suggested SDG indicators identified to potentially align with the SEEA, required more than one account to support their calculation. Thus, highlighting the importance of the integrated information system the SEEA provides.

# 7 Synthesis of country findings

The assessment of the links between national indicator initiatives, the SEEA and the SDGs was based on an expert assessment of indicators from across the NCAVES countries (South Africa, India, China, Mexico and Brazil). The South African indicators were primarily assessed by SANBI and Statistics South Africa. The evaluation of the Indian Indicators was completed by Ministry of Statistics and Programme Implementation (MoSPI), Government of India. In the case of China, the assessment was undertaken by Research Center for Eco-Environmental Sciences at the Chinese Academy of Sciences. For Mexico and Brazil, an initial assessment of national indicators was completed by consultants or representatives of UNSD and UNEP supporting the NCAVES project in-country.

For China, Mexico and Brazil, the inventory of national indicators has not been validated by the national governmental partners for the project. For all five countries, small amendments were made by UNEP-WCMC to improve consistency between countries and with the assessment of global indicators.

## 7.1 Assessment of National Indicators for Generation via the SEEA

A synthesis of the high-level findings of assessment across NCAVES countries is presented in Table 10. As Table 10 illustrates, there is a broad consensus that there is a significant role for the SEEA in supporting National Indicator generation across all 5 of the NCAVES Countries. 79 national indicators are identified as 'Full Possibility' for generation via the SEEA in Mexico; 36 are identified in India; 35 in South Africa; 22 in China; and, 17 in Brazil. This observation is aligned with the findings of the assessment of global indicator initiatives, where 41 such possibilities were identified. It is noted that, these numbers should be considered as somewhat indicative for Mexico and China, as double counting resulted from the occurrence of the same specific within multiple the different indicator initiatives reviewed.

As revealed in Table 10, for South Africa, India, Mexico and Brazil, the Land Cover / Land Use / Ecosystem Extent Accounts would be priorities for compilation in order to support national indicator calculation. These accounts were 'scored' to be relevant to between 17% and 27% of the national output indicators identified as 'Full Possibility' for generation via the SEEA in these countries. This finding supports the SEEA EEA Technical Recommendations to start with compiling ecosystem extent accounts when implementing ecosystem accounting.

Table 10 reveals there are strong differences across NCAVES countries with respect to the most important accounts for generating specific indicators identified as full possibilities for alignment with the SEEA. For example, the Ecosystem Services Accounts scored poorly with respect to their relevance to the 'Full Possibility' national output indicators in South Africa, India, Mexico and Brazil (scoring between 1 and 10%), but very highly for China, as discussed latter in this section.

For South Africa, Mexico and Brazil, the SEEA Water was identified as also being a priority for compilation for national indicator generation. The SEEA Water Accounts scores indicate they are relevant to between 18% and 26% of the national output indicators identified as 'Full Possibility' for generation via the SEEA in these countries. Slightly higher, yet similar, to the findings from the assessment of global indicators (17%).

An important observation from the national indicators assessment is that for many of the national indicators identified as full possibilities for generation via the SEEA, more than one account was considered relevant to their calculation. This highlights the importance of the SEEA for integrating different data and information to support regular indicator calculation.

**Table 10: Synthesis of national indicator assessment and alignment with the SEEA across NCAVES countries**

| | South Africa | India | China* | Mexico | Brazil | | Global |
|---|---|---|---|---|---|---|---|
| Indicator initiatives reviewed | 11 | 1 | 12 | 2 | 1 | | 9 |
| Number specific indicators reviewed | 47 | 40 | 28 | 99 | 33 | | 289 |
| Number of 'Full Possibility' output indicators | 35 | 36 | 22 | 79 | 17 | | 41 |
| Number of 'Full Possibility' SDG output indicators | 11 | 36 | N/A | 19 | 17 | | 17 |
| Full Possibility to Align with National **SDG 15.1.1** Indicator | ✓ | ✓ | N/A | ✓ | ✓ | | ✓ |
| Full Possibility to Align with National **SDG 15.3.1** Indicator | ✓ | × | N/A | × | ✓ | | ✓ |
| Full Possibility to Align with National **SDG 11.7.1** Indicator | × | × | N/A | × | × | | ✓ |
| Full Possibility to Align with National **SDG 6.6.1** Indicator | × | × | N/A | ✓ | ✓ | | ✓ |
| **Account matching scores to all 'Full Possibility' output indicators** | | | | | | | |
| Any | 0 (0%) | 1 (3%) | 0 (0%) | 0 (0%) | 1 (6%) | | 1 (2%) |
| Land cover/use/ecosystem extent | 9.5 (27%) | 6 (17%) | 0 (0%) | 13.5 (17%) | 3.5 (21%) | | 12 (29%) |
| Ecosystem condition | 5.5 (16%) | 2 (6%) | 5 (23%) | 15 (19%) | 2 (12%) | | 7.5 (18%) |
| Ecosystem services | 0.5 (1%) | 0 (0%) | 15 (67%) | 8 (10%) | 1 (6%) | | 5.5 (13%) |
| Biodiversity | 0 (0%) | 2 (6%) | 1 (5%) | 12.5 (16%) | 1.5 (9%) | | 2.5 (6%) |
| Carbon | 0 (0%) | 1 (3%) | 1 (5%) | 0.5 (1%) | 0 (0%) | | 3 (7%) |
| Monetary Ecosystem Asset Account | 0 (0%) | 0 (0%) | 0 (0%) | 1 (1%) | 0 (0%) | | 0 (0%) |
| Protected Area Accounts | 12.5 (36%) | 3 (8%) | 0 (0%) | 4 (5%) | 2 (12%) | | N/A |
| SEEA Water | 6 (17%) | 4 (11%) | 0 (0%) | 20.5 (26%) | 4 (24%) | | 7 (17%) |
| SEEA CF Asset | 1 (3%) | 0 (0%) | 0 (0%) | 2 (3%) | 2 (12%) | | 2.5 (6%) |
| Other Central Framework Account (e.g., residual flows, physical flows not from the environment, energy, expenditure) | 0 (0%) | 17 (47%) | 0 (0%) | 2 (3%) | 0 (0%) | | 0 (0%) |

* China 'Scores' have been calculated from the information in Table 6.

## 7.2 Using the SEEA for reporting on National SDG Indicators

With respect to the National SDG Indicators reviewed for South Africa, India, Mexico and Brazil, the findings presented in Table 10 generally reflect those for the assessment of global indicators. In South Africa 11 National SDG Indicators were identified as Full Possibilities for generation via the SEEA, In India it was 36, in Mexico 19, in Brazil 17 and for the assessment of global indicators 17 were identified. It is highlighted that it has not been possible to assess the link between the SEEA and National SDGs in China as part of this assessment. Furthermore, for Mexico and Brazil, the SDG indicators reviewed remain draft or suggested, as such these indicators are not confirmed as being officially nationally determined.

It is noted the Indian result is considerably higher that the result from the assessment of global SDG indicators. In part this is due to the inclusion of a wider range of SEEA Central Framework Accounts in national indicator inventory compiled by the Indian team. However, for both India and Mexico, there are several national SDG indicators that have been developed that do not have direct equivalents in the global SDG indictor framework. This reflects national tailoring of SDG Indicators to best align with national circumstances and illustrates the advantage of the SEEA in organising information for serving a range of nationally relevant indicators for different reporting purposes.

As part of the assessment of global indicators, 4 priority SDG Indicators were identified for testing their generation via the SEEA (SDG 15.1.1, 15.3.1, 11.7.1 and 6.6.1). Table 10 reveals that the National Implementation of SDG 15.1.1 was identified as a 'Full Possibility' for generation via the SEEA in all four countries in which the National SDG indicators were assessed. For SDG 15.3.1, the National Indicator was considered a 'Full Possibility' for generation via the SEEA in South Africa and Brazil. For SDG 6.6.1, the National Indicator was considered a 'Full Possibility' for generation via the SEEA in Mexico and Brazil. SDG 11.7.1 was not identified as a 'Full Possibility' for generation via the SEEA in any of the NCAVES countries.

The above discrepancies with the assessment of global SDG indicators may arise due to the national tailoring of SDG indicators to countries circumstances. For instance, for Brazil, the national SDG indicator 11.7.1 is identified as a partial possibility for alignment. This reflects that the national tailoring of the indicator is focused on household access and ramps for sidewalks, rather the physical coverage of the urban environment by public open spaces in the global SDG 11.7.1 indicator. In some ways, this can be considered a corollary to the above observation on the ability of the SEEA supporting the generation of nationally tailored SDG indicators in India and Mexico.

Based on the national indicator assessments, there exists a strong potential for the SEEA to support the national reporting on of the SDG targets and associated measurement of national indicators generally. For SDG 15.3.1 and 6.6.1, the assessed potential with respect to the national implementations of the indicators is more mixed. As such, the results of the in-country testing of the method notes to generate these indicators may prove insightful for informing their national determinations.

## 7.3 Linking the SEEA to different environmental policy themes

The assessment of South Africa, China and Mexico national indicators included a review of several indicator initiatives outside of the national indicator framework for the SDGs. This provides an opportunity gather insights for implementing the SEEA in a way that best responds to different countries environmental policy objectives and themes.

In South Africa the compilation of Protected Area Accounts is aligned to policy interest in these particular management areas and the ecosystem assets they cover. Accordingly, the Protected Area Accounts scored highly in South Africa, being considered relevant to 36% of national output indicators identified.as 'Full Possibilities' for generation via the SEEA. More universal support for the utility for the Protected Areas Accounts is illustrated in the analyses for India, Mexico and Brazil, where they were scored as being relevant to between 5% and 12% of national output indicators identified as full possibilities for generation via the SEEA. This reflects that countries clearly need systematic data on protected areas to regularly report on indicators for these management areas.

In China there is a strong policy and management interest in maintaining and enhancing ecosystem services flows within different administrative areas. Notably via the Gross Ecosystem Product (GEP) initiative. Where poor environmental stewardship is linked to loss of ecosystem services supply, this would be translated into reductions in GEP. Due to this focus on ecosystem service flows, the Ecosystem Services Accounts scored high in the China assessment. They were considered to be relevant to 67% of all national output indicators identified as full possibilities for generation via the SEEA.

In Mexico, the policy interest in maintaining biodiversity-related natural capital is observed through the higher scores the Ecosystem Condition Accounts and thematic accounting for biodiversity achieve. These are considered to be relevant to 19% and 16% of the national output indicators identified as full possibilities for generation via the SEEA. This highlights the role the SEEA can play in supporting national policy objectives related to biodiversity and delivering indicators that provide a deeper insight into ecosystem and species level biodiversity trends.

The role that the SEEA can play as organising framework for data is important. This can help identify where the main data gaps lie and provide insight into the potential indicators that could be generated with the right data basis in place. For instance, for South Africa and India, possibilities were identified for the SEEA to address identified indicator gaps. In particular, using the SEEA to generate indicators for water quality, marine protected areas and sustainable fishing and directing appropriate data collection efforts in this regard.

An important collective observation from this assessment is that the different accounting modules (or parts of the SEEA information system) can speak to a range of environmental policy objectives, themes, development perspectives and analytical objectives (including gap analysis). For instance, informing planning for conservation grounded in area-based planning and management, mainstreaming ecosystem services into economic planning and building ecological integrity and stocks of biodiversity-related natural capital. This illustrates a key advantage in using the SEEA as an organising framework for indicator calculation, that it is a multipurpose framework with a modular approach, allowing countries to focus on policy priorities. Moreover, it allows different perspectives to be combined and reconciled in order to provide an integrated coherent picture to inform development that proceeds in balance with nature.

# Appendix A: Assessment of South African Indicators from a SEEA perspective (Excel file)

The South African team identified a total of 59 specific indicators with the broad potential for partial or full alignment with the SEEA. The team then implemented the following stepwise approach to further assess each specific indicator from a SEEA perspective:

1. The 'Specific Indicators Reviewed' spreadsheet in Appendix A (Excel file) was populated with an indicator ID for each specific indicator (Column A), the national framework the indicator was from (Column B) and the definition of the specific indicator (Column C)
2. Each specific indicator was then assed as to whether it provided information for SEEA accounts (i.e., could be integrated into the SEEA, Column D), could be generated by SEEA Accounts (Column E) and which two SEEA Modules were most relevant to the indicator (Columns F and G). The South African team added the Protected Area account category to this analysis, potential thematic account for the SEEA. Protected Area accounts are a priority for testing in South Africa as part of the NCAVES project.[8] Where only one accounting module was considered relevant for the indicator, this was entered into both Column F and G. From this information 'scores' for the relative usefulness of different accounting modules can be calculated.
3. The indicators that are a priority for the NCAVES Project in South Africa are identified in Column H. These are the indicators that could be generated by, or integrated in to, the SEEA accounting modules considered in the assessment of global indicators (as described in Section 1.1).
4. For those indicators we think are the priority indicators for the NCAVES project, the South Africa team filled in additional columns of information on methodology (columns I to R). This included metadata on the custodian agency (Columns I), the operational status of the indicator (Column J), a description on the methodology for calculating the indicator (Columns K and L), its data needs and availability (Columns M) and (where possible) frequency of production / data collection (Column N).
5. Where the indicator was an SDG Indicator this was recorded in Column O and if it was an Aichi Target in Column P. Column Q recorded information on any links to SDG Targets Indicators and Column R on links to any other indicator initiatives.
6. In addition to the indicator initiatives identified in Section 2.1, gaps in indicator initiatives for South Africa have also been identified (termed 'Gap indicators). These are indicators that are considered a priority for development but are not currently operational, experimental or under development (as shown in Column J). The gap indicators can be identified by their unique identifier in column A (GAP

[8] It should be noted that for the indicator SDG 6.6.1, change in the extent of water-related ecosystems, the two most relevant accounts were amended to include SEEA Water, as well as Land cover/use/ecosystem extent. This was to ensure consistency with previous analyses undertaken by UNEP-WCMC and also to account for groundwater bodies.

01…) and are blank in Column J (with the exception of GAP 04 - Marine Protected Areas Securing Fisheries Resource Base, where there is an indicator under development).

7. In order to align the South Africa national indicator inventory with the assessment of global indicators, the UNEP-WCMC added three further columns. Column S identifies if the indicator was an output (i.e., can be generated by the SEEA) or input (can be integrated into the SEEA) indicator. Column T provides a Yes / No assessment of whether the indictor is of high relevance to the NCAVES project.
8. The final, Column U assigns a Full, Partial or None Possibility for alignment of the indicator with the SEEA. The was based on consideration of the following factors:
    - **Full possibilities for alignment:** Output indicators for which the SEEA has clear potential to provide all, or most, of the information required for their calculation and input indicators that provide data for SEEA accounts. This represents a conceptual alignment based on the structure of the SEEA framework.
    - **Partial possibilities for alignment**: the SEEA can organise some of the information for calculating the indicator. Substantial information is required from other sources to calculate the indicator.

# Appendix B: Assessment of India Indicators from a SEEA perspective (Excel file)

In order to assess these specific indicators from a SEEA perceptive the following stepwise approach was followed by the Indian National team:

1. Each specific indicator was evaluated on the basis of being a full, partial or none possibilities for calculation (i.e., an output indicator that can be generated by the SEEA) using the accounting modules, the SEEA modules described in Section 1.1 plus the SEEA CF Environment Expenditure Accounts; SEEA-Energy subsystem; Material / Waste Flow Accounts; and, Residual Flow Accounts. The was based on consideration of the following factors:
    - **Full possibilities for alignment:** Output indicators for which the SEEA has clear potential to provide all, or most, of the information required for their calculation and input indicators that provide data for SEEA accounts. This represents a conceptual alignment based on the structure of the SEEA framework.
    - **Partial possibilities for alignment**: the SEEA can organise some of the information for calculating the indicator. Substantial information is required from other sources to calculate the indicator.
2. Where a specific indicator was assessed as being either a full or partial possibility for calculation via the SEEA (i.e., an output indicator), this was recorded in Column F in Appendix B (Excel file). The name of the national indicator was recorded in Column C and the associated Global SDG Target and Indicator Number recorded in Column A and B, respectively.
3. In column D the relevant accounts were recorded for calculating the indicator and in column E the framework (Central Framework of Experiment Ecosystem Framework) that contains the relevant accounting module was recorded.
4. In order to align the Indian assessment with the global and South African assessments, some minor adjustments have been made by UNEP-WCMC. These are detailed in column G and H of the spreadsheet presented in Appendix B.

# Appendix C: Assessment of China Indicators from a SEEA perspective (Excel file)

In order to assess these specific indicators from a SEEA perceptive the following stepwise approach was followed by the Research Center for Eco-Environmental Sciences and UNEP-WCMC:

1. The Research Centre for Eco-Environmental Sciences compiled the spreadsheet identifying each specific indicator organised under the different National Indicator Initiatives / frameworks. In column F they provided the broad method for calculating the indicator and in Column N some short notes on how to align with the SEEA
2. Drawing on this information, UNEP-WCMC provided further assessment note on how to align the specific indicator with the SEEA, focusing on how to calculate the indicator. These are provided in Column O, with a conclusion on alignment potential in Column P
3. Each specific indicator was assessed by UNEP-WCMC on the basis of being a full, partial or none possibilities for calculation (i.e., an output indicator that can be generated by the SEEA) using the accounting modules the SEEA modules described in Section 1.1. The assessment result is provided in Column Q. The was based on consideration of the following factors:
    - **Full possibilities for alignment:** Output indicators for which the SEEA has clear potential to provide all, or most, of the information required for their calculation and input indicators that provide data for SEEA accounts. This represents a conceptual alignment based on the structure of the SEEA framework.
    - **Partial possibilities for alignment**: the SEEA can organise some of the information for calculating the indicator. Substantial information is required from other sources to calculate the indicator.
4. Where a specific indicator was assessed as being possibility for calculation via the SEEA (i.e., an output indicator) this was recorded in Column R.
5. In columns S and T, the two most relevant accounts were recorded for calculating the indicator were recorded.