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System of
Environmental
Economic
Accounting

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

Working document

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Glossary

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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).

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).

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

Distinct indicators: Indicators that belong to more than one global indicators initiative (e.g., change in the extent of water related ecosystems is adopted as SDG 6.6.1 and Aichi Target 5.5.1 but only one of these would feature in the set of distinct indicators).

Full Possibilities for Alignment with SEEA: Output indicators for which the SEEA has obvious 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.

Indicator Methodological Gap: Proposed indicator from a global initiative for which there is no agreed methodology for measurement. Tier III SDG Indicators and the generic Aichi Targets indicators with no specific indicators are included.

Mainstreaming Opportunity: Possibility for the SEEA to generate an indicator that communicates progress of integrating the benefits provided by the environment / biodiversity into sustainable development planning (i.e., progress towards implementing an ecosystem approach to sustainable development).

1 Introduction

80

81 In 2015 the UN Statistical Commission established the Inter-Agency Expert Group on SDG (Sustainable
82 Development Goals) Indicators (IAEG-SDGs) to develop and implement a global indicator framework for
83 the SDGs and their targets. This framework was developed and adopted by the General Assembly on
84 Work of the Statistical Commission in July 2017 (as set out in the Annex of UN General Assembly
85 Resolution A/RES/71/313).¹ To facilitate the implementation of this framework, all indicators are
86 classified into three tiers based on their methodological development and availability of data at a global
87 level, as follows:

- 88 • Tier I: indicator is conceptually clear, established methodology and standards are available and
89 data are regularly produced by countries;
- 90 • Tier II: indicator is conceptually clear, established methodology and standards are available but
91 data are not regularly produced by countries
- 92 • Tier III: no established methodology or standards are available for the indicator or
93 methodology/standards are being developed or tested for the indicator.²

94 To inform the high-level political forum on progress towards the Sustainable Development Goals,
95 annual reports are produced under the auspices of the Secretary-General in cooperation with the United
96 Nations based on this global indicator framework (UN Economic and Social Council, March 2017).³ The
97 indicators presented in the progress report represent global, regional and sub-regional aggregates
98 calculated from data produced by national statistical systems (para. 2 and as directed by Resolution
99 A/RES/71/313).^{4,5} This data is aggregated by international agencies / custodians, who may adjust
100 national data for international comparability or estimate missing values using Tier I or Tier II
101 approaches outlined above when countries have no data on the indicators themselves.

102 National statistical offices face significant reporting requirements, with respect to the SDGs and other
103 conventions and processes. The SEEA (System of Environmental-Economic Accounting) is a multi-
104 purpose statistical framework, and provides an opportunity to streamline the production of SDG
105 Indicators with an environmental dimension with other demands for environmental-economic
106 statistics. For example, mainstreaming the environment into development and economic planning,
107 reporting under the other Rio conventions and understanding the distribution and status of a country's
108 natural capital wealth. This will not only reduce the data processing demands on national statistical
109 agencies, but also on custodian agencies who have to apply agreed global methodologies where
110 national data gaps emerge.

1.1 Aims and objectives

111 The aim of the work presented in this report is to develop an integrated environment-economy focused
112 sustainable development indicator set based on the SEEA Experimental Ecosystem Accounting (SEEA-
113 EEA) modules and selected modules in the SEEA Central Framework (SEEA-CF), in the context of the
114 2030 Sustainable Development Agenda and the discussion on the Post 2020 Biodiversity Framework.
115 The starting point for this work is to establish the role the SEEA can play in directly supporting the
116 production of SDG Indicators. This is described in the left hand side of Figure 1, which illustrates the
117

¹ <https://undocs.org/A/RES/71/313>

² <https://undocs.org/E/CN.3/2017/2>

³ <https://unstats.un.org/sdgs/files/report/2017/secretary-general-sdg-report-2017--EN.pdf>

⁴ <https://unstats.un.org/sdgs/files/report/2017/secretary-general-sdg-report-2017--EN.pdf>

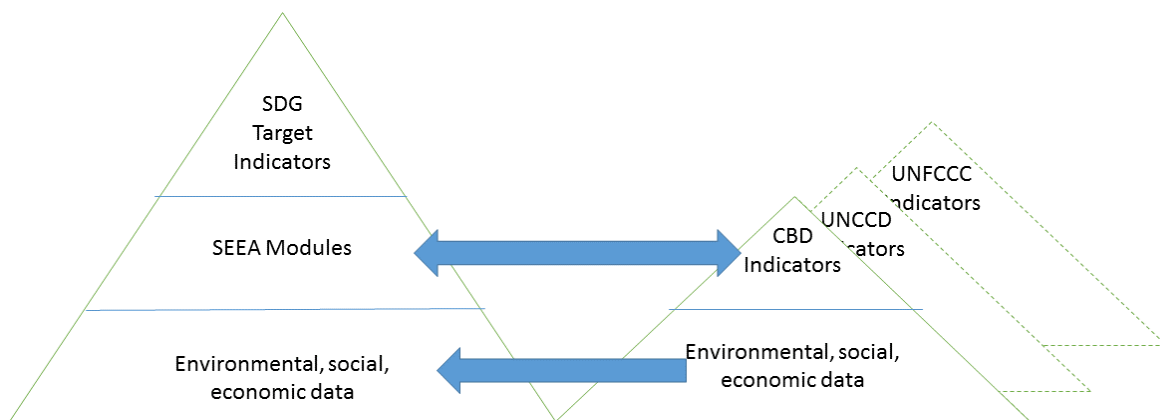
⁵ <https://undocs.org/A/RES/71/313>

118 well-known information pyramid. As shown in right hand side of Figure 1, the work is extended to
 119 evaluate how the SEEA can be aligned with other existing global indicator initiatives and associated
 120 data. This includes how the SEEA can be used to organise the environmental, social and economic data
 121 currently used for calculating multiple indicators on an individual basis in a consistent, harmonised
 122 fashion (represented by the bottom arrow in Figure 1). Accordingly, the SEEA accounting modules can
 123 be used to readily generate t range of indicators to support multiple reporting commitment
 124 (represented by the return arrow to the tips of the smaller pyramids in Figure 1). The work also
 125 evaluates existing indicators from these initiatives could also contribute input data to the SEEA
 126 Modules (e.g., with respect to Ecosystem Condition Accounting, also represented by top arrow in Figure
 127 1). This analysis is intended to facilitate and improve our understanding of how the SEEA can:

- 128 • Streamline multiple environmental reporting obligations and avoid repeated calculations of
 129 indicators from basic data.
- 130 • Improve consistency between multiple datasets and indicators for informing on progress
 131 towards the SDGs.
- 132 • Facilitate the integration of existing indicators into environmental-economic analysis to provide
 133 an improved evidence base to inform sustainable development.

134 In addition, to global indicator initiatives, national Indicators from India, Mexico and South Africa are
 135 evaluated. The results for these country case studies are provided in Appendix D (to be completed).

136



137
 138 **Figure 1: Structure of the analysis**

139 There are five objectives for the analysis:

- 140 1. Which global and national indicators have the potential to be generated using SEEA accounts
 141 and support reporting on progress towards SDG Targets?
- 142 2. Which global and national indicators can provide input data for SEEA Modules in support of
 143 reporting on progress towards SDG Targets?
- 144 3. What are the gaps in current indicator initiatives that could be filled using the SEEA and existing
 145 global (and national) data?
- 146 4. Which global and national indicators that could be generated by the SEEA to support reporting
 147 on SDG Targets should be considered priorities for testing?

148 5. What are the most suitable economic instruments to stimulate progress towards SDGs and
149 associated policy targets based on the set of identified priority indicators? (to be addressed in
150 further analysis)

151 2 Relevant SEEA Accounts

152 This analysis specifically focuses on the core and thematic accounts of the SEEA-Experimental
153 Ecosystem Accounting (SEEA EEA) and those in the SEEA Central Framework (SEEA CF) that are most
154 relevant to ecosystems and the services they provide (e.g., water provision, fish stocks, etc.). These
155 comprise the following:

- 156 • **Ecosystem Extent and Ecosystem Condition Accounts:** These are the core biophysical
157 accounts for measuring the stocks of ecosystem assets in the SEEA EEA. They measure the
158 area of ecosystems by type and physical characteristics that help understand the condition of
159 the ecosystems.
- 160 • **Ecosystem Services – Supply and Use (Physical and Monetary) Accounts.** These accounts
161 record the actual flows of services and goods from ecosystems to the economy in both
162 physical and monetary terms. It should be noted that the ecosystem services accounts are an
163 extension of the SEEA CF Physical Supply and Use Tables.⁶
- 164 • **The SEEA-CF Physical Flow (Supply and Use) Accounts.** These accounts measure the use of
165 natural resources from the environment, their use within the economy and the returns of
166 residuals in the form of solid waste, wastewater and emissions back to the environment. These
167 accounts provide information on provisioning services and as such they should be integrated
168 with ecosystem service supply and use accounts to support integrated ecosystem-economic
169 analysis. The SEEA CF Residual Accounts are not considered in the analysis, although they do
170 provide information on ecosystem condition pressures.
- 171 • **Thematic Biodiversity, Water, Carbon and Land Accounts.** Thematic accounts for land and
172 water are presented in the SEEA EEA and are grounded in the SEEA-CF Asset Accounting
173 approach / format.⁷
- 174 • **The SEEA-CF Physical Asset Accounts.** These accounts provide measures of 'Stocks' of natural
175 resources and may be an explicit parameter in an SDG indicator. Those that align with relevant
176 provisioning services (e.g., timber, water, fisheries) are specifically considered in the analysis

177 The Environmental Activity Accounts of the SEEA CF are recognised to have the potential to inform on
178 several of the SDG Indicators related to Overseas Development Assistance and Government
179 Expenditure on environmental protection. However, whilst these possibilities are acknowledged, this
180 analysis does not attempt to make the links to these accounts. The need to align classification of
181 biodiversity expenditures (e.g., under BIOFIN) and these accounts is acknowledged and a programme

⁶ See para 5.10 of the Technical Recommendations in support of the SEEA Experimental Ecosystem Accounts
[https://seea.un.org/sites/seea.un.org/files/technical_recommendations_in_support_of_the_seea_eea_final_white_c
over.pdf](https://seea.un.org/sites/seea.un.org/files/technical_recommendations_in_support_of_the_seea_eea_final_white_cover.pdf)

⁷ See para 9.4 of the Technical Recommendations in support of the SEEA Experimental Ecosystem
Accounts [https://seea.un.org/sites/seea.un.org/files/technical_recommendations_in_support_of_the_seea_eea_fin
al_white_cover.pdf](https://seea.un.org/sites/seea.un.org/files/technical_recommendations_in_support_of_the_seea_eea_final_white_cover.pdf)

182 for advancing this is under development between environmental-economic accounting and biodiversity
183 financing communities.⁸ This will support indicator production for SDG 15a and 15b.

184 With a clearly defined set of accounts identified, the following sections set out a stepwise approach for
185 assessing specific global indicator initiatives from a SEEA perspective and explicitly linking them to the
186 above accounts. By adopting a systematic approach, gaps in the current global indicator initiatives can
187 be identified and opportunities for the SEEA to generate indicators for priority SDG Targets can be
188 developed. Indicator alignment is considered from two perspectives:

- 189 1. *Generated using SEEA* (e.g., indicators that can be derived directly from the above accounting
190 modules, termed **output indicators**); and,
- 191 2. *Integrated into SEEA* (e.g., indicators that can contribute data or information to any of the above
192 accounting modules, termed **input indicators**).

193 3 Global Indicator Review

194 To focus the analysis, an inventory of global indicator initiatives was compiled. The inventory included
195 initiatives for the SDGs, Multilateral Environmental Agreements, biodiversity and the environment,
196 Green Economy / Growth and Wealth Accounting. This inventory is presented as Appendix A, which
197 provides a brief review of each indicator initiative and an assessment of their priority for analysis. This
198 assessment is based on the relevance of the indicator to the SDGs and the accounts identified in
199 Section 2. The review identified the following initiatives as high priority:

- 200 • Global Framework of SDG Indicators.
- 201 • United Nations Convention on Biological Diversity (CBD) Aichi Target Indicators (to be updated
202 in 2020).
- 203 • United Nations Convention to Combat Desertification (UNCCD) Indicators.
- 204 • United Nations Framework Convention on Climate Change (UNFCCC) Indicators.
- 205 • Biodiversity Indicator Partnership (BIP) Indicators.
- 206 • Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
207 Indicators.
- 208 • Sendai Framework for Disaster Risk Reduction (Sendai) indicators.
- 209 • The Ramsar Convention on Wetlands Indicators.

210 The assessment follows a stepwise approach. In Section 3.1 the SDG and other global indicator
211 initiatives listed above are reviewed and assessment is made on the possibilities to fully or partially
212 align individual indicators from these initiatives with the SEEA. This is based on metadata
213 requirements or the possibilities for the indicators to be directly integrated into the relevant accounting
214 modules set out in Section 2. Section 3.2 builds on this assessment by focusing on those indicators
215 identified as full possibilities for alignment with the SEEA. Specifically, Section 3.2 resolves any
216 repetitions of indicators (e.g., change in the extent of water related ecosystems is an SDG Indicator and

⁸ https://unstats.un.org/unsd/envaccounting/ceea/meetings/twelfth_meeting/Methodological%20alignment-biodiversity%20accounting%20Final.pdf

217 an Aichi Target Indicator). This allows a set of distinct indicators to be identified and avoids having to
218 assess the same indicator twice (or more). Section 3.2 then establishes the key SEEA accounting
219 modules that each distinct indicator can be aligned to. Section 3.3 explores overlaps where SDG
220 Indicators are also used for reporting on progress under other global indicators initiatives (e.g., Aichi
221 Targets and UNCCD). Identifying these instances is important as it identifies those indicators that
222 serve multiple purposes and will have high demand from policy makers and environmental managers.
223 Section 3.4 is similar, but focuses on where the Aichi Targets overlap with other global indicators
224 (excluding SDG indicators). Section 3.5 explores the existing methodological gaps for calculating SDG
225 and Aichi Target Indicators and identifies indicator development possibilities for the SEEA to address.
226 Finally, Section 3.6 takes a broader environment-economy perspective by identifying the key
227 biodiversity mainstreaming opportunities the SEEA can provide. This includes identifying a set of
228 potential SDG Targets where the SEEA could generate indicators for measuring progress in
229 implementing ecosystem based approaches towards their attainment.

230 **3.1 Methodology for assessing SDG Indicators from a SEEA** 231 **Perspective**

232 The IAEG-SDG Indicators are the necessary starting point to assess global indicator initiatives from a
233 SEEA perspective as they inform a set of SDG Targets to prioritise and initially focus on. From this
234 assessment a common approach and format for organising information and assessing other global
235 indicators from a SEEA perspective is achieved. This allows the findings from the assessments of
236 different indicator sets to be combined in a way that allows a coherent picture of the global indicator
237 landscape to be developed (e.g., where synergies might lie, where gaps may emerge, etc.).

238 **3.1.1 Methodology for assessing SDG Indicators from a SEEA Perspective**

239 To assess the IAEG-SDG Indicator set from a SEEA perspective, we implemented the following stepwise
240 approach (this is presented in Appendix B, SDG Indicators Tab, with reference to the columns as
241 indicated below):

- 242
243 1. The official list of SDG indicators was reviewed, expert judgment was used to identify any
244 indicators that could in part (e.g., ratio indicators) or completely, be generated by the SEEA
245 framework (e.g., SDG Indicator 15.1.1 Forest area as a proportion of total land area), or that
246 could provide input data to the SEEA framework (e.g., SDG Indicator 14.3.1 on marine acidity
247 for ecosystem condition accounting) (Column B).⁹
- 248 2. A unique Indicator ID field to represent the indicator, comprising 'SDG' and the indicator number
249 (e.g., SDG 15.3.1) was specified (Column A).
- 250 3. The Custodian Agency information (Column C) and information on the operational status of the
251 indicator (Column D) was added to the spreadsheet. The operational status was based on the
252 Tier Classification provided by IAEG-SDG Members as of 15 December 2017¹⁰ and updated to
253 reflect the six requests agreed by the IAEG-SDG for reclassification of Tier III indicators to Tier II
254 during the meeting of the group between 10 – 12 April 2018.¹¹

⁹ We took the SEEA alignment SDGs_24_01_18.xls provided by UNSD as our starting point and adapted this to include columns on alignment with SEEA ('Integrated into SEEA' and 'Generated by SEEA') and integrated the UNCEEA Comments to the IAEG as appropriate (SEEA and SDGs_Green_20 Nov.xls – provided by UNSD)

¹⁰ <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/>

¹¹ https://unstats.un.org/sdgs/files/meetings/iaeg-sdgs-meeting-07/7th%20IAEG-SDG%20Meeting%20tier%20reclassification%20requests_list%20of%20indicators_web.pdf

- 255 4. Information on the indicator definition (Column E), computation method (Column F), data
256 availability (including limitations) (Column G), and (where possible) frequency of production /
257 data collection (Column H) for the indicator was added from the SDG Indicators metadata
258 repository for Tier I and II and the Work Plans for Tier III Indicators.^{12, 13}
- 259 5. Details on how the SDG Indicator could be aligned with the SEEA framework accounts in terms
260 of their potential to be integrated into the SEEA framework (Column I) and / or generated using
261 the SEEA framework (Column J) was added to the spreadsheet based on expert judgement.
- 262 6. With this information in place, the spreadsheet was reviewed and each indicator assigned a
263 'Full', 'Partial', or 'None' possibility for alignment with the selected SEEA accounting modules
264 listed in Section 2. This was based on a consideration of the following factors:
- 265 a. **Full:** Where the SEEA has obvious potential to provide all, or most, of the information
266 required to calculate the indicator or when the indicator clearly represents an input
267 data for an accounting item of interest (e.g., an indicator of condition that could be
268 directly integrated into an ecosystem condition account). This represents a conceptual
269 alignment based on the structure of the SEEA framework.
- 270 b. **Partial:** Where the SEEA could organise some of the information for calculating the
271 indicator but:
- 272 i. there were more efficient / accepted means already in place;
- 273 ii. the indicator was derived from a statistical procedure to deal with missing
274 data gaps (e.g., Living Planet Index); or,
- 275 iii. the SEEA provides information that is essential or highly suited for calculating
276 the indicator, but substantial additional information from non-SEEA sources is
277 also required.
- 278 c. **None:** where the identified accounts were not considered relevant to the issue the
279 indicator is designed to inform on.
- 280 7. The penultimate column provides a short explanation of the above categorisation (Column K).

281 3.1.2 Methodology for Linking Other Global Indicators to the SEEA

282 The same approach and excel spreadsheet format employed for the SDG Indicators assessment was
283 also applied for the other high priority global indicator initiatives. The data consulted to inform the
284 indicator selection and its metadata, together with any methodological adaption is summarised below:

- 285 1. **Aichi Target Indicators:** The list proposed at CBD COP 13 was reviewed.¹⁴ Specific indicators
286 that were quantitative in nature and not related to plans, management actions, policies or
287 finance were captured in the spreadsheet. For instance, the specific indicators for Aichi Targets
288 16 to 20 were not included in the spreadsheet as they did meet this criteria. Where necessary
289 additional information on information was collected from the BIP website.¹⁵ Where an Aichi
290 Target was also an SDG Indicator, this was recorded (Column M), or if there was a link, but not
291 a direct match, to an SDG Target, this was noted in the spreadsheet (Column N).
- 292 2. **UNCCD Indicators:** The list of progress indicators proposed at COP 13, Ordos, China 2017 was
293 reviewed (note this is a draft decision at present).¹⁶ All indicators relevant to Strategic Objective

¹² <https://unstats.un.org/sdgs/metadata/>

¹³ <https://unstats.un.org/sdgs/tierIII-indicators/>

¹⁴ <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>

¹⁵ <https://www.bipindicators.net/>

¹⁶ <https://www2.unccd.int/sites/default/files/sessions/documents/2017-09/copL-18.pdf>

294 1 (to improve the condition of affected ecosystems); Strategic Objective 2 (to improve the living
295 conditions of affected populations), Strategic Objective 4 (to generate global environmental
296 benefits through effective implementation of the UNCCD) and Strategic Objective 5 (To
297 mobilize substantial and additional financial and non-financial resources to support the
298 implementation of the Convention) were included in the spreadsheet. Strategic Objective 3 (to
299 mitigate, adapt to, and manage the effects of drought in order to enhance resilience of
300 vulnerable populations and ecosystems) was not included due their qualitative nature.

301 3. **UNFCCC indicators:** All of the UNFCCC set of 40 performance indicators and the 39 core
302 climate-change related indicators proposed by the UN Economic Commission for Europe to
303 support inter alia UNFCC reporting were included.^{17, 18} These documents also provided the
304 principle source of metadata for completing the assessment. Where the UNFCCC indicator was
305 also an SDG Indicator or Aichi Target, this was recorded (Column M and N, respectively).

306 4. **BIP Indicators:** The list of all BIP indicators was assessed along with additional indicators that
307 have since been developed (list obtained from the BIP secretariat at UNEP-WCMC - identified in
308 Column M).¹⁹ A large majority of these indicators reflect the specific indicators of the Aichi
309 Targets. Indicators were included in the spreadsheet if they were quantitative in nature and not
310 related to plans, management actions, policies or finance. Where a BIP Indicator is also an SDG
311 or Aichi Target Indicator, this was recorded (Column N and O, respectively). These indicators
312 were not re-assessed on the BIP spreadsheet.

313 5. **IPBES Indicators:** The list of core, highlighted and socio-economic IPBES indicators were all
314 captured in the spreadsheet.²⁰ Where the IPBES indicator was also equivalent to an SDG
315 Target, Aichi Target Indicator or BIP Indicator this was recorded (Column M, N; and O,
316 respectively). These indicators were not re-assessed on the IPBES spreadsheet.

317 6. **Sendai Indicators:** The 38 Sendai Framework indicators are set out in the UN Office for Disaster
318 Risk Reduction (UNISDR) PreventionWeb website.²¹ Given the nature of the targets and the
319 specifics of the indicators themselves (e.g., number of countries implementing multi-hazard
320 EWS), the SEEA is considered to have limited utility as a framework for generating Sendai
321 indicators. As such the SEEA is not considered to be relevant to generating any of the specific
322 indicators listed. Nonetheless, there is clearly a role for mainstreaming the environment into
323 disaster risk reduction using the SEEA (this is explored in latter analysis).

324 7. **Ramsar Indicators:** In order to track progress towards the Strategic Targets of the convention,
325 a series of indicator questions are posed to countries in Section 3 of the national report
326 template for the Ramsar Convention.²² The SEEA provides a framework to streamline the
327 production of indicators for these questions with other reporting requirements (e.g., with
328 respect to SDG 6). The list of mandatory indicator questions were reviewed, all qualitative
329 indicators (where the answer was coded as =Yes; B=No; C=Partially; D=Planned; X= Unknown;
330 Y= Not Relevant) were disregarded and the remaining captured in the spreadsheet. Where the
331 Ramsar indicator question reflected an SDG Indicator this was captured in Column M. Where it
332 reflected an Aichi Target Specific Indicator, this was captured in Column N.

¹⁷ <https://www.unece.org/statistics/networks-of-experts/task-force-on-a-set-of-key-climate-change-related-statistics-using-seea.html>

¹⁸ <https://unfccc.int/sites/default/files/resource/docs/2009/sb/eng/04.pdf>

¹⁹ https://www.bipindicators.net/system/resources/files/000/002/201/original/2827_A3_BIP_Indicator_matrix_2.0.pdf?1512640311

²⁰ <https://www.ipbes.net/indicators-data-ipbes-assessments>

²¹ <https://www.preventionweb.net/drr-framework/sendai-framework-monitor/indicators>

²² <https://www.ramsar.org/document/national-report-form-for-cop13-offline-version>

333 **3.1.3 Results of Global Indicator Review**

334 After applying the initial selection criteria for including individual indicators from different global
 335 initiatives (as described above), it was possible to rationalise the number of indicators for review to 314.
 336 The distribution of these indicators is summarised in Table 1.

337 **Table 1: Distribution of global indicators reviewed**

Global Indicator Initiative	Number of indicators
IAEG-SDG Target Indicators	46
UNCBD Aichi Target Indicators	95
UNCCD Indicators	14
UNFCCC Indicators	64
BIP Indicators	60
IPBES Indicators	22
RAMSAR Indicators	13
Total	314

338

339 The results of the analysis for the SDG Indicators only, are presented in Table 2. This is a necessary
 340 starting point, as it directs attention to a set of priority SDG Targets to focus the assessment on. Table
 341 2 identifies that out of the 46 SDG Indicators captured on the spreadsheet, 21 have the potential for full
 342 and only 2 for partial alignment with the SEEA. As would be expected, Table 2 identifies a number of full
 343 possibilities for alignment of the SDG 14 (life below water) and the SDG 15 (life on land) indicators with
 344 the SEEA. In addition, a number of full possibilities for alignment are observed for the SDG 6 (clean
 345 water and sanitation) and SDG 11 (sustainable cities and communities) indicators. However, the latter
 346 would likely require development of urban scale environmental accounts and this may not, necessarily,
 347 align with the remit of national statistical agencies (i.e., they may be more likely to be implemented by
 348 specific municipal authorities).

349 It should be noted that whilst there is considered to be a full possibility for aligning SDG Indicator 8.9.1
 350 (sustainable tourism) with the SEEA, this assessment is based on the potential for the SEEA to provide
 351 information of the contribution of ecosystems to tourism activity and impact of tourism infrastructure
 352 on ecosystem extent (e.g., habitat conversion for infrastructure development). It is likely that the final
 353 SDG 8.9.1 indicator will also include sub indicators relevant to sustainable resource use, where the
 354 SEEA will have a wider role to play (e.g., with respect to quantifying energy use, waste flows and carbon
 355 emissions associated with tourism).

356 For SDG Indicator 15.5.1 (Red List), the level of detail on individual species required to generate the
 357 indicator is unlikely to be supported by the SEEA. However, in terms of integrating this indicator into
 358 the SEEA, national biodiversity accounts could possibly be informed via the Red List. Furthermore, the
 359 data on threat status collated via the Red List index could also be used to provide an aggregate
 360 indicator of ecosystem condition. This would require that a National Red List had been compiled, or
 361 global Red List data had been disaggregated to the national scale. More specific alignment to the SEEA
 362 would be greatly increased by sub-setting the Red List data into species with particularly habitat
 363 affiliations (Aichi Target 10.2.1 is a good example here, providing a Red List for coral building species).

364 With respect to the 2 partially aligned indicators, SDG indicator 6.1.1 (Proportion of population using
 365 safely managed drinking water), requires understanding the level of drinking water supply at individual
 366 household scale. Whilst there may be challenges for the SEEA will provide this insight, there are clear
 367 opportunities for the SEEA Water to inform on household water consumption from mains supplies. For
 368 SDG indicator 2.4.1 (Proportion of agricultural area under productive and sustainable agriculture), the

369 SEEA is considered to only provide the information on the agricultural area component of this ratio
 370 indicator.

371 **Table 2: SDG Indicators that have full or partial alignment with the SEEA**

	Full Alignment	Partial Alignment
1	6.3.1 - Proportion of wastewater safely treated	2.4.1 - Proportion of agricultural area under productive and sustainable agriculture
2	6.3.2 - Proportion of bodies of water with good ambient water quality	6.1.1 Proportion of population using safely managed drinking water services
3	6.4.1 - Change in water-use efficiency over time	
4	6.4.2 - Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	
5	6.6.1 - Change in the extent of water-related ecosystems over time	
6	8.9.1 - Tourism direct GDP as a proportion of total GDP and in growth rate	
7	11.3.1 Ratio of land consumption rate to population growth rate	
8	11.7.1 Average share of built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	
9	14.1.1 - Index of coastal eutrophication and floating plastic debris density	
10	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	
11	14.4.1 - Proportion of fish stocks within biologically sustainable levels	
12	14.5.1 - Coverage of protected areas in relation to marine areas	
13	14.7.1 - Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	
14	15.1.1 - Forest area as a proportion of total land area	
15	15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type	
16	15.2.1 - Progress towards sustainable forest management	
17	15.3.1 - Proportion of land that is degraded over total land area	
18	15.4.1 - Coverage by protected areas of important sites for mountain biodiversity	
19	15.4.2- Mountain Green Cover Index	
20	15.5.1 - Red List Index	
21	15.9.1 - Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	

372
 373 The results of the assessment across all global indicator initiatives are summarised in Figure 2. In
 374 broad terms, around a quarter of the indicators are assessed as having full possibilities for alignment
 375 with the SEEA for the Aichi Targets, UNCCD, BIP, IPBES and Ramsar indicator sets. This figure is below
 376 10% for the UNFCCC indicators. Nonetheless, there is a clearly a potential role for the SEEA to play in
 377 supporting reporting on a number of different conventions and national commitments beyond the
 378 SDGs.

379 In absolute terms, Figure 2 reveals 34 specific Aichi Target Indicators and 13 BIP Indicators were
 380 identified as full possibilities for alignment with the SEEA (in total 66 are identified across all global

381 indicator initiatives excluding the SDG Indicators). However, a number of these will also be included as
382 SDG Indicators and further analysis is required to identify the distinct indicators that satisfy multiple
383 reporting requirements (provided in Section 3.2). This will help identify where synergies and gaps in
384 global indicators exist. As a synergy example, the Red List Index is an SDG Indicator (SDG 15.5.1) and a
385 Specific Aichi Target Indicator (AT 12.3.1). Overall 78 indicators are identified as partial possibilities for
386 alignment with the SEEA across global indicator initiatives (excluding the 2 SDG indicators discussed
387 above).

388 **3.2 Analysis of global Indicators with full alignment with SEEA**

389 A key objective for the overall assessment is to identify a priority set of output indicators that can be
390 fully aligned to the SEEA and generated using SEEA accounting modules. This requires identifying the
391 set of distinct individual global indicators from across the global indicator initiatives reviewed (termed
392 'distinct indicators' in the methodological discussion below). This will also allow for a more focussed
393 assessment of the role of the SEEA in generating or integrating such indicators and identify which
394 indicators are relevant to multiple reporting processes.

395 **3.2.1 Methodology**

396 There is a common structure for organising information from the different global indicator initiatives in
397 Appendix B, this allowed the indicators with 'Full' possibilities for alignment to be collated within the
398 same spreadsheet (see 'Full Possibilities' tab in Appendix B). From this a set of distinct indicators can
399 be identified for analysis from a SEEA perspective. In order to complete this analysis the following steps
400 were taken:

- 401 1. The information on the Indicator ID, Description, Custodian Agency, Operational Status,
402 Definition / Source, Methodology, Data Needs & Availability, Frequency of Data Collection for
403 those indicators with 'Full Possibility' for alignment were captured for each global indicator
404 initiative in in Columns A to H. The information on how the Indicators could be aligned with the
405 SEEA framework was also retained in Columns I to L.
- 406 2. Column K was updated to provide an assessment of how well the underlying data for
407 calculating the indicator using the established methodology (if available) was aligned to the
408 SEEA and whether significant methodological work would be required to achieve such an
409 alignment.
- 410 3. Where the indicator was also an SDG Indicator this was captured in Column M. For example,
411 Aichi Target Indicator AT 14.3.2 is the Mountain Green Cover Index, which is also the SDG
412 Target 15.4.2 indicator. So SDG 15.4.2 is recorded in Column M for the AT 14.3.2 row in the
413 spreadsheet. Similarly, where the indicator was also an Aichi Target Indicator this was recoded
414 in Column N. For example, Ramsar indicator 8.6 is the extent of wetland, which is also Aichi
415 Target indicator AT 5.5.3. So AT 5.5.3 is recorded in Column N. Where the indicator was noted
416 to be related but not directly equivalent the prefix 'Related to' was made to the indicator ID in
417 Column M or N (e.g., the indicator was a sub indicator of equivalent indicator but with a
418 narrower ecosystem focus).

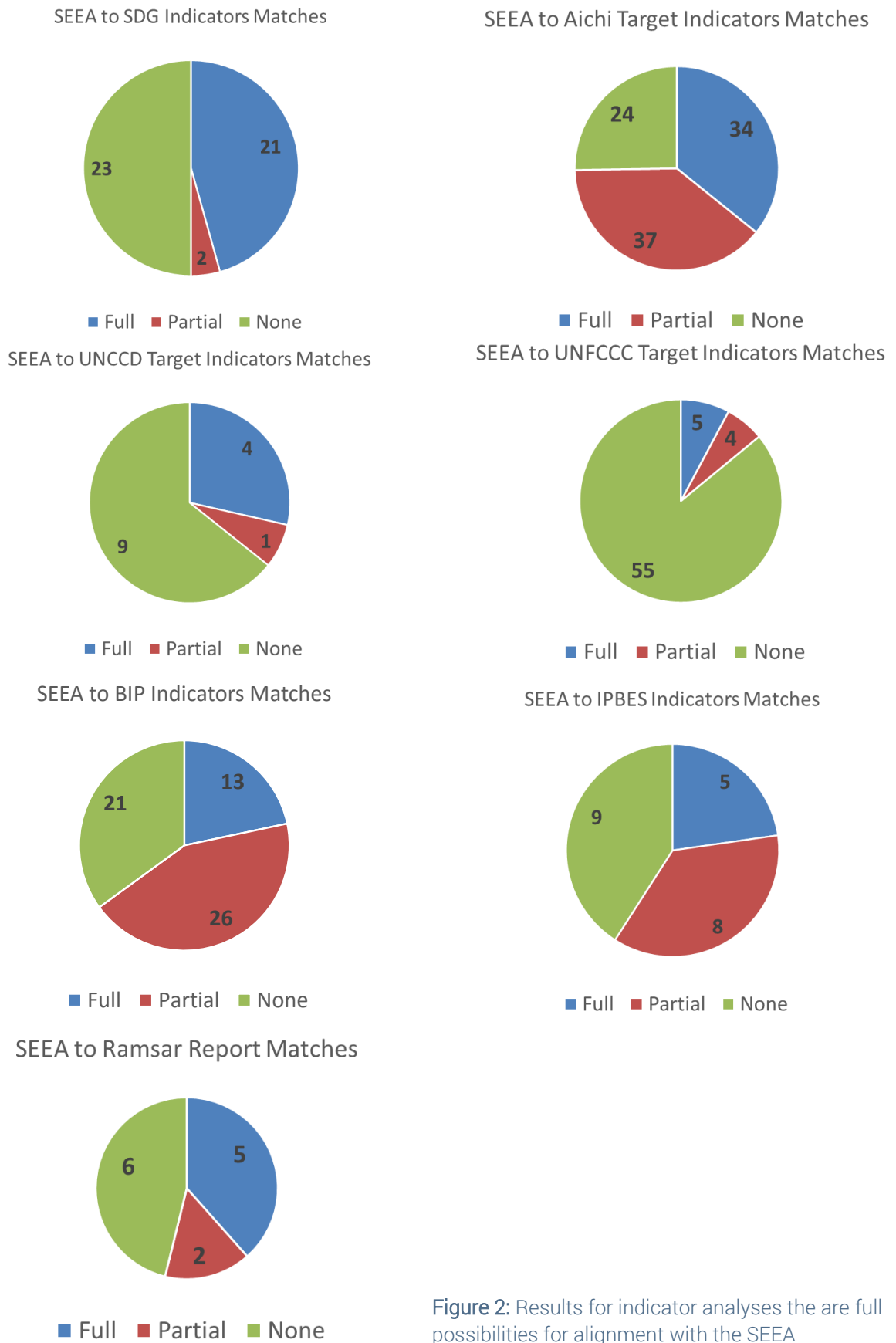


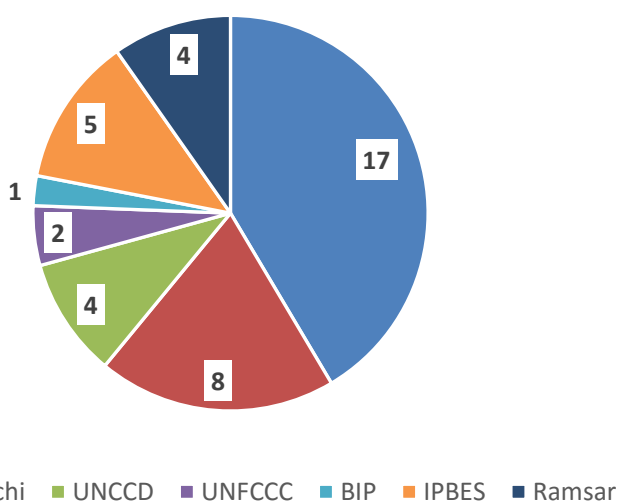
Figure 2: Results for indicator analyses the are full possibilities for alignment with the SEEA

- 419 4. A field for 'Distinct' was created in Column O, this was populated with a 'Yes' if the indicator
 420 met the following criteria:
- 421 ○ It was an SDG Indicator
 - 422 ○ It was an Aichi Target but not an SDG Indicator (excluding 'Related To' IDs)
 - 423 ○ It was an UNCCD, UNFCCC, BIP, IPBES or Ramsar Indicator but not an SDG Target or
 424 Aichi Target Indicator (excluding 'Related To' IDs).
- 425 5. Where there was a clear linkage to an SDG Indicator this was noted in Column P
- 426 6. A field to capture if the indicator was an input indicator (i.e., the possibilities for alignment with
 427 SEEA were mainly with respect to integration into a SEEA accounting module) or output
 428 indicator (i.e., the possibilities for alignment with SEEA were mainly with respect to generation
 429 by a SEEA accounting module) was created in Column Q.
- 430 7. Columns R and S captured the two most relevant account modules for generating or
 431 integrating the indicator. Where the SEEA-CF Flow and Asset Accounts were relevant to the
 432 SEEA-Water, "SEEA Water" was used to represent the relevant account. Where only one
 433 account was required for the indicator, this entered into both columns R and S. From this
 434 information scores for the relative usefulness of different accounting modules can be
 435 calculated.

436 3.2.2 Results

437 In total, 54 distinct input and output indicators were identified from the set of global indicator initiatives
 438 reviewed that were full possibilities for aligning with the SEEA. Focusing on the output indicators that
 439 could be generated using the SEEA only reduced this number to 41. The distribution of these 41 distinct
 440 output indicators across the global indicator initiatives is presented in Figure 3. Figure 3 reveals that 17
 441 SDG Indicators are full possibilities to be generated using the SEEA (i.e., output indicators).²³ Figure 3
 442 also shows that 8 Aichi Target Indicators as output indicators that could be generated using the SEEA
 443 (this excludes Aichi Target indicators that are also SDG Indicators as these are not 'Distinct').

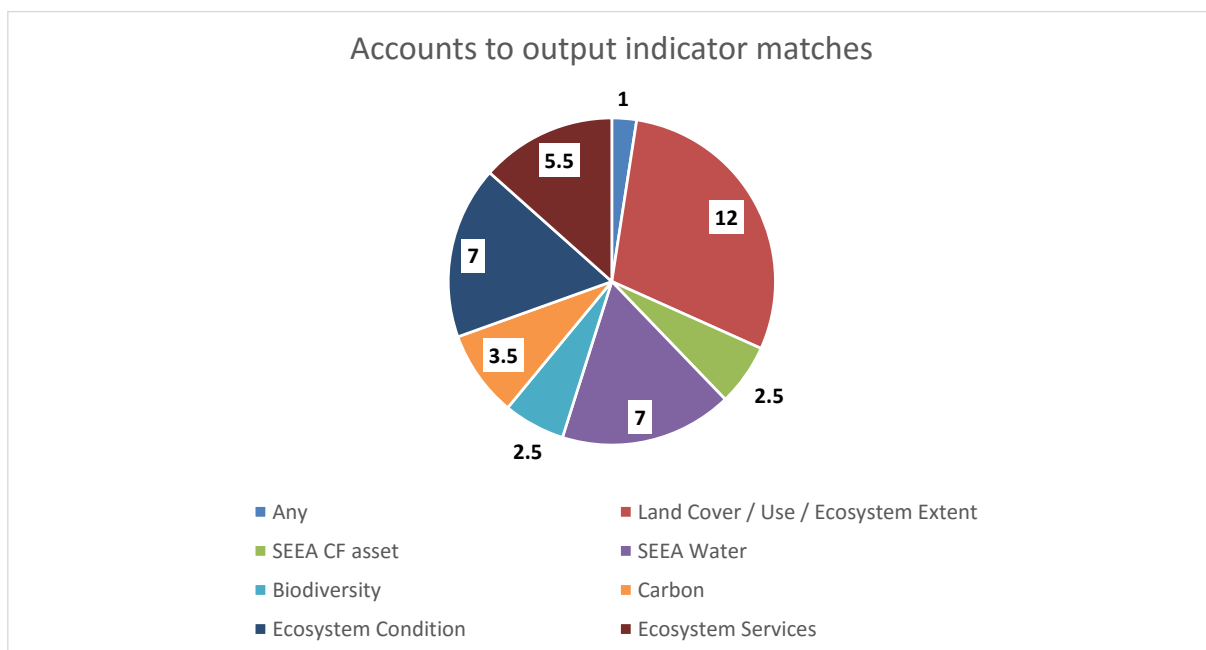
Distinct output indicators fully aligned to SEEA



444 **Figure 3:** Distribution of distinct output indicators with full possibilities for alignment with the SEEA

²³ As revealed in Table 2, there are also 4 SDG Indicators that could be integrated into the SEEA (i.e., input indicators).

446 Figure 4 summarises the scores for the different accounting modules for the 41 output indicators only
 447 (i.e., those with the full possibility for generation via SEEA).²⁴ This suggests that accounts for land
 448 cover, land use or ecosystem extent are particularly relevant for informing different indicator initiatives
 449 (scoring 12 out of 41). This is followed by ecosystem condition accounts and SEEA water accounts
 450 (both scoring 7 out of 41). It is notable that ecosystem service accounts only score 5.5 out of 41, these
 451 are also generally associated with very conventional provisioning services (biomass, crop, fisheries and
 452 wood provision). The exception is for SDG 11.7.1 (the only SDG Indicator where ecosystem service
 453 accounts were considered relevant), which relates to the provision of open space for public use in
 454 cities. This suggests the full potential of the environment and ecosystem services to contribute to
 455 sustainable development is only being considered implicitly (via capacity reflected in condition and
 456 extent) in existing global indicators.
 457



458
 459 **Figure 4:** Accounting modules ‘scores’ for output indicators

3.3 Analysis of SDG Indicators in other global indicator initiatives

460 Collating information on where indicators feature in multiple reporting commitments in the ‘Full
 461 Possibilities’ tab in Appendix B, allows the identification of the SDG Indicators that are also relevant to
 462 other reporting commitments countries face. These are summarised in Table 3, which organises all of
 463 the 17 SDG Target Indicators that are considered full possibilities for generation using the SEEA (i.e.,
 464 the set of output indicators identified in Figure 3) so that those relevant to the highest number of
 465 individual global indicators are at the top.
 466

467 Table 3 can help prioritise methodological development efforts to align indicator data with the SEEA for
 468 testing under the NCA and Ecosystem Service Valuation project. This is because there is likely to be a
 469 wide demand for those indicators at the top of Table 3 that satisfying multiple reporting requirements.

²⁴Note: as the SDG Target Indicator 15.9.1, for the Number of countries implementing SEEA (excluding energy accounts), represents the ‘Any’ entry).

Table 3: SDG Indicators and their use in other global indicator initiatives

SDG Indicator ID	SDG Indicator	Relevant Accounts	Aichi Indicator	UNFCCC Indicator	UNCCD Indicator	RAMSAR Indicator	BIP Indicator	IPBES Indicator	Total
15.3.1	Proportion of land that is degraded over total land area	Thematic Carbon Account & Ecosystem Extent / Land Cover Account	AT 5.3.2	CC.3, CC.21, CC.20	SO 1-1, SO 4-1, SO 1-3, SO 1-2		BIP X.2		10
6.6.1	Change in the extent of water-related ecosystems over time	Ecosystem Extent / Land Cover Account & SEEA Water Accounts	AT 5.5.3, AT 5.5.1			R 8.6	BIP B.1	IPBES H.10	6
15.1.1	Forest area as a proportion of total land area	Ecosystem Extent / Land Cover Account	AT 5.4.2	CC.3			BIP B.2	IPBES C.6	5
15.9.1	Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	All	AT 2.1.1, AT 2.3.1, AT 2.2.1						4
6.3.1	Proportion of wastewater safely treated	SEEA Water Accounts				R 2.6, R 2.11, R 2.8			4
6.4.1	Change in water-use efficiency over time	SEEA Water Accounts	AT 4.2.2, AT 4.2.3	CC.36					4
15.2.1	Progress towards sustainable forest management	Ecosystem Extent / Land Cover Account & Ecosystem Condition Account	AT 5.4.4	CC.38					3
15.4.1	Coverage by protected areas of important sites for mountain biodiversity	Biodiversity Account & Ecosystem Condition Account	AT 14.3.3				BIP X.17		3
11.3.1	Ratio of land consumption rate to population growth rate	Ecosystem Extent / Land Cover Account	AT 4.5.2						2
14.5.1	Coverage of protected areas in relation to marine areas	Ecosystem Condition Account and Biodiversity Account	AT 11.2.2						2
15.4.2	Mountain Green Cover Index	Ecosystem Extent / Land Cover Account & Ecosystem Condition Account	AT 14.3.2						2
6.3.2	Proportion of bodies of water with good ambient water quality	SEEA Water Accounts & Ecosystem Condition Account	AT 8.4.4						2
6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	SEEA Water Accounts							1
8.9.1	Tourism direct GDP as a proportion of total GDP and in growth rate	Ecosystem Extent / Land Cover Account & Ecosystem Services Account							1
11.7.1	Average share of built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Ecosystem Extent / Land Cover Account & Ecosystem Services Account							1
14.4.1	Proportion of fish stocks within biologically sustainable levels	SEEA Central Framework Asset Accounts (Fisheries)							1
14.7.1	Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	SEEA Central Framework Asset Accounts (Fisheries)							1

472 As Table 3 shows, SDG Target 15.3.1 (proportion of land that is degraded over total land area) is also
473 relevant to 5 global initiatives and 10 individual indicators. Consequently, this should be a priority for

474 generation using the SEEA. However, it is acknowledged that there may be significant measurement
 475 challenges with respect to meaningfully mapping and measuring change in degradation. Similarly SDG
 476 Indicator 6.6.1 is relevant to a number of global initiatives. SDG Indicator 15.1.1 is also relevant to
 477 several global indicator initiatives, although its calculation does benefit from data availability via
 478 existing global platforms (e.g., global forest watch²⁵). SDG Indicator 6.3.1 and 6.4.1 also feature
 479 relatively close to the top of Table 3.

480 The third column in Table 3 identifies the relevant SEEA accounting modules for calculating output
 481 indicators. Reflecting the results presented in Figure 4, Ecosystem Extent / Land Cover Accounts,
 482 Ecosystem Condition Accounts and SEEA Water Accounts feature strongly in this column.

483 3.4 Analysis of Full Possibility Non-SDG Output Indicators

484 It has been observed that the IAEG-SDG process did not maximise the potential to build on existing
 485 global biodiversity indicator frameworks used for biodiversity related conventions and processes. Many
 486 operational global indicators already used under the CBD have been identified as highly relevant to the
 487 SDG Targets.

488 There are two major reviews of the SDG indicator framework envisaged before 2030, in 2020 and 2025.
 489 These reviews could imply substantive changes to the framework, including the addition, deletion,
 490 refinement or adjustment of indicators. The preparation for the 2020 review begins in 2018, and
 491 presents a clear opportunity to promote better harmonisation of the SDG indicator suite with those
 492 used for the CBD, IPBES and other processes. Whilst the Aichi Targets also expire in 2020, it is
 493 expected that many of the Aichi Target Indicators will be retained. The potential for Aichi Targets to be
 494 retained and integrated into the post 2020 SDG Indicator set is increased where they are also adopted
 495 in other environmental reporting commitments or other inter-governmental process (e.g., IPBES).

496 Accounting for the above, Table 4 presents the 8 distinct Aichi Target Indicators represented in Figure 3
 497 and where they are also adopted in other global indicator initiatives outside of the SDGs (these are all
 498 output indicators with full possibilities for alignment with SEEA). Table 4 allows an identification of a set
 499 distinct Aichi Target indicators that also feature in other global indicator initiatives.

500 **Table 4:** Aichi Target Output Indicators that could be fully aligned to SEEA and their use in other global
 501 indicator initiatives

Aichi Target	UNFCCC Indicator	BIP Indicator	IPBES Indicator	RAMSAR Indicator
AT 4.2.1 - Human appropriation of net primary productivity		BIP X.8	IPBES H.7	
AT 5.5.2 - Natural habitat extent (land area minus urban and agriculture)	CC.3			
AT 5.5.3 - Wetland extent		BIP B.1	IPBES H.10	R 8.6
AT 6.4.6 - Trends in population of non-target species affected by fisheries				
AT 7.5.1 - Wild Bird Index for farmland birds/Living Planet Index (farmland specialists)		BIP X.5		
AT 12.3.5 - Wild Bird Index		BIP B.8		
AT 14.3.4 - Ocean Health Index		BIP D.2		
AT 15.2.1 - Trends in forest carbon stocks				

502

²⁵ <https://www.globalforestwatch.org/>

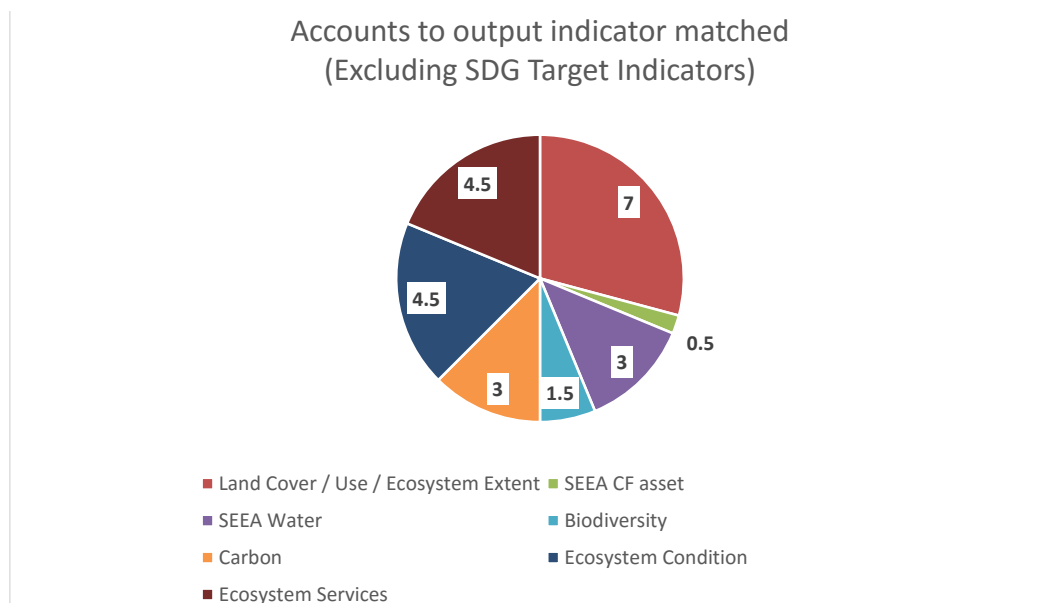
503 Overall Figure 3 identifies a total of 24 non-SDG Indicators, with the 8 Aichi Target indicators described
 504 in Table 4. The remaining 16 distinct output indicators from the other global indicator initiatives are
 505 presented in Table 5.

506 **Table 5:** Other global output indicators (excluding SDG and Aichi Target indicators) that could be fully
 507 aligned to the SEEA

Indicator ID	Indicator initiative	Indicator description	Links to other indicators	
1	BIP X.1	BIP	Extent of continuous mangrove forest cover	
2	IPBES C.8	IPBES	Total wood removals	
3	IPBES C.11	IPBES	Inland fishery production	
4	IPBES C.15	IPBES	Nitrogen use efficiency	
5	IPBES H.36	IPBES	Land under cereal production	
6	IPBES S.8	IPBES	World grain production per capita/year	
7	SO 1-1	UNCCD	Trends in land cover	15.3.1
8	SO 1-2	UNCCD	Trends in land productivity or functioning of the land	15.3.1
9	SO 1-3	UNCCD	Trends in carbon stocks above and below ground	15.3.1
10	SO 4-1	UNCCD	Trends in carbon stocks above and below ground*	15.3.1
11	R 8.5	Ramsar	trend in wetland condition	
12	R 2.6	Ramsar	No. households linked to sewage system	SDG 6.3.1
13	R 2.8	Ramsar	Percentage of sewage coverage in the country	SDG 6.3.1
14	R 2.11	Ramsar	No. wastewater treatment plants	SDG 6.3.1
15	CC.3	UNFCCC	losses of land covered by (semi-)natural vegetation	AT 5.5.2
16	CC.11	UNFCCC	GHG emissions form land use	
* Used to inform on 2 strategic objectives of the UNCCD				

508

509 Figure 5 repeats the analysis of evaluating the most important accounts for the generation of output
 510 indicators, focusing on the 24 distinct non-SDG Output Indicators presented in Tables 4 and 5. Figure 5
 511 further highlights the important role that land cover or ecosystem extent accounts can play in helping
 512 to derive indicators to support reporting on national commitments (scoring 7 out of 24). This is
 513 followed by ecosystem condition and ecosystem services accounts, each scoring 4.5 out of 24.



514

515 **Figure 5:** Accounting modules 'scores' for non-SDG Target output indicators

516 3.5 Analysis of Indicator Methodological Gaps

517 So far the assessment has focused on where the conceptual possibilities lie for aligning global
518 indicators with the SEEA. With respect to using the SEEA to generate output indicators, this will often
519 comprise establishing accounting approaches to align existing methodologies and data with the
520 compilation of relevant SEEA modules. However, where methodologies for calculating indicators are
521 currently undefined, the SEEA provides a framework to propose new methods and generate new
522 indicators to plug these measurement gaps in existing global indicator initiatives. This section provides
523 a brief analysis of the stated indicator methodological gaps in the SDG and the Aichi Target Indicators.
524 These two initiatives are the focus of the analysis as Table 3 illustrates significant synergies between
525 the SDG and Aichi Target indicators.²⁶ The methodological gaps in the current SDG Indicators are
526 considered to be those currently categorised as Tier III. The methodological gaps in specific indicators
527 for the Aichi Target are identified in the updated list of indicators for the Strategic Plan for Biodiversity
528 2011-2020.²⁷ This strategic plan clearly identifies a set of generic indicators with no matching specific
529 indicators decided upon at present.

530 3.5.1 Methodology for Indicator Methodological Gap Analysis

531 To identify methodological gaps in the SDG and Aichi Target indicators and evaluate them from a SEEA
532 perspective, the following stepwise approach was implemented (this is presented in Appendix C,
533 'Indicator Gaps' Tab, with reference to the columns as indicated below):

- 534 1. In Column A, a description for the overarching SDG Target was captured
- 535 2. The indicator ID (Column B), Indicator (Column C) for all Tier III (Indicated Column D) SDG
536 Indicators from the 'Full Possibilities' Tab in Appendix B were captured. The information on how
537 to align with the SEEA (integration and generation), whether the SDG Indicator was an input or
538 output indicator and the possibilities for alignment was also copied into Columns E to H.
- 539 3. This created a suitable structure, which was populated with all of the generic indicator
540 methodological gaps the Aichi Targets.²⁸
- 541 4. The potential to integrate or generate these Aichi Target Indicators with the SEEA, whether the
542 Indicator was an input or output indicator and the possibilities for alignment were captured
543 then in Columns E to H.

544 3.5.2 Results of Indicator Methodological Gap Analysis

545 The results of the methodological gap analysis are presented in Table 6. This reveals that out of the 17
546 SDG Indicators identified in Table 3 (i.e., those considered full possibilities for generation using the
547 SEEA as output indicators) only three indicators have methodological gaps (i.e., are Tier III). For these
548 instances there are no existing, accepted methodologies for calculating the indicators to be drawn on
549 and new SEEA based approaches could be proposed.

550 Specifically, generating SDG 11.7.1 is likely to require municipal scale accounting applications. There
551 are an increasing number of examples that can be drawn in this area to understand the availability of
552 open public space in built up areas, this includes the Urban EEA project for Oslo²⁹. In addition, the EU
553 MAES Pilot Study on Urban Ecosystem Condition could yield suitable measurement approaches for

²⁶ The exception to this is SDG Target Indicator 6.3.1 – Proportion of wastewater treatment. This only overlaps with the Ramsar indicators R.2.6, R.8 and R2.11. However, it should be noted that there is no agreed methodology or global data in place for the calculation of the Ramsar indicators (in fact they should be considered as indicator questions to relevant national authorities).

²⁷ <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>

²⁸ <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-28-en.pdf>

²⁹ <https://www.nina.no/english/Fields-of-research/Projects/Urban-EEA>

554 urban ecosystem accounting that could support the generation of this indicator via the SEEA.³⁰ For
 555 generating SDG 14.7.1, there remain challenges relating to how to measure the fraction of sustainable
 556 fisheries catch that may best be addressed via fishery expert workshops / forums. However, work has
 557 been progressed for the EU in developing Fish Biomass Accounts grounded in the SEEA-EEA approach,
 558 which could provide a framework to help inform on sustainability of fish harvesting and landings
 559 values. For SDG 15.9.1, establishing SEEA accounts (excluding energy) is also identified as an indicator
 560 for Aichi Target 2. Realising an institutionalised, regular production process for the SEEA (outside of
 561 energy accounting) is considered an appropriate indicator for this SDG Indicator.

562 For the Aichi Targets, there are a number of indicator gaps that the SEEA-EEA is considered extremely
 563 well-suited to address. In particular AT 10.5, 14.1, 14.4 and 15.1 provide very relevant entry points for
 564 the SEEA-EEA for measuring trends in ecosystem assets and services. These are may well reflect key
 565 indicators adopted under the post 2020 agenda and are very relevant to mainstreaming the
 566 environment into a range of policy objectives, for instance Ecosystem based Adaptation in support of
 567 the Sendai goals.

568 **Table 6:** Analysis of indicator methodological gaps from a SEEA perspective

Indicator ID	Indicator	Operational Status	Input / Output indicator	Possibilities for Alignment under this Project (Full, Partial, None)
SDG 11.7.1	11.7.1 Average share of built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Tier III	Output	Full
SDG 14.7.1	14.7.1 - Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries	Tier III	Output	Full
SDG 15.9.1	15.9.1 - Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020	Tier III	Output	Full
AT 7.4	Trends in proportion of production of aquaculture under sustainable practices	N/A	Output	Full
AT 10.5	Trends in extent and condition of other vulnerable ecosystems impacted by climate change or ocean acidification	N/A	Output	Full
AT 10.7	Trends in pressures on other vulnerable ecosystems impacted by climate change or ocean acidification	N/A	Output	Full
AT 11.3	Trends in areas of particular importance for biodiversity conserved	N/A	Output	Full
AT 14.1	Trends in safeguarded ecosystems that provide essential services	N/A	Output	Full
AT 14.4	Trends in restoration of ecosystems that provide essential services	N/A	Output	Full
AT 15.1	Trends in ecosystem resilience	N/A	Output	Full

569

3.6 Analysis of Mainstreaming Opportunities from a SEEA perspective

570

571 The SEEA framework is designed to support mainstreaming the environment into economic and
 572 development planning. In this regard, there are multiple entry-points for biodiversity and ecosystem
 573 services to support sustainable development objectives, such as climate change adaptation, food

³⁰ http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/102.pdf

574 security and supporting livelihoods. Drawing on such entry-points, the CBD, FAO (Food and Agriculture
575 Organisation of the United Nations), World Bank, UN Environment and UNDP (United Nations
576 Development Programme) have produced a technical note that maps the linkages between the Aichi
577 Targets and the SDGs.^{31,32} This provides an authoritative foundation on where mainstreaming
578 biodiversity into economic and wider development planning will directly support attainment of the SDGs
579 and their targets. Therefore, one is able to work backwards from an SDG Target via these linkages to
580 individual Aichi Targets that reflect the potential for biodiversity to contribute to the attainment of a
581 given SDG Target. If the SEEA can be used to generate an indicator for these individual Aichi Targets,
582 this indicator can also be considered as an indicator that communicates progress on mainstreaming
583 biodiversity into sustainable development planning. By identifying where these linkages can be realised
584 between the SDG and the Aichi Targets more generally (i.e., beyond those instances where an Aichi
585 Target Indicators is directly adopted as an SDG Indicator), this analysis allows existing methodologies
586 and data to be readily identified and adopted for biodiversity mainstreaming purposes via the SEEA.

587 **3.6.1 Methodology for identifying SEEA Mainstreaming Indicators**

588 In order to identify where SEEA based indicators could be generated to mainstream biodiversity into
589 achieving different SDG Targets, the following stepwise approach was implemented (presented in
590 Appendix C, 'Mainstreaming Opportunities' Tab, with reference to the columns as indicated below):

- 591 1. The SDG Description (Column C), SDG Target number (Column D), the SDG Target description
592 (Column E) where captured in the spreadsheet. The rationale for biodiversity being relevant to
593 that SDG Target provided by the CBD, FAO, World Bank, UN Environment and UNDP technical
594 note³³ was added in Column F and the relevant Aichi Targets in Column I.³⁴
- 595 2. If any relevant indicators had been captured as full possibilities for alignment with the SEEA,
596 this was captured in the spreadsheet (Column A) with the associated SDG Indicator ID (Column
597 B). Where such an indicator was already available, the respective SDG Target was no longer
598 considered in the analysis (i.e., SDG 6.3, 6.4, 6.6, 11.7)
- 599 3. In Column G an assessment was provided on whether the general requirements for generating
600 the indicator could be aligned with the selected SEEA accounting modules (Column G) and a
601 None, Partial or Full conclusion on the possibility for alignment was provided (Column H).

602 **3.6.2 Results of Mainstreaming Indicator analysis**

603 The results of the spreadsheet analysis are summarised in the Figure 6. This identifies that the SEEA
604 could potentially support the production of 17 indicators for mainstreaming biodiversity into the
605 sustainable development goals. The most relevant SDGs comprised SDG 1 – No poverty (2); SDG 2 –
606 Zero hunger (3) and SDG 9 – Industry, innovation and infrastructure (2) and comprised:

- 607 • SDG Target 1.4 – Relating to access to basic ecosystem services
- 608 • SDG Target 1.5 – Relating to building the resilience of ecosystem services supply on which
609 vulnerable persons depend
- 610 • SDG Target 2.1 – Relating to ensuring access to food provisioning services

³¹ <https://www.cbd.int/development/doc/biodiversity-2030-agenda-technical-note-en.pdf>

³² Extended cross-mapping to the BIP indicators is also possible via the following publication:
https://www.bipindicators.net/system/resources/files/000/002/291/original/Cross_mapping_4pp_A3.pdf?1525960022

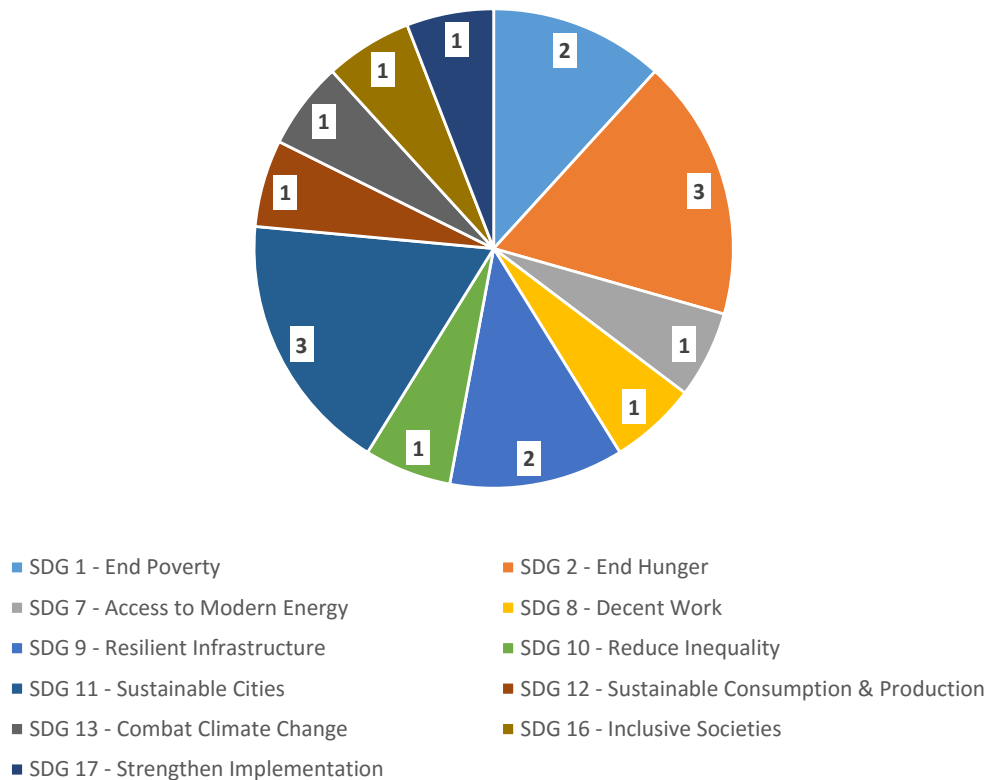
³³ <https://www.cbd.int/development/doc/biodiversity-2030-agenda-technical-note-en.pdf>

³⁴ SDG 14 and 15 are not included in the spreadsheet as these are environment focused goals and covered in the wider analysis

- 611 • SDG Target 2.3 – Relating to the flow of multiple ecosystem services to improve agricultural
- 612 yields
- 613 • SDG Target 2.4 – Relating to maintaining the condition and resilience of agricultural
- 614 ecosystems.
- 615 • SDG Target 9.1 – Relating to green infrastructure
- 616 • SDG Target 9.4 - Relating to green infrastructure

617 The potential for the SEEA for integrating environmental data into poverty alleviation (i.e., with respect
 618 to SDG 1 and 2) is currently a proposed application for testing via the Poverty-Environment Accounting
 619 Framework.³⁵ It would be useful to explore such applications further in the context of yielding
 620 indicators for poverty alleviation based on improving access to environmental / biodiversity resources.
 621 As shown in Figure 6, for SDG 11 – Sustainable cities and communities, three potential mainstreaming
 622 indicators were identified but these would require development of municipal scale accounts. A key
 623 observation is the potentially ability of the SEEA to support mainstreaming of biodiversity into achieving
 624 a wide range of SDG Targets. In total 11 SDG Targets are identified where biodiversity mainstreaming
 625 targets could be derived, in addition to SDG 14 and 15.

Mainstreaming Opportunities for the SEEA



626
 627 **Figure 6:** Mainstreaming opportunities for the SEEA
 628

³⁵ https://unstats.un.org/unsd/envaccounting/londongroup/meeting22/BK_7.pdf

4 Conclusions

629

630 The global indicator review is based on a rapid expert assessment process. The broad analysis of 314
631 individual global indicators across the set of 8 global initiatives reveals the following insights:

- 632 • Combined analysis revealed 54 full possibilities for alignment of global indicators with the
633 SEEA. This represents a conceptual alignment based on the structure of the SEEA framework.
634 Of these, 41 were output indicators that could be generated using the SEEA.
- 635 • Overall a further 80 partial possibilities for alignment of global indicators with the SEEA were
636 identified. Of these, 2 were SDG Indicators. The potential to achieve a full alignment of these
637 indicators with the SEEA was considered limited, although the SEEA still had a potential role to
638 play in organising some of the information necessary for the calculation of these indicators.
- 639 • Land cover / ecosystem extent and ecosystem condition accounts were identified as a priority
640 for calculation to assist national reporting obligations using the SEEA EEA. The SEEA Water
641 Accounts were also identified as a priority for calculation to assist national reporting. The
642 relatively low importance of ecosystem services accounts for calculating indicators is
643 considered to reflect a gap in the ability of existing indicators to mainstream the environment
644 into sustainable development.
- 645 • With respect to the SDG Indicators specifically, 21 offer full possibilities for alignment with the
646 SEEA and related to SDG 6, 8, 11, 14 and 15. Of these, 17 were considered to be output
647 indicators. Those SDG Target related output indicators that were relevant to other existing
648 global indicator initiatives comprised:
 - 649 ○ SDG Indicator 15.3.1 – Proportion of degraded land (Relevant to the CBD; UNFCCC;
650 UNCCD and Ramsar). The key accounts for calculation of this indicator are the
651 Thematic Carbon Accounts and Ecosystem Extent / Land Cover Accounts.
 - 652 ○ SDG Indicator 6.6.1 – Change in the extent of water related ecosystems (Relevant to
653 the CBD; Ramsar; BIP and IPBES). The key accounts for calculation of this indicator are
654 the Ecosystem Extent / Land Cover Accounts and SEEA Water Accounts.
 - 655 ○ SDG Indicator 15.1.1 – Proportion of forest area (Relevant to the CBD; UNFCCC; BIP
656 and IPBES). The Ecosystem Extent / Land Cover Accounts are the key accounts for
657 calculating this indicator.
 - 658 ○ SDG Indicator 6.3.1 – Proportion of waste water safely treated (Relevant to Ramsar)
659 and 6.4.1 - Change in water-use efficiency over time (Relevant to Aichi Targets and
660 UNFCCC). The SEEA Water Accounts are the key accounts for calculating this
661 indicator.
 - 662 ○ SDG Indicator 15.2.1 – Progress towards sustainable forest management (Relevant to
663 CBD and UNFCCC) are the Ecosystem Extent / Land Cover Accounts and Ecosystem
664 Condition Accounts
- 665 • Of the 24 Non-SDG target output indicators that were full possibilities for generation using the
666 SEEA, 8 of these were Aichi Target (AT) Indicators. Those that could inform other global
667 initiatives outside of the BIP comprised:
 - 668 ○ AT 4.2.1 – Human appropriation of net primary productivity (Relevant to IPBES)

- 669 ○ AT 5.5.2 – Natural habitat extent (Relevant to UNFCCC)
- 670 ○ AT 5.5.3 – Wetland extent (relevant to IPBES and Ramsar)
- 671 ● Analysis of the current methodological gaps in calculating SDG indicators identified
672 opportunities for the SEEA to provide new methods for calculating SDG Indicators 11.7.1 (Open
673 space for public use in cities) and 14.7.1 (sustainable fisheries). Analysis of the Aichi Target
674 Indicator gaps identified 8 indicator gaps that the SEEA could potentially address. Of these the
675 SEEA-EEA is considered very well suited to generate the following indicators:
 - 676 ○ AT 10.5 - Trends in extent and condition of other vulnerable ecosystems impacted by
677 climate change or ocean acidification
 - 678 ○ AT 14.1 - Trends in safeguarded ecosystems that provide essential services
 - 679 ○ AT 14.4 - Trends in restoration of ecosystems that provide essential services
 - 680 ○ AT 15.1 - Trends in ecosystem resilience
- 681 ● Analysis of mainstreaming opportunities for biodiversity in attainment of the SDGs, identified
682 17 SDG Targets that could be mapped to the broad Aichi Targets and that the SEEA could,
683 potentially, generate new biodiversity mainstreaming indicators for. The most relevant
684 comprised:
 - 685 ○ SDG Targets 1.4 and 1.5 – Relating to generating indicators communicating access to
686 basic ecosystem services and building resilience in their supply
 - 687 ○ SDG Targets 2.1, 2.3 and 2.4 – Relating to ensuring access to food provisioning
688 services and the condition of agricultural ecosystems to ensure a flow of multiple
689 services that contribute to food production.
 - 690 ○ SDG Targets 9.1 and 9.4 – Relating to green infrastructure

691 Overall, the assessment reveal that ecosystem services accounts are of relatively low importance for
692 calculating indicators. This is considered to reflect a gap in the ability of existing indicators to
693 mainstream the environment into sustainable development. This suggests the full potential of
694 harnessing environmental benefits and ecosystem services in pursuit of sustainable development is
695 only being captured implicitly (via capacity reflected in condition and extent) in existing indicators.
696 There is considered to be a key role for the SEEA to play in addressing this situation by providing more
697 explicit biodiversity mainstreaming indicators.

698 4.1 Proposed Global Indicators for Testing

699 The analysis identifies 41 possibilities for developing methods to align the generation of existing global
700 indicators as output indicators from the SEEA. Of these, 17 are SDG Indicators that methodological
701 development effort should be targeted towards to fully align their generation to the SEEA. In terms of
702 prioritising this methodological development effort and establishing testing possibilities, in the first
703 instance it is considered rationale to focus on SDG Indicators:

- 704 1. that are well matched with the accounts that are envisaged under the NCA and ES Valuation
705 project;
- 706 2. Serve multiple reporting purposes.

707 With respect to point 1, a number indicators were dependent on ecosystem extent accounts (or land
708 cover / use accounts as potential proxies), in combination with data from other SEEA modules.

709 Ecosystem extent and land cover accounts will be a starting point for accounting in most pilot
710 countries. As such, priorities for developing methodological approaches to test with countries could
711 include **SDG Indicator 15.3.1** – Proportion of degraded land (calculated via Ecosystem Extent / Land
712 Cover Accounts and Thematic Carbon Accounts); **SDG Indicator 6.6.1** – Change in the extent of water
713 related ecosystems (calculated via Ecosystem Extent / Land Cover Accounts and SEEA Water
714 Accounts); and, **SDG Indicator 15.1.1** – Forest area as a proportion of total land area (calculated via
715 Ecosystem Extent / Land Cover Accounts). With respect to point 2, these SDG indicators will also
716 support wider reporting obligations under the CBD, UNCDD and UNFCCC.

717 SDG Indicators 6.6.1 and 15.3.1 are further identified as a Tier II indicators, providing an opportunity for
718 the SEEA to contribute a statistical process for national scale data collection and estimation.
719 Furthermore, it is anticipated that the accounts required to generate SDG Indicators 15.1.1 and 6.6.1
720 could also inform on the Aichi Target indicators AT 5.5.2 – Natural habitat extent (also relevant to
721 UNFCCC) and AT 5.5.3 – Wetland extent (relevant to IPBES and Ramsar).

722 It is noted that a key challenge to developing extent accounts for deriving these indicators will be
723 defining extent in an ecologically meaningful manner that remains amenable to measurement on a
724 regular basis. In this context, further work is required to understand the trade-offs between
725 disaggregating identified global data for use by national statistical offices versus the use of nationally
726 (or regionally) established ecosystem typologies and how these can be combined to support regular
727 ecosystem accounting. Organising this type of data will also be relevant to other reporting processes
728 beyond the identified indicator initiatives, for example contributing to the Forest Resources
729 Assessments of the FAO (either directly or via the supply of ground-truthed data to extend remote
730 sensed observations).

731
732 SDG indicator methodological gaps were identified in relation to SDG Indicators 11.7.1 (Open space for
733 public use in cities) and 14.7.1 (sustainable fisheries) and there are key opportunities for the SEEA in
734 these areas. However, these are not considered to be well aligned with the types of SEEA accounts to
735 be developed under the NCA and Ecosystem Service Valuation project in the pilot countries
736

737 The review of the Aichi Target indicator gaps and environmental mainstreaming opportunities for the
738 SEEA identifies clear synergies. Specifically, it appears conceptually feasible to use the SEEA
739 framework to generate **Aichi Target Indicators: AT 14.1** (Trends in safeguarded ecosystems that
740 provide essential services can be linked to extent, condition and services accounts); **AT 14.4** (Trends in
741 restoration of ecosystems that provide essential services can be linked to condition and services
742 accounts) and **AT 15.1** (Trends in ecosystem resilience can be linked to condition accounts).
743

744 Operationalising the production of the above indicators would be highly beneficial for realising the most
745 promising environmental mainstreaming opportunities for reducing poverty (SDG Targets 1.4 and 1.5),
746 ending hunger (SDG Targets 2.1, 2.3 and 2.4) and building resilient (green) infrastructure (SDG Targets
747 9.1 and 9.4). These indicators should also be considered as priorities for development of methodologies
748 to generate via the SEEA as they are likely to be highly relevant to the post 2020 SDG and CBD agenda.
749 These indicators will also be particularly relevant to a range of wider policy goals, for instance
750 harnessing the full potential of Ecosystem based Adaption to climate change for mitigation of a wider
751 range of disaster risks (i.e., Goals A through E of the Sendai framework for disaster reduction). As such
752 the SEEA offers a pathway for integrating biodiversity and ecosystem services into decision making,
753 and ecosystem service accounts would have key role to play in this regard.
754
755

756 **Appendix A: Inventory of Global**
757 **Indicator Initiatives (Excel file)**

758

759



Appendix A -
Inventory of Global

760

761 **Appendix B: Assessment of**
762 **Global Indicators from a SEEA**
763 **perspective (Excel file)**

764



Appendix B -
Assessment of Indicators

765

766

767 **Appendix C: Indicator Gaps and**
768 **Mainstreaming Opportunities**
769 **(Excel file)**

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Appendix C -
Indicator Gaps and I

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776 **Appendix D: National Indicator**
777 **Reviews (To be completed)**