NCAVES – STATE OF PLAY OF BUSINESS ACCOUNTING AND REPORTING ON ECOSYSTEMS

Business consultation

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This work was undertaken as part of the project advancing the SEEA Experimental Ecosystem Accounting. This note is part of the Project "Natural Capital Accounting and Valuation of Ecosystem Services" (NCA VES) which has been established to advance the knowledge agenda on environmental-economic accounting, particularly ecosystem accounting, by initiating pilot testing of the System of Environmental Economic Accounting (SEEA) Experimental Ecosystem Accounting (EEA) in five strategic partner countries to the European Union (EU), namely Brazil, China, India, Mexico and South Africa. The United Nations Statistics Division (UNSD), the United Nations Environment Programme (UN Environment) and the Secretariat of the Convention on Biological Diversity are the implementing agencies of the project "Natural Capital Accounting and Valuation of Ecosystem Services. This project is funded by the European Union.

[1]The views and opinions expressed in this report are those of the author and do not necessarily reflect the official policy or position of the United Nations or the European Union.

SEEA

1 Introduction

The project **"Natural Capital Accounting and Valuation of Ecosystem Services"** (NCAVES) has been established to advance the knowledge agenda on environmental-economic accounting, particularly ecosystem accounting, by initiating pilot testing of the System of Environmental Economic Accounting (SEEA) Experimental Ecosystem Accounting (EEA) in five strategic partner countries to the European Union (EU), namely Brazil, China, India, Mexico and South Africa. The United Nations Statistics Division (UNSD), the United Nations Environment Programme (UN Environment) and the Secretariat of the Convention on Biological Diversity are the implementing agencies of the project. This project is funded by the European Union.

The main objectives of the project include a) improving the measurement of ecosystems and their services (both in physical and monetary terms) at the (sub)national level; b) mainstreaming biodiversity and ecosystems in (sub)national level policy-planning and implementation; and c) contributing to the development of internationally agreed methodology and its use in partner countries.

As part of the objective to mainstream ecosystem accounting and promote its use in partner countries, the project also includes a **workstream on business accounting**. While it's true that businesses and governments often have different aims when it comes to environmental accounting and are attempting to capture different kinds of information, it's clear that the work undertaken by governments can be hugely useful to that of businesses, and vice versa. Therefore, this workstream aims to:

- contribute to the alignment of natural capital accounting between the public and private sectors;
- explore how to harness synergies between the public and private sectors in the collection and use of statistics and data for natural capital accounting;
- provide a technical methodological contribution at the level of methods or of indicators that promotes alignment.

To reach these objectives, there is a need to bring together the public and private sectors to look at the intersection of business accounting and the SEEA, particularly with regards to ecosystems and ecosystem degradation and restoration. One of the main activities of the workstream is the **organization of a scoping workshop**. The workshop will take place on 16 and 17 Oct in New York.

To prepare this workshop two main activities have taken place:

1. a literature review of current practices in business accounting and reporting related to ecosystems and ecosystem degradation and restoration; the findings were reported in a 'background paper' (13 June 2019)
2. interviews with 12 companies to explore their interests and needs in terms of data collection/interpretation and accounting/reporting related to impacts and dependencies on ecosystems.

This **business consultation paper** includes the results of the business consultation and provides **first options for aligning national and corporate natural capital accounting**. It serves as an important preparatory document for the workshop.

After the workshop, a workshop report will be prepared, which will form the basis of a concise roadmap for aligning private and public-sector approaches to natural capital accounting that suggests concrete areas of work

that UNSD can facilitate between companies and the national statistical offices of the project countries and the statistical community at the global level.

2 Objectives of the business consultation

If there is one clear message on corporate sustainability reporting that increasingly pops up in 2019, then it is the request of investors, NGOs and other key stakeholders for greater transparency and disclosure on both current and future impacts of business activities. As a consequence, businesses are looking for credible and comparable accounting and reporting approaches. This tendency is reflected by the growing number of initiatives aimed at identifying common ground between assessment and accounting approaches or even standardization, both between the 'capitals' (e.g. integrated reporting) and between thematic approaches (e.g. in the field of biodiversity metrics).

At a national level, this standardization has already taken place, at least to a large extent. Therefore, it's worth exploring to what extent businesses can rely on what's already available and even more if there is room to adapt these national level approaches to make them also 'fit for purpose' by the private sector. While it's true that businesses and governments often have different aims when it comes to environmental accounting and are attempting to capture different kinds of information, it's clear that the work undertaken by governments can be hugely useful to that of businesses, and vice versa.

Reported (pilot) cases on how companies can use or have used national environmental accounting data for corporate environmental accounting, be it for internal decision making or reporting/external disclosure, are hard to find. Therefore, engaging with a number of businesses to explore the possibilities of such exercise, was thought to be extremely useful.

The **key objective of the business consultation** is to explore synergies between (sub)national ecosystem accounting and corporate ecosystem accounting (or natural capital accounting)[1]. In particular the consultation aimed:

- to get a clear understanding of the company's current approach in terms of natural capital focus areas and natural capital assessment, accounting and disclosure (to have an insight in the broader picture)
- to explore the company's natural capital data needs and data sources, as well as their views on strengths and weaknesses of these data sources (e.g. completeness, granularity level) and on lacking data;
- to explore the company's opinion on the SEEA EEA Framework as 1°/ a promising approach for collecting natural capital data at national or subnational level that could potentially be used by businesses, and 2°/ an ecosystem accounting approach that could be useful for corporate NCA.

Thematic focus areas that were discussed during the consultation included water and biodiversity (including ecosystem services) and related business risks and opportunities of respectively non-action and action by businesses. This also includes climate change risks related to degradation of ecosystems as well as opportunities related to ecosystem restoration. Water and biodiversity are typical landscape scale elements that often go beyond the direct land footprint of companies and therefore are interesting to make the bridge to (sub)national level information (e.g. river basins, ecosystems). The same applies to climate change risks and adaptation.

[1] See Section 2 on Scope. In fact, natural capital is a broader concept than ecosystems. Ecosystems are part of natural capital as natural capital also includes non-renewable stocks. However, within the scope of this study (no focus on non-renewable stocks) both terms, i.e. ecosystem accounting and natural capital accounting, can be used interchangeably.

3 Methodology

3.1. Selection of businesses

In order to obtain a representative view of the business community, 12 businesses were identified, belonging to a variety of sectors and active in many parts of the world (see Table 1). These companies had to fulfill the following requirements:

- track record in sustainability reporting
- willing to engage in this journey by sharing their key data needs and interests
- interested to engage in this research.

For the selection and recruitment of participating companies a longlist was prepared, largely exceeding the envisaged number of 12 companies. The longlist has been compiled on the basis of:

- suggestions by Natural Capital Coalition; NCC has also made some introductions
- suggestions by WBCSD; WBCSD has also made some introductions
- suggestions by NCAVES country representatives
- personal knowledge about frontrunner companies and personal contacts of the author.

Name of company	Sector	Country	Reasons for selection
ABN AMRO	Financial	The Netherlands (with global investment portfolio)	• interesting approaches on Integrated Profit & Loss reporting (and underpinning assessment) and on SDG compliance reporting
ACTIAM	Financial	The Netherlands (with global investment portfolio)	• Sustainability bank • Frontrunner in assessing NC performance of investments
ALPRO DANONE	Food	Belgium	• Planetary Boundary approach applied to products
BALFOUR BEATTY	Construction	UK	• interesting approach on using NCA to strengthen their No Net Loss approach
BASF	Chemistry	Germany (with production sites globally)	• Frontrunner corporate NCA • Initiator of Value Balancing Alliance
DOW	Chemistry	USA (with production sites globally)	• interesting approach on generating business value by investing in natural infrastructure (Nature Goal)
FORICO	Forestry	Australia	• first company applying the SEEA EEA framework
KERING	Luxury goods	France (with global supply chain)	• Frontrunner in the field of E P&L
LAFARGE HOLCIM	Mining	Swiss (with production sites globally)	• Frontrunner in the field of biodiversity accounting

			• Member of Value Balancing Alliance • Interesting approach on water accounting in India
NATURA	Cosmetics	Brazil	• Applying E P&L • Focus on local sourcing and social issues
ROYAL FRIESLAND CAMPINA	Food (dairy)	The Netherlands	• Interesting biodiversity performance tracking approach of their farmers
SYNGENTA	Agrochemicals	Swiss	• Interesting approach on enhancing biodiversity in agricultural landscapes

Table 1: Consulted companies

3.2. Consultation

A questionnaire was developed (see Annex 1) which was sent to the interviewees in advance of the interview. The phone or skype interview generally took about 60 minutes.

Questions were not always followed rigorously. The questionnaire served more as an overall guidance for the interview, allowing for a more tailor-made conversation taking account of the specific situation of the interviewed company. This offered the flexibility to discuss some issues more in detail while other issues were skipped, all depending on the specific expertise, experience and interests of the interviewees.

Interview notes were sent for approval to the respective interviewees, including a request for approval that the information could be disclosed to workshop participants and to all interviewees. All companies have explicitly expressed their approval. However, for this public version the interview notes have been removed.

4 Findings

The interview findings are structured according to the following categories:

- Data collection and interpretation
- Potential synergies with SEEA EEA Framework

Data collection and interpretation

Overall, data collection is considered as an expensive activity for companies and it's often hard for sustainability professionals within the industry to justify return of investment.

Therefore, data sharing and open source databases are very important for companies. As an example, Kering exchanges data with Olam and Danone.

It is very important for businesses that data are scientifically robust.

The challenges faced in terms of data collection and interpretation can vary much according to:

- Type of data in DPSIR framework[2]: pressures, state, impacts and dependencies
- Organizational focus area: product level, site level, project level, supply chain level (upstream part of value chain), corporate level, sector/portfolio level
- Thematic area: water, biodiversity, climate hazards
- Data collection approach e.g. Environmental impact assessment (EIA), primary data, secondary data, modeling, …

Data on pressures ('impact drivers' according to the Natural Capital Protocol) are relatively easy to collect by the company, although there are differences:

- At **site level**, all companies are measuring wastewater emissions (often differentiated over different pollutants) and water use. For biodiversity, companies are mainly measuring habitat destruction by direct land intake at project level (e.g. road construction by Balfour Beatty)
- The picture is very different for companies with a large footprint in the **supply chain** and gets really complicated when thousands of smallholder suppliers are involved (e.g. agrobusiness companies). Primary data collection from suppliers often results in low quality data (low confidence level). This was confirmed by Alpro and Kering. In such cases, companies often rely on secondary data such as life cycle assessment (LCA) databases (Kering) or even input-output (IO) modelling but issues here are regional differences which are not sufficiently captured in LCA or too generic data.
- Land use and/or land transformation is often applied as a proxy for biodiversity pressures (Kering, ABN AMRO, Actiam).
- Climate hazard data are not consistently collected by all companies, but companies that do collect such data often rely on commercial datasources such as Verisk Maplecroft.

Data collection on the extent and condition of the ecosystem which is affected by a company's activities

- Site level assessments of ecosystem extent and condition are typically applied by mining companies (LafargeH), building and infrastructure companies (Balfour Beatty), forestry companies (Forico) and companies that apply site level investments which might affect ecosystems (e.g. BASF, DOW):
    - Lafarge applies IUCN's BIRS tool (Biodiversity Indicator and Reporting System**)** for measuring site level biodiversity performance in quarries.
    - Balfour Beatty relies on EIA which is always carried out for large infrastructure projects and which provides detailed information on water, biodiversity, etc.; this is also the case for companies like BASF and DOW who prepare EIAs for site level investments
    - Forico manages forested land and continuously measures extent and condition parameters
    - DOW applies a particular ecosystem services lens for identifying nature-based solutions opportunities at site level.
- Assessing ecosystem extent and condition of ecosystems outside the site's fences requires an interpretation step, i.e. which is the area of influence (affected area) and which are the affected ecosystems? In most cases impacts and dependencies affect ecosystems in a wider area than just site level.

[2] The DPSIR framework (Drivers – Pressures – State – Impact – Response), developed by the European Environmental Agency, offers a good approach for describing the links between business activities and impacts and dependencies on natural capital

- In some cases, extent and condition of these affected ecosystems is not measured. This is in fact the case for the majority of the business community. In countries with a well-functioning institutional structure, regulatory norms for avoiding or limiting ecosystem degradation are embedded in the environmental permits. In such case, regulatory compliance gives companies a feeling of comfort ('no harm to nature'). However, many other countries have a weak environmental legislation.
- For water, quite some companies rely on WRI's Aqueduct tool which provides insights in e.g. water scarcity areas (Lafarge Holcim). Or they rely on water quality or quantity data from national water agencies or NGOs (Natura).
- For biodiversity, IBAT is mentioned a few times as a data source providing insight in the location of protected areas. However, IBAT doesn't solve the question if these protected areas are really impacted by a company's activities. Some companies also do field inventories (ex ante and/or ex post, or periodically) mainly for concrete sites or projects, which is the case for forestry (Forico), mining (LafargeHolcim) and construction (Balfour Beatty).
- Data on ecosystem services are collected by a minority of the interviewed companies (Forico, DOW, Kering; LafargeH, Natura and Syngenta piloting). From a business perspective, there are two types of ecosystem services (ES), i.e. 1°/ ES on which the company is not dependent and 2°/ ES on which the company is dependent. Both can be affected by the company's activities, either in a negative or in a positive way (DOW investing in nature-based solutions and Syngenta investing in multifunctional field margins are examples of positive impacts)

Data on the impacts and dependencies requires even more interpretation.

- Water use is a typical dependency which is measured by all companies, at least at site level. But information on only extracted volumes of water is not sufficient to assess the impact on ecosystems or other stakeholders in the watershed, and to assess water scarcity risk for the company.
- Water scarcity is considered as a material risk by many companies. Supporting tools includeWRI's Aqueduct (LafargeH), WWF's Water Risk Filter (Alpro) or the Verisk Maplecroft data sources on climate and environmental risks (Syngenta, Kering). However, the granularity of these supporting tools and data sources is often not sufficient. Alpro applies a 'Context Based Water Targets' approach.
- It was generally acknowledged that assessing biodiversity impacts is challenging. It requires insights into cause – impact relationships and sensitivities of different species and habitats to certain pressures. Friesland Campina measures negative and positive impact drivers of its farmers for calculating their biodiversity impact or performance. Thus, they don't measure condition of the affected ecosystem, but they include knowhow about cause – impact relationships in the calculation.
- A main challenge is the lack of data on the carrying capacity of the affected ecosystems. Companies aiming for 'zero impact' or 'planetary boundaries' need such information, as this is essential for the assessment.

SEEA and potential synergies

- Companies are not aware of the existence of the SEEA-EEA framework. Companies are not using natural capital data collected by NSOs. There is no connection at all between the statistical NC community and the business community.

- All in all, interviewees expressed interest in increased access to more detailed, comprehensive, spatially referenced and regularly updated ecosystem accounts. Financial institutions (FIs) in the first place promote increased use of such data by companies, which would make life easier for FIs (benchmarking, comparing investment options). Thus, if national statistics offices (NSOs) could provide such data to businesses, that would be beneficial for improving internal decision-making and external disclosure in terms of natural capital accounting.

- An additional advantage for multinational companies with sites in many countries, would be that NC data from local NSOs would be more standardized if they all collect and process data in line with the UNSEEA EEA principles or recommendations.

- Most companies limit their assessments to impacts on 'stocks'. A minority of companies also includes the flows of ecosystem services in their assessments (Forico, Kering; Lafarge Holcim is piloting a case in Spain). A minority of companies applies monetization in the valuation step (Forico, Kering, Balfour Beatty, all companies applying I P&L: Natura, Lafarge Holcim, ABN AMRO).

- An often-applied business application is the identification and assessment of business risks related to ecosystem degradation e.g. operational risks (e.g. due to decreasing availability of water). In the specific case of water availability, companies declare that the following type of information would be of most interest to them:
    - data on water levels, both actual water levels as trends and predictions of future water levels (under several scenarios)
    - data on pressures from other stakeholders (e.g. who else is extracting ground water in the watershed area?)
    - data on policy priorities (e.g. protection status) and policy targets (e.g. Science Based Targets)
    - data on the minimum acceptable water level (threshold values) in order not to disturb other human activities (such as transport on rivers) or not to harm biodiversity values (e.g. in wetlands dependent on sufficiently high water levels)
- Companies having adopted a 'zero impact' or a 'planetary boundaries' approach (Alpro, Actiam are very much interested in data related to carrying capacity, threshold values, environmental flows, etc.)
- Companies aiming for No Net Loss or Net Gain, will need to define a baseline. Ecosystem accounts might provide this information on condition that the granularity is sufficiently high.
- Companies looking at aligning their water and/or biodiversity targets with science-based targets which have been established at a higher level (e.g. extent and condition of specific ecosystem types such as threatened habitats), would benefit from (sub)national ecosystem accounts which include a local translation of these science-based targets for water and biodiversity.
- Companies considering investment in ecosystem restoration projects, would benefit from ecosystem accounts including biodiversity accounts for estimating the return on investment when comparing options for ecosystem restoration.

ANNEX 1: QUESTIONNAIRE FOR BUSINESS CONSULTATION

IDENTIFICATION OF INTERVIEWEE

Name:

Function:

Company:

Country:

Contact email address:

Contact telephone number:

Date of interview:

QUESTIONS

SECTION 1: Description of natural capital accounting and disclosure practices

The aim of this section is to get a clear understanding of the company's current approach in terms of natural capital accounting and disclosure.

During the interview we will touch upon issues such as:

- main drivers for NCA in the company, and business applications
- selection of relevant NC elements (water, land use, air, biodiversity, ecosystem services, ..) and why the company has decided to focus on these elements (or not)
- ambition level: what (e.g. zero impact, planetary boundaries, quantified target levels), why and how
- the way impacts and dependencies are valued, i.e. qualitative, quantitative, monetized, and how this is translated into risks (and maybe opportunities)
- is local context (e.g. carrying capacity of local ecosystem, protection status, future threats, …) factured in, and which challenges are faced in terms of data and interpretation?
- value chain scope (production sites, supply chain, ...)
- possibility to report by country (for multinationals)
- integrated reporting or not
- strengths and weaknesses of current approach, challenges, room for improvement, future plans

SECTION 2: Accounting approach and data collection

This section aims to explore synergies between national or subnational level ecosystem accounting and corporate ecosystem accounting (or natural capital accounting)[3]. In particular we are interested in:

- the type of data that are or could be offered by national statistics offices (NSOs) to businesses and provide added value for their internal decision-making or external disclosure in terms of natural capital accounting
- the potential alignment in terms of the accounting approach

The questions below specifically *focus on water and biodiversity (including ecosystem services) and to the business risks and opportunities of respectively non-action and action by businesses. This also includes* ***climate change*** *risks related to degradation of ecosystems as well as opportunities related to ecosystem restoration.* Water and biodiversity are typical landscape scale elements that often go beyond the direct land footprint of companies and therefore are interesting to make the bridge to (sub)national level information (e.g. river basins, ecosystems). The same applies to climate change risks and adaptation.

2.A. TYPE OF DATA

Practice shows that companies need more subnational data for ecosystem related assessments, such as water scarcity data in water catchment areas or sensitive biodiversity features within the area affected by company activities. Therefore, companies often rely on tools and/or specific datasets that provide these data (see Box 1). In many cases these datasets go into a much higher level of detail than national level data. The question is in how far companies have sufficient data with these tools and to what extent national or subnational statistical data at an appropriate level of detail can fill the gaps.

Box 1: Examples of ecosystem related data sources often used by companies

Water:

- Global Water Tool and Local Water Tool
- ….

Biodiversity:

- IBAT
- Globio
- Recipe
- ENCORE
- ….

Climate risk:

- ??

[3] In fact, natural capital is a broader concept than ecosystems. Ecosystems are part of natural capital as natural capital also includes non-renewable stocks. However, within the scope of this study (no focus on non-renewable stocks) both terms, i.e. ecosystem accounting and natural capital accounting, can be used interchangeably.

WATER SCARCITY

1. *What type of information do you use now?*
2. *Can you easily find this information? Which information sources do you use? Regional or country related differences?*
3. *What are the strengths and weaknesses of this information? (e.g. completeness, granularity level, accurateness, user friendliness, …)*
4. *What kind of information are you lacking and looking for?(e.g. future water availability on your production sites?)*

BIODIVERSITY

5. *What type of information do you use now?*
6. *Can you easily find this information? Which information sources do you use? Regional or country related differences?*
7. *What are the strengths and weaknesses of this information? (e.g. completeness, granularity level, accurateness, user friendliness, …)*
8. *What kind of information are you lacking and looking for?(e.g. presence of protected sites, protected species, sensitivity of species and habitats to pressures, specific ecosystem services, …)*

CLIMATE RISKS AND ADAPTATION

9. *Are you assessing current and future climate risks (e.g. droughts, floods) potentially affecting your production sites or your distribution network (e.g. transport)?*
10. *What type of information do you use now?*
11. *Can you easily find this information? Which information sources do you use? Regional or country related differences?*
12. *What are the strengths and weaknesses of this information? (e.g. completeness, granularity level, accurateness, user friendliness, …)*
13. *What kind of information are you lacking and looking for?*

2.B. ACCOUNTING APPROACH

Discussing business interest in potential alignment or synergies with the ecosystem accounting approach as developed by SEEA EEA assumes a basic insight and understanding of key concepts and terms applied by SEEA EEA. Therefore, the below clusters of questions are preceded by a short description of key characteristics of SEEA EEA (the numbers refer to the paragraphs in the updated Technical Recommendations (2017) on SEEA EEA).

GENERAL CONCEPT OF ECOSYSTEM ACCOUNTING

- (1.5) **Ecosystem accounting** is a coherent framework for integrating measures of ecosystems and the flows of services from them with measures of economic and other human activity. In the SEEA Central Framework, environmental assets are accounted for as individual resources such as timber resources, soil resources and water resources. In ecosystem accounting as described in the SEEA Experimental Ecosystem Accounting (SEEA EEA), the accounting approach recognises that these individual resources function in combination within a broader system by taking a spatial approach.
- (1.11 – Box 1.1) Recording stocks and flows for accounting
    - For accounting purposes, the **stocks** refer to the underlying assets that support production and the generation of income. Stocks are measured at the beginning and end of each **accounting period** (e.g. the end of the financial year) and these measurements are aggregated to form a balance sheet for that point in time. Information about stocks may be recorded in physical terms (e.g. the hectares of plantation forest) and in monetary terms.
    - For ecosystem accounting, the **stocks of primary focus** are the **ecosystem assets (EA)** delineated within **the area in scope of the accounts, i.e. the Ecosystem Accounting Area (EAA)** (as the SEEA is implemented, this is usually a country or region) (see 1.15). Ecosystem assets are usually continuous areas of a homogenous ecosystem type such as forests, wetlands or rivers (see also footnote[4]). Conceptually, information about each ecosystem asset, for example information on its extent, condition and monetary value, can be recorded at the beginning and end of each accounting period and thus contribute to understanding the potential for the stock to support the generation of ecosystem services into the future (ecosystem capacity).
    - Two types of flows are recorded in accounting, namely (i) changes in stock and (ii) changes in flows related to production, consumption and income:
        - **Changes in stock include additions to stock as a result of investment or, in the case of ecosystem assets, natural growth and improvements in condition; and reductions in stock due to extraction, degradation or natural loss**.
        - Concepts of production, consumption and income are all flow concepts. For ecosystem accounting, the **relevant flows relate to the supply and use of ecosystem services between ecosystem assets and beneficiaries including businesses**, governments and households. Benefits as described in ecosystem accounting are also flows.

[4] (3.8) SEEA EEA allows for considerable flexibility in the way in which these different areas may be delineated in practice. Both relatively coarse and relatively fine delineations may be applied, for example, linear landscape elements such as hedgerows may be distinguished as specific ecosystem assets. Further, the criteria used to delineate ecosystem assets may be quite varied, involving ecological factors only or also taking into account aspects of ecosystem use and management.

- (1.15) **Spatial structure and ecosystem assets**. An area referred to as the **ecosystem accounting area**, such as a country or region within a country, defines the scope of the set of ecosystem accounts. The ecosystem accounting area is considered to comprise multiple ecosystem assets (generally represented in accounts in terms of homogenous and continuous areas of different ecosystem types such as forests, lakes, desert, agricultural areas, wetlands, etc.). While the total area being accounted for will generally remain stable, the configuration of ecosystem assets and types, in terms of their area, will change over time through natural changes and land use changes. For accounting purposes, each ecosystem asset is considered a separable asset where the delineation of assets is based on mapping mutually exclusive ecosystem asset boundaries. **Ecosystem extent accounts** record the compositional changes within an ecosystem accounting area, with information about different ecosystem assets usually grouped to show a summary for the different ecosystem types.
- (1.16) **Ecosystem condition**. Each ecosystem asset will also change in condition over time. An **ecosystem condition account** for each ecosystem asset is structured to record the condition at specific points in time and the changes in condition over time. These changes may be due to natural causes or human/economic intervention. Recording the changes in condition of multiple ecosystem assets within a country (or sub-national region) is a fundamental ambition of ecosystem accounting.
- (4.2) The ecosystem condition account captures, in a set of key indicators, the state or functioning of the ecosystem in relation to both its ecological condition and its capacity to supply ecosystem services. Furthermore, (4.5) indicators in the ecosystem condition account should also reflect the relevant trends, policy priorities (e.g. preservation of native habitat) and pressures on ecosystems (e.g. deposition levels of acidifying compounds versus critical loads for such compounds). Generally, different ecosystem types require different indicators. For example, condition indicators relevant for forests will be less relevant for cropland.
- (1.17) The measurement of ecosystems often overlaps with the measurement of **biodiversity**. In the ecosystem accounting framework, biodiversity is considered to be a key component in the measurement of ecosystem assets rather than being considered an ecosystem service in its own right.
- (1.67) A distinction has been drawn between **ecosystem accounts** and **thematic accounts**. Ecosystem accounts are those covering specifically stocks and changes in stocks of ecosystem assets, and flows of ecosystem services, and may be compiled in both physical and monetary terms. Thematic accounts are those for specific topics **including land, carbon, water and biodiversity**. Data from thematic accounts may be used in compiling ecosystem accounts and may also provide important contextual information in their own right and support analysis of ecosystem accounting information.
- (2.28) Asset accounts are designed to record information on stocks and changes in stocks (additions and reductions) of ecosystem assets. **This includes accounting for ecosystem degradation**. The **ecosystem monetary asset account** records this information in monetary terms, based on valuation of ecosystem services and connecting to information ecosystem extent and condition.
- (2.11) There are **five core ecosystem accounts**:

1	Ecosystem extent account	physical terms
2	Ecosystem condition account	physical terms
3	Ecosystem services supply and use account	physical terms
4	Ecosystem services supply and use account	monetary terms
5	Ecosystem monetary asset account	monetary terms

This is well visualized in the below figure.

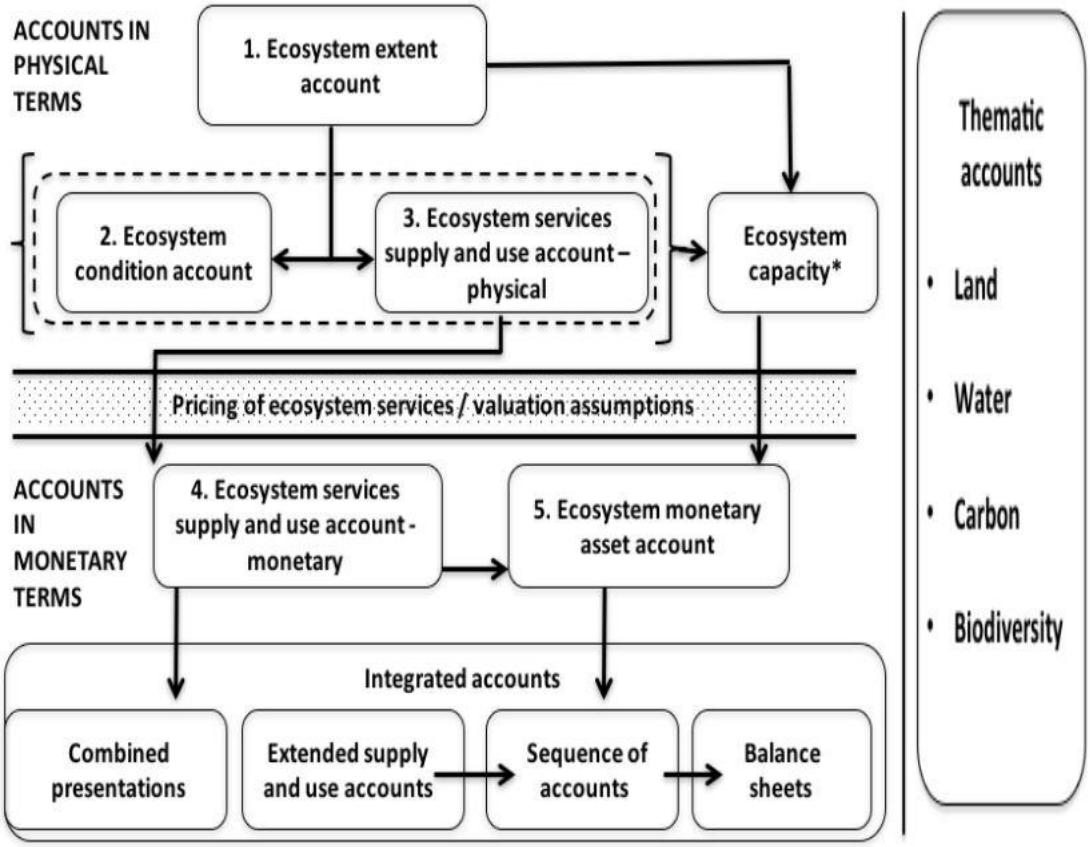

Figure 1: Connections between ecosystem and related accounts and concepts (Technical Recommendations SEEA EEA)

Questions

14. *Now that you've heard about these general concepts of ecosystem accounting as applied in SEAA EEA, do you think that there are promising concepts for being applied in a business context too? (balance sheet approach, i.e. stocks and changes in stocks (ecosystem assets such as forests, grasslands, …), flows and changes in flows of ecosystem services[5], principle of accounting period similar to e.g. a financial year)*
15. *Do you think this would fit well in integrated reporting?*
16. *Do you think that it would be feasible to collect ecosystem related data that are aligned with the time period in financial accounting?*

17. *What is your opinion regarding the 'ecosystem asset' as the main unit in the balance sheet? Is it applicable to business, and if so to which business sectors in particular? For instance, would it make sense for an agri-food company to classify its land in the supply chain in ecosystem asset classes (e.g. extensive grassland, intensive grassland, cropland, …) to be able to monitor extent and condition (see next question)?*
18. *Are 'ecosystem extent' and 'ecosystem condition' workable concepts for measuring changes in stocks and flows? These are reflected by the term 'state' (and 'change in state') in the Natural Capital Protocol.*

ECOSYSTEM SERVICES

- (1.18) **Supply of ecosystem services**. Either separately, or in combination, ecosystem assets supply ecosystem services. Ecosystem service accounts focus on the supply of ecosystem services (including provisioning, regulating and cultural services) to economic units, including businesses and households.
- (1.20) **Basket of ecosystem services**. Generally, each ecosystem asset will supply a basket of different ecosystem services. The conceptual intent in accounting is to record the supply of all ecosystem services over an accounting period for each ecosystem asset within an ecosystem accounting area.
- (1.21) **Use of ecosystem services**. For each recorded supply of ecosystem services, there must be a corresponding use. The attribution of the use of ecosystem services to different economic units is a fundamental aspect of accounting. In the SEEA EEA, ecosystem services are defined to support data integration with the production of goods and services that is currently recorded in the standard national accounts. Depending on the ecosystem service, the user (e.g. household, business, government) may receive the ecosystem service while either located in the supplying ecosystem asset (e.g. when catching fish from a lake) or located elsewhere (e.g. when receiving air filtration services from a neighbouring forest).
- (1.22) **Linking to benefits**. Flows of ecosystem services are distinguished from flows of benefits. In the SEEA EEA, the term benefits is used to encompass both the products (goods and services) produced by economic units as recorded in the standard national accounts (SNA benefits) and non-SNA benefits that are generated by ecosystems and consumed directly by individuals and societies (e.g. regulated water flow, reduced concentrations of emissions in the air).

Questions

[5] In the Natural Capital Protocol, the concept of stocks and flows is also applied.

19. *Ecosystem services: in corporate natural capital accounting, ecosystem services are mainly referred to in the context of dependencies (e.g. water provisioning, natural flood defense, pollination, …); the perspective in the SEEA EEA approach is somewhat different and looks at the capacity of ecosystem assets to generate ecosystem services; very few businesses consider ecosystem services generation as a business opportunity which can deliver business value; how does your business view ecosystem services?*

20. *Does your business monetize any ecosystem services? If not, is this something your business would consider?*

APPLICATIONS OF ECOSYSTEM ACCOUNTING

At the national or subnational level ecosystem accounts provide several important pieces of information in support of policy and decision making relating to environment and natural resources management, recognising that the management of these resources is of relevance also in economic, planning, development and social policy contexts. Typical applications are the following:

- (1.39) Detailed, spatial information on ecosystem services supply.
- (1.40) Monitoring of the condition of ecosystem assets.
- (1.41) Highlighting the ecosystem assets, ecosystem types and ecosystem services of particular concern for policy makers.
- (1.42) Monitoring the status of biodiversity and indicating specific areas or aspects of biodiversity under particular threat.
- (1.43) Quick response to information needs.
- (1.45) Monitoring the effectiveness of various policies.
- (1.46) Use in economic and financial decision making.

Questions

21. *Can businesses benefit from the presence of such detailed, comprehensive, spatially referenced and regularly updated ecosystem accounts for their own range of business applications? Which are these business applications?*
22. *An often-applied business application is the identification and assessment of business risks related to ecosystem degradation e.g. operational risks (e.g. due to decreasing availability of water). In the specific case of water availability, would data on water levels be sufficient? Or would you welcome additional information such as trends and predictions of future water levels (under several scenarios), data on pressures (who else is extracting ground water?), data on policy priorities (e.g. protection status) or data on the minimum acceptable water level (threshold values)[6] in order not to disturb other human activities (such as transport on rivers) or not to harm biodiversity values (e.g. in wetlands dependent on sufficiently high water levels)?*

[6] See SEEA EEA Technical Recommendation 4.5 "Indicators in the ecosystem condition account reflect the general ecological state of an ecosystem, its capacity to supply ecosystem services and the relevant trends. The indicators selected should be relevant for policy and decision making, for instance because they reflect policy priorities (e.g. preservation of native habitat); pressures on ecosystems (e.g. deposition levels of acidifying compounds versus critical loads for such compounds)..

23. *If your company has adopted a 'zero impact' or a 'planetary boundaries' approach, would information on ecosystems' capacity for providing services be interesting?*
24. *If your company is aiming for No Net Loss or Net Gain, you will need to define a baseline. Ecosystem accounts might provide this information on condition that the granularity is sufficiently high. Would this be a promising application for you?*
25. *If your company is looking for aligning its water and/or biodiversity targets with science-based targets which have been established at a higher level*[7] *(e.g. extent and condition of specific ecosystem types such as threatened habitats), do you think that (sub)national ecosystem accounts are in principle well suited for establishing these science-based targets for water and biodiversity?*
26. *If your company considers investment in ecosystem restoration projects*[8]*, would ecosystem accounts including biodiversity accounts be useful for estimating the return on investment when comparing options for ecosystem restoration?*
27. *Do you see other business applications?*

SECTION 3: Workshop

Under this section a free discussion with regard to the interests of the company in the workshop, their expectations and their potential involvement.

[7] Science-based targets for GHG emissions have been developed under the Paris Agreement on Climate Change, and may be developed for other ecosystem elements such as biodiversity

[8] Conservation NGOs such as WWF, IUCN and CI observe increasing interest from investors and industry to finance ecosystem restoration projects. See e.g. https://www.iucn.org/theme/forests/projects/cpic-conservation-finance-initiative