IMPROVING NATURAL CAPITAL DATA FLOW BETWEEN GOVERNMENTS AND BUSINESSES

Postion Paper
May 2022

Version	Status	Date
1.0	Operational	May 2022

Contents

Executive summary

Businesses[1] increasingly need high quality and relevant natural capital data. This is mainly driven by a growing awareness of risks related to ecosystem degradation as well as by the rapidly changing regulatory framework on external disclosure of corporate natural capital performance.

From a business perspective, there are challenges though, in meeting these data needs. Key challenges relate to the need for harmonization and standardization of natural capital approaches, that will define which data is most relevant. Other key challenges relate to accessibility of data, data quality and inadequate data infrastructure. In terms of data infrastructure, one of the issues is the disconnect between the business community and the statistics and scientific community (governmental organizations in charge of natural capital data collection, such as National Statistics Offices and environmental agencies), which is also reflected by the fact that the large majority of the latter is unaware of the natural capital data needs of the business community. An improved data flow from government (statistical offices and other agencies) to business can therefore be a key element in increasing businesses' sustainability performance.

However, it will also work the other way around. Governments too can benefit from improved natural capital data flows from the business community, not only for better policy making but also for tracking progress to international targets related to 'zero carbon' and 'nature positive', with the business community one of the main stakeholder groups.

We Value Nature, together with the Capitals Coalition and its Combining Forces program[2], has prepared this Position Paper with the aim to provide concrete recommendations on **improving the natural capital data flow between governments and businesses in the EU.**

Three key recommendations are put forward:

1. Governments (including NSOs) should recognize businesses as an emerging key user group of natural capital data collected by public authorities

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1   The business community referred to in this position paper also includes the financial sector

2   **https://naturalcapitalcoalition.org/projects/combining-forces-on-natural-capital**

2. Governments (including NSOs) should strive to make comprehensive national ecosystem accounts-based data available that is contextual and spatially relevant for business at least at a landscape level, which will turn out as a win-win for all actors

3. Business and government should combine forces and build on existing dialogues to establish a European dialogue platform covering both technical and institutional issues from both a supply and demand perspective.

Based on experience so far, business needs in terms of natural capital data can be summarized as contextual and spatially referenced information at least at a landscape level – and the higher the granularity of data, the better – on the following aspects of natural capital:

- Ecosystem types, extent and condition, and evolution over time

- Sensitivity of ecosystems and species to typical business-related impact drivers

- Presence of protected areas and protected species/habitats

- Ecological thresholds and safe operating space

- Science-based targets for nature at a landscape level

- Scenarios on ecosystem degradation and ecosystem restoration

- Typical ecosystem services associated with specific ecosystem types and local importance of these ecosystem services

- Priority areas for ecosystem restoration.

The SEEA EA accounts provide a good basis but should be complimented with additional data such as threats, thresholds, scenarios, etcetera, as well as with (internal) data from companies on their use of natural resources and ecosystem services, as well as on their impacts and dependencies on natural capital.

Governments and society as a whole will benefit from increased uptake of tailored public level natural capital data by businesses in 3 ways:

- more effective efforts by the business community to become nature positive and restore degraded ecosystems

- more meaningful tracking of progress to national and international targets

- better informed public level decision-making as a result of improved corporate disclosure of natural capital performance.

So far, good practice examples on how public level natural capital data can be tailored to the businesses needs and on how businesses are using these data are still relatively scarce. There is a need for much more examples, as this is key for triggering the interest of the wider business community.

1. Introduction

1.1 Context

Businesses[3] increasingly need high quality and relevant natural capital data. This is mainly driven by the following evolutions:

- a growing need to better understand business impacts and dependencies on nature and people, with the aim to understand and tackle future risks related to ecosystem degradation, which is increasingly highlighted as one of the top business risks (see e.g. WEF Risk reports[4]);

- increased recognition by businesses of the benefits of understanding impacts and dependencies on natural capital, which was initiated by the Natural Capital Protocol and since then has been further driven by numerous other initiatives In this space;

- the tendency towards mandatory disclosure of impacts and dependencies on nature in the near future (see e.g. International Sustainability Standards Board (ISSB), EU-Corporate Sustainability Reporting Directive (CSRD), Global Reporting Initiative (GRI), Post-2020 Global Biodiversity Framework negotiations, Task Force for Nature-Related Financial Disclosure (TNFD);

- the increased efforts in terms of harmonization and standardization of natural capital assessment approaches (see e.g. Transparent, Align).

Governments too can benefit from improved natural capital data flows from the business community, not only for better policy making but also for tracking progress to international targets related to 'zero carbon' and 'nature positive', with the business community one of the main stakeholder groups.

From a business perspective, there are challenges though, in meeting these data needs. A particular challenge relates to accessibility of data rather than data availability. Other challenges relate to data quality, inadequate data infrastructure and lack of capacity including skills to deal with data provided by new technologies[5]. In terms of data infrastructure, one of the issues is the disconnect between the business community and the statistical community[6], which is also reflected by the fact that the large majority of governmental organizations in charge of natural capital data collection, such as National Statistics Offices (NSOs) and environmental agencies is unaware of the natural capital data needs of the business community.

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3   The business community referred to in this position paper also includes the financial sector

4   Global Risks Report 2022 | World Economic Forum (weforum.org)
     https://www.weforum.org/reports/global-risks-report-2022

5   Natural Capital Coalition. 2019. Data use in natural capital assessments. Assessing challenges and identifying solutions. Full report. **https://capitalscoalition.org/wp-content/uploads/2019/02/Full-Report.pdf**

6   **https://seea.un.org/sites/seea.un.org/files/business_consultation_public_version.pdf**

At the same time, new opportunities arise, as governments[7] are creating natural capital accounts building on the new UN standard (SEEA Ecosystem Accounts), some are experimenting with tailoring this information to the needs of stakeholder groups and we are seeing a plethora and fortunately also increased standardization of new measurement methodologies, data collection techniques and data sources being applied in the business and financial sectors[8].

1.2 Objective

We Value Nature, together with the Capitals Coalition and its Combining Forces program[9], wants to explore **the potential for improving the natural capital data flow between governments and businesses in the EU.** This Position Paper:

- highlights the increasing needs of the business community in terms of natural capital data (given the growing awareness of risks related to ecosystem degradation, the rapidly changing regulatory framework on external disclosure of corporate natural capital performance and the increased harmonization and standardization of natural capital assessment approaches);

- highlights how comprehensive national natural capital accounts[10] (UN-SEEA Ecosystem Accounts) relate to the internationally accepted framework for business (Natural Capital Protocol);

- also highlights the potential of UN-SEEA EA to provide data relevant for business decision-making and how both frameworks can mutually strengthen each other;

- highlights the value (to governments and businesses) of greater alignment of comprehensive national (in particular the SEEA EA) and corporate natural capital accounting approaches;

- describes frontrunning initiatives and best practices/good examples from governments as well as business on using government natural capital data for business applications;

- identifies key challenges in using government's natural capital accounts to support business needs;

- recommends actions and next steps to improve.

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7   By 2022 the SEEA is being implemented in 90 countries with 36 of them compiling SEEA EA

8   See Thematic Report on Biodiversity Data by EU Business @ Biodiversity Platform (2022) **https://ec.europa.eu/environment/biodiversity/business/assets/pdf/2022/EU B@B platform Thematic Report 2022_FINAL.pdf**

9   **https://naturalcapitalcoalition.org/projects/combining-forces-on-natural-capital** the 'Combining Forces' program was established to bring together the public and private sectors' thinking on natural capital (Natural Capital Coalition, 2017); the objective of Combining Forces is to foster a greater mutual understanding of different approaches to the assessment of natural capital and to co-ordinate efforts to ensure that our relationship with nature is accounted for and included in decision-making.

10   Natural capital data collected by public authorities such as National Statistics Offices (NSOs) are sometimes perceived as data about an entire country but increasingly are data produced at finer scales but with national coverage, so in a more comprehensive way. Greater clarification of the scale at which data may potentially be available is essential to get over the first hurdle/misconception about the potential of the SEEA based datasets.

1.3   Approach

This Position Paper is builds on recent findings of the NCAVES project ("Natural Capital Accounting and Valuation of Ecosystem Services") (2017–2021) and additional interviews.

NCAVES has been established to advance the knowledge agenda on environmental-economic accounting, particularly ecosystem accounting (represented by the SEEA EA). NCAVES also included a workstream on business accounting, which since 2021 is formally established within an intergovernmental body, the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA), with the hopes of further collaboration and alignment between the public and private sector.

The NCAVES workstream on business accounting project produced a number of deliverables over the past two years, including a business consultation, a strategic roadmap and two pilot case reports (both with Holcim, i.e. one on a quarry in Spain and one on two facilities of Ambuja Cement (a subsidiary of Holcim) in India; these pilot cases analysed alignment of business natural capital accounting approaches with the SEEA Ecosystem Accounts.

By means of interviews with relevant experts, additional information was collected regarding best practices. Interviews were also very useful for validating and further strengthening the recommendations. Interviews took place with:

- David Barton, senior Research Scientist, Norwegian Institute for Nature Research (NINA) (interview 14 Dec 2021)

- Wilbert Van Rooij, director of Sarvision, The Netherlands (Interview 14 Feb 2022)

- Kaia Oras, Leading Analyst, Team Leader of Environment Statistics and Accounts, Economic and Environmental Statistics Department, NSO Estonia (interview 15 Feb 2022)

- Arturo de la Fuente, unit 'environmental statistics and accounts, sustainable development' of Eurostat (interview 17 Feb 2022)

- Alexander Hadzhiivanov, EBRD (interview 7 Jan 2022)

- Steven Tebbe (EFRAG) (interview 10 Jan 2022)

2. The Business Demand for Natural Capital Data

2.1 Drivers of business demand for natural capital data

Businesses depend on nature (e.g. water use, pollination, flood protection) and have impacts on nature (e.g. pollution, habitat destruction, overexploitation). There is growing evidence that for an increasing number of companies unsustainable interactions with nature are affecting their market value, profitability, cash flows and/or risk profile. Until now, apart from some exceptions[11], these impacts and dependencies are not visualized on a company's profit and loss statement or on their balance sheet. They remain "externalities", or issues without internal consequence. The lack of standardisation across corporate environmental assessment methods, including natural capital accounting, as well as the lack of regulation have always been an obstacle for getting environmentally sustainable activities and assets mainstreamed across the economy. As a result, there is a huge demand from stakeholders for comparable figures on company non-financial performance, not at least from the investors side who need reliable data for benchmarking purposes and investment decisions. There is also an increasing demand from the business sector itself and in particular from frontrunner companies who ask for more transparency based on a common set of rules on how to disclose non-financial performance. And finally, there is a clear demand from the regulators side. In particular, the EU Green Deal[12] explicitly commits the European Commission to work with businesses and other stakeholders on developing standardised natural capital accounting practices within the EU and internationally. The Commission has also taken the lead in tackling greenwashing by establishing a so-called taxonomy whilst also revising and strengthening its policies on non-financial reporting (see below).

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11   Examples are Kering (applying an Environmental Profit & Loss approach since more than 10 years; integration of environmental externalities) and Holcim (applying an Integrated Profit & Loss approach; integration of environmental and social externalities)

12   **https://ec.europa.eu/info/sites/default/files/european-green-deal-communication_en.pdf**

Fortunately, the situation is rapidly changing, both in terms of standardization as in terms of disclosure regulation.

In terms of standardization of measurement and valuation approaches, several initiatives have emerged over the past 2 years:

- The EU funded **Transparent**[13] project aims to provide recommendations for the standardization of the measure and value stage of the Natural Capital Protocol. The project is led by the Value Balancing Alliance, Capitals Coalition and WBCSD.

- The EU-funded **Align** project[14] (Aligning Accounting Approaches for Nature) is a sister project to Transparent and is focusing on making recommendations on biodiversity measurement and valuation.

- The **Science Based Targets for Nature (SBTN)**[15] is defining science-based targets for nature. SBTN will build out of the Earth Commission's thresholds[16] and allocation work to provide guidance on target setting for business and cities.

Secondly, there are many initiatives in the field of external disclosure:

- The **Task Force on Nature Related Financial Disclosures (TNFD)**[17] aims to provide a framework for organisations to report and act on evolving nature-related risks, in order to support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes.

- A key development is the transformation of the EU Non-Financial Reporting Directive into the **EU Corporate Sustainability Reporting Directive (CSRD)**[18] which will become operational within a few years and introduces more detailed reporting requirements[19].

- The IFRS Foundation (International Financial Reporting Standards) has launched the **International Sustainability Standards Board (ISSB)** to develop a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs[20]. The ISSB will sit alongside the IASB (International Accountancy Standards Board).

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13   Transparent — Capitals Coalition **https://capitalscoalition.org/project/transparent**

14   Aligning Accounting Approaches for Nature — Capitals Coalition **https://capitalscoalition.org/project/align**

15   Why set SBTs? — Science Based Targets Network
     https://sciencebasedtargetsnetwork.org/how-it-works/why-set-sbts-for-nature

16   Earth Commission — Earth Commission **https://earthcommission.org**

17   TNFD — Taskforce on Nature-related Financial Disclosures **https://tnfd.global**

18   Sustainable finance package | European Commission
     https://ec.europa.eu/info/publications/210421-sustainable-finance-communication_en#csrd

19   Although disclosure of impacts and dependencies will not be mandatory in the first reporting rounds

20   Similar to the CSRD, ISSB will not impose disclosure of impacts and dependencies in the first reporting rounds

- Business for Nature[21] is the business voice on nature and is advocating for ambitious policy on impacts and dependencies. **https://www.businessfornature.org/recommendations**

It is important to recognize that the above developments will be more effective if together they will create an aligned flow of information between business, finance and government that is based on a joint understanding of value. If successful, all these developments together are expected to generate a tremendous shift in the business and financial community mindset in terms of valuation of natural capital, a shift from shareholder to stakeholder capitalism[22]. This will fuel the business demand for natural capital data.

21 Business For Nature **https://www.businessfornature.org**

22 Making stakeholder capitalism real and rewarding – World Business Council for Sustainable Development (WBCSD); **https://www.wbcsd.org/Overview/News-Insights/Insights-from-the-CEO/Making-stakeholder-capitalism-real-and-rewarding** see also WBCSD's Redefining Value program **https://www.wbcsd.org/Programs/Redefining-Value**

2.2 Which natural capital data are businesses looking for and why?

As a result of these external drivers, companies and their stakeholders (including customers or investors) will increasingly be enforced to seek answers to questions such as[23]:

- What is the total environmental footprint[24] of my activity for a given (fiscal) year?

- What is my water footprint, my biodiversity footprint?

- Which natural capital impacts and dependencies are material for my company and where do they occur in the value chain? Why are they material (e.g. financial, operational, reputational risks)?

- Which are the natural capital elements my company is dependent on (e.g. water, pollination, timber, …)?

- How is the footprint distributed geographically (e.g. production abroad/ carbon leakage) and along each stage of the supply or value chain?

- How do I expect the footprint to evolve in time and across locations?

- Should I take risk mitigation measures and if so, where to concentrate efforts?

- How is the footprint comparing to those of other companies, sectors, countries, …?

- How does the footprint of project X compare with an alternative project Y?

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23   In the Natural Capital Protocol, these are called business applications; a business application is the intended use of the results of your natural capital assessment, to help inform decision-making

24   The terms 'environmental impact and 'environmental footprint' are often used interchangeably. Environmental impacts are sometimes more related to specific activities (e.g. impact of accidental release of toxic waste on a local habitat), while the environmental footprint is more related to an entity such as person, a company, a product and comprising the total impacts alongside the supply chain (also including uses of natural resources).

The type of natural capital data used by companies and investors is dictated by:

- the decision context, i.e. the type of decisions ('business applications')

- the maturity of the company in relation to Its natural capital approach

- compliance to regulatory and external disclosure requirements

- the need to enable delivery against global targets (e.g. SDGs, post 2020 Global Biodiversity Framework)

- the materiality of the issues concerned (higher materiality will require higher accuracy and quality of data)[25] which is often determined by local characteristics.

Business needs in terms of natural capital data can be summarized as contextual and spatially referenced information at least at a landscape level[26] on at least the **aspects of natural capital** listed in *Table 1.*

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25   Finance for biodiversity Working Group on Impact Assessment

26   In this context a landscape scale, contrary to site level scale, allows to take into account the functional relationships between natural processes and ecosystems. A good example is a water catchment area or a river valley. According to FAO (2013), a landscape is an area large enough to produce vital ecosystem services and small enough to be managed by the people using the land and producing those services (more in **Integrated Landscape Management | Land & Water | Food and Agriculture Organization of the United Nations | Land & Water | Food and Agriculture Organization of the United Nations** (fao.org))

Table 1: Natural capital data needs related to specific business applications/decision contexts

Natural capital data	Serving specific business needs
Ecosystem types (location, extent, tendency over time e.g. change in land cover)	Baseline mapping, understanding natural capital state, biodiversity footprint of sites, projects, supply chain
Ecosystem condition (information needs to include condition score e.g. on a scale of 0 to 1, condition indicators, evolution over time and the reasons for changes in condition i.e. impact drivers)	
Sensitivity of ecosystems and species to typical business-related impact drivers (e.g. water extraction, nitrogen emissions)	Understanding changes in natural capital due to company pressures. Risk screening. Identification of mitigation measures.
Presence of protected areas and protected species/habitats	Risk screening. Identification of mitigation measures. Identification of opportunities for restoration/offsets.
Ecological thresholds and safe operating space (including 'distance to threshold' or 'level of exceedance of threshold')	Risk screening. Identification of mitigation measures.
Science-based targets for nature at a landscape level	Target setting.
Scenarios on ecosystem degradation and ecosystem restoration	Risk screening. External disclosure of financial and non-financial business risks. Identification of opportunities.
Typical ecosystem services associated with specific ecosystem types and local importance of these ecosystem services	Identification of opportunities for Nature Based Solutions. Societal valuation of impacts.
Priority areas for ecosystem restoration including nature-based solutions	Identification of opportunities for offsets (as part of Nature Positive ambition) or for Nature Based Solutions.

Apart from the aspects of natural capital data, there are also requirements in terms of the characteristics of natural capital data to be useful for decision-making. TNFD sets out the characteristics of decision useful data which have been adapted in *Figure 1*.

However, **businesses are facing tremendous challenges when looking for suitable data.** are described in *Section 3*. *Section 4* will cover part of the solution will cover part of the solution, i.e. how public level natural capital data can help address the needs of the business community for natural capital data.

Figure 1: Characteristics of decision useful data (adapted from the TNFD for use in EU B@B Platform Thematic Report on Biodiversity Data, 2022)

Relevance	• Appropriate to the decision context • Formal recognition for application in the decision context
Rigor	• Suitable accuracy to enable companies to make decisions with reasonable assuarnce as to the integrity of the assessment results
Resolution	• Spatial and non-spatial i.e. fit for use at the right scale for the decision
Temporality	• Must represent the appropriate timescales for decision making
Update frequency	• Regularly updated or updated over an appropriate timescale for the decision context
Accessibility	• Easily accessible in different formats (including languages) and consideration of costs
Comparability	• Facilitates comparison through inter-operable formats and consitent and comparable within and between sectors
Geographic coverage	• Permit aggregation and disaggregation to allow for attribution across portfolios, footprints
Thematic coverage	• Should include pressures on nature, sate of nature and response
Authoriativeness	• From authoritative (peer reviewed, published) or verifiable source (subject to third party audit)

3. Challenges

The business consultation[27] carried out under the NCAVES business workstream made clear that data collection is considered as an expensive and difficult activity for companies and it's often hard for sustainability professionals within the industry to justify return of investment. But why is collecting the right type of natural capital Information so challenging for businesses?

Recent research[28] by the Capitals Coalition and UNEP-WCMC has confirmed that the overarching challenge is not the absence of data, but the **absence of data flow.** Information is not flowing effectively between actors across the system. It is a problem underpinned by four key barriers: accessibility, infrastructure, quality and capacity. *(Figure 2).*

Figure 2: Natural Capital Data Challenges (Capitals Coalition 2019)

ACCESSIBILITY
High data volumes, costs, inconsistent formats and accessing third party data

INFRASTRUCTURE
Under-investment in good data governance and lack of standards

DATA PROVIDERS → DATA COLLATORS → DATA USERS

QUALITY
Data gaps and inconsistencies, lack of measurement methodologies

CAPACITY
Lack of capacity to ensure robust data is developed and accessed for decision-making

Key Barriers

27   https://seea.un.org/sites/seea.un.org/files/business_consultation_public_version.pdf

28   https://capitalscoalition.org/data-information-flow-project-update

Challenges related to accessibility of data

- Access to data can be compromised by costs (some data are behind paywalls e.g. IBAT), licensing agreements, data security, and confidentiality[29]

- Lack of awareness on the existence of natural capital and biodiversity data might be an obstacle. An example is the Ecosystem Services Valuation Database (ESV Database)[30]. Also, National Statistics Offices (NSOs) are increasingly collecting such data, as part of their work on environmental economic accounts, but access to data might be an issue; in some country's national natural capital accounts and the underlying data are relatively easy to explore while in other countries direct online access to data might be difficult;

- In many occasions comprehensive national natural capital data is not available at the required granularity or formats suitable for corporate environmental management information systems and/or project or site level; this is a key obstacle that has been clearly demonstrated in both case studies prepared under the NCAVES business workstream[31]

- Data gaps are more challenging for some sectors than others. For supply chain companies in particular, the complexity of supply chains and lack of direct ownership over the data producing entity makes accessing data challenging. Although data is available for some issues e.g. Trase.Earth provides traceability of deforestation risk within supply chains, much broader coverage of issues and sectors is required[32].

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29 Confidentiality is indeed an issue; in many instances natural capital accounting data simply cannot be reported at high granularity (e.g. individual yield per acre of a farmer); NSOs sometimes can make micro data available to users but only if they do not have a profit motive.

30 **https://seea.un.org/sites/seea.un.org/files/case_study_report_ambuja_cement_india_draft_final_14july2021.pdf**

31 **https://seea.un.org/content/business-accounting**

32 See Thematic Report on Biodiversity Data by the EU Business & Biodiversity Platform (2022)

- From an investor perspective, lack of standardised disclosure requirements, lack of primary data (most data available to the finance sector on biodiversity is modelled) and lack of consensus on metrics means that corporate data for assessments is often unavailable[33].

- Challenges related to data quality

- Available data sources are often not providing the required level of accuracy (e.g. spatial granularity) which makes own measurements necessary[34]

- Divergent standards or a lack of data standards, for example concerning concepts, definitions and classifications, can also reduce the comparability and use of data[35].

Challenges related to capacity

- Accessing, interpreting and understanding natural capital data increasingly relies on strong geospatial analytical capabilities as well as specialist expertise (e.g. biodiversity). There is a difference between raw natural capital data and clear natural capital information including explanatory narratives for non-experts.

Challenges related to data infrastructure[36]

- At this moment, only a limited number of NSOs in the EU have started with ecosystem accounting, although this might change due to the expected amendment of Regulation (EU) 691/2011 on European environmental economic accounts which will make the integration of ecosystem accounts obligatory. This will provide a formal mandate to NSOs[37]; as a consequence, some countries (e.g. The Netherlands, Estonia) are more advanced than others;

33 PRI 2021. Unlocking biodiversity performance. Unpublished report by Chronos Sustainability and Globalbalance and Finance for Biodiversity Foundation (2021) Presentation 'Drivers and challenges of biodiversity data use by financial institutions' by Liudmila Strakodonskaya, ESG Analyst with Axa Investment Managers

34 https://seea.un.org/sites/seea.un.org/files/case_study_report_ambuja_cement_india_draft_final_14july2021.pdf and https://seea.un.org/sites/seea.un.org/files/case_study_report_holcim_spain_draft_final_14july2021.pdf

35 WWF, World Bank Group and Global Canopy (2022) Geospatial ESG. The emerging application of geospatial data for gaining 'environmental' insights on the asset, corporate and sovereign level

36 The Open Data Institute (Data infrastructure – The ODI) https://theodi.org/topic/data-infrastructure defines data infrastructure as the datasets, technology, training and processes that makes them useable, policies and regulation such as those for data sharing and protection, and the organizations that collect, maintain and use data.

37 MAIA Factsheet Finland: Currently there is no official mandate for natural capital accounting or ecosystem accounting in Finland. Methodological development for piloting ecosystem and water accounting has been a bottom-up process. The Eurostat initiative to update Regulation (EU) 691/2011 and the SEEA-EA are expected to increase demand for natural capital accounting from the policy side in Finland. https://maiaportal.eu/storage/app/media/MAIA_FI_Factsheet_Final.pdf

- So far, there is a disconnect between the business community and the statistics community[38]. NSOs are generally unaware of the natural capital data needs of the business community, and businesses are generally unaware of the potential opportunities from UNSEEA EA.

- There is also a disconnect between the statistics community and the policy community. Natural capital accounting is quite supply driven and not all policy decision-makers are already aware of its potential. Or it is mainly used for analyzing past evolutions instead of informing future decisions. Therefore, the actual use in policy decision-making could be much stronger if we connect supply and demand[39].

- Not all types of natural capital information which are looked for by business might be easily available at national level from a single source; apart from NSOs, also national or international environmental agencies (e.g. EEA) have responsibilities in the field of monitoring the state of the environment and at this moment it remains unclear where to find what information within one country, not to speak about the lack of a harmonized organisation or structuring of natural capital data between countries; as the landscape of natural capital and biodiversity data is evolving rapidly and new data sources and related tools are emerging[40] (e.g. IBAT[41], ENCORE[42], Aries[43] for SEEA[44]), the situation risks to get more and more confusing for businesses;

- Last but not least, there is a lack of investment in resources to secure the data; it Is unclear why this is the case but this is a major obstacle.

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38   **https://seea.un.org/sites/seea.un.org/files/business_consultation_public_version.pdf**

39   This was one of the main reasons for organizing the policy forums under the WAVES Program some 6 years ago.

40   See Thematic Report on Biodiversity Data by the EU Business & Biodiversity Platform (2022)

41   **https://www.ibat-alliance.org**

42   **https://encore.naturalcapital.finance/en/about**

43   **https://seea.un.org/content/aries-for-seea**

4. How public level natural capital accounts can help address the corporate natural capital data needs

4.1 Benefits of improved natural capital data flows between public and private level

Based on a business consultation[44] and recent pilot cases[45] with Holcim, many concrete synergies between public and private level natural capital accounting were identified including synergies in terms of natural capital data. The pilot cases demonstrate that both the overall concept of ecosystem accounting, as applied by the Ecosystem Accounting section of the System of Environmental-Economic Accounting (SEEA EA) *(see Annex 1)*, and specific elements of it might be instructive for businesses that are interested in applying natural capital accounting. The SEEA EA has therefore the potential for providing the bridge between public and private level natural capital accounting.

However, not only the business community will benefit from improved alignment between public and private level ecosystem accounting. NSOs or government authorities in general will be able to take advantage of several opportunities provided by increased natural capital data disclosure by the business community. The table in *Annex 2* presents a wide range of benefits of improved natural capital data flows between public and private level, both from the perspective of the public sector and the private sector.

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44 **https://seea.un.org/sites/seea.un.org/files/business_consultation_public_version.pdf**

45 **https://seea.un.org/content/business-and-natural-capital-accounting-case-study-ambuja-cement-india**
https://seea.un.org/content/business-and-natural-capital-accounting-study-quarry-restoration-holcim-spain

Some examples:

- increased access by businesses to high quality natural capital data, i.e. contextual information and integrated narratives on the state of natural capital at a landscape level, will lead to increased quality of internal decision-making and external disclosure; in turn, this will strengthen public level decision-making;

- driven by the development of environmental markets, many companies are now collecting site level data that will be relevant in compiling condition accounts and other accounts (e.g. estimates of soil carbon); there is clearly an opportunity here to work more collectively between public and private level;

- somehow similar might be the data flow driven by external disclosure obligations; if there is a mechanism to harvest corporate external disclosure data for feeding public level data sources (e.g. NSOs), this in turn will result in improved understanding of the impacts and dependencies of the private sector on natural capital and improved decision-making at governmental level; the CSR Directive is offering a tremendous opportunity here

- there is a huge opportunity in providing information on ecosystem restoration opportunities; impact investors as well as individual businesses are increasingly looking for concrete projects in which they can invest, either for offsets or as bankable projects; governments/NSOs are best placed to define priority areas for restoration, based on objective and comparable data;

- a growing number of companies is committing to achieve being 'nature-positive' (e.g. by 2030); this will drive demand for ecosystem extent and condition data (baseline setting); at the same time, there is hope that the 'nature-positive' concept will be embedded in national policies in line with the CBD post 2020 biodiversity targets, which means that national governments will be responsible for setting targets at country level and tracking progress to target; in the interest of all stakeholders, extent and condition maps with a sufficient level of granularity, will become increasingly necessary;

- the same applies to the science-based targets for nature idea, which is increasingly taken up by the business community; this will require specific natural capital data/information (e.g. data related to safe operating space, threshold values, environmental flows); there is an opportunity for governments / NSOs to translate science-based targets which have been established at a supranational level to concrete targets at national and subnational level and connect these to the spatially explicit contextual information on natural capital at a landscape level (e.g. river basin).

4.2 Good practice cases

This section provides a first series of examples of how governments are making their natural capital accounts helpful for business, and a second series of examples on how businesses are using or relying on natural capital data offered by governments.

The first series of examples cover The Netherlands, Norway and Estonia. These were identified with support of the EU-funded MAIA project. MAIA (Mapping and Assessment for Integrated ecosystem Accounting) aims to promote the mainstreaming of natural capital accounting in EU Member States and Norway. In MAIA, the SEEA-EA is used as the methodological basis for natural capital accounting (NCA). MAIA works closely with NSOs and Ministries and is aware of the state of play on national uptake of SEEA-EA across Member States and Accession Countries. MAIA has published country fact sheets[46] on state of ecosystem accounting in 10 EU countries.

The following case studies are presented in *Annex 3:*

- The MAIA Viewer and MAIA Analytical Tool (The Netherlands), as an example of how high-resolution maps and related graphics on ecosystem accounts can be made more user friendly and accessible to several stakeholder groups *(Example 1)*

- High resolution ecosystem accounts as a basis for improved urban planning in Oslo *(Example 2)*

- Estonia *(Example 3)* is linking land ownership accounts with ecosystem accounts and uses this as a basis to strengthen their policy on ecosystem restoration, while this is also very useful information for private landowners including businesses.

Within the business and finance community too, frontrunning initiatives are taking place with regard to the application of natural capital data. The examples below only offer a snapshot of the multitude of approaches, but they provide a good picture of the natural capital data needs of the private sector and the innovative ways of applying natural capital data in a business context.

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46   Country fact sheets (maiaportal.eu) **https://maiaportal.eu/factsheets**

The following examples are presented in *Annex 4:*

- Holcim Spain pilot case study NCAVES[47] *(Example 4);* the example shows how ecosystem accounting can be applied to monitor progress of a quarry rehabilitation

- Forico (Tasmania) *(Example 5);* this example shows how companies with large territories can generate many business benefits by applying ecosystem accounting

- Anglian Water (UK) *(Example 6)*

- European Bank for Reconstruction and Development (EBRD) *(Example 7)*

From these case studies the following conclusions can be made:

- Natural capital data viewers are perfect examples of how natural capital data can be made much more accessible for user groups, including the private sector. Such tools clearly prove that, as soon as public entities in charge of collecting and processing natural capital data start thinking from a user perspective, innovative and inspirational approaches serving the needs of the private sector, are becoming available.

The Dutch NSO (CBS) is developing an enhanced data viewer, where not only maps can be shown, but where stakeholders can interactively select areas and accounts to generate data that is useful for them. This was also indicated by the stakeholders to be a high priority: they found the information in the accounts very interesting but were generally not able to use the GIS datasets. The MAIA viewer facilitates easy access to information in SEEA accounts. It makes public level natural capital data available for analysis, reporting and decision-making by any type of interested stakeholder group. The Estonian NSO is developing a similar type of natural capital data viewer *(Example 1 and Example 3 in Annex 3).*

- Smart combinations of ecosystem accounts with other data, such as land ownership, might not only have benefits for policy development but also for the private sector.

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47   https://seea.un.org/content/business-and-natural-capital-accounting-study-quarry-restoration-holcim-spain

Statistics Estonia has experimented with linking ecosystem accounts with land ownership accounts (data available from cadasters), as this is beneficial for several reasons. Adding ecosystem extent account ownership as a separate layer in extent accounts is valuable as those who develop policies need data on different target groups (including the private sector) who need different actions. This will become even more significant in a situation where the value of land would include the value of the services supplied by the ecosystems. Therefore, it is important to further develop the aggregation of 'hectare'-based values of services. The desired situation would be that the ecosystem service values would become attributable to cadastral units and as such also to private businesses if they own the land. It also allows improved decision-making on land use *(Example 3 in Annex 3)*.

- Natural capital accounting approaches and related data and tools can be applied by subnational authorities too and tailored to the needs of specific target groups.

The Oslo Blue Green Factor is a municipal tool to support implementation of nature-based solutions at the property level in urban areas by real estate businesses. The tool relies on high resolution ecosystem accounting and translates this into performance-based green area indicators which — compared to ecosystem services valuation-based green area indicators — is much easier to apply[48]. Private companies, applying for a building permit, need to report on the achieved blue green score and how this is different from the original situation (baseline). This is a concrete example of how the high level SEEA EA principles based on extent, condition and ecosystem services accounting can be scaled down to the needs of specific target groups *(Example 2 In Annex 3)*.

- The SEEA EA concepts of ecosystem accounting area, ecosystem assets, extent and condition accounts and physical and monetary ecosystem services accounts have shown to work well in a business context too, in particular at site level for companies with large landholdings (such as mining and extraction, forestry). However, granularity of public level natural capital data is often not sufficient.

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48   An example is the presence of green roofs (vegetated rooftops); real estate developers only have to report 'presence of green roof' instead of making a monetary valuation of ecosystem services generated by the green roof

Holcim's approach at site level *(Example 4 in Annex 4)* has the following similarities with the SEEA EA: (i) the respective quarries can be considered as 'ecosystem accounting areas', i.e. the area in scope of the accounts, while the specific habitats within the quarry can be considered as 'ecosystem assets'; (ii) biodiversity (change in) state is also measured in terms of extent and condition; (iii) ecosystem services flows are expressed both in physical terms and monetary terms, which allows the compilation of ecosystem monetary asset accounts. A similar approach is applied by Forico, a forestry company in Tasmania *(Example 5 in Annex 4)*. Holcim Spain is collecting natural capital data with the support of a local university, as public level data are not sufficiently granular. Also for Forico, available data sets are often not sufficient and unreliable – hence the need to carry out their own data collection.

- Natural capital accounting at a landscape level combined with data on pressures and risks facilitates prioritization of 'nature positive' investments, but faces many data challenges.

Anglian Water, a water supply company in the UK, developed a risk register to map two pressures (growth and water resource availability) with the presence of natural capital for each local authority within the Anglian Water region. The map highlights locations of both high natural capital values and high threat level as priority areas for more careful spatial planning *(Example 6 in Annex 4)*.

EBRD (European Bank for Reconstruction and Development) is developing a Natural Capital Valuation Model to facilitate the identification of sustainable investment opportunities and to provide solid contextual information regarding the state of and threats on natural capital at a landscape level for better informed decision-making and risk management at a project level. In this way, the model will support the de-risking strategies of multilateral development banks (MDBs). However, data collection is challenging. The data which is available is often at country level, while the intent is to apply the natural capital valuation model at subnational and landscape scale. As well, data is often fragmented, anecdotal, study or project specific or highly context dependent. Related challenges are the lack of sufficiently detailed spatial information on natural capital and the fact that data are often available for administrative entities which in most cases don't match with the ecosystem boundaries (e.g. catchments) at a landscape scale *(Example 7 in Annex 4).*

- Although SEEA can provide companies with a structure to understand concepts of ecosystem services' extent and condition, and it potentially can unlock helpful and needed data, the concepts and language do not necessarily align with what is needed in a professional accounting context. Therefore a combined approach with frameworks that resonate more with business language (e.g. the Natural Capital Protocol), might be a good solution.

Forico, a private forest management company in Tasmania, Australia, has used SEEA EA as a starting point to produce considerable spatially explicit physical information on ecosystem extent and services. However, when the company decided to carry out their own data collection in 2019, to create illustrative Natural Capital Reports "NCR", it decided to base this work on the Natural Capital Protocol, as this felt closer to professional accounting, investment markets, and business language and concepts than the "economics" of SEEA.

- So far, good practice examples on how public level natural capital data can be tailored to the businesses needs and on how businesses are using these data are still relatively scarce. There is a need for much more examples, as this is key for triggering the interest of the wider business community.

5. Recommendations

The following recommendations are proposed:

1. Governments (including NSOs) should recognise businesses as an emerging key user group of natural capital data collected by public authorities

2. Governments (including NSOs) should strive to make comprehensive national ecosystem accounts-based data available that is contextual and spatially relevant for business at least at a landscape level, which will turn out as a win-win for all actors

3. Business and government should combine forces and build on existing dialogues to establish a European dialogue platform covering technical and institutional issues from both a supply and demand perspective

RECOMMENDATION 1: Governments (including NSOs) **should recognize businesses as an emerging key user group of natural capital data collected by public authorities**

An absolute precondition for any further discussion on this topic is the recognition of the business community by governments including NSOs and national environmental agencies as a key user group of natural capital data (including ecosystem accounting data in line with SEEA EA data). In short, businesses need better natural capital information for improving both internal decision-making as external disclosure. Although this recognition is clearly there at the level of Eurostat and several NSOs, a shift in mindset is required within several other public agencies dealing with natural capital data. The scientific community in particular — who is very influential in many of these agencies — is often totally disconnected from the business community and has no idea about the business needs.

An example are the European Environmental Accounts (EEA)[49], which – according to the Court of Auditors report on European EEA[50] – at this moment are mainly used by the Commission and the European Environment Agency. The European EEA are a key source of data to monitor and evaluate environmental policies and to measure progress towards achieving the Sustainable Development Goals (SDGs). Other (potential) users of the European EEA include EU Member States and researchers. The Court of Auditors report doesn't mention the business community explicitly as a potential user group, which is unfortunate. According to the Court of Auditors report "the strong point of the European EEA is the integration with other statistical data in particular the integration with the economic data which allows policy makers to assess the interaction of environmental and economic issues." This is an additional reason why the business community should be considered as a key user group. EEA data should be based on more intense and mutual data sharing with businesses (see also Recommendation 3).

RECOMMENDATION 2: Governments (including NSOs) **should strive to make comprehensive national ecosystem accounts-based data available that is contextual and spatially relevant for business at least at a landscape level, which will turn out as a win-win for all actors**

Based on experience so far, **business needs in terms of natural capital data can be summarized as contextual and spatially referenced information at least at a landscape level** – and the higher the granularity of data, the better[51] – on the following aspects of natural capital (see more extensive information in *Table 1* and more background and context in *Annex 2*):

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49   Search results for "environmental economic accounts" – Statistics Explained (europa.eu) **https://ec.europa.eu/eurostat/statistics-explained/index.php?search=environmental+economic+accounts&title=Special%3ASearch**

50   Special Report NO 16/2019: European Environmental Economic Accounts: usefulness for policymakers can be improved (europa.eu) **https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=51214**

51   Within the limits of what is acceptable from a confidentiality point of view

- Ecosystem types, extent and condition, and evolution over time

- Sensitivity of ecosystems and species to typical business-related impact drivers

- Presence of protected areas and protected species/habitats

- Ecological thresholds and safe operating space

- Science-based targets for nature at a landscape level

- Scenarios on ecosystem degradation and ecosystem restoration

- Typical ecosystem services associated with specific ecosystem types and local importance of these ecosystem services

- Priority areas for ecosystem restoration

Governments (including NSOs) could address the emerging needs of the business community by making comprehensive national ecosystem accounts-based data available that is contextual and spatially relevant for business at least at a landscape level.

Governments and society as a whole will benefit from increased uptake of tailored public level natural capital data by businesses in 3 ways:

- more effective ecosystem restoration efforts by the business community

- more meaningful tracking of progress to national and international targets (e.g. SDGs, Resource Efficiency, Circular Economy strategies, post-2020 biodiversity targets – including how this can support future EU/MS roll-out of net gain policies)

- better informed public level decision-making as a result of improved corporate disclosure of natural capital performance.

Business and government should combine forces and build on existing dialogues to establish a European dialogue platform covering **technical and institutional issues from both a supply and demand perspective**

Business and government should combine forces, build on existing dialogues (including EU Business @ Biodiversity Platform, Capitals Coalition Combining Forces program and UNSD Business Accounting Working Group) to establish a dialogue platform in the EU, that brings together NSOs and business representatives, for covering technical as well as administrative and institutional issues from both a supply and demand perspective.

As both the public and private sector have common goals ('mainstreaming natural capital information for improved decision-making'), cooperation is key. Getting insight in each other's needs (see above) will require communication anyway. This communication can be implemented by establishing a formal dialogue platform between both communities. The dialogue could cover any issues which are considered as barriers for improved natural capital data flows between the public and the private sector. Although many issues might have a technical nature (e.g. type of data, user friendly tools), some issues might have a more administrative or institutional character, such as lack of capacity (time, resources, knowledge) or lack of coordination between data supply institutions. Apart from experts in data collection and creation, representatives of the user communities (businesses but also governments) should be invited to participate. The dialogue platform could also discuss concrete case studies and tools on how public level natural capital data and tools can be applied in a business context.

Regarding data sharing, given the tremendous challenges regarding natural capital data compilation, public-private cooperation will be the only way forward. NSOs mainly have data at a landscape level, which provides contextual information to businesses. Businesses have data on pressures, i.e. impact drivers consisting of emissions and uses. But businesses increasingly have data on natural capital state (condition) and even on ecosystem restoration (given the growing business uptake of the nature positive ambition). These data are more refined as they are collected at a local scale. So, data should not only be shared by NSOs to the business community. There is also the other route where businesses share information with NSOs. And here several routes deserve particular attention. A first route builds on the increased development of environmental markets, which drives site level data collection by many companies. These data will be relevant in compiling condition accounts and other accounts (e.g. estimates of soil carbon). A second route benefits from increased data availability driven by external disclosure obligations, such as the information reported under the CSR Directive. About 50.000 companies throughout the EU are subject to the CSRD and first reporting is probably expected in 2024 (on performance in 2023). Given the requirement to digitalize CSRD reported data, information could be easily harvested on corporate emissions and resource uses by the most important companies in the EU. Ideally, in future revisions of the CSRD, natural capital data would be reported in specific formats which would facilitate translation to natural capital databases and/or make data more relevant for policy support.

The dialogue platform could discuss and look for ways or mechanisms to harvest these data from both routes.

Businesses might also be reluctant to share data. Asset spatial locations (geolocation) data is rarely disclosed by organizations, costly or impossible to find. It may be commercially sensitive and there is no clear financial incentive to share the data. Therefore, mechanisms to enable the confidential exchange of company biodiversity data are needed. WWF recently highlighted a need for new ways of aggregating and sharing data to overcome the challenges posed by the diversity of data sources (WWF-UK 2022)[52]. Secure interconnected data platforms with open data standards could help overcome these complexity and interoperability challenges. The recently launched Open-Source Biodiversity Data Platform Initiative[53] [54] by the Green Digital Finance Alliance is exploring how such barriers can be overcome by creating a decentralized data exchange mixing open-source features and privacy enhancing technology[55]. The Initiative aims to make geolocation data available for capital and financial markets and to facilitate disclosure of biodiversity risks and impacts. The Technical Dialogue Platform could investigate to what extent this initiative can be expanded towards the public sector.

52   WWF-UK. 2022. "Geospatial ESG." **https://wwfint.awsassets.panda.org/downloads/geospatial_esg_report.pdf**

53   Green Digital Finance Alliance. 2020. "Fintech for Biodiversity: A Global Landscape."
     https://www.f4b-initiative.net/_files/ugd/643e85_f1268987291f498e823752f898432835.pdf

54   See Thematic Report on Biodiversity Data (europa.eu) **https://ec.europa.eu/environment/biodiversity/business/assets/pdf/2022/EU B@B platform Thematic Report 2022_FINAL.pdf**

55   The UN Big Data WG has also worked on 'privacy preserving techniques' (see **https://unstats.un.org/bigdata/task-teams/privacy/index.cshtml** and related handbook: **https://unstats.un.org/bigdata/task-teams/privacy/UN Handbook for Privacy-Preserving Techniques.pdf**

Annex 1: The SEEA Explained

The System of Environmental-Economic Accounting 2012—SEEA Central Framework (SEEA CF)[56], which was adopted by the United Nations Statistical Commission in March 2012, is the first international statistical standard for environmental-economic accounting. The SEEA CF is a measurement framework for compiling accounts that detail the relationship between the economy and the environment, and that describe natural capital stocks and changes in stocks of environmental assets[57] (e.g. water, energy, etc.).

The SEEA CF provides information related to a broad spectrum of environmental and economic issues including, in particular, the assessment of trends in the use and availability of natural resources, the extent of emissions and discharges to the environment resulting from economic activity, and the amount of economic activity undertaken for environmental purposes (e.g. environmental protection expenditures).

The SEEA CF is based on agreed concepts, definitions, classifications and accounting rules which are compatible with the System of National Accounts (from which GDP is derived). As an accounting system, it enables the organization of information using accounting tables in an integrated and conceptually coherent manner.

This information can be used to create coherent indicators and aggregates to inform decision-making and for a wide range of purposes. SEEA accounts can be both physical or monetary, and the accounts are typically compiled by government (in particular national statistical offices (NSO)).

The SEEA CF is complemented by the SEEA Ecosystem Accounting (SEEA EA), which was adopted by the UN Statistical Commission in 2021. The SEEA EA constitutes an integrated and comprehensive statistical framework for organizing data about habitats and landscapes, measuring ecosystem health and services, and linking this information to economic and other human activity in a spatially explicit way (i.e. through maps). The SEEA EA complements the SEEA CF by taking the perspective of ecosystems. While the CF looks at "individual environmental assets", such as water resources, energy resources, etc. and how those assets move between the environment and the economy, the SEEA EA takes the perspective of ecosystems to consider how individual environmental assets interact as part of natural processes within a given spatial area.

In 2021, over 90 countries have applied the SEEA Central Framework and over 40 countries have compiled (or are in the process of compiling) SEEA EA accounts.

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56 **https://seea.un.org/sites/seea.un.org/files/seea_cf_final_en.pdf**

57 Contiguous spaces of a specific ecosystem type (e.g. forest, grassland, wetland, lake) characterized by a distinct set of biotic and abiotic components and their interactions.

Figure 3: SEEA EA ecosystem accounts and how they relate to each other
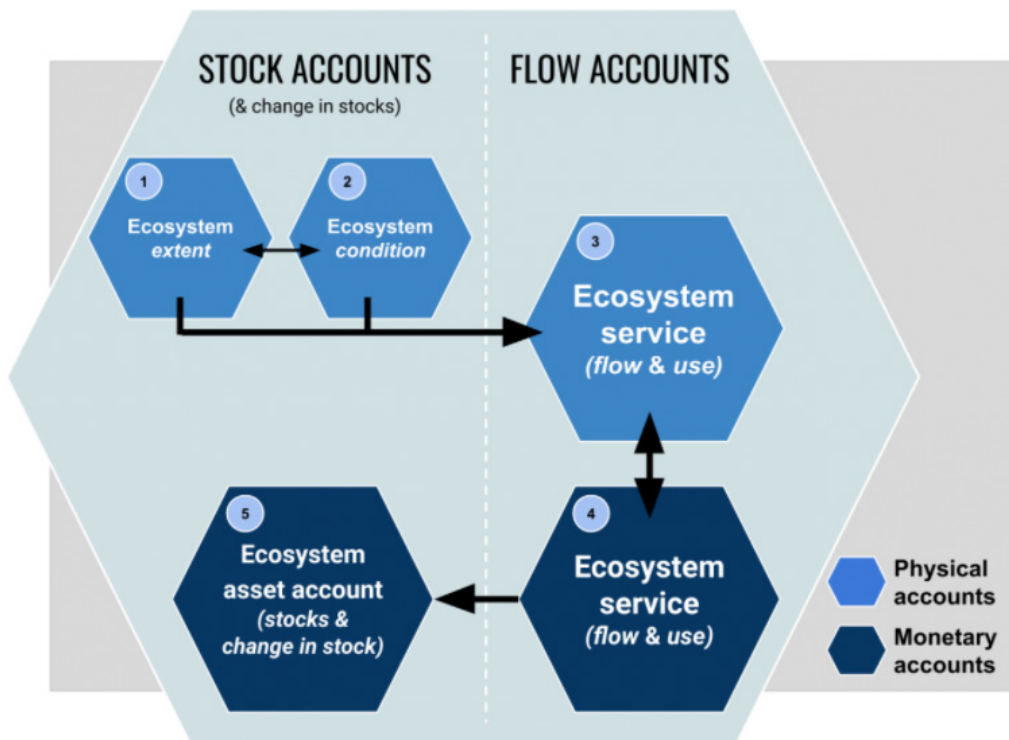
The emphasis in ecosystem accounting is on recording stocks and flows, and the changes in these stocks and flows over time. The SEEA EA consists of five core stock and flow accounts which measure different aspects of ecosystems and their relationship to the economy, in both physical and monetary terms *(Figure 1)*. Ecosystem extent stock accounts form the basis of the SEEA EA and measure the size and location of ecosystems (often portrayed using maps). Ecosystem condition accounts build off ecosystem extent accounts to measure the health of these ecosystems. Ecosystem service flow accounts measure the flow of ecosystem services to the economy and society in both physical and monetary terms. Finally, ecosystem asset accounts show the monetary value of ecosystems based on their current and predicted future ecosystem service flows.

The SEEA EA also includes thematic accounts. These provide information for specific policy-relevant topics including climate change (carbon), water and biodiversity (species occurrence). Thematic accounts may be compiled by extending or adapting existing SEEA EA accounts to provide more data on a specific theme.

Annex 2: Benefits of improved natural capital data flows between public and private level

Table 2: Benefits of improved natural capital data flows between public and private level

Opportunities for businesses	Opportunities for governments / NSOs
Better and accessible data	
- Businesses are interested in natural capital information which: 1. provides an insight in or a better understanding of the natural capital context in which companies operate, i.e. at a landscape level; contextual information is particularly useful with regard to natural capital state and changes in state, pressures threatening state of natural capital and thresholds which should not be exceeded - see also 'Risks and opportunities-based approach' (below) for an example on contextual information related to water availability risks - see also 'Supporting 'nature-positive' ambitions and policies' (below) 2. is easily understandable for non-experts; 'integrated narratives' that have transformed data into information that can easily be digested by businesses is most welcome...	- These are the business needs that have not been captured yet by NSOs[58] - Quantity, quality and consistency of private sector data for the production of national SEEA EA accounts could be improved substantially with standardized principles and guidelines for ecosystem accounting and reporting applied by private sector - If businesses have increased access to high quality natural capital data e.g. data and integrated narratives on the state of natural capital at a landscape level, the quality of corporate external disclosure will increase which in turn will strengthen public level decision-making - Many companies are now collecting site level data that will be relevant in compiling condition accounts and other accounts (e.g. estimates of soil carbon). In these cases it is not a question of businesses using SEEA methods but rather SEEA using data already compiled by business. This is the direction of flow in the economic accounts – SNA[59] uses corporate accounting data and makes it fit for purpose. There is clearly an opportunity here to work more collectively. This direction of data flow from businesses will likely be driven by the development of environmental markets which will require business to collect site level data in which case SEEA's engagement with the designers of environmental markets and their data requirements is the best entry point...

58   Special Report of European Court of Auditors

59   SNA: System of National Accounts

Opportunities for businesses	Opportunities for governments / NSOs
Better and accessible data (cont...)	

3. includes scenarios e.g. expected evolution of ecosystem state under different climate change scenarios and/or ecosystem degradation scenarios; this will become increasingly important as is already reflected by emerging initiatives such as the TNFD;

4. is sufficiently detailed, in particular for project or site level assessments;

5. is comprehensive; a total picture is required, providing information on all four pillars (air, water, land, biodiversity) of natural capital;

6. is spatially referenced; SEEA EA is spatially explicit

7. is regularly updated;

8. is credible.

- Businesses are interested in accessible and user-friendly natural capital data sources or platforms

- Improved (better informed) internal decision-making and external disclosure on reduced natural capital impacts or dependencies (performance) due to increased access to more suitable KPIs that blend with others used in the board rooms and that are better linked to detailed, comprehensive, spatially referenced and regularly updated ecosystem accounts and contextual information (that can be used in various operational areas, including risk assessment, product design, material sourcing, etc.)

- Reduced costs for establishing and operating natural capital accounting systems (presuming user friendly access to NSO data)

- An additional advantage for multinational companies with sites in many countries, would be that SEEA accounts from NSOs would be more standardized if they all collect and process data in line with the SEEA EA framework, which would facilitate comparison of sites across countries.

- Somehow similar might be the data flow from external disclosure. If there is a mechanism to harvest corporate external disclosure data for feeding public level data sources (e.g. NSOs), this on its turn will result in improved understanding of the impacts and dependencies of the private sector on natural capital and improved decision-making at governmental level; the CSR Directive is offering a tremendous opportunity here; all reported natural capital data by about 50.000 EU based companies will be publicly available and digitalized (i.e. machine readable, taggable); the draft standards for disclosure are being prepared by different 'clusters'; while Cluster 3 is in charge of disclosure requirements in the field of water, biodiversity and ecosystems, Cluster 9 is covering the format and digitisation; it might be worth to connect.

- New information opens new and innovative policy options for promoting sound environmental policy and for greening the economy through public-private partnerships (including for trade and development).

- The statistical community can learn from innovative business approaches on how to present and disseminate natural capital performance (e.g. the Environmental Profit & Loss dashboard by Kering).

Opportunities for businesses	Opportunities for governments / NSOs
Risks and opportunities-based approach	

- The focus of the SEEA on natural capital stocks and dependencies provides a good link with business risks (business materiality) and therefore makes it appealing to businesses.

- Contextual information at a landscape level is essential for the identification and assessment of business risks related to ecosystem degradation e.g. operational risks due to decreasing availability of water. In the specific case of water availability, companies declare that the following types of contextual information would be of most interest to them:

  1. data on water levels, both actual water levels as trends and predictions of future water levels (under several scenarios)

  2. data on pressures from other stakeholders (e.g. who else is extracting ground water in the watershed area?)

  3. data on policy priorities (e.g. protection status) and policy targets (e.g. Science Based Targets)

  4. 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 (e.g. wetlands)

- As much as business activities can generate risks to nature, environmental degradation can in turn affect a company's business operations and increase its nature-related risks, which can ultimately transfer up to the financial sector. This is the double materiality concept. Therefore, companies are not only interested in information related to their impacts on natural capital, but also how ecosystem degradation can affect their operations, their profitability, etc. Evidently, also investors are very interested in the latter.

- Consequently, companies and investors are interested in data that allow them to predict the effect of mitigation actions, both actions to reduce negative impacts on nature as actions to restore nature and how these will reduce these risks

- Once standardized principles and guidelines for ecosystem accounting and reporting are applied by companies, the investor community will have access to more solid benchmark information and sector specific information on natural capital performance to base their investment decisions on; this would support the 'Sustainable Finance' agenda, one of the priority areas of the European Green Deal.
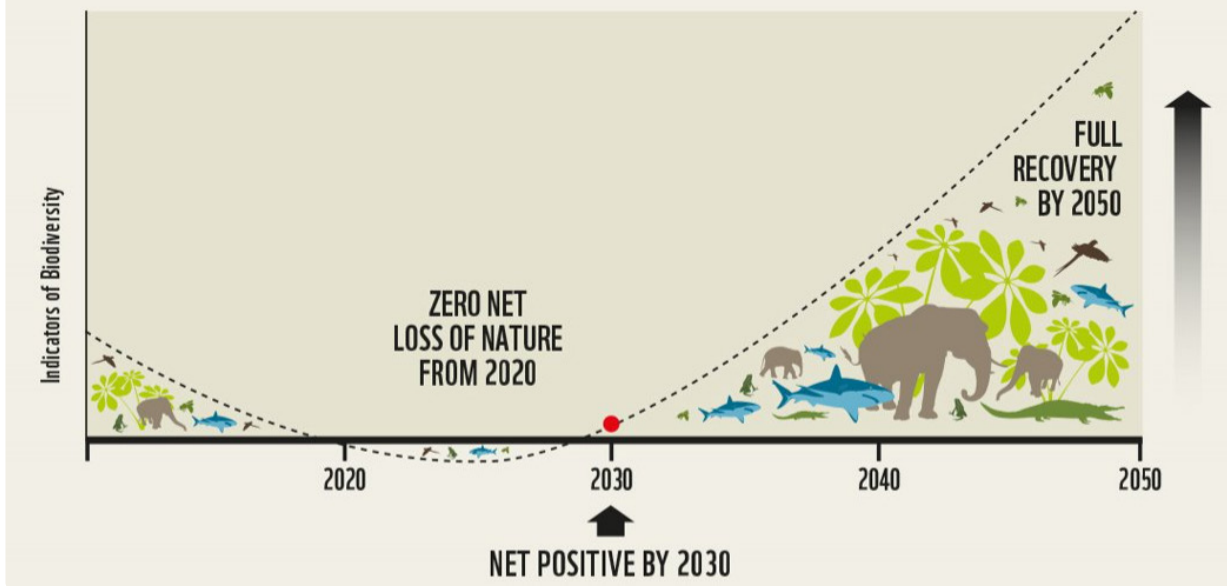
- There is a huge opportunity in providing information on ecosystem restoration opportunities. Impact investors as well as individual businesses are increasingly looking for concrete projects in which they can invest, either for offsets or as bankable projects. Today, there is a quest for bankable projects which are able to create positive environmental returns that lead to improved biodiversity and climate mitigation and/or adaptation, while also being attractive for financial institutions to invest in. WWF refers to these bankable projects as Bankable Nature Solutions[60]. Governments/NSOs are best placed to define priority areas for restoration, based on objective and comparable data.

60 Blueprint on bankable nature solutions, WWF Netherlands, June 2020

Opportunities for businesses	Opportunities for governments / NSOs
Supporting 'nature-positive' ambitions and policies	

Opportunities for businesses

- The 'nature-positive' concept is rapidly gaining traction not only at a policy level but also within the business community. During COP26 there was also a general acknowledgement that a 'zero carbon' ambition should go hand in hand with a 'nature positive' ambition. The 'nature-positive' concept is being used in the context of 'bending the curve (by 2030)' and means that by 2030 positive impacts on nature are outweighing negative impacts on nature in order to achieve a net positive situation.

- An increasing number of companies is committing to achieve 'nature-positive' (e.g. by 2030). Application of the mitigation hierarchy is key when the 'nature-positive' concept is applied to biodiversity. This will require biodiversity data for defining a baseline, as well as for selecting potential offset areas and investing in offset restoration measures. Ecosystem extent and condition accounts (see 'Extent and condition metrics' below) might provide this information as far as granularity is sufficiently high.

- In line with the interest in nature-positive ambitions, the science-based targets for nature idea (based on planetary boundaries concept) are increasingly taken up by the business community. This will require specific natural capital data/information. Companies which have adopted a 'zero impact' or a 'planetary boundaries' approach will be very interested in data related to safe operating space, threshold values, environmental flows, etc.

- Companies looking for alignment of their water and/or biodiversity targets with science-based targets would benefit from (sub)national ecosystem accounts which include a local translation of high-level science-based targets for water and biodiversity.

Opportunities for governments / NSOs

- Potential for more meaningful tracking progress to national level targets such as SDGs, post-2020 biodiversity targets (including how this can support, for example, future EU/MS roll-out of net gain policies), Resource Efficiency, Circular Economy strategies etc.

- It can be expected that the 'nature-positive' concept will be embedded in international policies such as the CBD post 2020 biodiversity targets. National governments will be responsible for setting targets at country level and tracking progress to target. Science-based 'net gain' targets will need to be achieved by joint efforts of all stakeholders, including the business community. NSOs are well placed to track progress to target at a country level, including the contributions of every stakeholder group such as the business community, on condition that corporate data are shared (see above).

- There is an opportunity for governments / NSOs to translate science-based targets which have been established at a supranational level (e.g. extent and condition of specific ecosystem types such as threatened habitats) to concrete targets at national and subnational level and connect these to the spatially explicit contextual information on natural capital at a landscape level (e.g. river basin).

Global Goal for Nature: Nature Positive by 2030

Indicators of Biodiversity

ZERO NET
LOSS OF NATURE
FROM 2020

FULL
RECOVERY
BY 2050

2020   2030   2040   2050

NET POSITIVE BY 2030

Opportunities for businesses	Opportunities for governments / NSOs

Extent and condition metrics for stocks

- The concepts of 'ecosystem accounting area' and 'ecosystem assets', as applied in SEEA EA *(see Annex 1),* are relatively easy to apply and map at a company site level. This is particularly interesting for companies with large land footprints (e.g. forestry, agro-industrial companies, extractives, water supply companies). Application through the value chain will be more challenging but this is largely related to the complexity of accurately mapping sourcing locations. Once these are known and spatially explicit, the same concepts can be applied. Although ecosystem accounting according to SEEA EA Is not applied everywhere yet, it is a major advantage that SEEA EA provides a harmonized approach globally, which is appealing to companies with sites and supply chains in many countries.

- The concepts of extent and condition accounts can be tailored to the specific company and locational context. As an example, in the mining sector, the respective quarries can be considered as 'ecosystem accounting areas' (EAA), i.e. the area in scope of the accounts, while the different ecosystem types or habitats within the quarry can be considered as 'ecosystem assets' and measured over time. Applying extent and condition accounts is an excellent way to track ecosystem performance, e.g. progress to biodiversity No Net Loss or Net Gain targets.

- At present, most companies limit their assessments to 'flows' (e.g. amount of groundwater extracted). However, in some situations, understanding changes in the state of the stock may be important. This may be the case when assessing dependencies on provisioning services or assessing site-level biodiversity impacts, where changes in the stock are directly observable (e.g., the volume and/or condition of standing timber in a forest) or can be inferred from flows (e.g., a reduced stock due to clearing two hectares)[61]. Given the increased interest in planetary boundaries approaches, having an insight in the 'safe operating space' also requires stock level assessments (see 'Supporting 'nature-positive' ambitions and policies' above). SEEA EA ecosystem extent and condition accounts provide an approach that can be used at the business level as well.

- There is an opportunity for providing spatially referenced extent and condition metrics with a high level of granularity to the business community (see also 'Better and accessible data'). In terms of condition alignment on applied metrics is highly recommended (currently businesses use metrics such as Mean Species Abundance (MSA) and presence of threatened species, as these are most frequently applied in available corporate biodiversity measurement tools)[62].

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61   Box 6.1 in Natural Capital Protocol

62   NSO The Netherlands is developing thematic biodiversity accounts with MSA being applied as a suitable metric for ecosystem condition (Dutch Natural Capital Accounts 2013-2018 (cbs.nl)) **https://www.cbs. nl/en-gb/publication/2021/22/dutch-natural-capital-accounts-2013-2018**

Opportunities for businesses	Opportunities for governments / NSOs

Ecosystem services and valuation

- The ecosystem services accounts as applied in SEEA EA, either in physical or in monetary terms or both, are an interesting approach for companies that are looking for ways to measure and demonstrate the societal benefits of their efforts in ecosystem restoration or nature-based solutions[63]. Monetary valuation of natural capital performance is also important for companies who want to express all aspects of business performance in one metric (which is the aim of the Value Balancing Alliance).

- The supply of ecosystem services generated by ecosystems owned or created by companies could be recorded as a positive externality, while their degradation would be a negative externality.

- However, monetization in SEEA EA is based on transaction-based accounting (exchange values) while the majority of private sector approaches is based on social values (e.g. monetization of the societal benefits of ecosystem services).

- Companies that already apply tools for measuring biodiversity at site level with a regular periodicity can easily integrate this data into extent and condition accounts. Adding monetary ecosystem services accounts will increase insights into the links between ecosystem condition and ecosystem services value. This will improve the business case for investments in ecosystem restoration. A good example is mining companies that often have plenty of data on how ecosystem condition is evolving in its quarries – ranging from complete habitat loss during active exploitation to advanced rehabilitation afterwards[64].

- There is an opportunity for governments / NSOs to provide spatial information on the societal value of nature-based solutions. The societal value is very dependent on the location and is mainly determined by the presence of beneficiary groups, some examples:

  o value of urban forests is very high as many people benefit from ecosystem services such as climate regulation – 'cooling of heat island effects – or air purification and health impacts)

  o value of restored natural floodplains is very high in densely populated areas with much infrastructure that is vulnerable to flooding.

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63 Examples are DOW (**Value Nature | 2025 Goals | Science & Sustainability | Dow Corporate**), Balfour Beatty (**Artboard 4 (balfourbeatty.com**) and Kering (**EP&L: a measurement tool for sustainable Luxury | Kering**)

64 See the HOLCIM pilot case
https://seea.un.org/sites/seea.un.org/files/case_study_report_holcim_spain_draft_final_14july2021.pdf

Opportunities for businesses	Opportunities for governments / NSOs
Credibility	

- Applying a natural capital accounting approach which is in line with the SEEA EA will increase credibility of external disclosure on natural capital performance, as the SEEA EA is an internationally accepted and frequently applied approach by governments (improved relevance and credibility when data come from trusted source of information such as NSO)

- A SEEA EA compliant accounting approach facilitates

  1. the implementation of a no net loss / net gain biodiversity ambition

  2. land management decisions, including trade-off analysis and optimisation assessment

  3. scenario and risk analysis (e.g. impacts of climate change)

  4. ecosystem footprint approaches

  5. stakeholder engagement, by recognizing the spatial context and multiple values

  6. non-financial reporting – e.g. corporate sustainability reports

  7. ability to align with certification schemes (e.g. FSC), which could even lead to new revenue opportunities such as access to environmental markets (e.g. carbon credits, water credits) and green finance

  8. comparability and aggregation of natural capital data in a multinational context; companies with sites in many countries would benefit from using natural capital data from NSOs as these data can be expected to be standardized according to the SEEA EA. This means that multinational companies which utilize accounts from various countries data can expect to receive data that can be readily integrated across the supply chain.

Consistency of data from business level to national level including as much site-based level data as possible provides a coherence in narrative that in turn provides credibility to the data and supports coherence in decision making between business and government.

Annex 3: Best practice case studies from government authorities

Case study 1:
The MAIA Viewer and MAIA Analytical Tool (The Netherlands)

In The Netherlands, there is much policy interest in the possibilities of NCA. The potential of NCA as a source of information for the parliament and to monitor SDGs is acknowledged. And interestingly, the first set of published accounts already sparked interest from the private sector. Recently some specific policy areas are identified as to where NCA can contribute, among others forest strategy and circular agriculture.

The Netherlands has a high level of expertise in NCA. This is reflected in the high number of published accounts. The extent and condition accounts are available on a regional and national scale. A wide variety of ecosystem services is incorporated in their ecosystem asset, ecosystem services (ES) biophysical and ES monetary supply and use accounts. For the thematic accounts, a carbon and biodiversity account are published, while a marine account on a national scale is still being developed.

Sharing the NCA with stakeholders is key for the Dutch NSO (CBS, Central Bureau of Statistics). The Netherlands is actively trying to engage policymakers and other stakeholders in the accounting process and are looking for relevant key indicators and usage of the accounts. Previous experience with potential end-users of natural capital accounts have demonstrated that only sharing data (maps and accounts) is not sufficient for the end-users to be able to use it for their own policy applications. The goal is to develop an enhanced viewer, where not only maps can be shown, but where stakeholders can interactively select areas and accounts to generate data that is useful for them. This was also indicated by the stakeholders to be a high priority: they found the information in the accounts very interesting but were generally not able to use the GIS datasets. That's why CBS, together with Wageningen University Research (WUR) and with the support of the EU funded MAIA project, is investing in the development of an enhanced viewer for interested stakeholders which are not able to use the GIS datasets, the so-called MAIA Viewer. SarVision is in charge of the practical development of the MAIA Viewer and MAIA Analytical Tool.

The MAIA viewer facilitates easy access to information in SEEA accounts. It makes public level NCA data available for analysis, reporting and decision-making by any type of interested stakeholder group. The MAIA Viewer currently (Dec 2021) includes 59 information elements, spread over 94 maps (mainly covering The Netherlands, but gradually expanding with maps from other EU Member States). The information mainly relates to terrestrial and freshwater ecosystems, but France has added 6 maps with marine data. The current information in the MAIA Viewer covers multiple years (from 2011–2020, although differences depending on the type of data). The MAIA Analytical Tool is able to provide statistical reports for well-defined spatial areas such as administrative units (e.g. communities, provinces), customized areas (i.e. defined by the user) and imported (multi)polygons. These reports typically provide the following information *(see example in Figure 4):* histograms, extent accounts table, condition accounts table, ecosystem services accounts tables (expressed in physical and monetary units), carbon stock accounts. Also, pressures are included such as nitrogen deposition and acidification.

Farmer associations have used this to demonstrate the value of their agro-ecological work. Rabobank is showing interest in the Viewer to assess the C-neutrality of its portfolio.

Figure 4: Example of application by the MAIA viewer and MAIA Analytical Tool
(from SarVision)
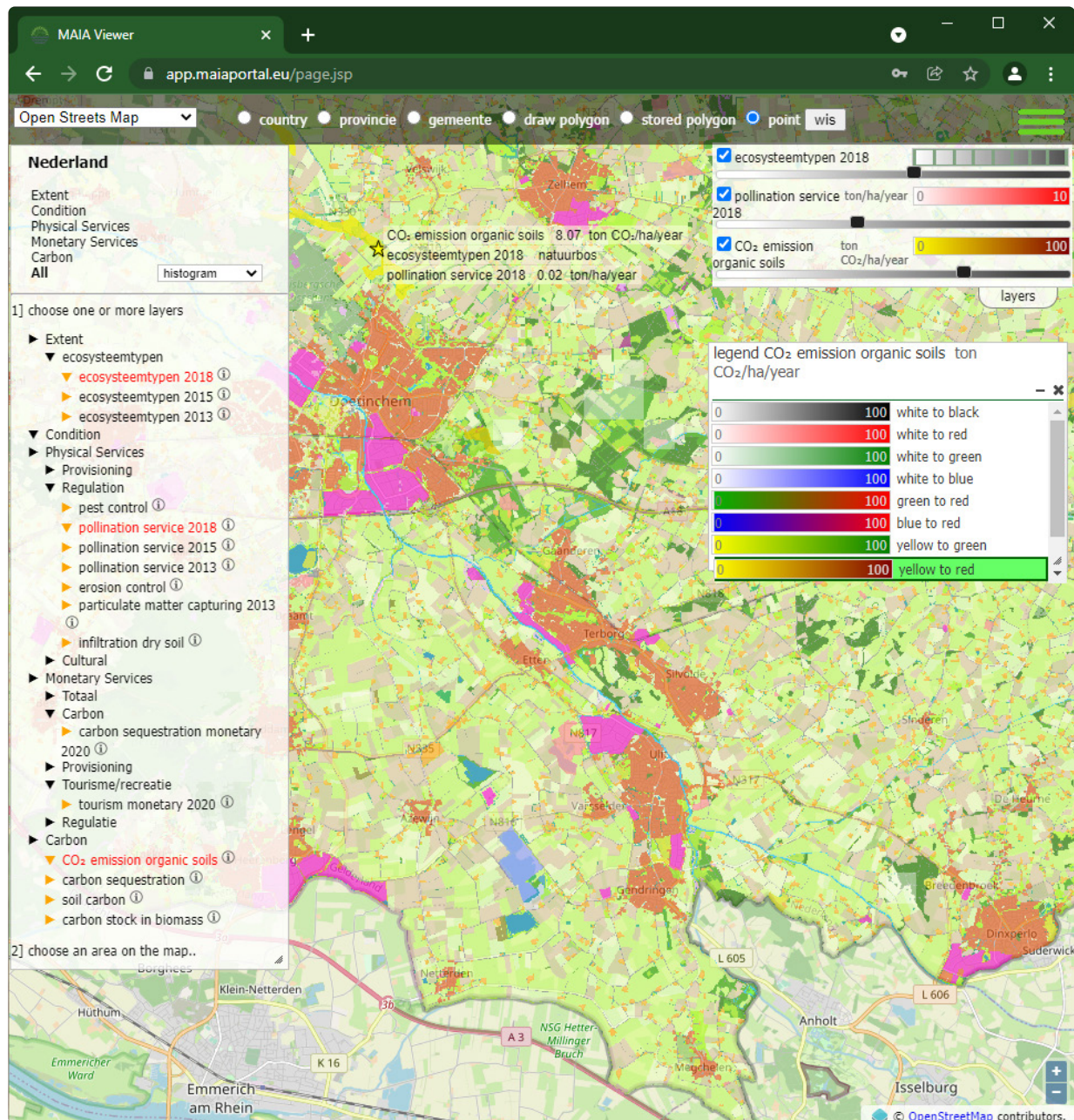
Based on:

- MAIA Fact Sheet The Netherlands (**MAIA_NL_Factsheet_Final.pdf (maiaportal.eu)**)

- Interview Wilbert Van Rooy and Rob Luiken (SarVision), 14 Feb 2022

- **Dutch Natural Capital Accounts 2013–2018 (cbs.nl)**

Case study 2:
The Oslo Blue Green Factor

Natural capital accounting approaches and related data and tools do not always apply at national level. The Oslo Blue Green Factor is a municipal tool to support implementation of nature-based solutions at the property level in urban development for housing, commercial, or administrative purposes by real estate businesses. It Is based on the concept of green area indicators (GAI) (see *Figure 5*).

GAI are generally defined as the ratio of the area of biologically available surfaces (i.e., those covered by vegetation, open water, permeable paving and storm water infiltration, etc.) compared to total parcel area *(see Figure 5)*. Scores for surface types are weighted according to attributes such as permeability to water, runoff storage ability, relationship to soil functioning, naturalness of the vegetation, capacity to be suitable habitats for plants and animals, and green amenities for people.
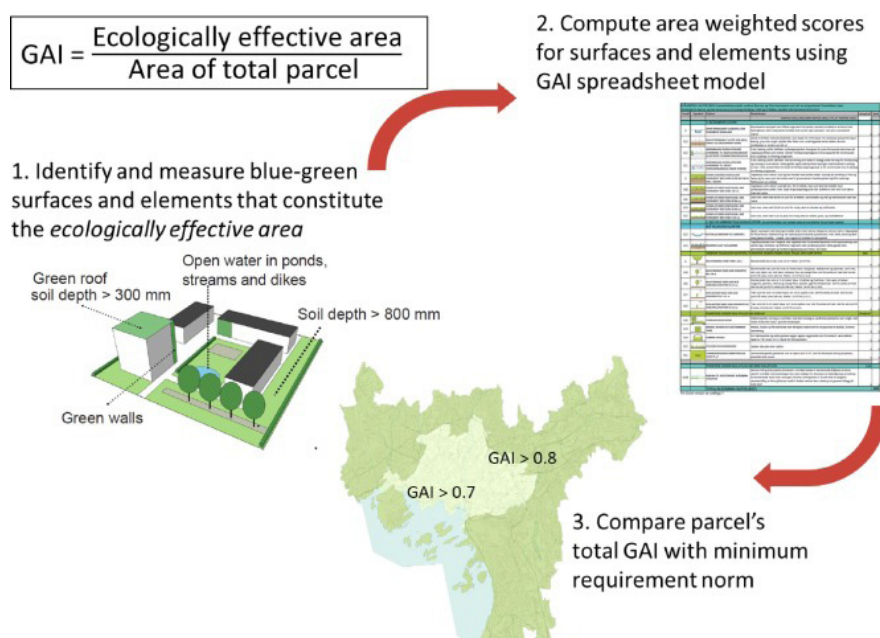
Surfaces with greater vegetation coverage, more permeability to rainwater and higher suitability as habitat for biological diversity will represent areas with higher ecological effectiveness and potentially provide a range of ecosystem services in urban areas. A central purpose behind many of the GAIs is to establish a minimum standard for the proportion of blue and green elements that a developed parcel must contain.

The urban planning literature devotes increasing attention to urban ecosystem services (ES) and its potential for utilitarian valuation including assigning preference weights, valuation and pricing of green and blue characteristics of urban development projects. However, valuation of ES is complex and costly. The Oslo Blue Green Factor is a so-called performance-based green area index, which is different from an 'ecosystem services valuation-based' green area index. The Oslo Blue Green Factor relies on physical proxies of performance (i.e. physical structures such as 'a vegetated roof') in lieu of valuation of ecosystem services which lowers site-specific information costs of green area indicators at property level. Direct weighting of elements, rather than the ES they provide, reduces the information costs of attributing the ecological functions of different types of blue green elements to specific ES. Other examples are Berlin's Biotope Area Factor (BAF) and Stockholm's Green Area Factor (GYF). Performance-based green area indicators are increasingly used as policy instruments to promote nature-based solutions in urban property development. They rely on high resolution ecosystem accounting.

A performance-based green area indicator suggests a link between urban ecosystem accounting and permitting for private property development. Private companies, applying for a building permit, need to report on the achieved blue green score and how this is different from the original situation (baseline). They need to generate a map, based on a tool provided by the Municipality, and present the scores. These scores can be spatially different according to the policy priorities at city level. The Norwegian Standards Bureau has prepared a business standard on how businesses can report on the Blue Green Factor. This Is a concrete example of how the high level SEEA EA principles based on extent, condition and ecosystem services accounting can be scaled down to the needs of specific target groups.

Figure 5: Concept of Green Area Indicators

$$GAI = \frac{\text{Ecologically effective area}}{\text{Area of total parcel}}$$

1. Identify and measure blue-green surfaces and elements that constitute the *ecologically effective area*

Green roof soil depth > 300 mm

Open water in ponds, streams and dikes

Soil depth > 800 mm

Green walls

GAI > 0.8

GAI > 0.7

2. Compute area weighted scores for surfaces and elements using GAI spreadsheet model

3. Compare parcel's total GAI with minimum requirement norm

Exploration of GAI designs with public-private sector sharing of information and transaction costs looks promising. More generally, it might be interesting to explore how GAI systems can be designed to complement existing policies that promote conservation and restoration of urban nature by both the private and public sector. The approach also offers opportunities for supporting No Net Loss policies at a landscape level.

Based on:

- Interview David Barton, NINA, 14 Dec 2021

- Scientific paper[65] in Elsevier, Landscape and Urban Planning, Volume 219, March 2022

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65 **Comparing the implicit valuation of ecosystem services from nature-based solutions in performance – based green area indicators across three European cities – ScienceDirect**

Case study 3:
Relevance of NCA data for landowners in Estonia (Statistics Estonia)

Statistics Estonia publishes information on ecosystem extent and ecosystem services, as well as on nature protection and relevant expenditures. The statistics can be used to plan nature conservation and biodiversity development, develop a support system and implement landscape and habitat diversity conservation measures.

Statistics Estonia has experimented with linking these ecosystem accounts with land ownership accounts. Data on land ownership or the nature of the land tenure for terrestrial ecosystems is available in many countries in the form of cadasters. If these are attributed to ecosystem assets, this will provide a basis for monitoring the effects of land management policies within a given region. They see the following advantages of linking ownership accounts to ecosystem asset accounts:
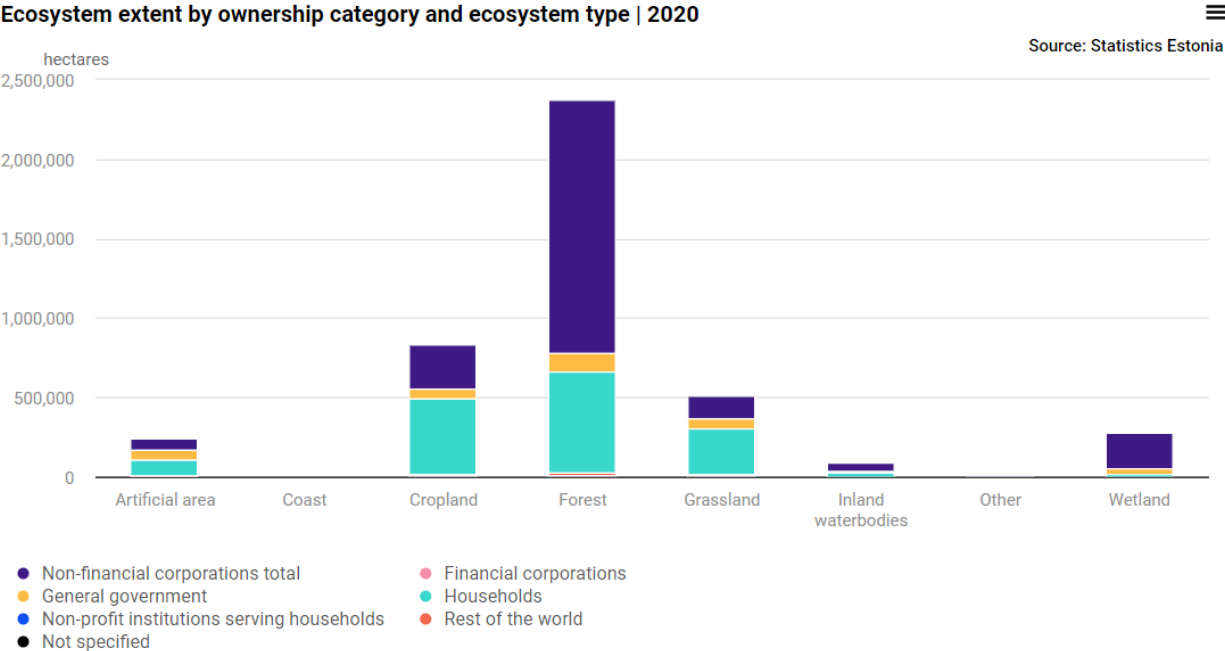
- Ecosystem extent account ownership as a separate layer in extent accounts is valuable as those who develop policies need data on different target groups who need different actions.

- This will become even more significant in a situation where the value of land would include the value of the services supplied by the ecosystems. Therefore, it is important to further develop the aggregation of 'hectare'-based values of services. The desired situation would be that the ecosystem service values would become attributable to cadastral units.

- Data which could be used to analyze alternative uses of land (ecosystems) is important for landowners and everyone who decides on the purpose of the cadastral unit.

Statistics Estonia has elaborated detailed supply and use tables for ecosystem services in monetary units, in which ownership is reflected ('users'). This is reflected in *Figure 6*. The largest ecosystem type is forest forming 55% from the total extent, second largest is cropland and then comes grassland. The owner of most (55%) of the ecosystems are non-financial corporations (mainly forestry companies). They own also more than half of forest extent (67%), wetlands (82%), coasts (62%) and inland waterbodies (56%). Second largest owner are households (35% of total extent). General government owns ca 8% of total extent.

Finally, it's worth mentioning that Statistics Estonia also has a Viewer, quite similar to the MAIA Viewer.

Figure 6: Ecosystem extent by ownership category and ecosystem type in 2020
(Statistics Estonia)

Ecosystem extent by ownership category and ecosystem type | 2020

hectares

- Non-financial corporations total
- Financial corporations
- General government
- Households
- Non-profit institutions serving households
- Rest of the world
- Not specified

* Non-financial corporations total includes areas managed by the State Forest Management Centre.

Based on:

- Interview with Kaia Oras, Leading Analyst, Estonian Statistics Office, 15 Feb 2022

- **Biodiversity protection and land use | Statistikaamet**

Annex 4: Best practice case studies from the private sector

Case study 4:
Rehabilitation of a quarry by HOLCIM Spain

Until a few years ago, Holcim used to restore quarries only after many years without mining activity, and restoration was mainly limited to planting monoculture forests of pine trees. Now, Holcim applies a new concept of quarry restoration with the main objective of restoring quarries into important biodiversity sites.

To increase overall societal benefits, the approach not only aims to enhance intrinsic biodiversity values but also ecosystem services. Holcim Spain has developed a tailormade approach, based on combining BIRS (Biodiversity Indicator and Reporting System, developed by IUCN) and the LBI (Long-Term Biodiversity Index, developed jointly with WWF) with a monetization of ecosystem services. The approach has been tested on the Yepes – Ciruelos quarry. The approach allows for assessing biodiversity condition and ecosystem services in the different phases of the exploitation cycle, i.e. prior to, during and after exploitation, supporting decision-making for optimal development of both biodiversity and societal benefits. *Figure 7* provides a map showcasing the cumulative number of different ecosystem services provided by different spots in the quarry.

The eastern part of the quarry is the part with long natural succession. It provides a higher variety of ecosystem services compared to the western side that is still in use as agricultural land. The dark blue colored area is the excavation front.

Although Holcim's approach doesn't refer explicitly to the concepts of ecosystem assets and ecosystem accounting area, it is applied in practice. Holcim's approach at site level has the following similarities with the SEEA EA:

• The respective quarries can be considered as 'ecosystem accounting areas' (EAA), i.e. the area in scope of the accounts. The specific occurrences of different ecosystem types or habitats within the quarry can be considered as 'ecosystem assets.

- BIRS applies a spatial approach where different habitats (comparable to 'ecosystem assets') are measured in terms of extent and condition. The same applies to LBI. LBI also makes use of a spatial approach based on 'ecological units' – which are different from the BIRS habitats – and a condition appraisal. The LBI approach has much in common with the species occurrence account in the SEEA EA.

- Holcim Spain's approach to add an ecosystem services dimension makes this picture complete: ecosystem services flows are expressed both in physical terms and monetary terms, which allows the compilation of ecosystem monetary asset accounts.

Figure 7: Cumulative number of different ecosystem services provided by different spots in the quarry

10 Ecosystem services aggregation

1
2
3
4
6
7
8
9
10
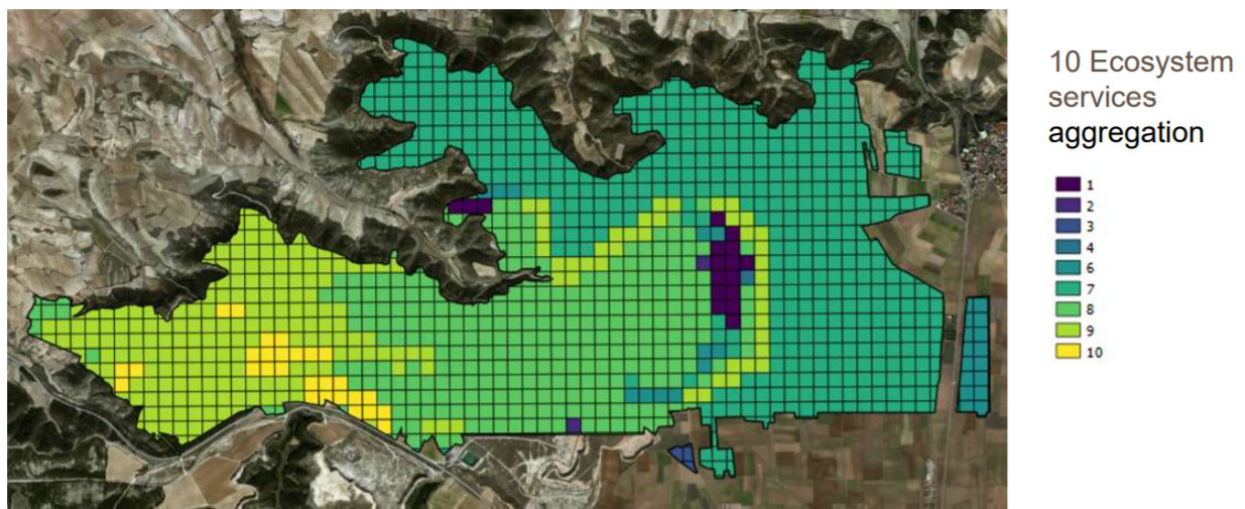
Holcim's Integrated Profit & Loss (IP&L) approach at corporate level, which is inspired by KPMG's True Value methodology (see *Figure 8*), relies on the concepts of a balance sheet and annual accounting periods which is similar to the SEEA. It also contains information on stocks (e.g. rehabilitated quarries) and flows (e.g. emissions of GHG) in physical and monetary terms.

Overall, this approach aligns with the SEEA EA in principle, as the environmental externalities can be recorded in the SEEA EA compliant physical accounts (see *Figure 8*). However, the SEEA EA does not price these externalities.

Holcim is reporting its annual surface of rehabilitated area at corporate level, but from a SEEA EA perspective, the ecosystem services generated by the ecosystems under control by Holcim can be interpreted as positive externalities and (after valuation) be included in the IP&L. At the same time, in case ecosystems decline in condition (e.g. when a new quarry is excavated), the resulting cost of degradation can be interpreted as a negative externality and included in the IP&L. Degradation costs and enhancement benefits are estimated in SEEA EA based on the change in the monetary ecosystem asset value that is the result of decline or improvement in (physical) condition.

Having monetary ecosystem asset value accounts would allow for a clear recording of changes in the monetary value of ecosystems over time due to:

- the typical sequence of degradation and rehabilitation in quarries, which includes both abrupt and gradual conversions between ecosystem types (e.g. agricultural land into open mine; open mine into grassland; grassland into forest);

- human-induced habitat restoration activities, aimed at optimizing biodiversity and ecosystem services values; and

- revaluations (due to changes in unit prices of ecosystem services).

Figure 8: Link between KPMG's True Value methodology applied by Holcim and environmental accounting according to SEEA EA
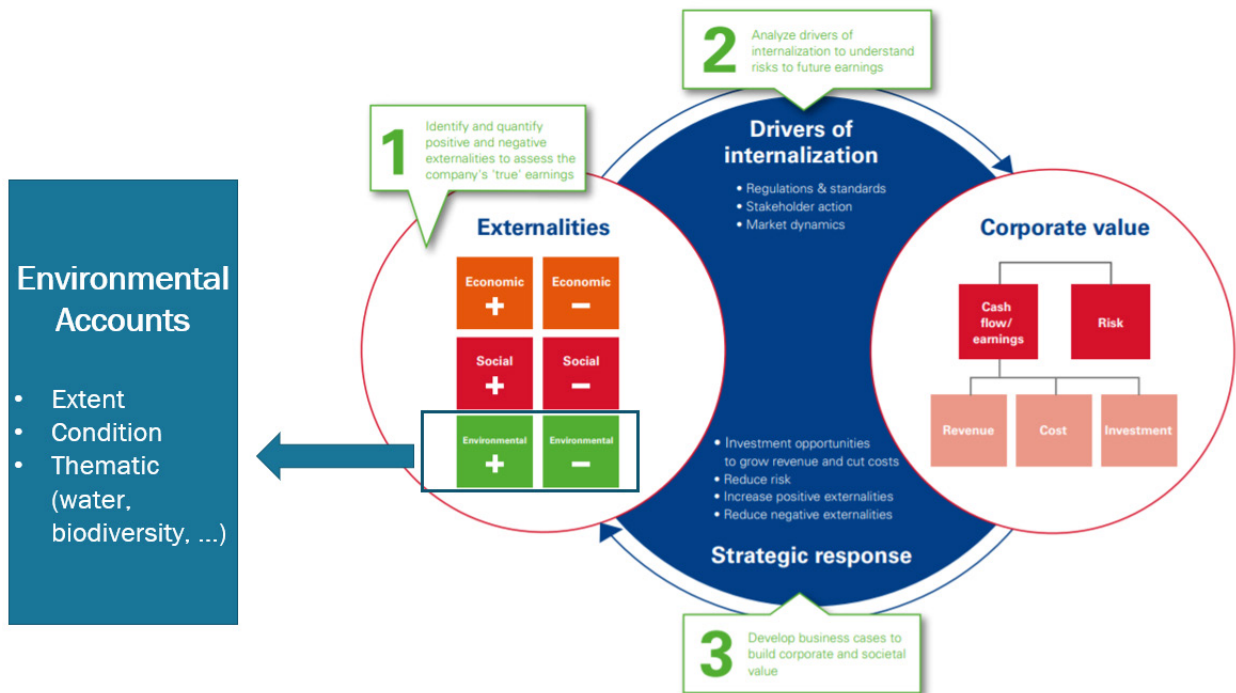

Holcim Spain needs a lot of biodiversity and ecosystem services data. They are mainly relying on own measurements (in close cooperation with service providers such as universities and consultancies). They currently use few data sources from third parties, such as data from national, regional or local authorities or data from international data sources. Own measurements are expensive and time-intensive, but deemed necessary due to the fact that currently available data sources are not providing the required level of accuracy. Efforts by governments and developers of tools and databases – often facilitated by the rapidly evolving remote sensing and satellite imagery technologies – are increasing to strengthen the granularity and quality of natural capital datasets globally and locally. The recent evolutions at national level where University of Madrid is leading the preparation of detailed ecosystem extent, condition and ecosystem services accounts for Spain under the MAIA project (Mapping and Assessment for Integrated ecosystem Accounting) might be a gamechanger.

Case study 5:
Forico (Tasmania)

An example of how SEEA-EA based accounts can be used to shape and implement business-level NCA is Forico, a private forest management company which manages 181,000 hectares of plantation and natural forest land in Tasmania, Australia.

Figure 9: Identification of ecosystem assets in Forico's managed Estate
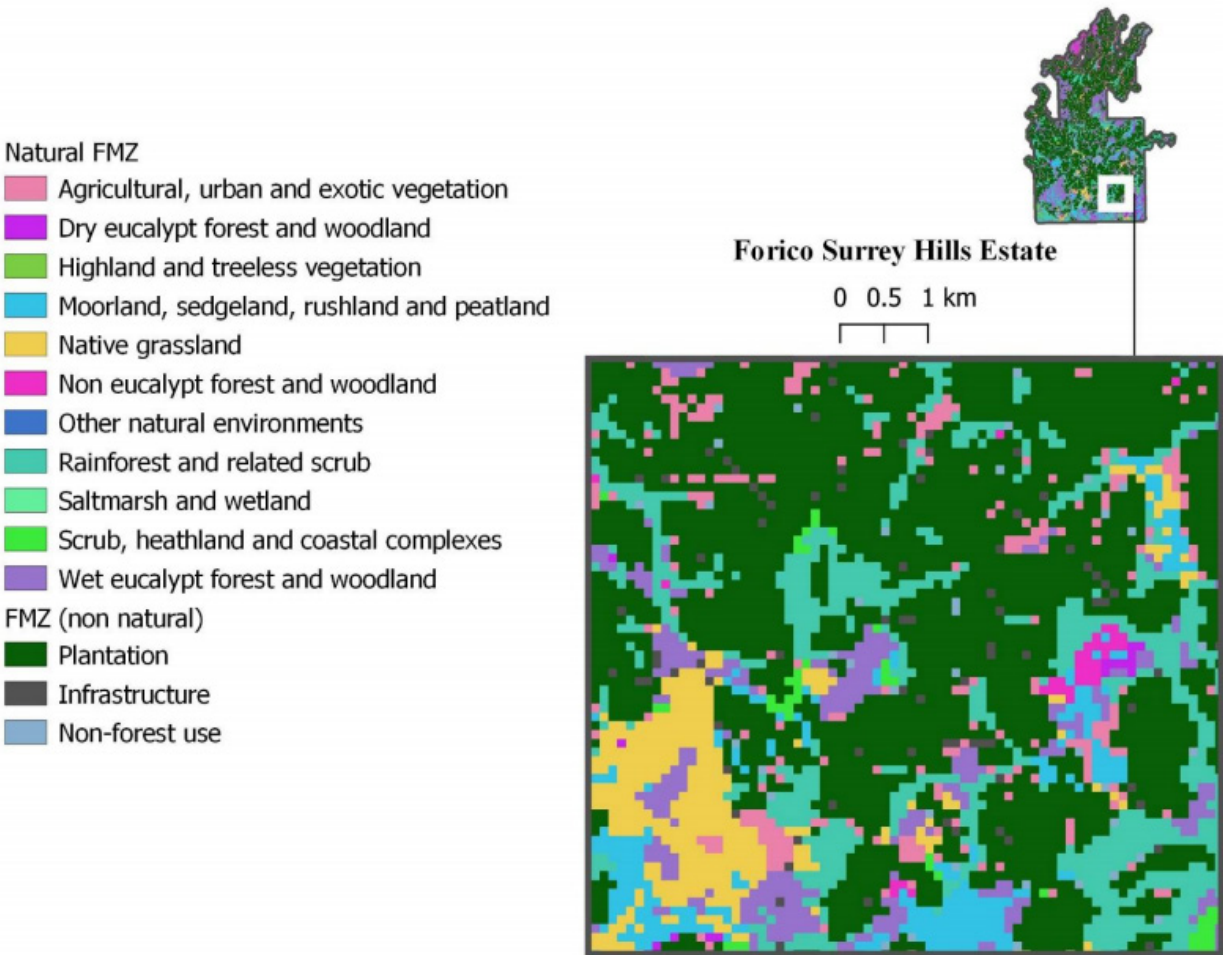
Ninety thousand hectares of plantation are managed for wood fibre production, while 81,000 hectares of natural forest are managed for biodiversity and conservation purposes. In 2016, Forico engaged IDEEA Group to provide a theoretical proof of concept on an accounting framework to show the extent and condition of the ecosystem services from the Estate. This "Accounting for Forico's Forest Assets" project showedhow the SEEA EA couldbe applied to measure the extent and condition of the Estate's ecosystem services.

Specifically, this involved (i) accounting for the stock and changes in stock (including changes in condition) of ecosystem assets held by Forico and (ii) accounting for the flow of ecosystem services supplied by these assets (i.e. beyond plantation fibre production) and produced considerable spatially explicit physical information on ecosystem extent and services. The results showed that areas under Forico management provided significant provisioning services as well as carbon sequestration and habitat services (as shown in the maps below). It shows how the SEEA provided Forico with a structure to understand concepts of ecosystem extent, condition and services, and it introduced an impressive breath of data, tables and lists to support business-level decision making, for example through forest management planning, and to underpin delivery against sustainable forest management reporting, certifications and assessment protocols.

Figure 10: Ecosystem services flows at ecosystem asset level
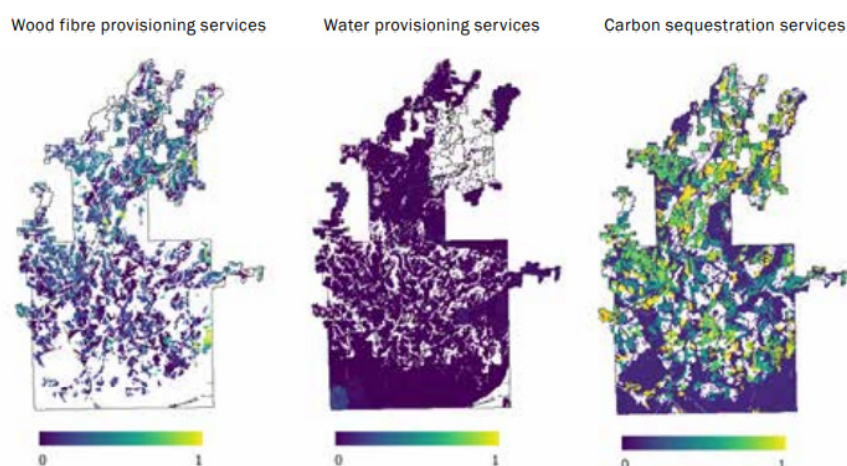
Whilst the SEEA-EA is impressive with its maps, comprehensiveness, and intent, Forico also wanted to find a way to succinctly and easily communicate its impacts and dependencies from nature to stakeholders. This led Forico to explore the Natural Capital Protocol and Integrated Reporting frameworks to translate the its forest assets data into a message with balance and relativity. The principles-based Natural Capital Protocol framework instinctively aligned with the "Accounting for Forico's Forest Assets" project objectives of producing data that is pragmatic, scalable, timely, technically robust and auditable. Reporting the natural capital story was important to Forico's approach, and so they followed the Natural Capital Protocol framework which included scoping the Report using a materiality assessment to ensure it would maintain transparency while focusing messaging to key stakeholder on the most relevant metrics for decision-making. Forico's reports are quite innovative as they have integrated SEEA, Natural Capital Protocol and traditional Financial Reporting frameworks to value their most material ecosystem services which had been measured across the Estate and presented them in a format that resonates with financial markets and the business community. For Forico, the Natural Capital Protocol framework was a useful project management framework with terminology aligned to professional accounting concepts, that they could use to further develop their natural capital approach and reporting objectives.

Forico's two reports are publicly available on their website: see **https://forico.com.au/#ncr**

Case study 6:
Anglian Water (UK)

Anglian Water is the largest water and sewerage company in England and Wales by geographic area, covering 23 per cent of the land area (27,476 km^2). It supplies 4.3 million people with high-quality drinking water and collects used water from over six million customers. The company operates in the driest region in the UK — receiving only two-thirds of the national average rainfall each year (approximately 600 mm).

Anglian Water recognises that it has the potential to affect the environment both positively and negatively. It seeks to ensure that its activities enhance rather than damage nature. Anglian Water's starting point, when looking at what it could be doing to enhance the environment, was not at the company level but rather the wider region it serves. To better understand the context in which it operates, Anglian Water commissioned a study by the University of East Anglia to characterise the natural capital assets in the region. The natural capital asset check examined the quantity, quality and location of natural assets, such as habitats, soils, freshwaters and bathing waters. It also assessed key benefits that flow from these assets such as support for food production, climate regulation and recreation use. The study drew on freely available data to ensure that the approach could be easily replicated for other geographical areas or stakeholders in the region.

A risk register was used to map two pressures (growth and water resource availability) with the presence of natural capital onto each local authority within the Anglian Water region *(Figure 11)*.

Figure 11: Geographical analysis of natural capital assets and pressures in sourcing area of Anglian Water (water supply company, UK)
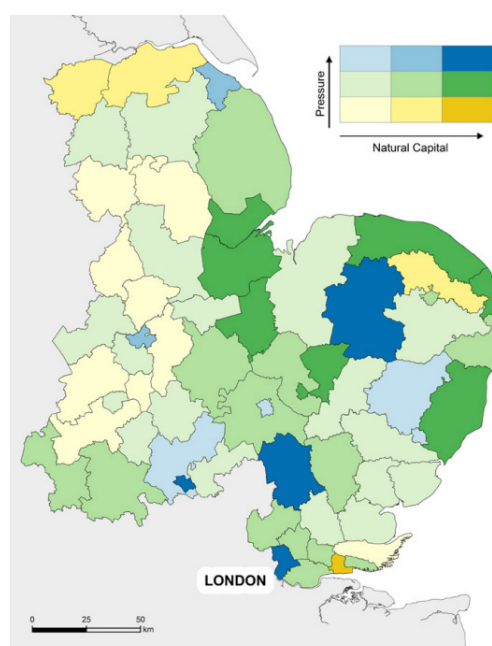
The authorities depicted in the darker green and blue shades had significant amounts of natural capital but also the highest levels of pressure on those assets. The map highlights locations where there is likely to be a need for careful spatial planning.

Based on: **nat-cap-aw-case-study-modelling-better-business.pdf (cam.ac.uk)**

Case study 7:

EBRD's Natural Capital Valuation model at a landscape level

Since July 2021, EBRD initiated and leads on a joined MDB project 'Development of a Natural Capital Valuation Model for Multilateral Development Banks – Pilot application in support of the SDGs in Kyrgyzstan and Uzbekistan'.

This one-year project, carried out by Arcadis with support of IDEEA Group, is an example of the increased attention of the Multilateral Development Banks to natural capital. In line with their frontrunning role in terms of sustainability, the MDBs have recently agreed to step up their efforts towards the protection, restoration and sustainable use of nature. In a joint statement signed at the COP26 Climate Conference in Glasgow[66], the institutions state that "progress on global sustainable development, climate and biodiversity goals cannot be achieved without addressing the direct and indirect drivers of nature loss and transforming the way in which we value, use, conserve and share the benefits from nature". To address this challenge, the MDBs commit to further mainstream nature considerations into their policies and operations. This will be reflected in five areas: (1) maintaining thought leadership in the development of safeguards for ecosystems, (2) fostering "nature-positive" investments, (3) creating regional synergies and setting out strategic approaches, (4) valuing nature to guide decision-making and (5) enhancing reporting on efforts and initiatives to mainstream nature.

The ultimate purpose of the Natural Capital Valuation methodology is to facilitate the identification of sustainable investment opportunities and to provide solid contextual information at a landscape level for better informed decision-making and risk management at a project level and in this way, to support the de-risking strategies of multilateral development banks (MDBs). The NCV Model and the associated strategies for creating revenues from natural capital will be tested on two practical pilots in the region. The outcomes from the pilot studies will be discussed with relevant stakeholders, including national authorities and market stakeholders, in order to identify viable investment opportunities (bankable nature solutions) in line with the recommendations developed for the two pilot cases.

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66 **MDB Joint Nature Statement – UN Climate Change Conference (COP26) at the SEC – Glasgow 2021 (ukcop26.org);** The joint statement was signed by the Asian Development Bank, the African Development Bank, the Asian Infrastructure Investment Bank, the EBRD, the European Investment Bank, the Inter-American Development Bank (IDB), IDB Invest, the Islamic Development Bank, Caribbean Development Bank and the World Bank Group.

The NCV Model is largely based on the SEEA EA, as this appeared to be the natural capital approach that satisfies most criteria in terms of desirable features. The particular focus in the application of the SEEA will be the use of ecosystem accounting given its capability of (i) focusing at the landscape scale in terms of multiple ecosystem types; (ii) incorporating multiple ecosystem services both market and non-market, and (iii) applying a spatial approach. The SEEA is also able to provide outputs that satisfy some key applications in particular reporting and monitoring and some aggregate performance measures (e.g. natural capital wealth and gross ecosystem product). The SEEA does not, of itself, provide analytical results such as provided by cost-benefit analysis, risk assessments and scenario modelling, but the data from accounts based on the SEEA's concepts and definitions can be used to support such applications. Aside from satisfying a majority of technical criteria, the SEEA has particular merit from its endorsement by the United Nations Statistical Commission as the international statistical standard for natural capital accounting. This status is equivalent to the status of measures of gross domestic product via the System of National Accounts. The status and the active programs of work underway to implement the SEEA in all countries, provide a strong basis for the NCV Model to be applied consistently around the world. This is particularly the case given the increasing investment in public sector and global data sets that are SEEA compliant.

The approach proposed for this project is therefore the application of the SEEA for the organization of data[67], the description of the current (baseline) situation and the presentation of data concerning alternative scenarios.

Availability of the appropriate natural capital data is one of the challenges in this project. The data which is available is often at country level, while the intent is to apply the natural capital valuation model at subnational and landscape scale. As well, data is often fragmented, anecdotal, study or project specific or highly context dependent. Related challenges are the lack of sufficiently detailed spatial information on natural capital and the fact that data are often available for administrative entities which in most cases don't match with the ecosystem boundaries (e.g. catchments) at a landscape scale. Based on the findings, the study will highlight a number of recommendations on specific natural capital data needs in relation to this type of landscape level assessments.

Results of the project are expected to become available in the second half of 2022.

Based on: Interview with Alexander Hadzhiivanov, EBRD and work underway by Arcadis on behalf of EBRD

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67   Noting that the SEEA provides guidance across a range of natural capital themes including ecosystems, natural resources, water, energy, emissions, waste and environmental expenditures.
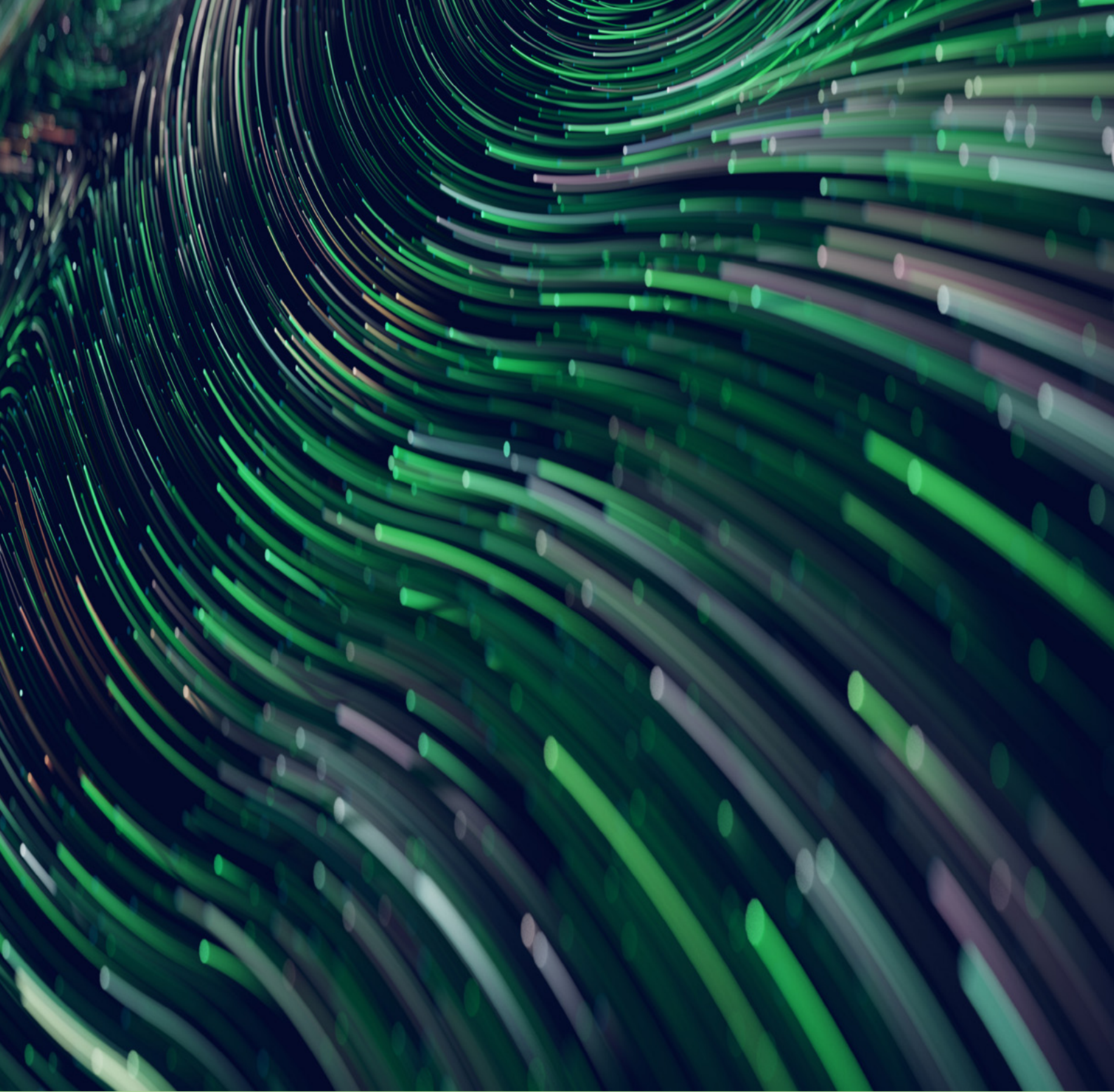
The campaign is being led by the **Institute of Chartered Accountants in England and Wales** alongside the **World Business Council for Sustainable Development**, **IUCN** and **Oppla**.

ICAEW

🌸 wbcsd

IUCN

⚪ oppla

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821303

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