



# From Obstacles to Opportunities – Towards an Action Plan for improved Natural Capital and Ecosystem Accounting Implementation

**Report from the International Workshop  
On Opportunities and Obstacles for Natural Capital Accounting,  
held in Brussels on the 27th and the 28th of January 2015**

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**Peter Torkler, Günter Mitlacher (WWF Germany)**  
**Project Coordinator**

## Executive Summary

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Over the last decade a consensus has been growing that **accounting for natural capital** and integrating that approach in governmental and business decision-making is an important pillar of global, national, regional, local and corporate conservation efforts. Accounting for natural capital aims to support halting biodiversity loss and avoiding the deterioration of ecosystems and the services they provide that underpin human well-being and economic prosperity.

Therefore, **Parties to the Convention on Biological Diversity (CBD)**, decided at the 10th Conference of Parties in 2010, to integrate the values of biodiversity and ecosystems in national accounting and reporting systems by 2020, under **Aichi Target 2**. The **European Union** committed to the same goal under the **EU Biodiversity Strategy in order to** improve knowledge of ecosystems and their services in the EU. The latest national reports submitted to the CBD Secretariat indicate some progress towards Aichi Target 2. The Global Biodiversity Outlook (GBO-4) published in 2014 states that **progress has been made in mapping and assessment of biodiversity, ecosystems and their services and in incorporation of their values into planning processes and strategies**. However, there is still relatively **little attention given to the integration of natural capital accounting into national reporting and accounting systems**.

When fully implemented, natural capital and ecosystem accounting, will deliver accessible information that helps the understanding of **how society benefits from biodiversity and ecosystems**, and how protecting them contributes to sustainable economic development. Currently, policy makers base most of their decisions on economic indicators, such as GDP, but these indicators do not take into account the value of natural resources that societies and economies depend on. Therefore, it is essential to complement these kinds of economic indicators with more comprehensive **‘wealth’ accounting, which incorporates accurate environmental and ecosystem accounts**. While ecosystems are facing unprecedented pressures and ongoing depletion, natural capital and ecosystem accounting is about showing citizens, businesses, and decision makers how important biodiversity and ecosystems are in underpinning the prosperity and wellbeing of nations in future.

As less than five years remain before the deadline of the Aichi Targets in 2020, this report highlights the **main challenges** relating to the further implementation of natural capital and ecosystem accounting: first, relating to the **policy and institutional underpinnings** for natural capital and ecosystem accounting; second, the **capacity, technical knowledge and resources**; and third, the potential policy applications of the information generated. The report sets out recommendations, compiled in a **roadmap towards improved natural capital and ecosystem accounting application up to 2020**. It targets decision makers and natural capital experts in international institutions, in national authorities as well as within the EU institutions.

This report is mostly based on the discussions and findings of the International Workshop On Opportunities and Obstacles for Natural Capital Accounting, held in Brussels on the 27th and the 28th of January 2015. WWF and the French Ministry of Foreign Affairs and International Development have brought together

a group of experts to **identify the biggest obstacles and challenges and most promising success factors** for incorporating natural capital and ecosystem accounting into policy decision making.

Some clear conclusions and recommendations were drawn from the workshop:

- » Over the period 2010 to 2014, **less than 20% of Parties to the CBD** have been in the process of developing ecosystem accounts for policy making, and all countries need to scale up their efforts to implement ecosystem accounting in order to meet the 2020 Aichi Target.
- » The current **lack of strong political support** needs to be addressed through increased advocacy and awareness-raising about the value and policy applications of natural capital and ecosystem accounting.
- » Each country should set up a **high-level independent Natural Capital Committee** to advise their government on strategies and actions to implement NCA.
- » The **legal and institutional basis** in many countries needs to be developed and improved, i.e. appropriate legislation, responsible institutions and administrative processes must be in place as well as sufficient and long-term **financial, technical and human resources**.
- » **Efficient management of available data** is of utmost importance. A comprehensive and integrated data infrastructure should be established to promote appropriate data collection from all sources (such as field data, satellite and remote sensing) and efficient data management.
- » A wide range of potential **policy applications** exists. Substantial economic benefits can be gained from better recognition of ecosystem accounting in many different policy fields, such as finance, agriculture, water, energy/climate, and forestry. This should be demonstrated through case studies and lesson sharing across countries.

As a matter of urgency

- » By September 2015, ecosystem accounting should be better integrated into the targets of the **Sustainable Development Goals**, and must be incorporated into the implementation and monitoring framework.
- » By 2016, a **review and assessment** of status, approaches, and outputs of the various international initiatives currently underway to promote ecosystem accounting should be elaborated and presented at CBD COP 13.
- » By 2016, a **roadmap to achieve ecosystem accounting** according to the Aichi Target 2 timeline up to 2020 should be developed and used to call upon CBD Parties to scale-up their efforts towards implementation
- » By 2016, the **EU must scale-up efforts**, e.g. more Member States need to be engaging on this agenda and a module for ecosystem services accounts for inclusion in the EU Regulation on European Environmental Economic Accounts in 2017 must be prepared.
- » By 2016, a **'knowledge sharing web platform'** should be created to exchange expertise and experience at the international and national level and across all actors; it would facilitate capacity building, training, and sharing of knowledge and expertise among practitioners.
- » By 2016, enhanced support should be provided by **development agencies to those developing countries which have sufficient enabling conditions in place for NCA**, and **international initiatives**, to build more capacity for the timely implementation of ecosystem accounting by 2020.

The action plan presented in this report aims to provide guidance as to how best to scale up efforts in natural capital accounting, and in particular ecosystem accounting, in order to achieve the Aichi Target by 2020.

## 1.1 Purpose of the Workshop

This report is based on the outcome of the International Workshop On Opportunities and Obstacles for Natural Capital Accounting, held in Brussels on the 27th and the 28th of January 2015. WWF and the French Ministry of Foreign Affairs and International Development brought together a group of experts to identify the biggest obstacles and challenges and most promising success factors for incorporating Natural Capital Accounting (NCA) into policy decision making. The objective of the workshop was to discuss the different models applied across countries and international institutions to implement NCA systems and to develop a roadmap for speeding up the process of incorporating NCA into policy decision making with a particular focus on ecosystem accounting.

Workshop participants discussed the following topics:

**Policy Support:** How to ensure political support for NCA? What legal framework must be in place and what are the policy objectives of NCA?

**Capacity Needs:** What management tools and strategies can be supported by NCA? What are the data requirements, statistical standards, capacities and financial needs to apply NCA?

**Policy application:** How can NCA influence policy decisions? What are the benefits of using NCA in policy making? What type of decisions can be influenced? Which policy fields can benefit from NCA?

## 1.2 Policy Commitments and Processes

Over the last few years a consensus has been growing that accounting for natural capital and integrating that approach in governmental and business decision-making is an important pillar of international, national, regional, and local level including corporate conservation efforts.

New momentum was created at the tenth Conference of the Parties to the Convention on Biological Diversity (CBD COP 10), held in Nagoya, Japan in 2010, where Parties decided on the **Strategic Plan for Biodiversity 2011-2020 including the 20 Aichi Targets**<sup>1</sup>. Under strategic *Goal A: Address the underlying causes of biodiversity loss*, **Target 2** requires that *By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.*

The **European Union** incorporated the issue under the **EU Biodiversity Strategy**<sup>2</sup> with the following commitment of **Target 2**: *By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems, and* **Action 5**: *Improve knowledge of ecosystems and their services in the EU Member States, with the assistance of the Commission, will map and assess the*

*state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020.*

Figure 1 shows a list of recent policy commitments and related activities following the CBD COP 10 decision and Aichi Target 2 from global to national level.

**Fig. 1**  
Policy commitments on  
ecosystem accounting  
and related activities  
(ten Brink, 2015)

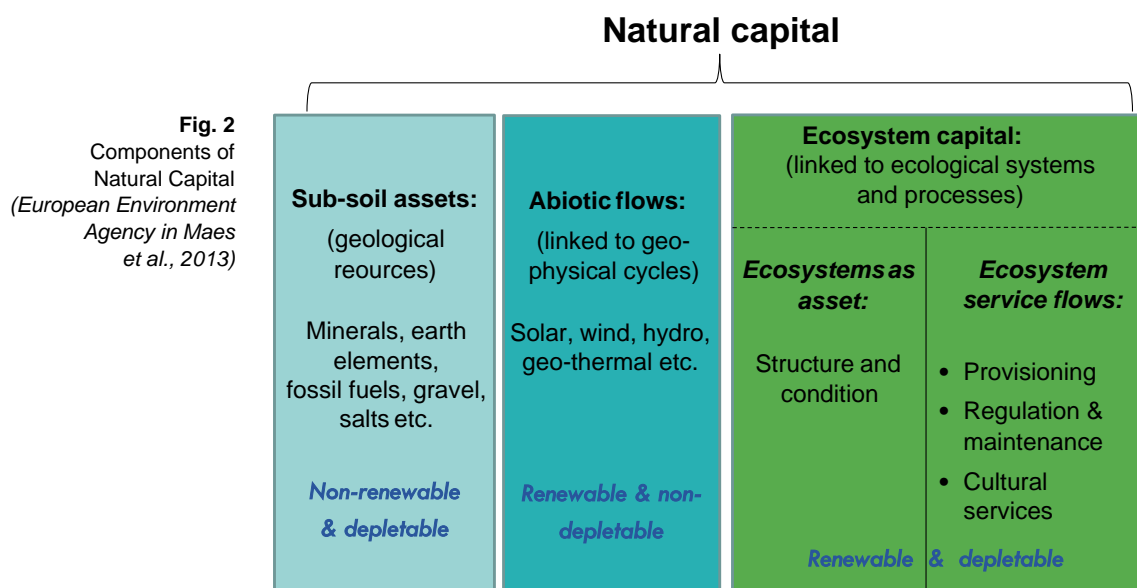
Policy commitments & accounting related activities	
<b>Global</b>	<b>Strategic Plan for Biodiversity 2011-2020: Target 2</b> <b>Rio+20 Conference: 57 countries</b> – call to strengthen NCA implementation <b>‘Beyond GDP’, ‘Stiglitz-Sen-Fitoussi Commission’, OECD’s Better Life Initiative</b> <b>UN System of Environmental and Economic Accounting (SEEA)</b> <b>Global Partnership for Ecosystem Valuation and Wealth Accounting (WAVES)</b>
<b>EU</b>	<b>Biodiv. Strategy Action 5: promote integration of values in accounting by 2020</b> <b>7<sup>th</sup> Environmental Action Programme (7<sup>th</sup> EAP)</b> <b>Mapping and Assessment of Ecosystems and their Services (MAES) initiative</b> <b>EEA Ecosystem Capital Accounts</b> <b>Regulation on National Environmental Economic Accounts (Regulation (EU) 691/2011)</b> <b>Practical need for accounts to help implement Water Framework Dir. (2000/60/EC)</b>
<b>Country</b>	<b>NBSAPs – National Biodiversity Strategies and Action Plans</b> <b>Member States: Range of national commitments and (experimental) accounts</b>

### 1.3 Concept of Natural Capital

**Natural capital** is a concept that underlines the role of nature in the economy and human welfare, alongside other forms of capital (e.g. manufactured/man-made capital, human and social capital) (Pearce et al. 1989). Natural capital is the ‘stock’ of natural assets that yields a ‘flow’ of valuable services into the future and that provide benefits to humans. Natural Capital is composed of four categories: sub-soil assets (e.g. minerals), abiotic/non-living flows (e.g. wind), ecosystems (e.g. forest ecosystem) and ecosystem services (e.g. water regulation, see Figure 2). **The Millennium Ecosystem Assessment (2003)<sup>3</sup> defined ecosystem services as “the flow of benefits that people obtain from ecosystems”.**

**Ecosystem services** include provisioning, regulating, cultural, and supporting services. According to MEA (2003), provisioning services are the products people obtain from ecosystems (e.g. food, fuel, fiber, fresh water). Regulating services are the benefits people obtain from the regulation of ecosystem processes (e.g. air quality maintenance, climate regulation, erosion control). Cultural services are the non-material benefits people obtain from ecosystems through e.g. spiritual enrichment and aesthetic experiences. Supporting services are those that are necessary for the production of all other ecosystem services (e.g. production of oxygen, soil formation).

**Valuation** of biodiversity, ecosystems and their services is a multi-dimensional, context-dependent tool. A basic distinction should be made between ‘extrinsic’ and ‘intrinsic’ values. Whereas **extrinsic values** are derived from a certain



**Fig. 2**  
Components of Natural Capital  
(European Environment Agency in Maes et al., 2013)

objective, goal or purpose that is being pursued, **intrinsic values** are non-derivative and are associated with ethical considerations. They are independent on the utility provided to humans, and refer to the value a certain object has 'by (and of) itself'. **Economic valuation** of natural capital predominantly aims to capture the extrinsic values of ecosystems, expressed in physical or monetary terms (see Figure 3). The concept of valuation in the context of NCA is anthropocentric, because it awards value to nature only in relation to its human benefit. There is a danger that this could sideline the intrinsic value perspective. Recognizing the intrinsic value of biodiversity and nature is a crucial element of valuation for well-being of societies and should not be omitted (WWF, 2014). This is much harder to assess, almost by definition, but some methods such as surveys and participatory approaches can still be used to help assess this value to some extent. The process of giving explicit consideration to this intrinsic value should help to inform decision making, and reduce the risk that nature's value is underestimated.

**Fig. 3**  
How is natural capital valued?  
(Ekins, 2015)

UCL Institute for Sustainable Resources
 UCL

## Natural Capital: how is it valued?

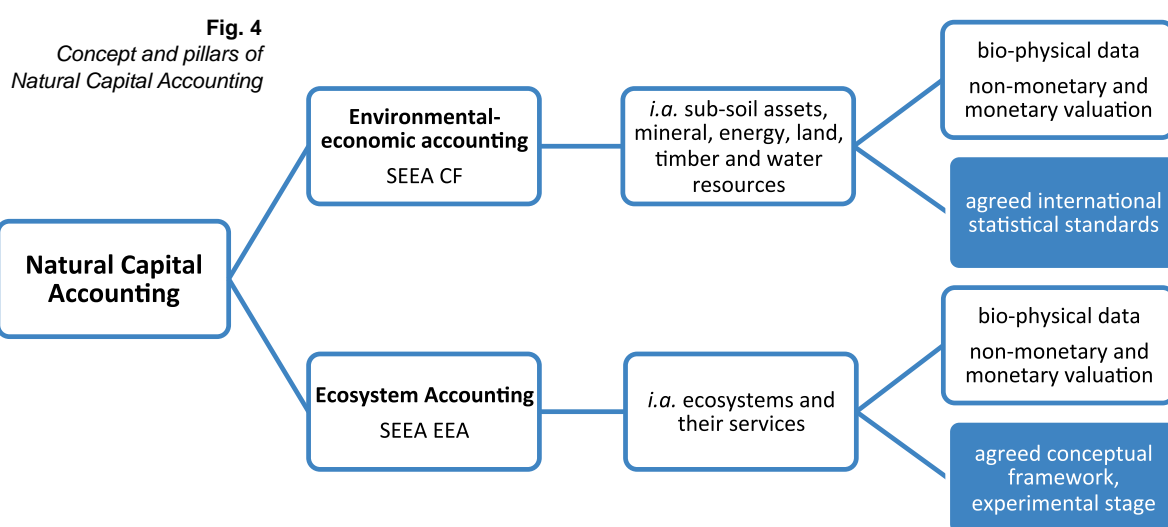
- Value of the natural capital *stock* is derived from the discounted value of the *flow* of ecosystem goods and services (EGS)
- Value = (Use + option + existence) value
  - Market (or surrogate) market valuation for EGS if feasible
  - Non-market valuation methods: WTP/MTA
- Values may be expensive to generate (need research, problems with transfer), have high levels of uncertainty, and be open to challenge/arouse controversy
- Importance of appropriate communication

## 1.4 Natural capital accounting, environmental-economic accounting and ecosystem accounting

Different concepts have been used in ‘environmental’ and ‘ecosystem accounting’ (ecosystem accounting, environmental-economic accounting, ecosystem capital accounting and natural capital accounting). The basic distinction for the purpose of this report is between ‘environmental-economic accounting’ and ‘ecosystem accounting’ as defined by the **System of Environmental-Economic Accounts** (SEEA) framework (see Figure 4):

- » **Environmental-economic accounting** relates to data on individual environmental assets that directly benefit economic activity (e.g. land, mineral, timber and energy resources) as represented by the SEEA Central Framework (CF)<sup>4</sup>.
- » **Ecosystem accounting**, as represented by the SEEA Experimental Ecosystem Accounts<sup>5</sup> (SEEA EEA), considers environmental assets from an ecosystem perspective and relates to how individual assets interact within certain spatial areas to produce ecosystem services, such as regulating services.

It should be noted that most provisioning ecosystem services are captured through environmental-economic accounting, such as species harvested for food, fibre, timber and energy. A more comprehensive range of ecosystem services, such as water purification, flood and storm protection and pollination, are only captured through ecosystem accounting (WWF, 2014).



This report uses the term ‘**natural capital accounting**’ to encompass both ‘**environmental-economic accounting**’ and ‘**ecosystem accounting**’ (see Fig. 4). **Ecosystem accounting** techniques aim to aggregate information for **statistical purposes**, in particular at the national level. They help to reflect the contribution of ecosystems to well-being, thereby ensuring these values are taken into account in policy decision-making. It aims to organise ecosystem data while also providing guidance for integration within economic data. Such a framework allows a range of indicators to be constructed to complement the current set of predominantly economic indicators to measure the wealth of countries. Ecosystem accounting complements other activities that assess the efficiency of natural resource use and the contribution of environmental goods to economic activities. It also provides a better understanding of the impact of economic activities on the environment (WWF, 2014).

A **natural capital accounting standard** was discussed and elaborated over the last years regarding the System of National Accounts (SNA) (see Figure 5). In 2012, work on the **System of Environmental-Economic Accounting - Experimental Ecosystem Accounts** (SEEA-EEA) has been released under the auspices of the UN, the European Commission, the Food and Agriculture Organization of the United Nations, the Organisation for Economic Co-operation and Development and the World Bank Group. The SEEA-EEA starts from the perspective of ecosystems and links ecosystems to economic and other human activities. SEEA-EEA reflects a synthesis of current knowledge in the measurement of ecosystems. While it represents a convergence of disciplines across ecology, economics and statistics on ecosystem accounting, there are important measurement and conceptual challenges which remain (UN et al, 2014b).

**Fig. 5**  
Timeline of developing  
the SEEA frameworks  
(Weber, 2015)



At this stage, ecosystem accounting is still in an experimental phase. Several initiatives and projects have been launched to broaden the experience on ecosystem accounting (cf 2.2, 4.2).

The policy commitments mentioned in section 1.2 basically relate to ecosystem accounting, which was also in the main focus of the workshop discussion.

## 1.5 Obstacles and challenges

### Results from a questionnaire launched by the French Government

In 2014, the **French Ministry of Foreign Affairs and International Development**, together with the World Bank, circulated a questionnaire to experts of National Statistical Offices and governments to gather relevant expertise on NCA (Jeantil & Recuero Virto, 2015). The purpose of this survey was to seek information about obstacles to the use of NCA. Experts from statistical institutions from nine upper-income countries (UI = mainly from the EU) and from seven non upper-income countries (Non UI = from Africa, Asia and Latin America) participated in the questionnaire. The questions addressed six groups of factors which appear to influence and explain the relative lack of use of natural capital accounting (see Table 1). 'Institutional' factors are the most critical ones for both groups. In non upper-income countries 'data availability' and 'cooperation' factors rank as high

as ‘institutional’ factors. The findings were presented in the workshop by Jeantil & Recuero Virto (2015). The main relevant factors, which differ from upper and non upper-income countries, are shown in Table 2:

## Which factors explain lack of use?

**Tab. 1**

Group of factors influencing the relative lack of use of NCA (0 value = not relevant; high values highlighted in red, Jeantil & Recuero Virto, 2015)

UI countries	All	UI	Non UI
Political	0,76	0,67	0,90
Structural	0,70	0,56	0,91
Institutional	1,13	0,97	1,38
Design	0,85	0,81	0,91
Data availability	0,86	0,56	1,33
Cooperation:	0,87	0,59	1,33

**Tab. 2**

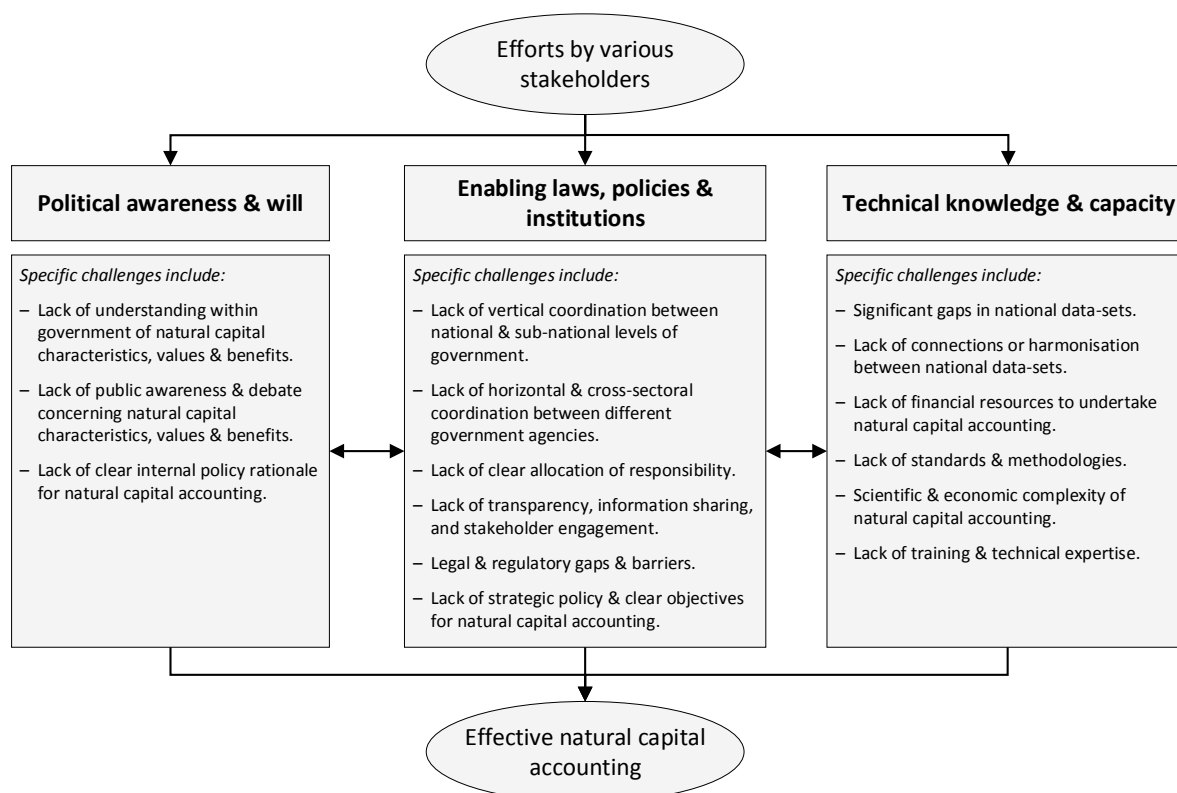
Ranking of factors which explain the relative lack of NCA use in upper-income countries (UI) and non upper-income countries (Non UI) (Jeantil & Recuero Virto, 2015)

UI countries	
Political:	1. Lack of political support by key people (e.g., politicians or head of a governmental agency)
Structural:	1. Exogenous shocks have changed priorities in the country (e.g., 2008 global crisis, 1973 oil crisis )
Institutional:	1. Lack of a clear lead agency (or clear implementation structure among collaborating agencies)
Design:	1. Difficult to draw a link between environment accounts and policy decision
Data availability:	1. It is too early to use environmental accounts for a fundamental policy use
Cooperation:	1. Lack of strong endorsement and mainstreaming by international agencies in their programs
Non UI countries	
Political:	1. Lack of political support by key people (e.g., politicians or head of a governmental agency) 2. Lack of ownership by the county on the development and uses of environmental accounts
Structural:	1. Inadequate stage of development of the country (other priorities considered more important)
Institutional:	1. Institutional leadership unable to promote policy use by other ministries 2. Insufficient broad engagement of stakeholders 3. Lack of a clear lead agency (or clear implementation structure among collaborating agencies)
Design:	1. Difficult to draw a link between environment accounts and policy decision 2. Lack of an ‘umbrella framework’ that combines environmental accounts and environmental statistics 3. Unclear guidelines, e.g. guidance is not (yet) available in case of ecosystem accounting
Data availability:	1. Insufficient data to use it for policy decision because of lack of staff and financial resources 2. Decreasing data availability (confidentiality of data, weaker administrative burden placed on companies)
Cooperation:	1. Lack of strong endorsement and mainstreaming by international agencies in their programs 2. Lack of international forum for training and the exchange of experiences that would include policy analysis 3. Concerns by developing countries that additional ‘conditionalities’ might be imposed by international agencies

**Fig. 6**  
On obstacles and  
challenges –  
experiences from the  
GLOBE Natural  
Capital Initiative  
(Milligan, 2015)

## Results from the GLOBE Natural Capital Initiative

Obstacles and challenges were reported and discussed through various presentations by the workshop participants. Figure 6 gives an overview of significant obstacles and challenges for implementing effective NCA in practice, based on experiences from the **GLOBE Natural Capital Initiative**<sup>6</sup>.



## Summary

The current experiences with NCA and ecosystem accounting presented at the workshop indicated the following areas of challenges and obstacles:

- 1. Lack of political awareness, support and ownership including governance, legal, and institutional constraints, in particular the lack of a clear lead agency.**
- 2. Lack of appropriate technical knowledge and capacity, data availability from all relevant sources on different levels, effective data management, and a useful methodological framework.**
- 3. Lack of sufficient financial and human resources including training opportunities for key people.**
- 4. Lack of policy application and mainstreaming in various sectors, insufficient cooperation among stakeholders, ministries and agencies at the international, national, regional, and local level.**
- 5. Many developing countries face an inadequate stage of institutional and conceptual development to apply NCA, because other priorities are considered more important.**

The workshop discussion on how to achieve more political support can be summarized as follows:

- » There is still a lack of political will, support, and ownership for concrete implementation of NCA, and particularly ecosystem accounting as part of NCA. Currently NCA and ecosystem accounting are mainly discussed in environmental and statistical expert circles.
- » Policy makers are either not understanding or not completely convinced about the benefits and added value of NCA and ecosystem accounting in terms of its application to policy decision making.
- » While ambitious plans have been put in place in various countries (e.g. Canada, France, Germany, UK, EU) and across international initiatives (WAVES<sup>7</sup>, GLOBE<sup>8</sup> etc.), the results of initial efforts and pilot projects applying ecosystem accounting and practices remain insufficiently well recognized by decision makers.

Therefore, one of the major challenges for ecosystem accounting is how to continue raising political will and awareness of the benefits for society and economy, and how to ensure ongoing political support at the international, European and national level.

## 2.1 Political awareness raising

There is weak, but **growing policy and analytical demand** for information and statistics on ecosystems and their linkages to economic and social activities (Co-molet, 2015; Ekins, 2015; ten Brink, 2015). The discussion in the workshop clearly showed that the current **lack of strong political support** needs to be tackled by continuous advocacy and communication about ecosystem accounting. While ecosystem accounting has usually been promoted by environmental authorities, it is rarely discussed at the national level across ministries - particularly finance ministries – in a way which is necessary to generate cross-cutting policy responses.

The **costs of natural capital depletion are often overlooked by policy**. It is evident that if these costs are not calculated through ecosystem accounting and NCA, and incorporated into the national accounts, then these accounts fail to give a comprehensive picture of a country's wealth. Therefore, one focus of advocacy should be on the costs associated with natural capital depletion. The costs of policy inaction will accumulate over time and increase the burden for natural capital restoration.

### Recommendations discussed at the workshop:

- » NCA and ecosystem accounting champions and best practices should be identified and used to increase awareness on the value of NCA.
- » NCA practitioners need to clearly communicate the role and the benefits of ecosystem accounting in the policy making process.
- » Information sharing on the value of biodiversity and related ecosystem services should be promoted to foster political recognition by decision makers.
- » High-level political support should be called upon to meet the policy commitments at global, European and national level.

## 2.2 International policy frameworks

### Post-2015 Development Agenda

Ecosystem accounting and NCA need to be better integrated in international policy frameworks and initiatives, in particular related to sustainable development. The current discussion on the new Post-2015 development agenda and the Sustainable Development Goals (SDG) creates new opportunities for NCA. In that context, progress towards more sustainable development patterns is being promoted, including the use of natural capital approaches, and improved information systems with clear indicators will play a central role in monitoring performance towards those goals<sup>9</sup>.

The newly established Experimental Ecosystem Accounting (SEEA EEA) framework (see section 1.4) should facilitate easier adoption of **ecosystem accounting as part of the SDG framework**. It should support the urgent need for increased monitoring and more explicit management of the natural resources and ecosystems that sustainable development relies on. The Sustainable Development Solutions Network<sup>10</sup> has made a proposal for indicators and a monitoring framework for the SDG (Sustainable Development Solutions Network, 2015). This text foresees an Indicator 55 that states Country implements and reports on System of Environmental-Economic Accounting (SEEA) accounts. SEEA is proposed as an indicator under Goal 8 (economic growth), Goal 12 (sustainable consumption and production), Goal 15 (protection of ecosystems and biodiversity), and Goal 17 (Global partnership for sustainable development). The integration of SEEA as an indicator is a significant step forward.

Greater support should also be provided to national governments in the implementation of ecosystem accounting and its policy application, as a key part of the official development assistance that will be provided under the SDG framework (see section 4.2).

#### **Recommendations discussed at the workshop:**

- » By 2015, ecosystem accounting should be fully integrated into the targets of the Sustainable Development Goals.
- » The SEEA EEA framework with its suite of indicators should be used to monitor natural capital and ecosystem changes under the SDG implementation framework.
- » Enhanced support should be provided by development agencies to national governments to build capacity for the implementation and application of NCA and ecosystem accounting (see section 4.2).

### CBD Aichi Target 2 implementation

Four years after the CBD decided on the Strategic Plan 2011-2020 and its 20 Aichi Targets, the Global Biodiversity Outlook 4 (GBO-4<sup>11</sup>) provided a mid-term evaluation (SCBD, 2014). On Aichi Target 2 the GBO-4 stated that important progress has been made in incorporating values of biodiversity and ecosystem services into planning processes, and integrating ecosystem accounting into national accounts. However, due to wide variation among countries and a slow integration process in implementation, there remain significant challenges to fully achieving the Aichi Target until 2020.

In order to speed up implementation and increase the chance of achieving Aichi Target 2 by 2020, increased engagement and activity is needed under current global initiatives, such as WAVES<sup>12</sup>, World Bank Wealth of Nations<sup>13</sup>, TEEB<sup>14</sup>, UNEP Inclusive Wealth Index<sup>15</sup>, and the GLOBE Natural Capital Initiative<sup>16</sup>. The different approaches and initiatives should be better connected and synergies identified.

**Recommendations discussed at the workshop:**

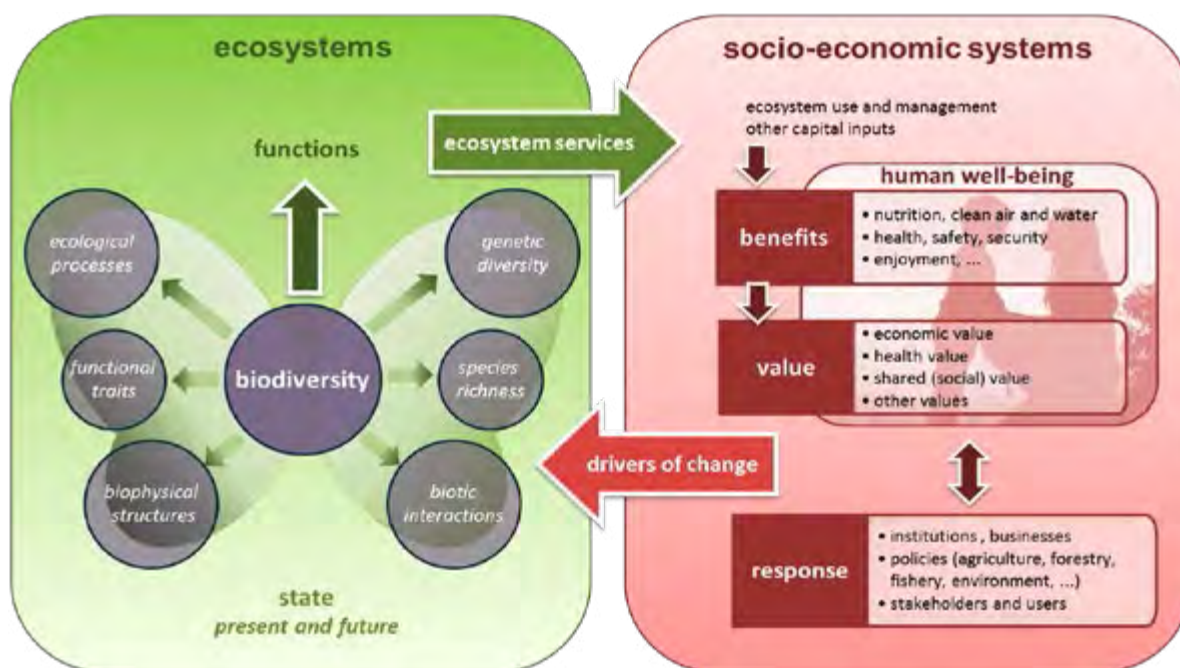
- » By 2016, a review and assessment of status, approaches, and outputs of the various international initiatives currently underway to promote ecosystem accounting should be elaborated and presented at CBD COP 13.
- » By 2016, a roadmap to achieve ecosystem accounting according to the Aichi Target 2 timeline up to 2020, should be developed and used to call upon CBD Parties to scale-up their efforts towards implementation.

## 2.3 EU policy

The **EU Biodiversity Strategy requires within Target 2, Action 5**, that Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020. Accordingly, the **7th EU Environmental Action Programme (7EAP<sup>17</sup>)** of 2013 underlines, in article 27, that the integration of the economic value of ecosystem services into accounting and reporting systems at EU and national level by 2020 will result in better management of the EU's natural capital. In article 83, it says that Work to develop a system of environmental accounts, including physical and monetary accounts for natural capital and ecosystem services, will need to be stepped up.

The 7EAP also foresees, in article 84, developing and applying alternative indicators that complement and go beyond GDP to monitor the sustainability of progress and continuing work to integrate economic indicators with environmental and social indicators, including by means of natural capital accounting. All these texts are emphasizing the need for the EU and its Member States to engage more in NCA and particularly ecosystem accounting.

The **EC Working Group on Mapping and Assessment on Ecosystems and their Services (MAES)** has been established to implement the provisions of the EU Biodiversity Strategy on ecosystem accounting. The group provided a conceptual framework and methodological guidance to ensure coherent mapping and assessment across Europe (see Figure 7). However, it was reported that many methodological and data challenges still need to be addressed (Petersen, 2015). The concept of value in the context of the discussion presented throughout this report is anthropocentric because it awards value to nature only in relation to its human benefit. There is a danger that this could sideline the so-called 'intrinsic value' perspective, i.e. the value of nature for and by itself.



**Fig. 7**  
Conceptual framework  
for MAES  
(Maes et al., 2013)

The Regulation 691/2011 on European Environmental Economic Accounts<sup>18</sup> provides a legal framework for NCA, where Member States currently report on 6 modules (air emissions accounts, environmental taxes, material flows, physical energy flow accounts, environmental goods and services sector and environmental protection expenditure). As article 10 of Regulation 691/2011 states that every 3 years the European Commission shall propose new modules that should be introduced, the European Commission should prepare a **module for ecosystem services accounts**, alongside modules on water accounts, to be proposed by 31st December 2016 for the next amendment of the EU Regulation on European Environmental Economic Accounts.

The European Strategy for Environmental Accounts 2014-2018<sup>19</sup> endorsed by the European Statistical System Committee, supports progress on NCA implementation, but until now has not proposed the introduction of a module on ecosystem accounting. In that context, work on the value of biodiversity and ecosystem services needs to be strengthened significantly.

Despite the existence of these various policies, regulations and strategies, there remain significant **obstacles at EU level**, such as:

- » the implementation process is too slow and patchy,
- » financial and human resources are lacking,
- » too few EU Member States are experimenting with ecosystem accounts,
- » a EU-wide set of ecosystem accounts is missing that would provide a frame for EU policy.

In this process, the European Commission, Eurostat, EEA, and the EC Working Group on Mapping and Assessment on Ecosystems and their Services (MAES) have to play a key role to better coordinate and to jointly increase efforts to promote urgent implementation of the 2020 political commitments.

**Recommendations discussed at the workshop:**

- » The European Commission should prepare a module for ecosystem services accounts to be proposed for the next amendment of the EU Regulation on European environmental economic accounts in 2017.
- » A long-term vision and plan should be developed by all actors at the EU level to integrate the currently patchy and fragmented activities of ministries, agencies, statistical offices and research institutions, and to better coordinate parallel processes.
- » A 'knowledge innovation platform' should be established to facilitate knowledge generation, create a stronger data foundation, and enhance capacity to efficiently manage data and information.
- » The work to develop a harmonised EU-wide set of ecosystem accounts should be enhanced, and clear methodological guidance should be provided to Member States in a reference document.
- » Institutions at the EU-level should better coordinate and jointly increase efforts to promote the implementation of the 2020 political commitments on ecosystem accounting.
- » The EU Commission should encourage more Member States to engage in the EC MAES Working Group activities to broaden the experience with ecosystem accounting in Member States and provide additional funding.

## 2.4 National legal and institutional approaches

The second **GLOBE Natural Capital Accounting Study**<sup>20</sup> highlights experiences in developing **legal and policy frameworks for NCA**. The study reports challenges and lessons learned in twenty-one countries and outlines a vision for future action to improve the global knowledge base concerning legal and policy options for managing natural capital. The GLOBE study and workshop discussions identified a range of obstacles that needs to be addressed, such as legal and regulatory gaps and barriers, and the lack of strategic policy and clear objectives for NCA. These obstacles are also relevant for ecosystem accounting.

**Conclusions from the 2nd GLOBE NCA Study (Milligan et al. 2014):**

1. Efforts to develop laws and policies for natural capital accounting rely on continued cooperation and diverse forms of support. This entails international effort – accounting standards such as UN-SEEA; commitments and goals such as the post-2015 SDGs and Convention on Biological Diversity; capacity-building and research partnerships such as WAVES. It also entails national efforts – across various parts of government and diverse stakeholders, including communities and the private sector.
2. There is no 'best practice' approach to legal and policy reform for natural capital accounting. The task is complex and specific to national circumstances, cutting across many policies, institutions and sectors. Frameworks may involve combinations of new legislation, and new action under old laws. Practical national approaches that may prove useful for others are outlined.
3. A key future challenge for legislators is to develop and share innovative approaches for sustainably managing natural capital. Accounting is an important step towards that goal – others are needed. This Study highlights initial steps that countries have taken to link natural capital accounting with broader strategies for natural capital management.

As there is no ‘one-size-fits-all’ solution, particularly regarding legal and institutional arrangements, countries should learn from these experiences and generate ideas adapted to their own context.

**Recommendations discussed at the workshop:**

- » Appropriate legislation and administrative arrangements should be developed to embed ecosystem accounting and NCA in relevant policy frameworks at national level.
- » Efforts to share experience in implementing NCA and applying it to policy should be increased.
- » The existing international initiatives should be strengthened to support more countries on their path to develop country-specific legal arrangements.

## 2.5 Institutional coordination and governance

As ecosystem accounting as part of NCA remains a new area of work in many countries, the appropriate **institutional structures** often still need to be designed, developed, and established. The GLOBE study along with other experience presents a set of obstacles related to institutional arrangements, which need to be addressed:

- » Lack of vertical coordination between national, regional and local levels of administration.
- » Lack of horizontal and cross-sectoral coordination between government agencies, statistical institutions and stakeholders.
- » Lack of clear leadership and allocation of responsibility.
- » Lack of transparency, information sharing, and stakeholder engagement.

It was noted that in some countries new approaches to promote **better coordination among authorities and stakeholders**, such as statistical offices, the environment ministry/agency, ministries of economy and finance, agriculture, forestry and fishery ministries, and research institutes, have already been created. Working groups supporting ecosystem accounting have been established in Belgium, France, Germany, and the UK, amongst others. Often involving civil servants, experts, academics, and NGO representatives, such platforms aim to assess the most important policy questions and coordinate and shape the further development of ecosystem accounting at a national level.

For example, France launched the **French Assessment of Ecosystems and Ecosystem Services** to incorporate biodiversity values into national accounting and planning processes. A project team from the Ministry of Ecology, Sustainable Development and Energy was established, along with a steering committee and a scientific advisory board (Puydarrieux 2015).

In the United Kingdom the **UK National Ecosystem Assessment** (UK NEA, 2011)<sup>21</sup> provided the first analysis of the benefits that the natural environment provides to society and national wealth. The assessment had a significant impact on national UK policy by influencing the Natural Environment White Paper, which set out 92 policy commitments to help mainstream natural capital in decision-making, including the establishment of the Natural Capital Committee (UK NCC)<sup>22</sup>. The NCC is an independent advisory body set up to advise the UK Government on the sustainable use of natural capital. It has seven members from

academia and business and brings together expertise and experience in ecology and environmental science, economics and business. “The Committee’s role is to provide independent, expert advice to Government. Ultimately, the Committee aims to put the value of England’s natural capital at the heart of the Government’s economic thinking.” They work closely with the Office of National Statistics in the UK who is developing the natural capital accounts.

A case study from **Portugal**, presented at the workshop, showed how the incorporation of NCA is progressing at the national scale, with the involvement of a broad range of stakeholders. Starting in 2004 with the first national ecosystem assessment, many steps have already been undertaken towards the mainstreaming of NCA in Portugal in policy making, including a national TEEB study in 2014. The Gulbenkian Oceans Initiative proposed the following key recommendations (Saldanha, 2015):

- » Include the policy relevance of the natural capital accounts in the development process to influence decision-making.
- » Elaborate a tailored training and communication strategy targeting multiple audiences.

**Recommendations discussed at the workshop:**

- » A high-level independent Natural Capital Committee should be set-up in each country to advise the government on strategies and actions to implement NCA.
- » Horizontal and cross-sectoral coordination between different government agencies and vertical coordination between national, regional and local levels of administration should be established.
- » A clear allocation of responsibility to a lead agency to steer the NCA process is necessary.
- » A process of public and private stakeholder engagement should be organized in order to enhance transparency and information sharing.

According to the workshop discussions, NCA still faces a lot of challenges in terms of technical knowledge and capacity, such as

- » Lack of sufficient financial resources to undertake natural capital accounting.
- » Significant gaps in national data-sets.
- » Lack of connections or harmonisation between national data-sets, because of scientific and economic complexity of natural capital accounting.
- » Different views on appropriate methodologies and the lack of accounting standards.
- » Lack of information sharing, training and technical expertise.

### 3.1 Financial, technical and human resources

The insufficient political support for NCA (see section 2.1.) leads to **poor financial and human resources** to accomplish timely implementation of natural capital and ecosystem accounting commitments on global and European level by 2020. Moreover, the recent economic crisis has significantly slowed down progress, as public resources are under strict restrictions. However, sufficient resources are needed to meet administrative requirements, develop technical and scientific capacity for data collection and management, as well as harmonize methodological standards (see Figure 8).

**Fig. 8**  
Areas of NCA that need  
financial resources  
(Ekins, 2015)

UCL Institute for Sustainable Resources

### Outline of presentation

- There have been calls for comprehensive natural capital accounting for many years (at least since the mid-1980s)
- Progress has been made, but it has been slow and uneven, and the information base is still far from what is required to manage natural capital in the same way as physical capital and infrastructure is managed.
- In order for policy makers to commit the necessary resources to natural capital accounting there is a:
  - Need for a compelling theoretical narrative as to why natural capital is important
  - Need for robust methodologies of measurement and assessment (DPSIR, EIA, LCA, MFA, SFA, footprints, Natural Capital Asset Check)
  - Need for applications of these methodologies (UK: satellite accounts, Biffaward, National Ecosystem Assessment)
  - Need for a clear account of the value of natural capital (in monetary or non-monetary terms)
  - Need for practical case studies as to where natural capital accounting has been useful to policy makers (in UK not clear)

**Recommendations discussed at the workshop:**

- » Sufficient financial, technical and human resources should be provided by countries to further develop NCA including ecosystem accounting for timely integration into the Systems of National Accounting in order to meet Aichi Target 2 by 2020.
- » Developing countries, which have already set up enabling conditions, should be supported financially to build technical and human capacities for NCA (see section 4.2)

## 3.2 Data management for mapping and assessment

Some methodological issues have been discussed in the workshop and the following questions arise from the debate addressing mapping and assessment, data management, and accounting methodology:

- » Which ecosystems types have to be mapped, assessed and accounted (inter alia forests, grassland, cropland, freshwater, marine, urban ecosystems)?
- » What kind of data and indicators are needed on ecosystem types and ecosystem services?
- » Should a supply or a demand approach be used regarding services?
- » Should we account for stocks or for flows of ecosystem services?
- » What are the relevant spatial scales?
- » What are useful monetary valuation methodologies?

### Mapping and assessment of ecosystems and their services

An example on how to address these questions is shown in Figure 9, which represents the approach of the **EU MAES Working Group on Mapping and Assessment of Ecosystems and their Services** (Maes et al., 2013; Maes et al., 2014) (see section 2.3). The MAES group has provided a comprehensive guidance on how to collect and mainstream existing data, information and knowledge towards mapping and assessment of ecosystems and their services, building on the Common International Classification of Ecosystem Services (CICES, Haines-Young & Potschin, 2013). The MAES reports show that one could make better use of existing datasets such as national biodiversity databases, land use/cover maps (e.g. EU CORINE Land Cover), forest and water data, habitat classification systems (e.g. European Nature Information System - EUNIS), species population data etc.

On the **methodological approach** the MAES group proposes a step-wise approach:

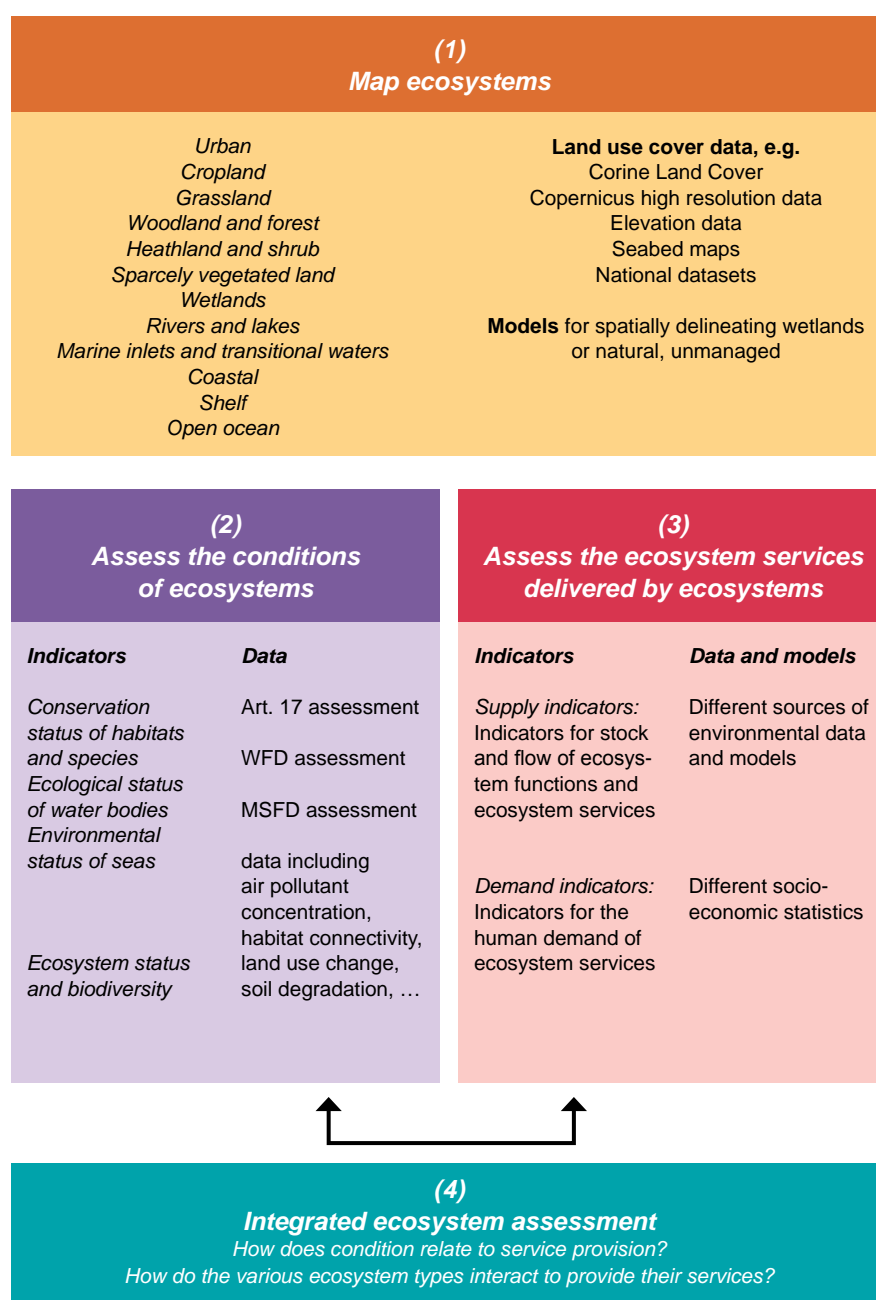
1. Produce a biophysical baseline mapping and assessment of the status of major ecosystems.
2. Produce a biophysical baseline mapping and assessment of the defined ecosystem services.
3. Align ecosystem service assessments with scenarios of future changes to ensure their usability.
4. Value ecosystem services and integrate the results into environmental and economic accounting.

The MAES group delivered a toolkit and knowledge base for ecosystem mapping and assessment (see Figure 9). However, the MAES group states that basic bio-

physical data collection and processing do need further elaboration and research (Maes et al., 2013; Maes et al., 2014).

Building on the MAES reports, the EEA has recently promoted the EU's work to develop a first version of pan-European ecosystem mapping. By using the DPSIR (Drivers-Pressures-State-Impact-Response) approach, the EEA has also proposed steps towards mapping and assessment of pressures, in relationship with ecosystem conditions, and impacts on biodiversity. Moreover, the EEA confirmed that there are knowledge gaps in terms of functional relationships between ecosystem conditions and ecosystem services (European Environment Agency, 2015).

**Fig. 9**  
Mapping and assessment  
of ecosystems and their  
services within the EU  
(Maes et al., 2014)



At the global level UNEP carried out a pilot project to develop the first **global map of the ecosystem stocks of natural capital**. The global map combines layers of key ecosystem assets into a composite map covering both terrestrial and marine ecosystems (Dickson, 2014). However, many challenges on data availability remain at the global level. In fact, in many countries **data availability and limitations remain the relevant constraints** on mapping and assessment of ecosystems and their services.

### Data management

It will be of utmost importance to **efficiently manage available data** given limited public financing and human resources (see section 3.1). Ecosystem accounting requires large sets of data on ecosystems, economic and social aspects. Some information is already available on national, European and international level, and need to be collected, stored and processed consistently.

However, the available information is often not in the necessary format or held by different organisations. Hence, the relevant data needs to be sourced or generated, shared and organized systematically for ecosystem accounting purposes. The data needs to be robust and reliable. Efficient data management on different geographical scales is a challenging task, but important for these purposes. The establishment of a comprehensive data infrastructure is a necessary long-term investment as it will provide a structure and enhance the quality of data in a way that will be useful in a wide range of policy fields (Petersen, 2015; Weber, 2014).

#### Recommendations discussed at the workshop:

- » Identify and make use of available data reported under existing environmental legislation (e.g. MAES in the EU).
- » Set up a comprehensive and integrated data infrastructure as part of a long-term investment to accomplish NCA systems.

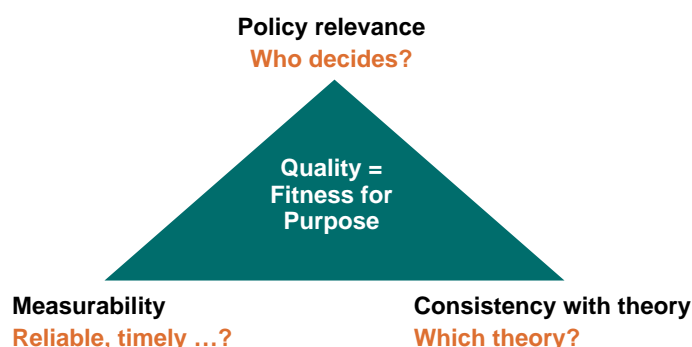
## 3.3 Accounting methodology and standard

At its forty-fourth session in 2013, the **United Nations Statistical Commission welcomed SEEA-EEA** as an important first step in the development of a statistical framework for ecosystem accounting and encouraged the use of SEEA-EEA by international and regional agencies and countries to test and experiment in this new area of statistics (see section 1.4).

Ensuring a **high quality of statistical information** is of utmost importance as a basis for policy decisions. The quality of information depends on its policy relevance, its measurability, and its conceptual consistency (see Figure 10).

The SEEA-EEA standard is the broadly agreed concept and should be **applied by all countries** in order to gather more experience and develop the framework further. Building on SEEA-EEA, it was proposed to produce an ecosystem accounting guide in order to give advice on data management and accounting methodology for practitioners.

**Fig. 10**  
Statistical challenges  
in NCA application  
(Steurer, 2015)



**Recommendations discussed at the workshop:**

- » The SEEA-EEA<sup>23</sup> standard should be applied by all countries to test and experiment with the framework, and collaborate to gather experience and to elaborate best practices in ecosystem accounting.
- » A short guide on SEEA-EEA should be produced, summarizing how national and international agencies should apply it


### 3.4 Frequent delivery of accounts

The workshop discussed the need for **regular and reliable delivery** of accounts to repeatedly focus the attention of policy makers on these issues – noting that more standard economic information e.g. relating to GDP is published very frequently and thus influences the media and public debate considerably. It was proposed that accounts should be annually or biennially completed and published.

As it builds up over time, **time-series data on natural capital** will help us to understand trends, see how well or badly we are performing in terms of our management of natural capital, and anticipate future developments (Weber, 2014). However, sufficient political support and institutional capacity will be needed to ensure continuity in data collection, management and processing (see section 2.1 and 3.2). Realistically, the frequent delivery of consistent and comprehensive ecosystem accounts is unlikely at this stage, as ecosystem accounts are still in the experimental phase. However, practitioners could start with basic accounts at the national level, i.e. forest, carbon and water accounts.

Statistics Canada was one of the first statistical offices that provided **environmental accounts over a long period (though not ecosystem accounts)**. Since 1997 results have been published annually on stocks and flows (see Figure 11). Nevertheless many gaps remain to be addressed, i.e. on marine resources, land cover, and water. Natural capital data is not as timely or frequent as corresponding economic data. Moreover, valuation of ecosystem services remains a challenge. In the case of ecosystem accounts, the work in Canada is still experimental, and such an account has so far been produced only once, in 2013.

**Fig. 11**  
NCA carried out by  
Statistics Canada  
(Smith, 2015)



## Overview

- NCA carried out by Statistics Canada since 1992
  - Official results published annually since 1997
  - *Statistics Act* provides legal basis (though not explicit)
- Stock accounts (physical and monetary; annual)
  - Minerals, forests, water, land and ecosystems
  - Value of natural capital included in national balance sheet
- Flow accounts (physical; annual and biennial)
  - Energy use, water use, GHG emissions, selected EGS
  - Integrated with the annual input-output accounts to improve analytical basis

### **Recommendations discussed at the workshop:**

- » Over time, as the methodology and technical capacity develops, ecosystem accounts should be compiled and published yearly or biennially, and should be used alongside economic accounts to inform policy makers and measure economic performance.

## 3.5 Scientific research and knowledge generation

The scientific foundation of ecosystem accounting needs to be improved in order to ensure appropriate application, as there is still a considerable lack of knowledge about the state and functioning of ecosystems in physical terms (see section 3.2). However, this is a costly process, which requires sustained financial support for research (see section 3.1).

In this context, EU funded projects such as OpenNESS and OPERAs are developing new approaches. OPERAs is developing ecosystem science for policy and practice to enhance the sustainable use of ecosystems and their management<sup>24</sup>. OpenNESS works on operational frameworks that provide tested and practical solutions for integrating ecosystem services into land, water and urban management and decision-making<sup>25</sup>. These projects and other initiatives are valuable contributions towards improving the scientific basis and developing tools for biophysical, economic and social assessments of ecosystem services. Research on ecosystem accounting and valuation is still necessary to broaden the knowledge base and should be expanded.

### **Recommendations discussed at the workshop:**

- » The scientific foundation for mapping, assessment and valuation of biodiversity and ecosystem services for ecosystem accounting should be improved and expanded through further research.

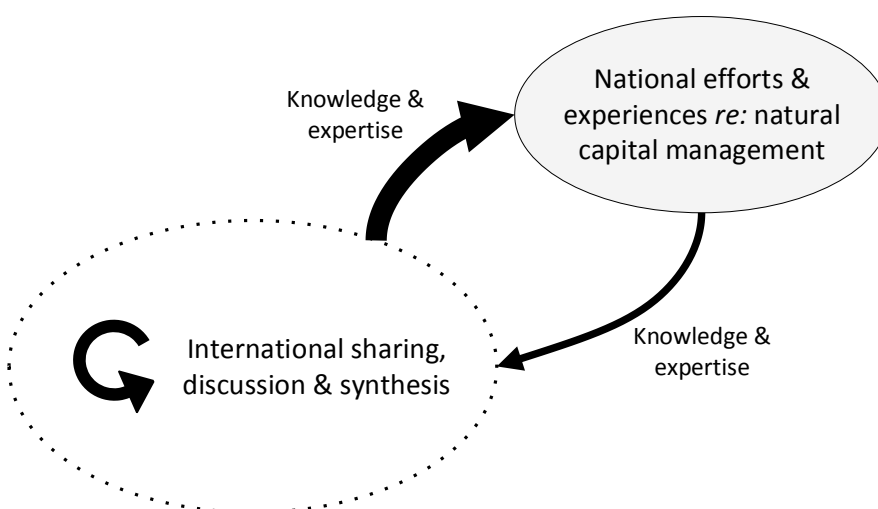
### 3.6 Capacity building, training, and exchange of information

The capacity of developed countries is more advanced (see section 2.3 on EU) than the capacity of developing countries, where the available resources for mapping, assessment, and accounting are very limited. Since the 2010 CBD COP 10 in Nagoya, Japan, **several initiatives** have been created to contribute to NCA and ecosystem accounting application including capacity building in developing countries:

- » The **World Bank's Wealth Accounting and Valuation of Ecosystem Services (WAVES)** partnership aspires to build a global platform for training and knowledge sharing and to support international work on natural capital accounting. It currently supports the implementation of natural capital accounting in eight developing countries<sup>26</sup>.
- » UNEP's Ecosystem Services Economics Unit carries out a programme on **Valuation and Accounting of Natural Capital for Green Economy (VANTAGE)** with two country-based pilot studies on ecosystem service assessment<sup>27</sup>.
- » The UNEP led **Project for Ecosystem Services (ProEcoServ)** is a GEF-funded umbrella project that aims to integrate of ecosystem services approaches into resource management in six developing countries<sup>28</sup>.
- » The **GLOBE Natural Capital Initiative (GNCI)** has been working with legislators from 21 industrialised and developing countries on knowledge sharing about the application of natural capital accounting in different country contexts<sup>29</sup>.
- » The **CBD Secretariat** published training material on "Ecosystem Natural Capital Accounts: A Quick Start Package" and convened a training session during CBD COP 12 in Pyeongchang, Republic of Korea<sup>30</sup>.
- » The **EU MAES** process (see section 2.3 and 3.2).

Lessons learned so far from these initiatives include the necessity of **improving capacity building, training, sharing of knowledge and expertise among practitioners** at the national and international level and across all sectors (see Figure 12).

**Fig. 12**  
Knowledge sharing cycle  
between the national and  
international level  
(Milligan, 2015)



Given the small number of countries which are currently engaged in the ecosystem accounting implementation process more efforts are needed across the globe. In particular, **supporting developing countries** is essential in order to help

them meet the Aichi Target 2 on integrating the values of biodiversity in development and poverty reduction plans by 2020.

Development cooperation has an important role to play in strengthening capacity and supporting the implementation of ecosystem accounting in order to meet the Aichi Target 2 by 2020.

**Recommendations discussed at the workshop:**

- » A 'knowledge sharing web platform' should be created to exchange expertise and experiences at the international and national level and among all actors.
- » Capacity building, training, sharing of knowledge and expertise among practitioners should be an integral part of ecosystem accounting projects and programs.

A review of the **policy-related users and uses of environmental accounts** compiled in a select group of developed countries by WAVES (2013) demonstrates that “environmental accounts are policy relevant and are actively used in a variety of ways. They respond directly to stated policy goals in a number of nations. In other cases, data from the accounts are used as part of the evidence base to monitor policy success. In still others, they feed into analytical research that either leads to policy action or assesses the success of that action.”<sup>31</sup>

Ecosystem accounting should be equally **policy relevant**, and should improve policy decision making affecting biodiversity and ecosystems. The workshop participants stated that there is a need to better demonstrate how NCA and ecosystem accounting can **inform decision making in various policy fields and across different sectors**. The following questions were discussed:

- » How can NCA and ecosystem accounting influence policy decisions?
- » What are the benefits of using NCA and ecosystem accounting in policy making?
- » What types of decisions can be influenced?
- » Which policy fields can benefit from NCA and ecosystem accounting?

Major policy sectors, such as finance, infrastructure development, agriculture, urbanization, water, energy/climate, forestry, biodiversity etc. could benefit from the information that NCA and ecosystem accounting can provide, whether through informing policy design, policy implementation or policy evaluation. However, the use of natural capital accounts and data to inform these decisions remains limited. It appears **difficult for policymakers to make the link between environment and ecosystem accounts, and policy decision making** (see sector 1.5).

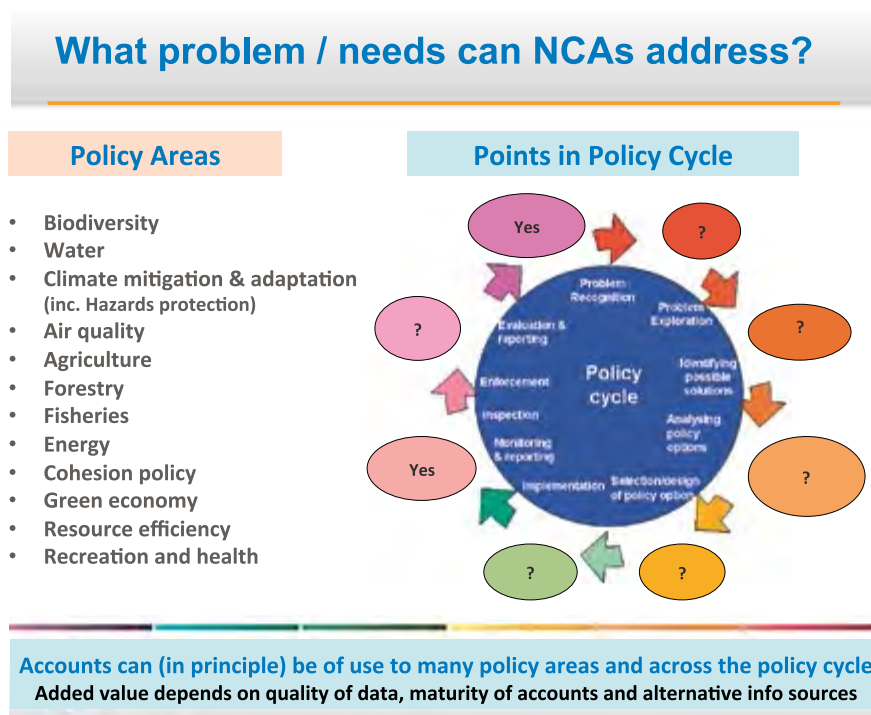
### 4.1. Application in sector policies

In principle, NCA can be of use in a broad range of policy fields and across the policy cycle, as was presented at the workshop (see Figure 13).

NCA can help throughout the policy cycle, for example through:

- » **Problem recognition and exploration** by collecting information on the state of ecosystem capital stocks and flows and by providing information on the pressures on ecosystems and their services.
- » **Identifying possible solutions** through providing complementary information for the development of policies.
- » **Supporting policy implementation** by for example identifying areas of degradation meriting attention and areas of potential added value from investment in nature for ecosystem services.
- » **Monitoring and reporting**, as NCA can help to track progress regarding degradation and restoration objectives (Ten Brink, 2015).

**Fig. 13**  
Policy fields and points  
in policy cycle of  
relevance for NCA  
(Ten Brink, 2015)



Within the EU MAES exercise, it was shown that the results of ecosystem accounting could feed information into various EU policies in order to demonstrate the values of ecosystems and their services (Maes et al., 2014, see Figure 14). This includes policies related to natural resources management, e.g. forest and land management and marine protected areas to enhance fisheries. It can also play an important role in informing climate adaptation strategies and infrastructure development of the EU. Moreover, ecosystem accounting can be used to identify priority areas for conservation and investment in natural capital restoration.

**Fig. 14**  
EU Policy fields  
targeted by the  
MAES process  
(Maes et al., 2014)



The example from Portugal presented at the workshop illustrated how marine policy issues can be informed through ecosystem accounting at the regional level. The Gulbenkian Oceans Initiative is carrying out a research project on ecosystem assessment and mapping, and building direct links between marine ecosystem services and economic activities/human wellbeing (see Figure 15). It also explores the current threats to ecosystems, drivers of change and negative externalities, analyses trade-offs and undertakes scenario analysis (Saldanha, 2015).

**Fig. 15**  
Ecosystem Valuation  
targeting marine  
policy in Portugal  
(Saldanha, 2015)



## 4.2. Application in national policies

NCA and ecosystem accounting can play a crucial role in **national economic development planning, and likewise can play a crucial role in informing sustainable development planning, poverty reduction strategies, and green economy approaches in developing countries.** The developing countries engaged in the initiatives of WAVES<sup>32</sup>, VANTAGE<sup>33</sup>, ProEcoServ<sup>34</sup>, and GLOBE<sup>35</sup>, are usually aiming to achieve better policy integration and the mainstreaming of NCA considerations in their sustainable development planning at the national level (see Table 3). However, currently only a small number of developing countries which are Parties to the CBD have started the process towards utilising ecosystem accounting.

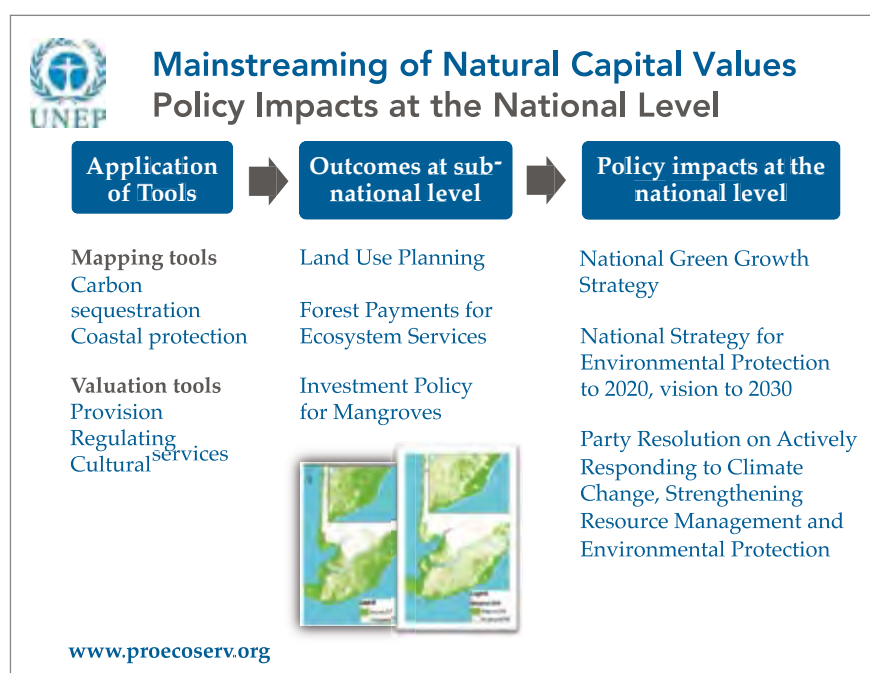
**Tab. 3**  
Countries participating  
in global initiatives  
to apply ecosystem  
accounts

	Africa	Asia	Latin America	Europe
<b>WAVES</b>	Botswana Madagascar Ruanda	Indonesia Philippines	Colombia Costa Rica Guatemala	
<b>VANTAGE</b>	Uganda	India		
<b>ProEcoServ</b>	South Africa & Lesotho	Vietnam	Chile Trinidad & Tobago	
<b>GLOBE Initiative</b> (the GLOBE Legislators Network also comprises countries with economies in transition* and developed countries**)	DRC Nigeria South Africa	India Indonesia Mongolia Philippines  China* Japan** Korea (ROK)**	Colombia Costa Rica Peru  Argentina* Brazil* Mexico* Canada** USA**	France** Germany** Italy** United Kingdom** Slovenia** Sweden** Russia** Other EU and non-EU countries**

These initiatives by international agencies and institutions aim

- » To help countries incorporate the value of natural capital in national accounts (WAVES).
- » To integrate assessment results into development planning and policies, ensuring that courses of action including those that increase food security and alleviate poverty are consistent with environmental sustainability (VANTAGE).
- » To better integrate ecosystem assessment, scenario development and economic valuation of ecosystem services into national sustainable development planning (ProEcoServ).
- » To advance the implementation and long-term integration of the natural capital approach into decision-making across all government departments (GLOBE).

**Fig. 16**  
Policy impacts through  
mainstreaming of  
NCA into national and  
subnational strategies  
(Esen, 2015)



In developing countries NCA can help to identify trends in natural capital use and depletion which will impose costs and risks on the economy, and which will significantly impact the achievement of sustainable development pathways. Ecosystem accounting can influence policies at both the national and the local level (see Figure 16).

Overall, less than 20% of the Parties to the CBD are currently in the process of developing ecosystem accounts for policy making as required by Aichi Target 2 (see section 1.2). Hence, efforts need to be scaled up significantly in order to meet the 2020 target. Particular emphasis should be given to **supporting developing countries to enhance application.**

**Recommendation discussed at the workshop:**

- » More effort must be made to develop and mainstream NCA and ecosystem accounting into national development plans, poverty reduction strategies, and green economy approaches in developing and developed countries, if Aichi Target 2 will be met in 2020.
- » Enhanced support should be provided by development agencies to national governments and international initiatives to build more capacity for the timely implementation and application of NCA and ecosystem accounting by 2020 (see section 3.6).

### 4.3. Mainstreaming ecosystem accounting into economic policymaking

NCA and ecosystem accounting should be **embedded in all aspects of economic policy making**, not just utilised for environmental policy. Environmental accounts can be used to report on the impact and assess the performance of not only environmental policies, but also growth and development strategies as discussed above. Indeed, they can be used as a complementary measure to assess the state of the nation's overall economic performance alongside GDP. NCA and ecosystem accounting are central to the discussion on the need to **look 'beyond GDP'** to measure the 'true wealth' of nations<sup>36</sup>. GDP is currently used as the main measure of a nation's economic performance and wealth, but it overlooks the economic impact of the depletion of stocks of natural capital on the ecosystem services they can deliver, and thus ignores the potential negative impact of natural capital depletion on a country's future economic performance.

As ecosystem accounting is still in an experimental phase there is not a huge body of evidence available on policy applications as yet. However, during the workshop a suite of **potential policy applications** was presented (see Figure 18), which range far beyond environmental policies.


For example, ecosystem accounting can potentially play an important role in **disaster risk reduction**, by facilitating more explicit consideration of the impact of natural capital depletion on risks such as flooding, storm damage or drought. Conversely ecosystem accounting might help identify opportunities for cost-effective solutions based on natural infrastructure, reducing costs for risk mitigation strategies e.g. by reducing the need for the construction of artificial flood defences for example.

It would be possible to undertake scenario analysis to assess **future risks to the**

**economy from natural capital depletion**, based on projections of future trends under different assumptions. This would be similar to the ‘**stress testing exercise**’ that takes place in the banking sector in Europe, which assesses the sector’s vulnerability under a range of possible future macroeconomic scenarios, and thus highlights risks and helps inform appropriate policy responses.

Ecosystem accounting can also be used to **influence public spending decisions**, and to **prioritise investment in ecosystem restoration**, by identifying those natural assets which will yield the largest economic gain. It can also be used in the design of mechanisms that will help to finance investment in natural capital, such as **pollution taxes**, or **payments for ecosystem services**, and to help make the business case for investment in **natural capital restoration projects** (see Figure 17).

**Fig. 17**  
Potential policy  
applications (Ellis,  
2015)



## Potential Policy applications

**Risk assessment and management**

- UK Natural Capital Committee's asset risk register to identify tipping points
- Risks to current / future sources of growth = 'stress testing' exercise like banks
- Disaster risk reduction, such as flooding, storm damage or drought

**Inform public finance decisions**

- Identify priorities for investment (e.g. based on asset risk register)
- Enhance value for money (e.g. cost effective infrastructure development, saving health costs etc.)
- WWF's proposed 'fund pooling' approach
- Project appraisal / cost benefit analysis / Environment Impact Assessment

**Facilitate financing mechanisms for investment in natural capital restoration**

- Identify 'investable' projects (e.g. EU Natural Capital Financing Facility)
- Identify policy mechanisms that will help create incentives for business to invest i.e. create markets for environmental goods, or through taxation etc.
- Support PES schemes and many others
- Sovereign wealth funds

1

Overall, the workshop presentations showed that a wide range of potential policy applications exists, and that substantial economic benefits can be gained from better recognition of ecosystem accounting in different policy fields.

#### **Recommendations discussed at the workshop:**

- » Develop an advocacy strategy that demonstrates the need to mainstream ecosystem accounting into economic policymaking, by highlighting the economic costs of overlooking natural capital depletion, and the policy benefits of incorporating it more widely into economic decision making.

## Towards an action plan for improved natural capital and ecosystem accounting implementation

**Some progress has been achieved in recent years**, in the mapping and assessment of biodiversity and ecosystems and their services and, to a lesser extent, the incorporation of their values into planning processes and strategies. There has also been progress when it comes to integrating NCA and ecosystem accounting into frameworks of national accounts. However, the discussions in the workshop clearly revealed that enormous effort is still required if we are to achieve the CBD's Aichi Target 2, which states that by 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems<sup>37</sup>.

That conclusion is backed by the latest national reports submitted to the CBD Secretariat. While these indicate some progress towards Aichi Target 2, they show that we are nonetheless falling significantly short of what is required, and the GBO-4 states that relatively **little attention is still given to the integration of natural capital accounting into national reporting and accounting systems**<sup>38</sup>.

What steps need to be taken to make the significant and necessary progress required, to achieve our commitments within the specified 2020 timeline? Pulling together the key conclusions and recommendations from the workshop, the following proposed 'action plan' provides guidance as to how efforts could be scaled up with this goal in mind, by 2020:

Countries, stakeholder, and international organisations should take urgent action on the following recommendations:

**By 2015, natural capital and ecosystem accounting should be incorporated into the Post 2015 Development Agenda by:**

- » Better integrating NCA and ecosystem accounting into the targets of the Sustainable Development Goals.
- » Using the SEEA-EEA framework with its suite of indicators to monitor natural capital and ecosystem changes as part of the SDG implementation framework.

**By 2016, the CBD COP 13 should be urged to scale up efforts by**

- » Elaborating a review and assessment of status, approaches, and outputs of the various international initiatives on ecosystem accounting and present the results at CBD COP 13.
- » Developing a roadmap to advocate for the achievement of ecosystem accounting according to the Aichi Target 2 timeline and to call upon CBD Parties to take concrete steps towards rapid implementation.

**From now onwards, governments should enhance efforts to implement natural capital and ecosystem accounting at the national level by**

- » Setting up a high-level independent Natural Capital Committee in each country to advise the government on strategies and actions to integrate NCA in reporting systems.
- » Establishing horizontal, cross-sectoral, and vertical coordination teams between different government authorities, agencies, and stakeholders.

- » Designating a lead agency to steer the national NCA process.
- » Developing appropriate legislation and administrative structures to integrate ecosystem accounting and NCA in relevant policy frameworks.
- » Providing sufficient and long-term financial, technical and human resources for timely integration into the Systems of National Accounting.

**From now until 2020, countries must collaborate to build experience in the application of NCA, to improve data collection, and plug knowledge gaps with appropriate research**

- » By applying the SEEA-EEA<sup>40</sup> standard in all countries to test, experiment and collaborate to accumulate and synthesise experience and to elaborate best practices in ecosystem accounting.
- » By developing a comprehensive and integrated data infrastructure with data from all sources (such as field data, satellite and remote sensing), and an effective data management.
- » By improving the scientific foundation of ecosystem accounts and closing knowledge gaps with additional research.
- » By publishing ecosystem accounts yearly or biennially, complementing economic accounts.

**From 2016 onwards, establish and implement a communication strategy**

- » To call for high-level political support to meet the policy commitments that have been made at the global, European and national level.
- » To identify NCA and ecosystem accounting champions and best practices to increase the awareness of policy makers about this agenda.
- » To develop case studies illustrating the wide policy relevance and importance of incorporating NCA and ecosystem accounting into economic policy decisions.
- » To illustrate the relevance of accounting for national sector policies and increase its application in decision-making processes.
- » To share lessons learned and information on the values of biodiversity and related ecosystem services widely with stakeholders and decision makers.

**By 2016, start a capacity building and knowledge sharing initiative**

- » To create a 'knowledge sharing web platform' to exchange expertise and experience at the international and national level, and across all sectors.
- » To enhance capacity building, training, sharing of knowledge and expertise among practitioners.
- » To publish a short guide on SEEA-EEA<sup>41</sup>, summarizing how national and international agencies should go about implementing ecosystem accounting.

**From 2016 onwards, for development agencies and international initiatives to support developing countries in the implementation of natural capital and ecosystem accounting**

- » To strengthen international initiatives to assist developing countries in the implementation and application of ecosystem accounting.
- » To support financially those developing countries which have sufficient enabling conditions in place for NCA to build appropriate technical, human and legal capacities.
- » To assist those developing countries which have sufficient enabling conditions in place for NCA in mainstreaming NCA and ecosystem accounting into national development plans, poverty reduction strategies, and green economy approaches to meet the Aichi Target 2 in 2020.

**The European Union should speed up efforts and take the following steps:**

- » By 2015, encourage more Member States to engage in the EC MAES Working Group activities to broaden the experience with ecosystem accounting in Member States and provide additional funding.
- » By 2016, develop a long-term vision and plan at the EU level to integrate the fragmented activities of ministries, agencies, statistical offices and research institutions and to better coordinate parallel processes.
- » By 2016, to establish a 'knowledge innovation platform' to strengthen the knowledge generation, data foundation, and capacity to efficiently manage data and information.
- » By 2016, enhance the work to develop a set of EU-wide ecosystem accounts and provide clear methodological guidance to Member States in a reference document.
- » By 2016, prepare a module for ecosystem services accounts for inclusion in the EU Regulation on European Environmental Economic Accounts in 2017.

## References

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- Allebone-Webb, S., Jiménez-Aybar, R., Matthews, A., Stevens, D., 2013. The GLOBE Natural Capital Legislation Study. The Global Legislators' Organisation. London, UK. <http://globelegislators.org/images/natural-capital-study/GLOBE-Natural-Capital-Legislation-Study.pdf>
- Convention on Biological Diversity, 2010. Conference of the Parties 10, decision X/2, UNEP/CBD/COP/DEC/X/2, 29 October 2010. <https://www.cbd.int/decision/cop/default.shtml?id=12268>
- Dickson, B., Blaney, R., Miles, L., Regan, E., van Soesbergen, A., Väänänen, E., Blyth, S., Harfoot, M., Martin, C.S., McOwen, C., Newbold, T., van Bochove, J., 2014. Towards a global map of natural capital: Key ecosystem assets. UNEP, Nairobi, Kenya. [http://wcmc.io/towards\\_a\\_global\\_map\\_of\\_natural\\_capital](http://wcmc.io/towards_a_global_map_of_natural_capital)
- European Commission, 2011. Our life insurance, our natural capital: an EU biodiversity strategy to 2020, COM (2011) 244 final, Brussels. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0244&from=EN>
- European Environment Agency, 2015. European ecosystem assessment — concept, data, and implementation. Contribution to Target 2 Action 5 Mapping and Assessment of Ecosystems and their Services (MAES) of the EU Biodiversity Strategy to 2020. EEA Technical report, No 6/2015. Copenhagen. <http://www.eea.europa.eu/publications/european-ecosystem-assessment>
- European Parliament and Council, 2011. Regulation (EU) No 691/2011 of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts, Official Journal of the European Union, L 192/1, 22.7.2011. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:192:0001:0016:EN:PDF>
- European Parliament and Council, 2013. EU 7th Environment Action Programme to 2020. Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet', Official Journal of the European Union, L 354/171, 28.12.2013. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013D1386&from=EN>
- European Parliament and Council, 2014. Regulation (EU) No 538/2014 of the European Parliament and of the Council of 16 April 2014 amending Regulation (EU) No 691/2011 on European environmental economic accounts, Official Journal of the European Union, L 159/113, 27.5.2014. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0538&from=EN>
- European Statistical System Committee, 2014. European Strategy for Environmental Accounts, 21st Meeting of the European Statistical System Committee, ESSC 2014/21/24/EN, 11 April 2014, Luxembourg. <http://ec.europa.eu/eurostat/documents/1798247/6079569/ESSC-2014-21-EN-24-EuropeanStrategy-env.pdf>
- Haines-Young, R., Potschin, M., 2013. Common International Classification of Ecosystem Services, Consultation on Version 4 August-December 2012, Report to The European Environment Agency. [http://test.matth.eu/content/uploads/sites/8/2012/07/CICES-V43\\_Revised-Final\\_Report\\_29012013.pdf](http://test.matth.eu/content/uploads/sites/8/2012/07/CICES-V43_Revised-Final_Report_29012013.pdf)
- Maes, J., et al., 2013. Mapping and Assessment of Ecosystems and their Services. An analytical framework for ecosystem assessments under action 5 of the EU biodiversity strategy to 2020. Publications office of the European Union, Luxembourg. [http://ec.europa.eu/environment/nature/knowledge/ecosystem\\_assessment/pdf/MAESWorkingPaper2013.pdf](http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/MAESWorkingPaper2013.pdf)
- Maes, J., et al., 2014. Mapping and Assessment of Ecosystems and their Services. Indicators for ecosystem assessments under Action 5 of the EU Biodiversity Strategy to 2020. Publications office of the European Union, Luxembourg. [http://ec.europa.eu/environment/nature/knowledge/ecosystem\\_assessment/pdf/2ndMAESWorkingPaper.pdf](http://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/2ndMAESWorkingPaper.pdf)
- Milligan, B., Terama, E., Jiménez-Aybar, R., Ekins, E., 2014. GLOBE Natural Capital Accounting Study, 2nd Edition. GLOBE International and University College London. London. <http://globelegislators.org/publications/legislation/natural-capital-new>
- Millennium Ecosystem Assessment, 2003. Ecosystems and Human Well-being: A Framework for Assessment. Island Press, Washington. <http://www.unep.org/maweb/documents/document.765.aspx.pdf>
- Pearce, D.W., Markandya, A., Barbier, E., 1989. Blueprint for a Green Economy. Earthscan, London.
- Petersen, J.E., Gocheva, K., 2015. EU reference document on Natural Capital Accounting. Prepared as part of the EU MAES process (Mapping and Assessment of Ecosystems and their Services). Revised draft for consultation, 6 January 2015. [http://projects.eionet.europa.eu/ecosystem-capital-accounting/library/reference-document-natural-capital-accounting/final-revised-reference-document-nca-consultation-january-2015/download/en/1/NCA\\_draft%20reference%20document\\_for%20consultation\\_06-01-2015.pdf](http://projects.eionet.europa.eu/ecosystem-capital-accounting/library/reference-document-natural-capital-accounting/final-revised-reference-document-nca-consultation-january-2015/download/en/1/NCA_draft%20reference%20document_for%20consultation_06-01-2015.pdf)
- Secretariat of the Convention on Biological Diversity, 2014. Global Biodiversity Outlook 4, Montreal. [www.cbd.int/GB04](http://www.cbd.int/GB04)
- Sustainable Development Solutions Network, 2015. Indicators and a Monitoring Framework for Sustainable Development Goals. Revised working draft for consultation, 15 May 2015. <http://unsdsn.org/resources/publications/indicators/>
- United Nations, 2014. Open Working Group proposal for Sustainable Development Goals. Document A/68/970, 12 August 2014. <https://sustainabledevelopment.un.org/sdgsproposal> and <http://undocs.org/A/68/970>

United Nations, European Commission, FAO, IMF, OECD, The World Bank, 2014a. System of Environmental-Economic Accounting 2012 – Central Framework. New-York. [http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA\\_CF\\_Final\\_en.pdf](http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf)

United Nations, European Commission, FAO, OECD, The World Bank, 2014b. System of Environmental-Economic Accounting 2012 – Experimental Ecosystem Accounting. New-York  
[http://unstats.un.org/unsd/envaccounting/seeaRev/eea\\_final\\_en.pdf](http://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf)

WAVES, 2013. Users and Uses of Environmental Accounts - A Review of Select Developed Countries. Waves, World Bank Group. <http://www.wavespartnership.org/sites/waves/files/documents/PTEC1-%20Users%20and%20Uses%20of%20Environmental%20Accounts.pdf>

Weber, J.L., 2014. Ecosystem Natural Capital Accounts: A Quick Start Package. Technical Series No. 77, Secretariat of the Convention on Biological Diversity, Montreal. <https://www.cbd.int/doc/publications/cbd-ts-77-en.pdf>

WWF, 2014. Accounting for Natural Capital in EU Policy Decision-Making - A WWF background paper on policy developments. WWF Germany, Berlin. [http://wwf.panda.org/about\\_our\\_earth/all\\_publications/?222134/Accounting-for-Natural-Capital-in-EU-Policy-Decision-Making-A-WWF-background-paper-on-policy-developments](http://wwf.panda.org/about_our_earth/all_publications/?222134/Accounting-for-Natural-Capital-in-EU-Policy-Decision-Making-A-WWF-background-paper-on-policy-developments)

## Workshop presentations

---

Comolet, A., 2015. Ecosystem Accounting for More Effective Mainstreaming of Ecosystem Concerns into Development Policy. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Ekins, P., 2015. Building Policy Support for Natural Capital Accounting. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Esen, E., 2015. The Role of NCA in Mainstreaming Natural Capital into Development Planning Experiences from Developing Countries. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Jeantil, M., Recuero Virto, L., 2015. Environmental accounting and public policy decisions. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Ledoux, L., 2015. Natural Capital Accounting and MAES, the EU policy context. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Milligan, B., 2015. 2nd GLOBE Natural Capital Accounting Study. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Petersen, J.E., 2015. Natural capital accounting – current progress in relation to the MAES pilot. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Puydarrieux, P., 2015. Natural Capital Accounting in France. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Saldanha, F., 2015. Portugal Case Study. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Smith, R., 2015. Natural Capital Accounting in Canada. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Steurer, A., 2015. Addressing obstacles for incorporation of ecosystems and their services into accounting systems - policy and statistical context. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 28 January 2015.

ten Brink, P., 2015. Making natural capital accounts policy relevant – opportunities and challenges. Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

Weber, J.-L., 2015. From environmental to ecosystem accounting, what is our experience? Presentation at the International Workshop on opportunities and obstacles for Natural Capital Accounting. Brussels, 27 January 2015.

## Additional sources of information

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Beyond GDP – European Commission: [http://ec.europa.eu/environment/beyond\\_gdp/index\\_en.html](http://ec.europa.eu/environment/beyond_gdp/index_en.html)  
BISE – Biodiversity information system for Europe: [www.biodiversity.europa.eu](http://www.biodiversity.europa.eu)  
CICES - Common International Classification of Ecosystem Services: <http://cices.eu/>  
CBD - Convention on Biological Diversity: <http://www.cbd.int/>  
Ecosystem Services Partnership: <http://www.es-partnership.org/esp>  
EU BON – Building the European Biodiversity Observation Network: [www.eubon.eu](http://www.eubon.eu)  
Eurostat – Environment: <http://ec.europa.eu/eurostat/web/environment/>  
Globe Natural Capital Initiative: <http://globelegislators.org/the-globe-natural-capital-initiative>  
European Commission - Joint Research Centre: <https://ec.europa.eu/jrc/>  
London Group on Environmental Accounting: <http://unstats.un.org/unsd/envaccounting/londongroup/>  
MAES: <http://biodiversity.europa.eu/maes>  
Millennium Ecosystem Assessment: <http://www.millenniumassessment.org/en/index.html>  
Natural Capital Coalition: <http://www.naturalcapitalcoalition.org/>  
Natural Capital Project: <http://www.naturalcapitalproject.org/>  
OECD Better Life Index: <http://www.oecdbetterlifeindex.org/>  
OpenNESS : [www.openness-project.eu](http://www.openness-project.eu)  
OPERAs: [www.operas-project.eu](http://www.operas-project.eu)  
ProEcoServ: <http://www.proecoserv.org/>  
System of Environmental-Economic Accounting: <http://unstats.un.org/unsd/envaccounting/default.asp>  
TEEB: <http://www.teebweb.org/>  
The World Bank – Wealth of Nations: <http://data.worldbank.org/data-catalog/wealth-of-nations>  
UNCEEA - UN Committee of Experts on Environmental-Economic Accounting: <http://unstats.un.org/unsd/envaccounting/ceea/>  
UNEP Finance Initiative: <http://www.unepfi.org/>  
UNEP Inclusive Wealth Index: <http://inclusivewealthindex.org/>  
Vantage - Valuation & Accounting of Natural Capital for Green Economy: <http://www.es-valuation.org/index.php/es-unit/vantage>  
WAVES - Wealth Accounting and the Valuation of Ecosystem Services: <https://www.wavespartnership.org/en>

## List of Acronyms

7EAP	7th EU Environmental Action Programme	Eurostat	The statistical office of the European Union
CBD	Convention on Biological Biodiversity	GDP	Gross Domestic Product
CICES	Common International Classification of Ecosystem Services	GLOBE	Global Legislators Organisation
COP	Conference of the Parties	IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
EEA	European Environment Agency	MA	Millennium Ecosystem Assessment
EU	European Union	MAES	Mapping and Assessment of Ecosystems and their Services
Eurostat	The statistical office of the European Union	NCA	Natural Capital Accounting
GBO-4	Global Biodiversity Outlook 4	NGO	Non-Governmental Organisations
GDP	Gross Domestic Product	OECD	Organisation for Economic Co-operation and Development
GLOBE	Global Legislators Organisation	PES	Payments for Ecosystem Services
MAES	Mapping and Assessment of Ecosystems and their Services	REDD	Reducing Emissions from Deforestation and Forest Degradation
MEA	Millennium Ecosystem Assessment	SEEA	System of Environmental-Economic Accounts
NCA	Natural Capital Accounting	SEEA CF	System of Environmental-Economic Accounts Central Framework
NGO	Non-Governmental Organisations	SEEA EEA	System of Environmental-Economic Accounts Experimental Ecosystem Accounts
OECD	Organisation for Economic Co-operation and Development	SNA	System of National Accounts
ProEcoServ	Project for Ecosystem Services	TEEB	The Economics of Ecosystems and Biodiversity
SDG	Sustainable Development Goals	UK	United Kingdom
SEEA	System of Environmental-Economic Accounts	UK NCC	United Kingdom Natural Capital Committee
SEEA-CF	System of Environmental-Economic Accounts Central Framework	UK NEA	United Kingdom National Ecosystem Assessment
SEEA-EEA	System of Environmental-Economic Accounts Experimental Ecosystem Accounts	UNCCD	United Nations Convention to Combat Desertification
SNA	System of National Accounts	UNCEEA	United Nations Committee of Experts on Environmental-Economic Accounting
TEEB	The Economics of Ecosystems and Biodiversity	UNFCCC	United Nations Framework Convention on Climate Change
UK	United Kingdom	UNEP	United Nations Environmental Programme
UK NCC	United Kingdom Natural Capital Committee	WAVES	Wealth Accounting and Valuation of Ecosystem Services
UK NEA	United Kingdom National Ecosystem Assessment	WWF	World Wide Fund for Nature
UN	United Nations		
UNEP	United Nations Environmental Programme		
VANTAGE	Valuation and Accounting of Natural Capital for Green Economy		
WAVES	Wealth Accounting and Valuation of Ecosystem Services		
WWF	World Wide Fund for Nature		
CBD	Convention on Biological Biodiversity		
CICES	Common International Classification of Ecosystem Services		
COP	Conference of the Parties		
EC	European Commission		
EEA	European Environment Agency		
EU	European Union		

## Footnotes

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- 1) <https://www.cbd.int/decision/cop/default.shtml?id=12268>
- 2) <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0244&from=EN>
- 3) <http://www.unep.org/maweb/documents/document.765.aspx.pdf>
- 4) United Nations et al., 2014. System of Environmental-Economic Accounting 2012 – Central Framework. New-York. [http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA\\_CF\\_Final\\_en.pdf](http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf)
- 5) United Nations et al., 2014. System of Environmental-Economic Accounting 2012 – Experimental Ecosystem Accounting. New-York. [http://unstats.un.org/unsd/envaccounting/seeaRev/eea\\_final\\_en.pdf](http://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf)
- 6) <http://globelegislators.org/the-globe-natural-capital-initiative>
- 7) <https://www.wavespartnership.org/en>
- 8) <http://globelegislators.org/the-globe-natural-capital-initiative>
- 9) <https://sustainabledevelopment.un.org/sdgsproposal> and <http://undocs.org/A/68/970>
- 10) <http://unsdsn.org/wp-content/uploads/2015/05/FINAL-SDSN-Indicator-Report-Table-1.pdf> and <http://unsdsn.org/wp-content/uploads/2015/05/FINAL-SDSN-Indicator-Report-Table-2.pdf>
- 11) [www.cbd.int/GBO4](http://www.cbd.int/GBO4)
- 12) Wealth Accounting and the Valuation of Ecosystem Services; <https://www.wavespartnership.org/en>
- 13) The World Bank – Wealth of Nations, <http://data.worldbank.org/data-catalog/wealth-of-nations>
- 14) TEEB, [www.teebweb.org](http://www.teebweb.org)
- 15) UNEP Inclusive Wealth Index, <http://inclusivewealthindex.org/>
- 16) The Globe Natural Capital Initiative, <http://globelegislators.org/the-globe-natural-capital-initiative>
- 17) EU 7th Environment Action Programme, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D1386&from=EN>
- 18) REGULATION (EU) No 691/2011, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:192:0001:0016:EN:PDF> and REGULATION (EU) No 538/2014, amending Regulation (EU) No 691/2011 <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0538&from=EN>
- 19) European Strategy for Environmental Accounts, <http://ec.europa.eu/eurostat/documents/1798247/6079569/ES-SC-2014-21-EN-24-EuropeanStrategy-env.pdf>
- 20) Milligan, B., Terama, E., Jiménez-Aybar, R., Ekins, E., 2014. GLOBE Natural Capital Accounting Study, 2nd Edition. GLOBE International and University College London. London, UK. <http://globelegislators.org/publications/legislation/natural-capital-new>
- 21) UK National Ecosystem Assessment <http://uknea.unep-wcmc.org/>
- 22) <http://www.naturalcapitalcommittee.org/>
- 23) SEEA-EEA = System of Environmental-Economic Accounts – Experimental Ecosystem Accounts
- 24) OPERAs <http://www.operas-project.eu>
- 25) OpenNESS <http://www.openness-project.eu/>
- 26) WAVES, <http://www.wavespartnership.org/en/waves>
- 27) VANTAGE, <http://www.esv-valuation.org/index.php/esv-unit/vantage>
- 28) ProEcoServ, <http://www.proecoserv.org/>
- 29) Globe Natural Capital Initiative, <http://globelegislators.org/the-globe-natural-capital-initiative>
- 30) ENCA Quick Start Package, <https://www.cbd.int/doc/publications/cbd-ts-77-en.pdf>
- 31) <http://www.wavespartnership.org/sites/waves/files/documents/PTEC1-%20Users%20and%20Uses%20of%20Environmental%20Accounts.pdf>
- 32) <http://www.wavespartnership.org/en/waves>
- 33) <http://www.esv-valuation.org/index.php/esv-unit/vantage>
- 34) <http://www.proecoserv.org/>
- 35) <http://globelegislators.org/the-globe-natural-capital-initiative>
- 36) [http://ec.europa.eu/environment/beyond\\_gdp/index\\_en.html](http://ec.europa.eu/environment/beyond_gdp/index_en.html)
- 37) Convention on Biological Diversity (2010), Conference of the Parties 10, decision X/2, UNEP/CBD/COP/DEC/X/2 (29 October 2010) <https://www.cbd.int/decision/cop/default.shtml?id=12268>
- 38) <https://www.cbd.int/gbo4/>
- 39) SEEA-EEA = System of Environmental-Economic Accounts – Experimental Ecosystem Accounts
- 40) SEEA-EEA = System of Environmental-Economic Accounts – Experimental Ecosystem Accounts
- 41) SEEA-EEA = System of Environmental-Economic Accounts – Experimental Ecosystem Accounts



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