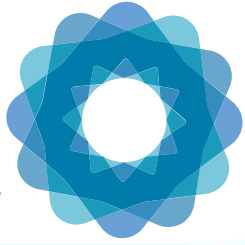




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System of
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Natural Capital

Issue paper

Prepared for the 30th Meeting of the London Group on Environmental Accounting by:

Aldo Femia

Ioanna Grammatikopoulou

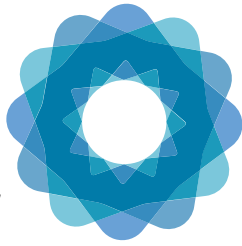
Alessandra La Notte

Simon Schürz

Clément Surun

Michael Wolf

30th September to 3rd October 2024 | Washington D.C



Motivation

🌸 Definition for accounting frameworks and official statistics

- 🌸 Widespread (and diverse) use of term „natural capital“
- 🌸 No formal definition in SNA 2008, SEEA CF 2012 or SEEA EA 2021, but introduction of some aspects of natural capital in SNA 2025
- 🌸 Labels are important. They convey ideas and world views. Providing definitions is part of our job

🌸 Implications of the SNA 2025 introduction of natural capital

- 🌸 Issues within the SNA
- 🌸 Issues extend to SEEA, in particular the SEEA CF update

🌸 Natural capital and sustainability?

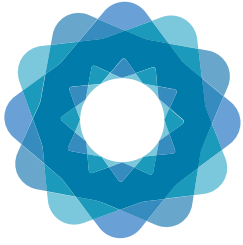
- 🌸 What information is needed?
- 🌸 Natural capital between weak and strong sustainability

🌸 (Natural capital valuation)

SEEA CF Update Issue List:

In the 2025 SNA revision, several issues have been addressed in the area of natural capital and the environment, and the updated SEEA CF must consider the implications. In addition, there is a need to understand the implications of changes to the asset classification of the 2025 SNA, as there is a need for a harmonized asset classification for the SNA/SEEA from a SEEA perspective, i.e. the inclusion of natural resources / ecosystems / renewable energy resources etc. In addition, there may be overlaps in terminology between the SEEA CF and 2025 SNA which need to be clarified.

To ensure consistency with the SNA it should be investigated if the changes in the 2025 SNA have an impact on the SEEA. First an overall impact assessment of the proposed changes will be done. Based on this assessment, changes to the SEEA may be proposed.



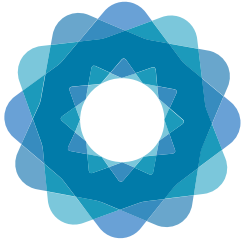
Conceptual Background

🌸 Early uses natural capital:

- 🌸 First treatment of nature as capital dates back to the early 20th century (e.g. Muir, Pinchot)
- 🌸 Natural capital included in wealth accounts and macro-frameworks (e.g. Weitzman 1976)
- 🌸 Critique of „pricing of nature“ (e.g. Schumacher)

🌸 Natural capital as one of society's capitals:

- 🌸 Comprehensive wealth measurement, sustainable development (Pearce 1988, Daly 1990)



Conceptual Background (cont'd)

🌸 Natural capital and accounting:

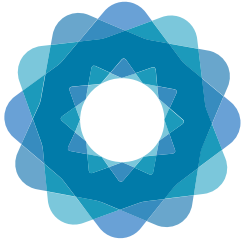
- 🌸 Classical perspective: In accounting, capital initially corresponded to the part of the loan that had to be repaid in full and had to be kept intact
- 🌸 *Capital* originally concerns a physical asset under human control for which property rights are enforced and economically used, and cared for by an owner
- 🌸 (Modern) Capitalist Capital: Materialist and fundist perspectives

🌸 Natural capital and economic theories:

- 🌸 Neoclassical theory: natural capital as input in production function, externalities need to be internalized
- 🌸 Critique

🌸 Natural capital and sustainability concepts

- 🌸 Weak sustainability: compensation of exhaustible resources by increase in artificial capital + mitigation of damages
- 🌸 Strong sustainability: limits to substitutability, critical capital, reference conditions



Definitions of Natural Capital

🌸 Early definitions focused on a production perspective (*materialist perspective*):

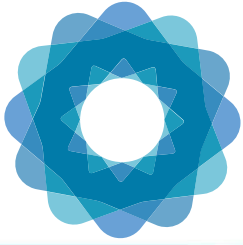
🌸 *Natural capital [are] natural assets in their role of providing natural resource inputs and environmental services for economic production. (United Nations 1997)*

🌸 Shift to view natural capital as source of current and future flows of benefits (*fundist perspective*):

🌸 *Natural capital refers to the stock of renewable and nonrenewable natural resources that are used by economic units (i.e., industries, households, and government), including flows of nonrenewable resources like energy and minerals as well as ecosystem services. (United Nations 2020)*

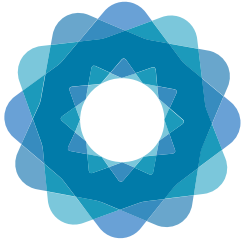
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Definitions

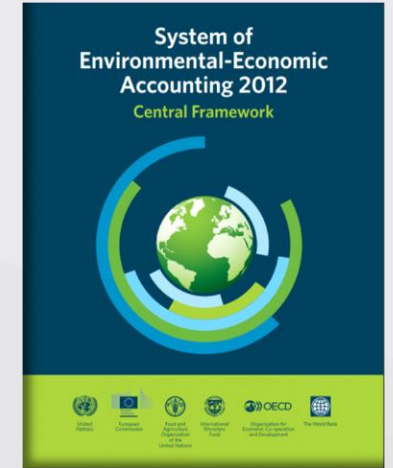


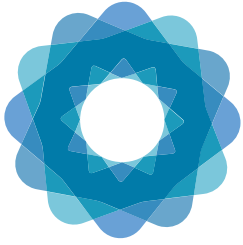
SEEA CF (2012)

❁ No reference to natural capital

❁ Environmental assets:

- ❁ *Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. (SEEA CF, 2.17)*
- ❁ *[The] scope comprises those types of individual components that may provide resources for use in economic activity. (SEEA CF, 5.10)*
- ❁ Only the monetary scope is aligned with SNA,
 - ❁ *[There] is no requirement in physical terms that environmental assets must deliver economic benefits to an economic owner. For example, remote land and timber resources should be included within the scope of the environmental assets of a country even if they do not currently or are not expected to deliver benefits to an economic owner. (SEEA CF 2012, 5.39)*





SEEA EA (2021)

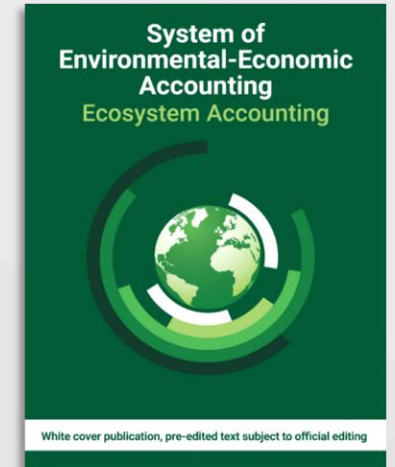
❁ No reference to natural capital

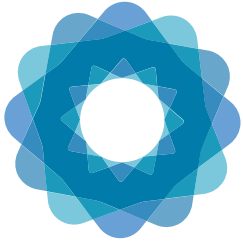
❁ Ecosystem assets:

- ❁ *Following the Convention on Biological Diversity (CBD) an ecosystem is a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit". (SEEA EA, 2.6)*
- ❁ *Ecosystem assets (EAs) are contiguous spaces of a specific ecosystem type characterised by a distinct set of biotic and abiotic components and their interactions. (SEEA EA, 3.5)*
- ❁ Some SNA-type natural resources are in scope, others not

❁ Valuation (Recommendations):

- ❁ NPV of services rather than individual resources
- ❁ SNA and "non-SNA" benefits





SNA (2008)

❁ No reference to natural capital

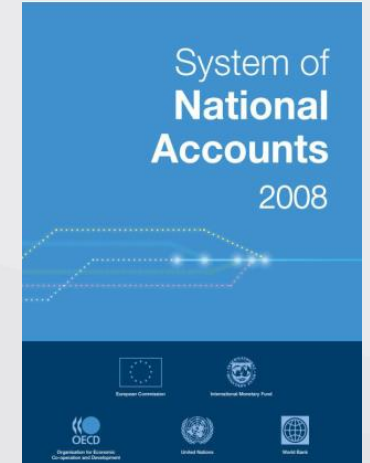
❁ Natural resources:

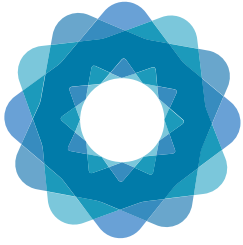
❁ *Natural resources [...] are included in the balance sheets provided that institutional units are exercising effective ownership rights over them, that is, are actually in a position to be able to benefit from them. (SNA, 1.46)*

❁ Two conditions:

- ❁ defined ownership of economic units
- ❁ expected to generate economic benefits (income/rent or resale value)

❁ Only monetary dimension





SNA (2025)

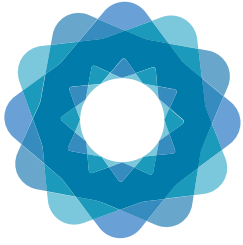
❁ Introduces natural capital (assets) and depletion

❁ Natural capital:

- ❁ *To establish a measurement scope for the stock of natural capital, SEEA defines environmental assets as the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity (SEEA Central Framework, 2.17). From this broad, biophysical scope, two primary measurement categories emerge: natural resources and ecosystem assets. (SNA 2025, Chapter 35)*
- ❁ *While this framing of natural capital encompasses stocks of natural resources and ecosystem assets, these two categories of natural capital are not mutually exclusive and there is a clear overlap between ecosystem assets and a number of natural resources including land, biological resources and water resources. (Rev 2025 SNA, 35.27)*

❁ Calculating depletion requires physical stocks (and extractions) for at least some natural resources

SNA
2025
Revision

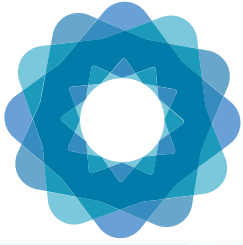


Other accounting contexts:

- ❁ Changing Wealth of Nations (CWON, World Bank)
- ❁ Natural Capital Declaration (UNEP)
- ❁ Convention on Biological Diversity (CBD), World Forum on Natural Capital
- ❁ Natural Capital Coalition

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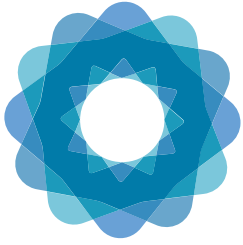
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Discussion Issues

I. Natural capital as an *umbrella term*?



Natural capital as an *umbrella* term

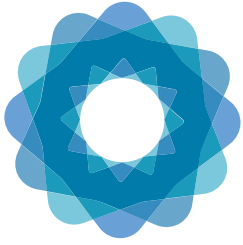
🌸 Nature

... may hold both anthropocentric and non-anthropocentric values, in that it is by definition unknowable and only partially perceivable to humans

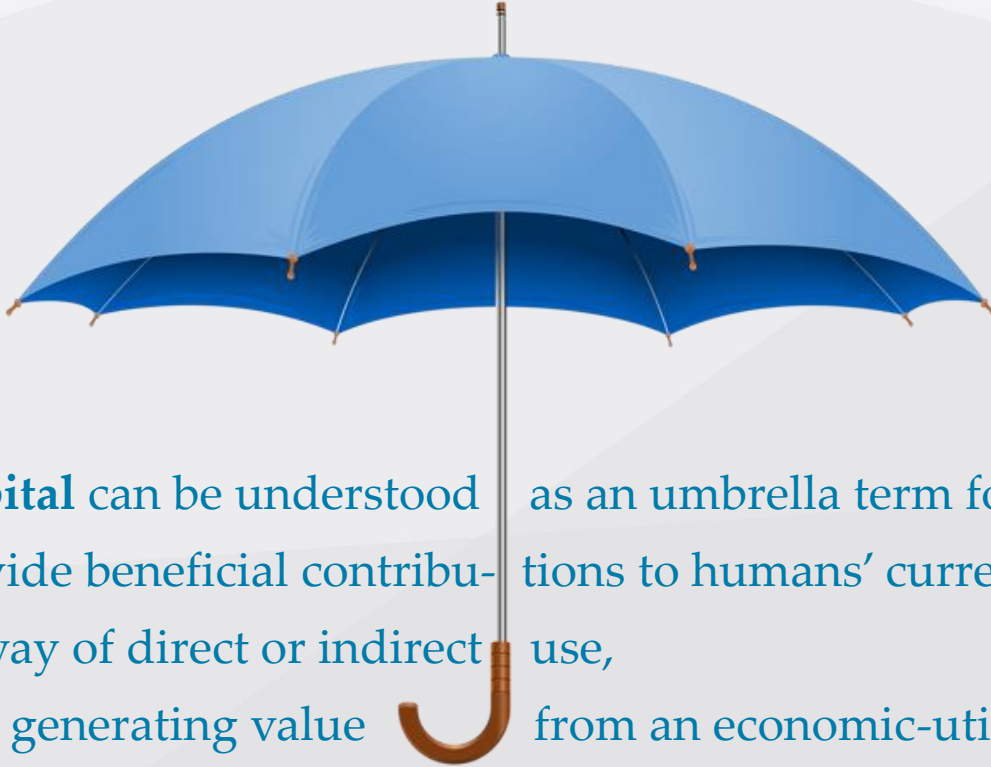
🌸 Nature that benefits humans

... represents the source of instrumental value, in particular use-values (ecosystem services, abiotic flows, spatial functions) and non-use values.

⚙️ Nature that is the source of (positive) use-values = Natural Capital



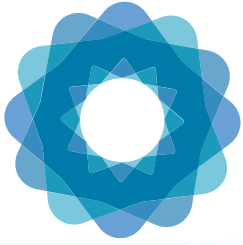
Natural capital as an *umbrella* term



- ❁ **Natural capital** can be understood as an umbrella term for aspects of Nature that:
 - ❁ ...provide beneficial contributions to humans' current or future well-being
 - ❁ ...by way of direct or indirect use,
 - ❁ ...thus generating value from an economic-utilitarian perspective
 - ❁ ...and thereby defined by such value rather than physical existence

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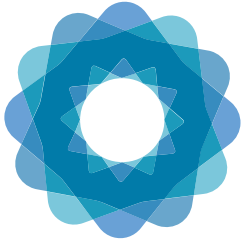
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Discussion Issues

II. Issues with the SNA 2025 Natural Capital



(Some of the) Issues with the SNA 2025 Natural Capital



❁ Natural capital not a standard „store-of-value“ asset

- ❁ *An asset is a store of value representing a benefit or series of benefits accruing to the economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another. (SNA 2008, 3.5; SNA 2025, 4.5)*
- ❁ A fund of values approach does not demand that humans command when the capital is used. The flow appears and has to be made useful at the same time. In the fund of values approach there is not a necessary relation between the flow and a physical object (e.g. between capture of solar energy and the sun).

❁ Definition does not match what is measured

- ❁ *[...] in the context of the SNA, natural capital is restricted to natural resources (SNA 2025, 11.21)*
- ❁ Issue: potential underappreciation of natural capital, misinterpretation of depletion/depletion-adjusted aggregates (net aggregates)
- ❁ Chapter 35 „Measureing sustainability of well-being“ describes how natural capital is (partially) measured

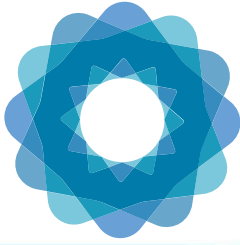
❁ Overlap in the asset classification

- ❁ Provisioning services and natural resources

❁ Further issues

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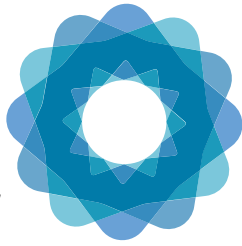
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Discussion Issues

III. Implications for the SEEA CF Update

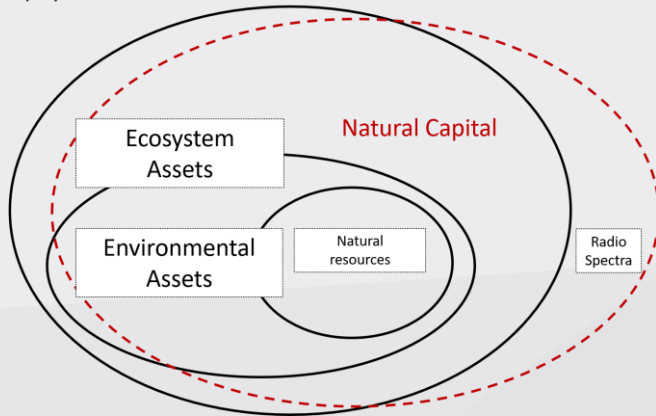


Implications for the SEEA CF Update

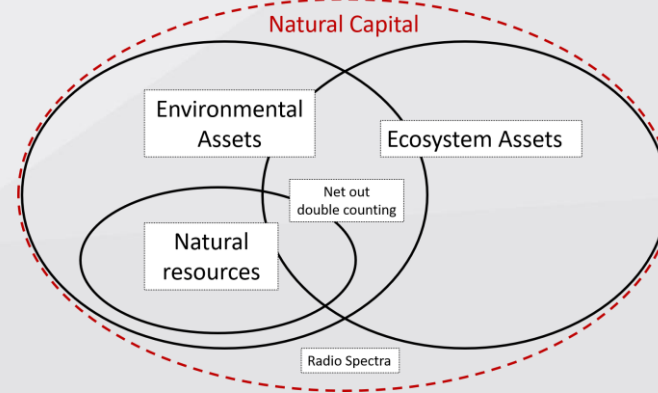
Definition and scope

SEEA provides the international standard to measure natural capital and has agreed concepts, definitions and accounting treatments for measuring the components of natural capital [...] (SNA 2025, 35.24)

In physical terms



In monetary terms



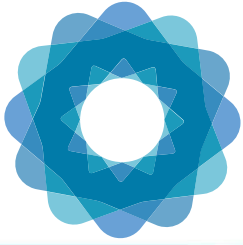
Methodology

Double counting

Valuation

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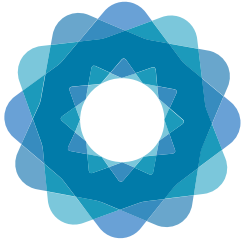
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Discussion Issues

IV. Natural capital and sustainability



Natural capital and sustainability

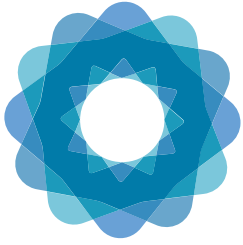


🌸 Sustainability in the „capitals approach“

- 🌸 *Sustainable development is development that ensures non-declining per capita national wealth by replacing or conserving the sources of that wealth; that is, stocks of produced, human, social and natural capital. (SEEA 2003)*
- 🌸 *[D]evelopment is sustainable if it does not decrease the capacity to provide non-declining/capita utility for infinity (Neumayer 2003)*
- 🌸 *[T]he sustainability of past developments is implied if the level of [comprehensive] wealth in real terms is non-declining“ (SNA 2025, 35.105)*

🌸 SEEA

- 🌸 In principle “neutral” towards any specific concept of sustainability
- 🌸 But currently provided *tools* and the monetization approach pushed by the SNA Revision point towards weak sustainability
- 🌸 SEEA and SNA currently provide necessary but not sufficient tools for measuring sustainability



Natural capital and sustainability



Weak sustainability

Therefore we have to value natural capital **depletion** (i.e. the economic value of a quantity reduction in a natural resource) and **degradation** (i.e. the economic value of damage to natural capital quality). Otherwise, the sustainability planner cannot know whether natural capital losses are being compensated by equivalent or greater capital investments elsewhere in the economy. (Dietz & Neumayer 2007)

Strong sustainability

- Ecological debt (liabilities) (e.g. Kervinio & Surun 2023)
- Identify critical natural capital?
- Sustainability reference values (see next presentation)
- Ecosystem extent and condition



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