Accounting for national and corporate ecological debts: developments since unpaid ecological costs

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Mesurer pour comprendre

Building an accounting system to contribute to policy targets

- **More and more policy targets** in the EU:
  - Bird and Habitat directives; Water framework directive, Marine Strategy framework directive
  - Now: nature restauration law, Green Deal
- Recent adoption of CSRD: focus on double materiality (financial & **impact materiality**)

- Evidences still lack regarding ES valuation and accounting use… *(IPBES, 2022; Selina WP4; Comte et al., 2022)*
- ...while there's a growing demand for **biodiversity financing needs** analyses and building **trajectory to targets**

- Need to include a large set of value (IPBES, 2022*)... in monetary accounts too

~~2010': Should we preserve biodiversity?~~ -> 2020': How to preserve biodiversity?

What ecosystem accounts to fit in this new context?

** In June 2023, the UNCEEA "Noted the request to take a range of perceptions of value into account in ecosystem accounting, including those of indigenous peoples" (18th UNCEEA, minutes)*

Methods to design and calculate ecological debts

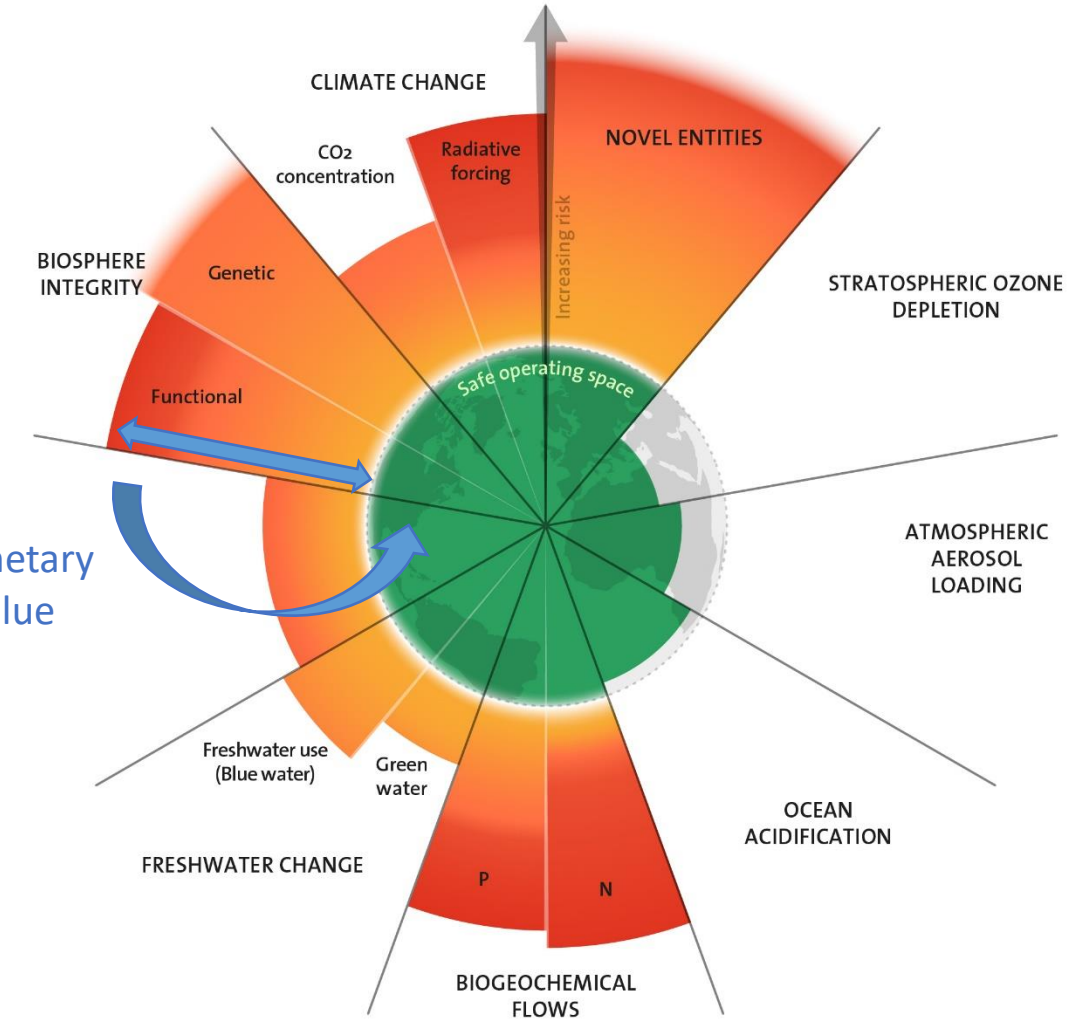
- Based on:
  - The **history** of national accounting and of the SEEA — *Vanoli, 2005; Surun, 2023*
  - **Business accounting** theory (& the C.A.R.E. model) — *Rambaud et Richard 2015; Rambaud et Feger, 2019*
  - **Conservation** science and policy — *IPBES, 2022; Feger and Mermet, 2021; Feger et al. 2018*
  - A **sociological** perspective on statistics & NA — *Desrosières, 2002; Miller, 1986*

- **Experimental accounts** (in France):
  - Water bodies (WFD) — *Surun, 2023*
  - Marine ecosystems (MFSD / MAIA project) — *Comte et al., 2022*
  - No net land-take (« Climate and resilience » law) — *Surun, 2023; Gonon, 2021*
  - Protected species and habitats (Habitats directive) — *Surun, 2023*
  - Carbon emissions — *Germain et Lellouch, 2020; INSEE*

- We developed an **accounting proposal** — Kervinio & Surun et al., 2023

HOW TO DEFINE ECOLOGICAL LIABILITIES?

Basics



Debt

Monetary value

Definition

An ecological debt arises as a result of (reversible) environmental degradation.
It is expressed as a difference between a current condition indicator and a reference level.

Monetary valuation method*

Budgeted costs to ensure the preservation of the ecological entity:

- Prevention costs (ex ante; e.g. water treatment plant, birds and dolphins scaring devices)
- Restoration costs (ex post)

In line with the **CSRD spirit and business « historical cost accounting »****

** Similar (but not identical) to "Restoration cost-based approaches" (SEEA EA, part 12.3.2)*
*** Business accountants have gone backwards from net present value (the IFRS has change its "fair value" from NPV to market value)*

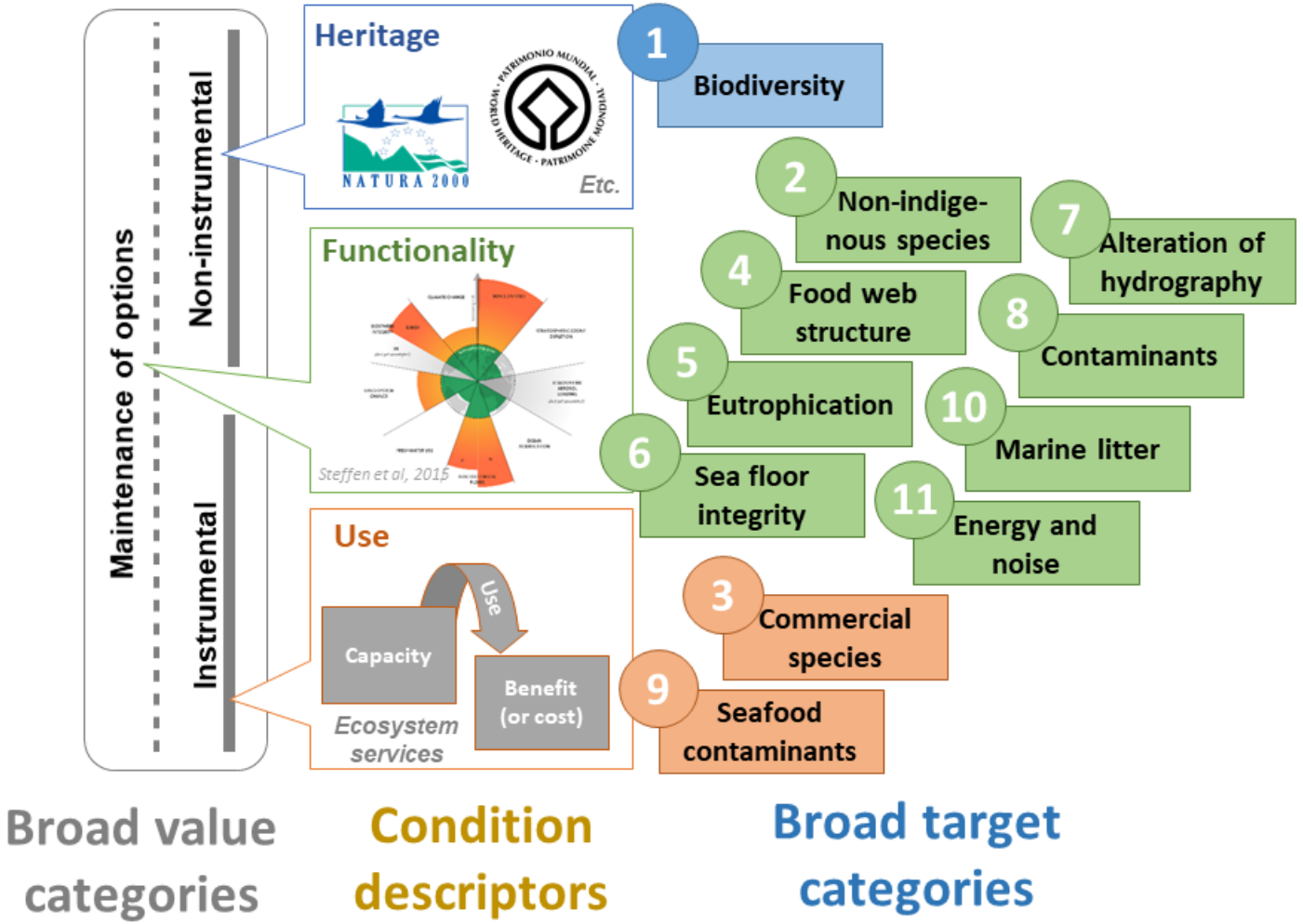
An inclusive perspective on ecosystems

Thanks to:

- Condition indicators coming from **policy and management schemes** -> reflect actual stakeholders' matters of concerns (collective « willingness to preserve »)

- Need for **scientific robustness** to ensure indicators truly represent ecosystems, species, etc.

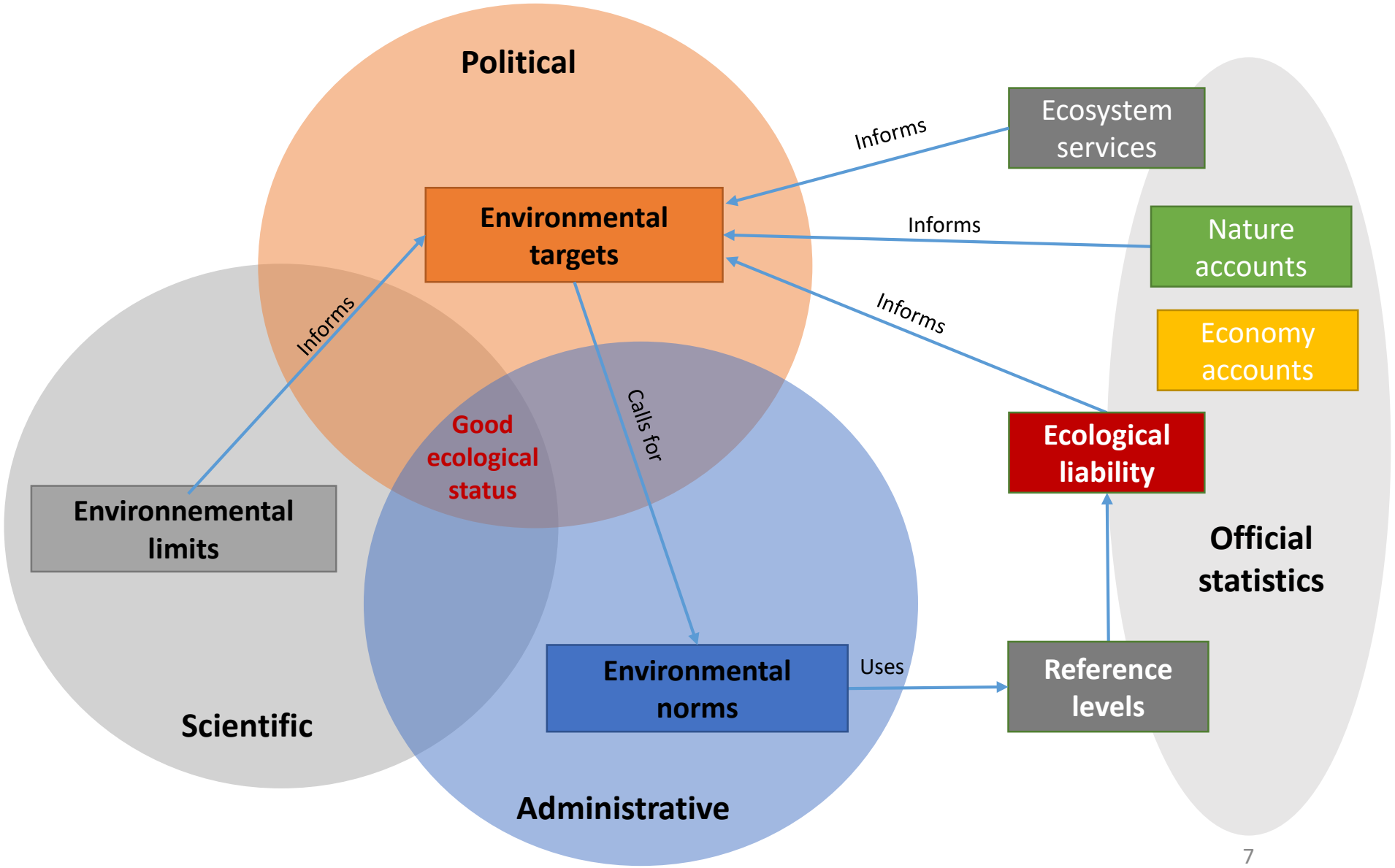
- This choice allows for environmental **NA to be directly useful** for environmental policies



Marine descriptors (MSFD)

Good ecological status as legitimate targets

- **Scientifically robust**, **politically accepted**, and **manageable**
- **Rather stable over time** (like carbon neutrality, or no net loss of biodiversity, GES is a kind of focal point for policy-makers)
- Part of **institutional arrangements** (defined outside statistical offices)



IS IT COMPATIBLE WITH NATIONAL ACCOUNTING?

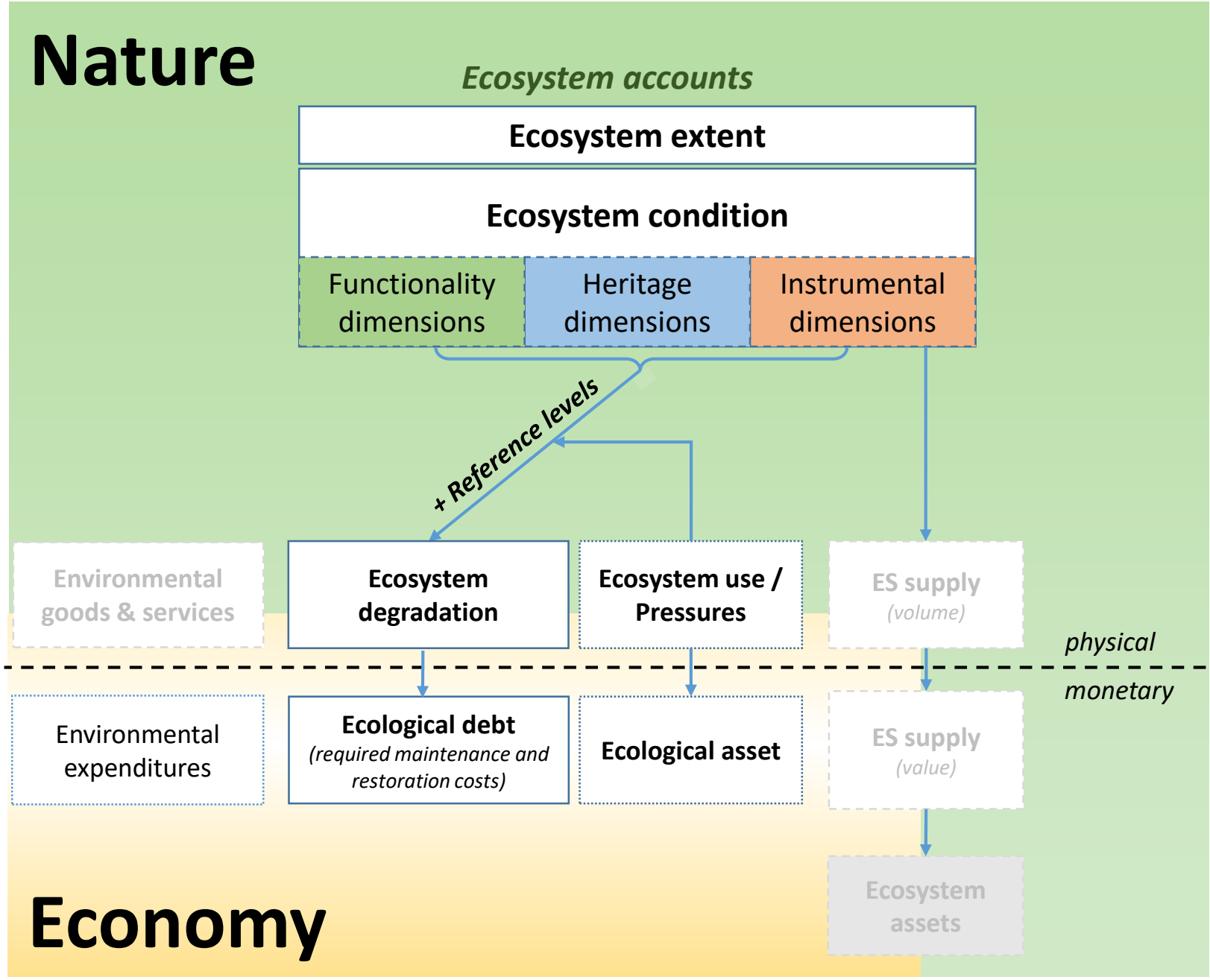
NO NET LAND-TAKE AS AN EXAMPLE

Integrated accounts proposal

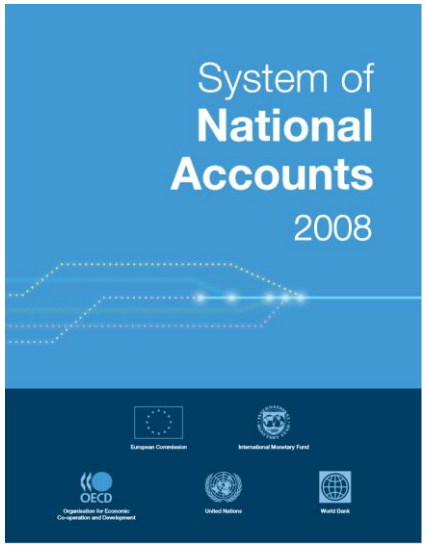
(based on Kervinio & Surun et al., 2023)

- **Most SEEA EA and CF biophysical accounts**
- **Monetary accounts for all dimensions of interest** (not only instrumental), including non-use values
- Leave apart the ecosystem services framework

- Articulate condition, biodiversity funding needs and NA to **truly connect ecosystem values to economic decision**



A SNA-compatible system



- A **biophysical extension** of the SNA

- Two kinds of monetary valuation:
  - **Economic perspective**: modelled prospective debts by environmental ministry / agencies
  - **Accounting perspective**: bottom-up aggregation of organizations' liabilities (CSRD reports, impacts studies, ...)

- The *accounting perspective* gives **exchange values**, in accordance with the SNA *(SNA 2008; van de Ven, 2023)*
  - Liability = commitment to pay in the future
  - Need for an external validation: contract or obligation -> today, degradation authorisation, by derogation to law or policy targets
  - Third party: "Ecosystem trustee" -> today, this is often public administrations

- Accounting structure is:
  - different from Vanoli's « unpaid ecological costs » -> **no imputations**
  - aligned with business « historical cost » accounting (see the C.A.R.E model)

Land-take example
(2021 data)

Method ("economic perspective"):
Land-take: 214,5 km²
Target: 194,6 km²
Debt: 19,9 km²

Restoration costs: 95-350 €/m²
Monetary debt: €1,9-7 billion

CURRENT ACCOUNTS

	Uses	Construction	Nature	Nature	Construction	Ressources
Production account					322	Production
	Intermediate consumption	198				
	Preservation activities	1				
	GDP	124				
	Consumption of fixed capital					
	On non-financial assets	9				
	On natural assets	0,2				
	NDP	105				
					1	Preservation activities
Generation of income account					124	***GDP***
	Compensation of employees	80				
	Op. surplus / Mixed income	34				
Allocation of primary income account						
Secondary distribution of income account						
Use of disposable income account						
	Savings	34				

CHANGES IN ASSETS AND LIABILITIES

	Changes in assets	Construction	Nature	Nature	Construction	Changes in liabilities and net worth
					34	***Savings***
Capital account	Gross fixed capital formation	10				
	Consumption of fixed capital	-9				
	Net lending (+) / net borrowing (-)	15				
Natural capital	Gross natural capital formation					
	Activities area	7				
	Consumption of natural capital					
	Activities area	-0,2				
	Ecological loans		7 -1		7 -1	Natural loans - Natural, agriculture & forestry areas
Financial account	***Net acquisition of financial assets***					***Net acquisition of liabilities***
	Monetary gold and SDRs					Monetary gold and SDRs
	Currency and deposit	6 -1				Currency and deposit
	Loans					Loans
	Equity and investment fund shares			7 -1		Equity and investment fund shares
Other volume changes						
Revaluations						

WHAT'S NEXT?

Ways forward

- On the conceptual side :
  - Better define and **create typologies** of “debts”, “ecological assets” and “ecological intermediate consumptions” *(note: ≠ SEEA’s “ecosystem assets”)*
  - Develop the corresponding **supply and use tables**

- On the practical side:
  - More experiments on other environmental topics (e.g.: **agriculture ecosystems**) and **countries**
  - Develop **standardised preservation cost databases**

- Articulate scales:
  - Model macroeconomic debts using: Copernicus, reporting under nature directives, CGE models, etc.
  - Use **new data from business**: CSRD business reports, impact studies, etc.

- **Survey potential users** to adjust the accounting details

=> We’re looking for collaborations!

Key takeaways

- Conceptual developments confirm **consistency with the SNA** and statistical principles

- Ecological liabilities:
  - Fit much more within the **current context** than in the 1990's (when cost-based approaches were dominant in the SEEA)
  - Directly **answer policy needs** to make a transition and *then* stay in a sustainable situation
  - Can **balance the hegemony of GDP** (-> an adequate indicator for the « Beyond GDP » movement)
  - Allows to **connect non-use values and national accounting**

- Technical developments and experiments are still required

Soon available in English

To go further

- Kervinio, Y., Surun, C., Comte, A., Levrel, H., 2023. Defining ecological liabilities and structuring ecosystem accounts to support the transition to sustainable societies. OE 8, e98100.

- Surun, C., 2023. La comptabilité des dettes écologiques nationales et d'entreprises, un outil de pilotage vers une économie durable (Thèse de doctorat)

-> To be translated in English (available on request by email to clement.surun@agroparistech.fr)

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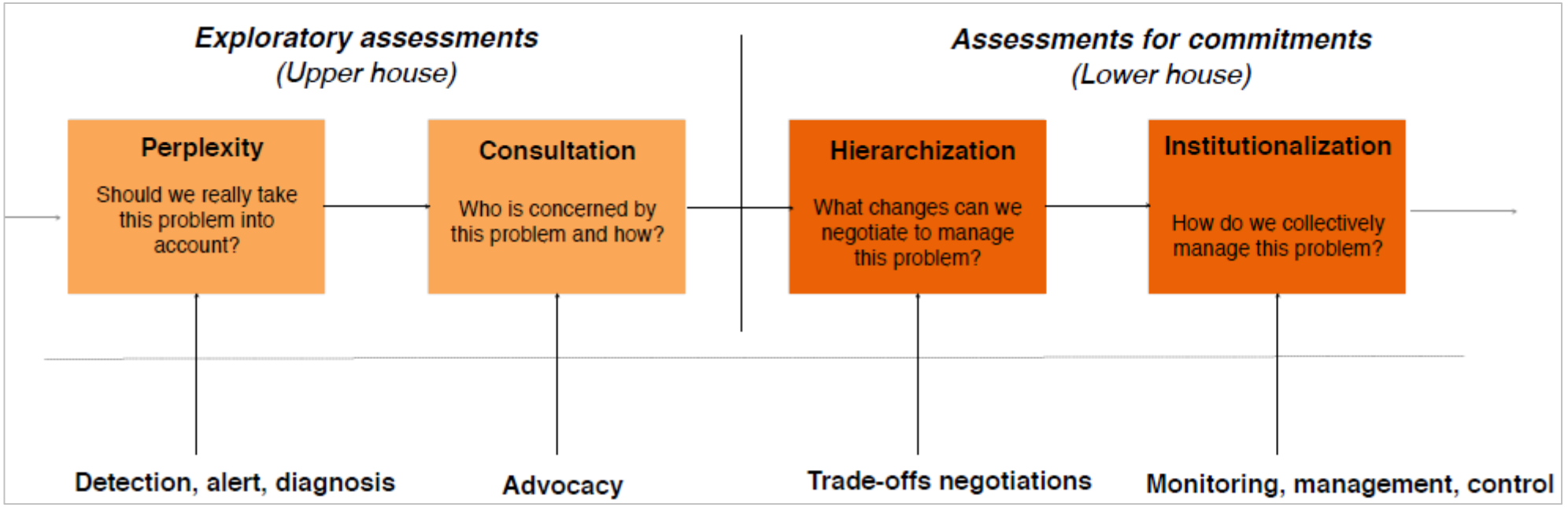
APPENDIX

Maturity of environmental issues and accounting systems

Source: Surun 2023; based on Feger et al., 2017, Latour, 2004, *Politics of nature: how to bring the sciences into democracy, and SEEA EA chap. 8)*



Main purpose of the information system

SEEA EA monetary accounts

Modelled liabilities

Monetary ecological liabilities and assets

What level of reality? Who make the disputable choices?

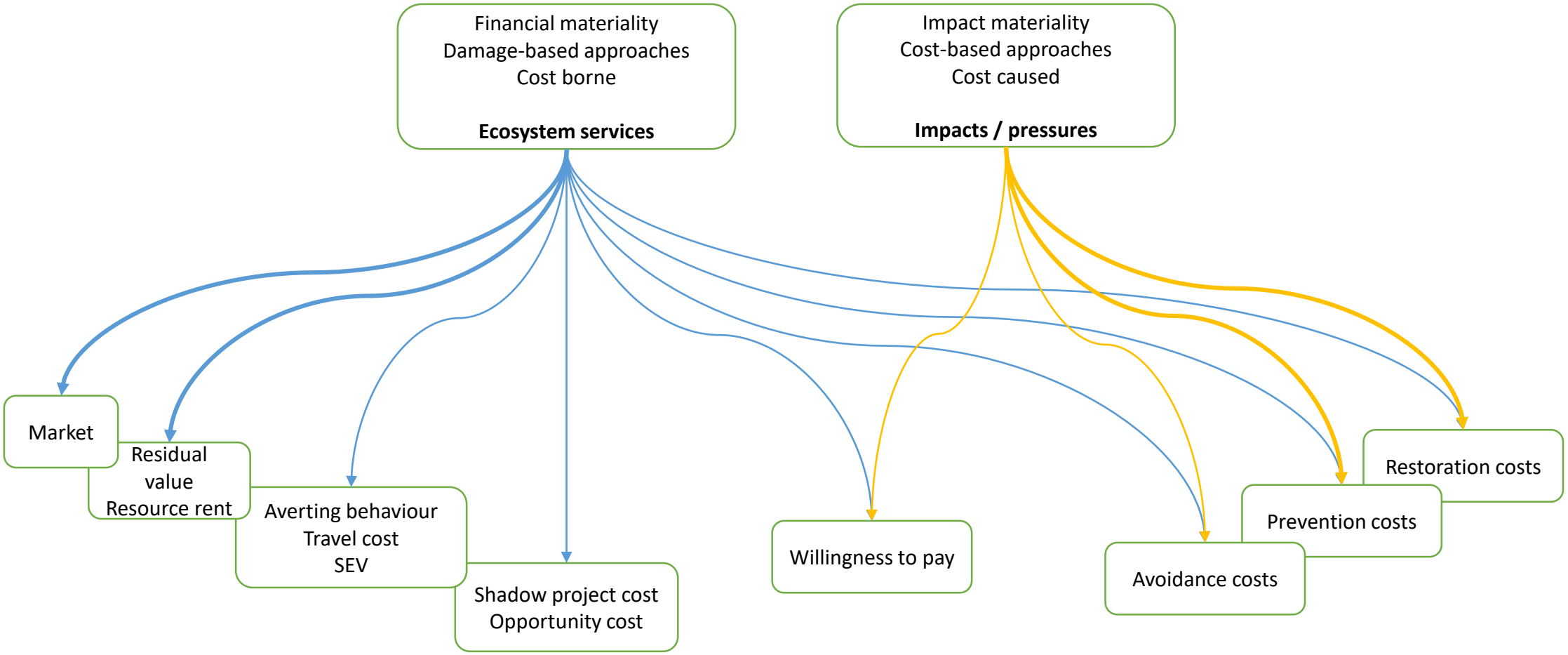
Source: Kervinio & Surun et al., 2023

	Economic (modelling) approach	Accounting (observation) approach
Who produce the numbers?	Ministry services, researchers	Business accountants (-> row data for NSO)
What data?	- State of the environment - Global / mean preservation costs	- Real uses of the environment - Individual preservation budget
Disputable choices	Hypothesis in the model	Actual institutional arrangements
Status	**External estimates -> abstract models to imputations**	**Economic facts -> accounts**

Towards a **satellite account** of financing needs for the ecological transition?

Towards **extended NA** based on observations?

Valuation framing & methods (tentative)



Good consistency with exchange value

Poor consistency with exchange value