

Workshop on MAES

pilot study on Natural Capital Accounting

European Environment Agency
27-28 June 2013

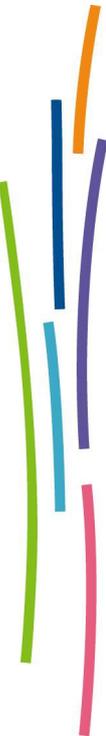
Frederic Nauroy

**French Ministry of Ecology,
Sustainable Development and
Energy**

Statistics Department



MEDDE/CGDD/SOeS



Introduction

Context:

A lot of works and initiatives on the "beyond GDP" issue:

- ✓ Rio +20 (WG GDP+), Stiglitz commission report, UNECE/OECD/Eurostat TF, EEA and OECD works,...
- ✓ In France: Grenelle environnement, National strategy 2014-2020 (in the course of elaboration, need of "extra GDP" indicators);

Objectives:

- Elaborating new indicators to complement GDP;
- Moving towards inclusive national accounts;
- Improving the description of the relations between nature and the economy.

NPEC : definition

Notion close to the "maintenance costs" concept.

Concept radically different from the "costs of damages"

NPEC : Costs of measures for preventing or restoring environmental deterioration. 5 types are mentioned in SEEA 1993:

- Reduction in economic activities or complete abstention from specific activities;
- Substitutions among the outcomes of economic activities (production of other products or modification of household patterns);
- Substitutions among the inputs of economic activities without modifying the outputs (use of new technologies);
- Activities to prevent environmental deterioration, without modifying the activities themselves (end of pipe technologies);
- Restoration of the environment and measures diminishing the environmental impacts of economic activities.

Two different visions of the relations between nature and the economy

1°) SEEA EEA (volume 2) vision

Nature is represented as a supplementary sector beside economic sectors and households. Its degradation is analysed through the functioning and capacities of ecosystems.

The valuation of ecosystems services and ecosystems degradation gives rise to an adjusted NDP aggregate. The adjustments are positive for the the non market ES while they are negative for the degradation of ecosystems.

2°) NPEC approach

Nature and economy = 2 separated entities.

The degradation of natural assets coming from human activities is considered on the final demand side.

Two main reasons:

- The final demand includes the emissions resulting from production processes as well as those generated by final uses (residential heating, households transports).
- The domestic final demand includes imports of products which causes residuals abroad.

Final demand at total costs

The purpose is not to raise the level of consumption by adding a new line to the list of consumed products. The volume of consumption and its content do not differ from the national accounts.

The approach consists in a valorisation mode of the final demand to take into account the estimated amount of non paid ecological costs. \Rightarrow The value of the products may be adjusted by the costs of respecting different ecological standards (but actually not borne).

$$\mathbf{FDTC = FDPC + NPEC}$$

(Final demand at total costs = Final demand at paid costs + non paid ecological costs)

Consequences:

- The domestic final demand includes NPEC \Rightarrow Final demand at total costs;
- The economic production value (GDP) and the national income are left unchanged;
- The national saving (gross or net) is reduced by the annual amount of NPEC;
- The accounts are balanced by a capital transfer from nature to the economy. 

The NPEC approach differs from the "greened economy modelling". It is not preceded to an internalisation of the non paid costs to establish their potential consequences on the whole economy (new estimates of production, income, consumption, prices, foreign trade,...).

Ongoing project

First step:

Dashboard on NPEC: valuation of the amounts of NPEC for different natural assets. 

Second step:

Estimating indicators of the imbalance of the relations between nature and the economy.

Final demand at paid costs / Final demand at total cost (%)

Third step:

(once having a sufficiently complete view of the global NPEC (atmosphere, water, soils))

- Degradation adjusted net saving: $NS - NPEC$;
- Ecological debt variation.

Dashboard on non paid ecological costs (extract)

Natural asset	Natural environment / Type of pollution	Ecological threshold / norms	State and physical change of natural assets	Valuation mode of non paid costs	Estimated amount of annual ecological cost or debt	Estimation quality / remaining issues
Climate	Greenhouse gases: 6 direct GHGs Kyoto protocol	France: four-fold reduction in emissions between 1990 and 2050 (POPE act 2005) ⇒ <i>factor 4</i>	France: emissions are decreasing, but at an insufficient rhythm: - 1 % while - 3 % is required.	Marginal abatement cost of carbon: 32€/t in 2010 (CAS, 2008) ; 36€/t in 2012 ("de Perthuis" committee T30)	€0,6 bn in 2010	 Taking account of a specific value for non CO2 GHGs (agriculture). Estimating the cost on the basis of the carbon footprint of the final demand.
Inland water	Surface water, ground water	EU directive on water policy (2000): good quantitative, ecological and chemical status to achieve in 2015.	Good ecological status achieved by 41 % of the bodies of surface water (2009); Good chemical state for 43 % of the bodies of SW; Bad chemical status for 41 % of the groundwater bodies.	Measures programs established by the French water agencies.	€27 bn between 2010 et 2015 (51 Md€ for the total achievement of the mesures) Sum of the costs of measures programs established by the different water agencies. This amount is similar to an ecological debt	 Difficult to know whether this amount only contains additional cost Possibility to estimate NPEC through the use of interim evaluations.



Simplified representation

Nature accounts (annual variation)

Natural assets degradation: - 50
Capital transfer: 50



Accounts of the economy

Gross domestic product (GDP):	1000
Gross operating surplus:	300
Gross disposable income:	1000
	-
Final consumption:	900
$NPEC_{FC}$	45
	=
Adjusted gross saving 1:	55
	-
Gross capital formation:	100
$CENP_{GCF}$	5
	=
Adjusted gross saving 2:	-50
	+
Capital transfer:	
$CENP_{CF} + CENP_{FBC}$	50

Linking French assessment of ecosystem services and natural capital accounting

Philippe Puydarrieux

**French Ministry of Ecology,
Sustainable Development
and Energy**

**Division for Natural Resources
and Risk Economics**



Crédit photo : Arnaud Bouissou/MEDDE

Ministère de l'Écologie, du Développement durable et de l'Énergie

www.developpement-durable.gouv.fr

Natural capital

It is the **stock of natural ecosystems** that produces a **flow** of valuable ecosystem goods or services into the future.

The valuation of a part of this stock of ecosystems could be approached by the Net Present Value of these future **flows of ecosystem services**.

But this assumption raises several questions

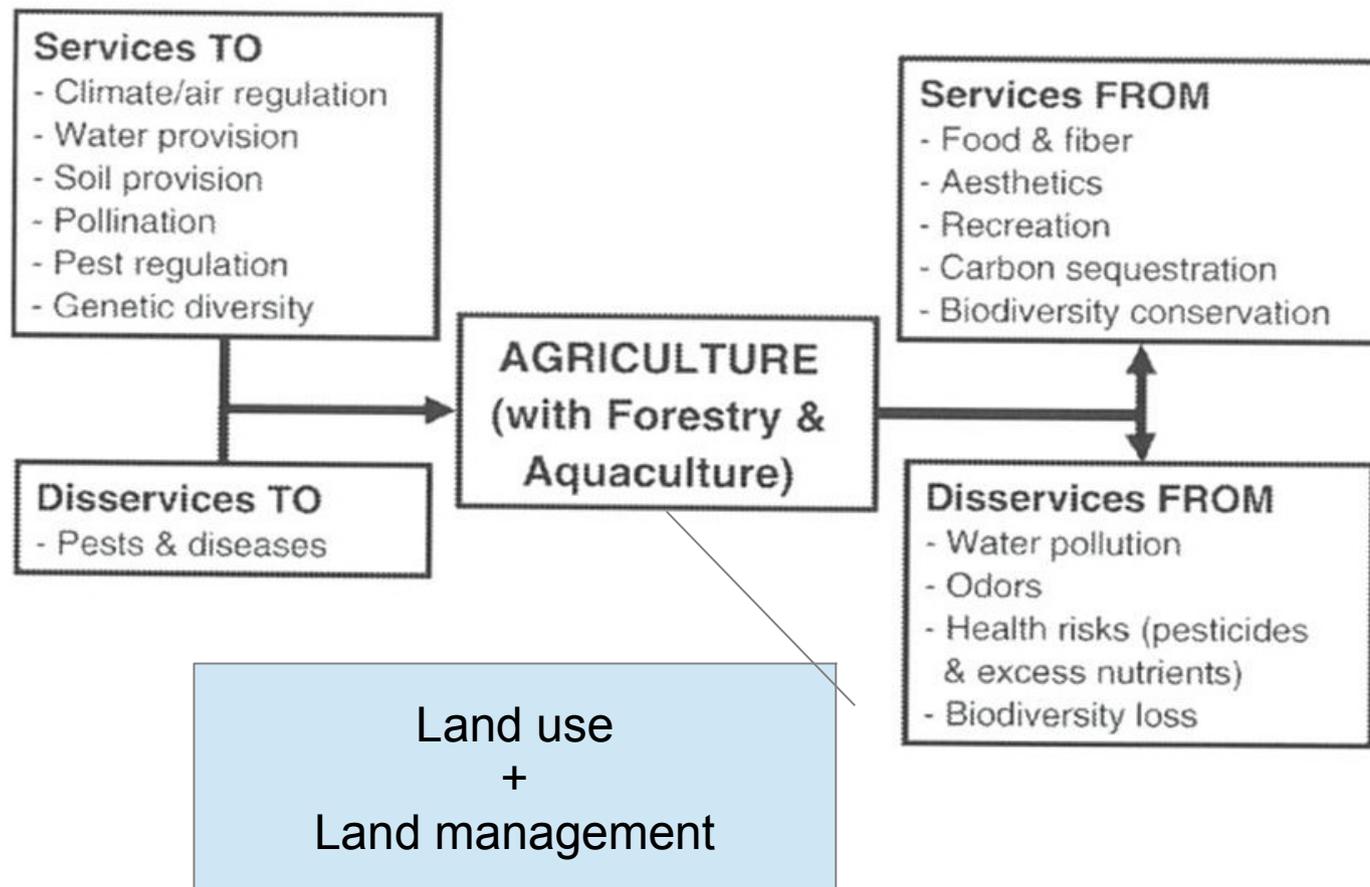
Questions for accounting

- How to measure ecosystem degradation (capital loss) and ecosystem enhancement (profit) ?
 - What is “degradation” and “enhancement” ?
 - Is the ES approach appropriate and good enough (*to measure degradation and enhancement*)?
- Is it possible to move from research to operational implementation ?
 - Is it possible to build a tool kit to assess ES ?
 - Is it already possible to standardize the ESA ?

Ecosystem degradation and Ecosystem enhancement

The concept of ecosystem services has been designed in order to show the benefits produced by the ecosystem, not the added costs to human activities.

This approach is not objective from an accounting perspective.



Loss and profit : For whom ?

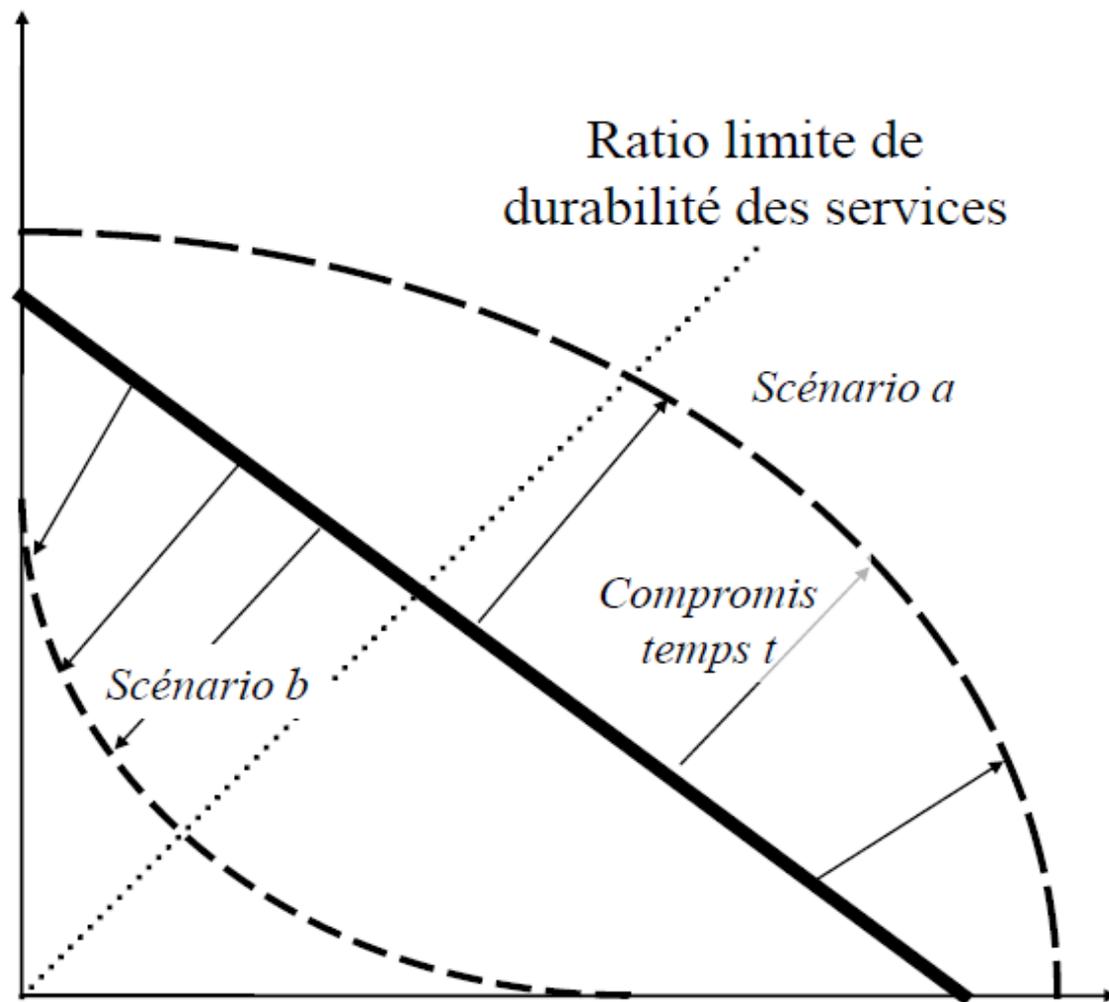
- Who is “allowed” to decide if a ES is a service (+) or a disservice (-) ?
 - Example :
 - Pollination is a positive service for some producers of lemons
 - For those who produce hybrid seedless lemons, natural pollinators can genetically “pollute” production and decrease the value of provisioning service.

→ Is the CICES complete, including some ES that could be “negative” for human activities but not necessarily for biodiversity (e.g. : “pests and diseases”) ?

Proposal : Promoting a “bundles” approach

Provisioning
Services

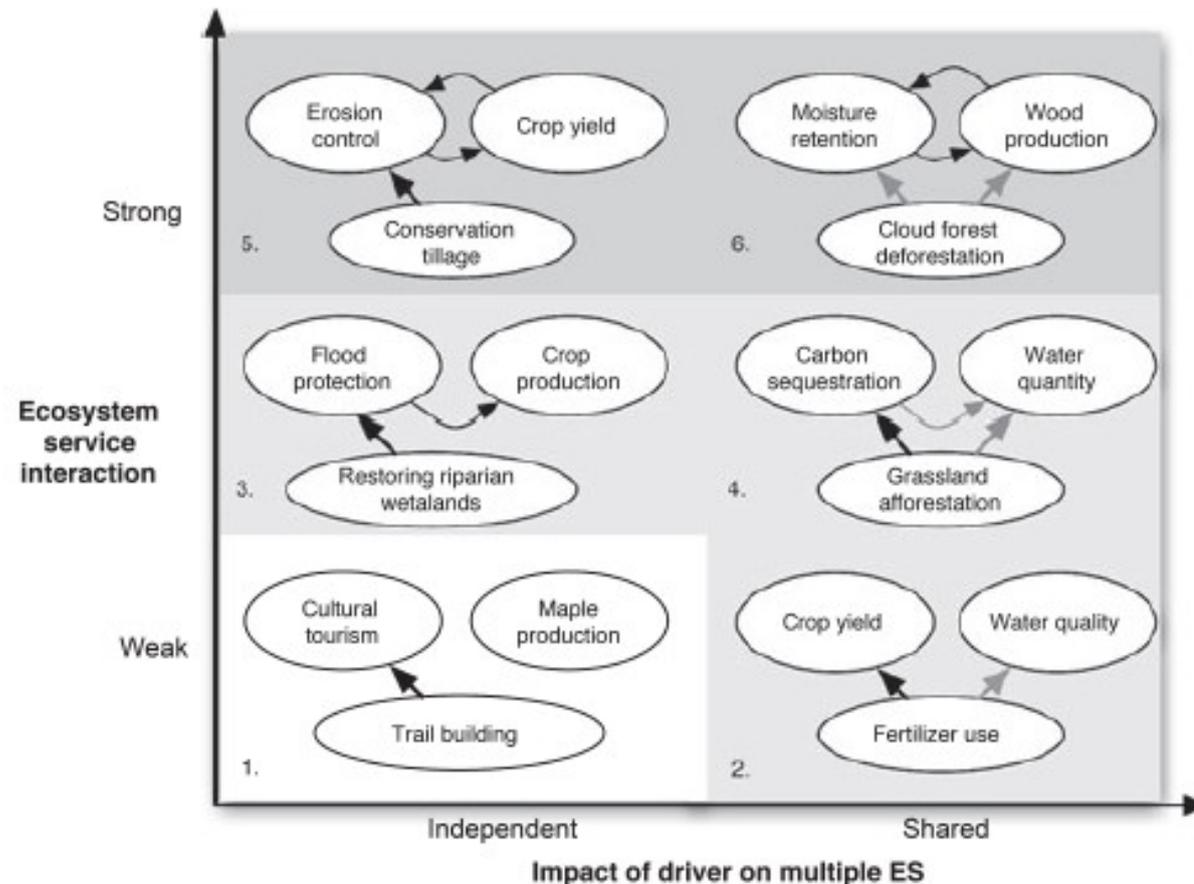
= merchant
services



Support and Regulating services =
Non-merchant services

Our proposal

1. Define a list of bundles of ES
2. Identify the relationships among these packages of ES (e.g by pairs)
3. Quantify the function establishing the relationship between value of provisioning service and value of regulating service

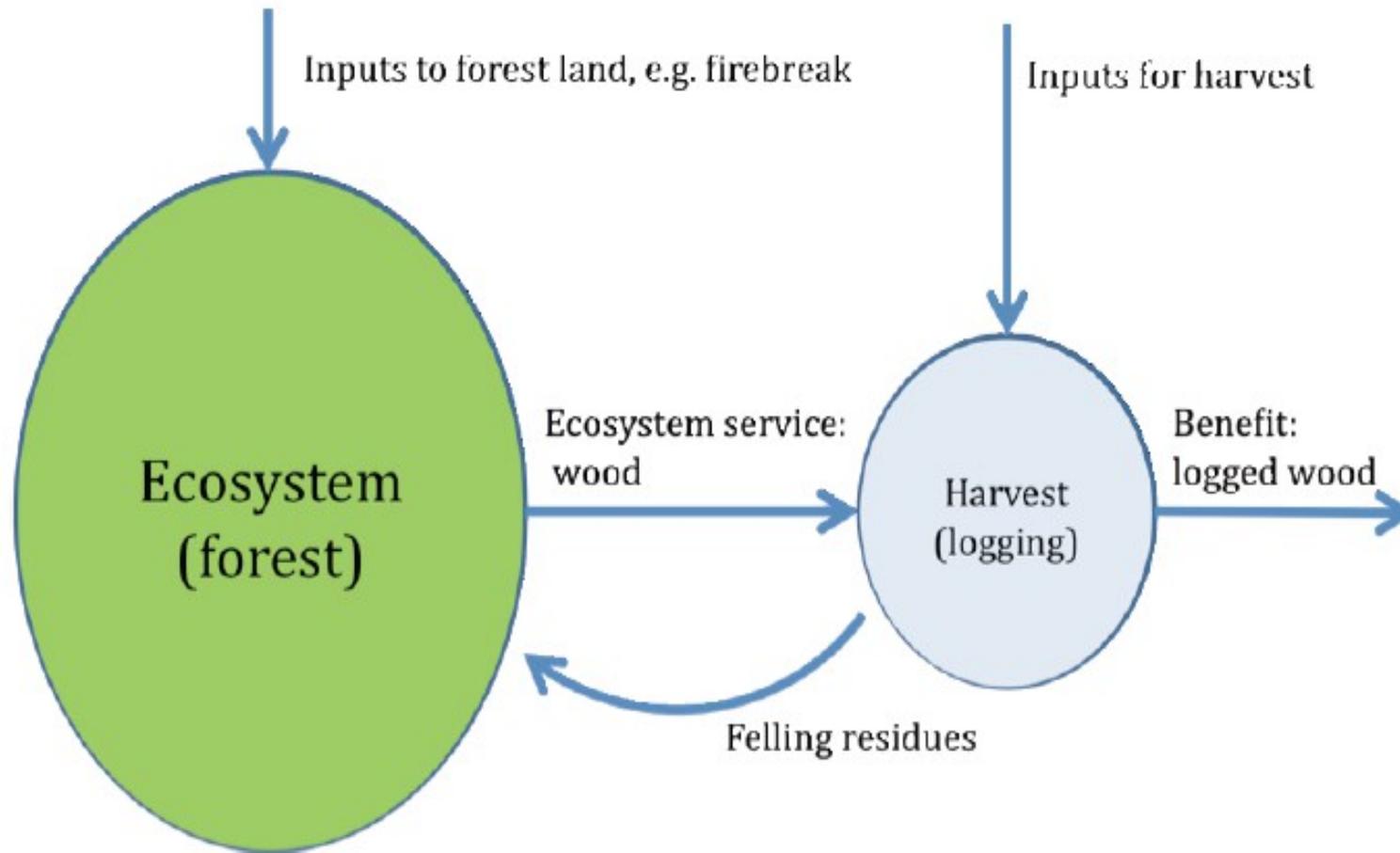


Towards a “tool kit” for ES valuation

The needs :

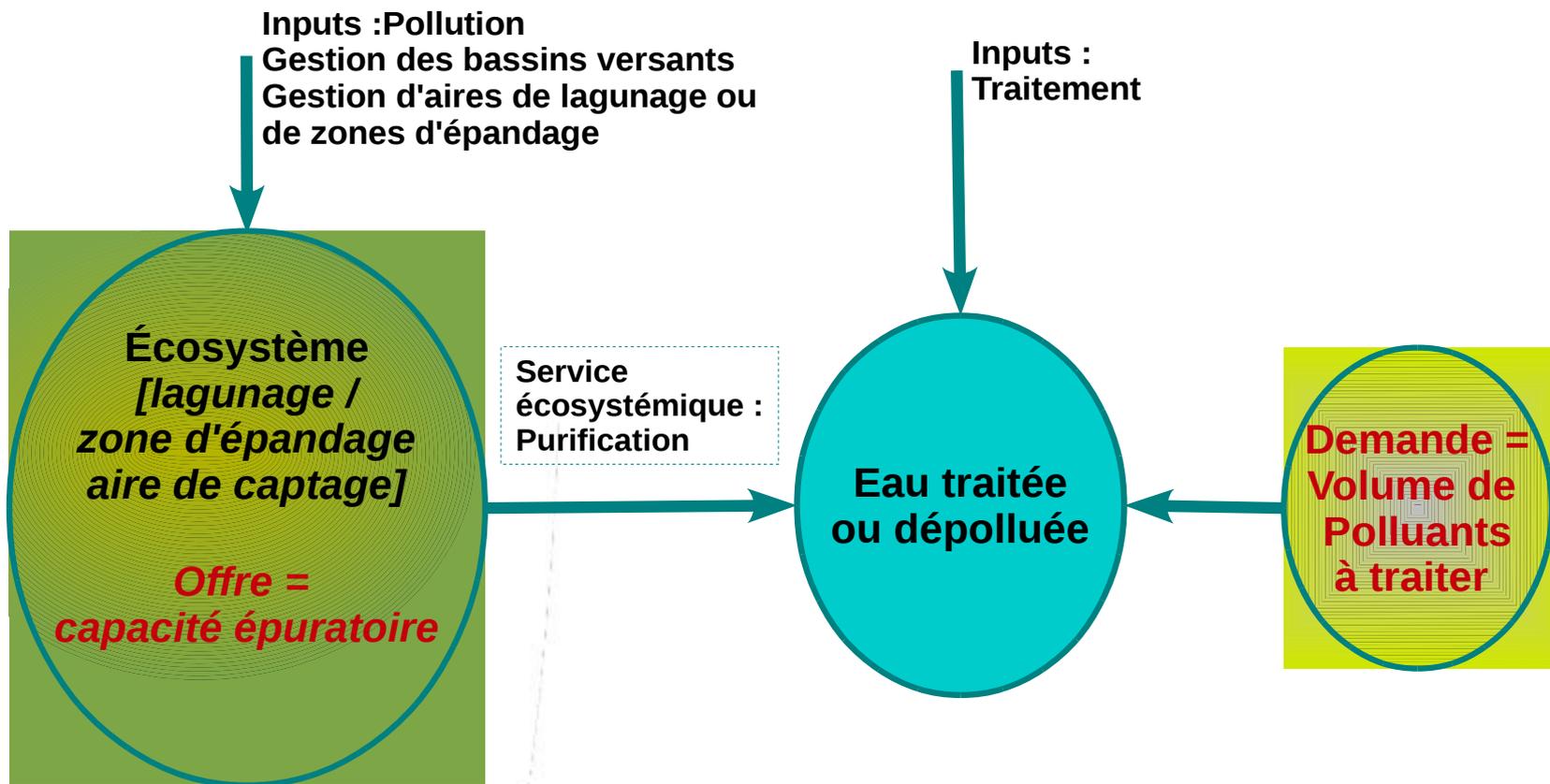
- A methodology easy to implement : cheap
- A methodology easy to replicate (from one site to another, from one year to another, etc.)
- Standards (tutelary values, “tutelary” functions)

One service = One conceptual model



From SEEA vol. 2 , 2012

Example : Regulation service of water purification



ES Valuation

Physical value : self purification capacity of the Ecosystem (T/ha/an) for a pollutant

Monetary value (€/ha/an) :

Self purification capacity of the Ecosystem (T/ha/an) x Avoided treatment cost (€/T/an)

Next step

Identifying :

- values available, conditions of use
- values lacking

Thank you for your attention

Philippe.puydarrieux@developpement-durable.gouv.fr

Frederic.nauroy@developpement-durable.gouv.fr