SUB-REGIONAL CAPACITY BUILDING WORKSHOP ON SUSTAINABLE FINANCE AND RESOURCE MOBILIZATION FOR BIODIVERSITY FOR CARICOM MEMBER STATES
ST. JOHN'S, ANTIGUA AND BARBUDA
18 - 21 MAY 2015

Ecosystem Natural Capital Accounting (1)

Principles and Framework

Jean-Louis Weber

Consultant to the Secretariat of the Convention on Biological Diversity
Former Special Adviser on Economic-Environmental Accounting to the European Environment Agency,
EEA Scientific Committee Member
Honorary Professor, University of Nottingham
jlweber45@gmail.com
Website: ECOSYSTEM CAPABILITY
http://www.ecosystemaccounting.net/

4 sessions

1. Principles and Framework
2. Presentation of ENCA-QSP
3. Presentation of the Mauritius experimental accounts 2013
4. The way forward in the context of small developing states

What is ecosystem accounting?

What it is?

- Spatial
- Covering all ecosystems
- Combination of ecology and national accounting

How did it happen?

- Evolved over many years in academic and government agencies
- A rapidly evolving field

1953
1968
1993
2008

1993
2003
2012

2013

Where is it happening

- Several countries are developing ecosystem accounts

Source: Michael Vardon's presentation at the World Bank WAVES 1st Knowledge Exchange on Ecosystem Accounting, Manila, the Philippines, 23-27 February, 2015

Example: Mauritius – Experimental Ecosystems Natural Capital Accounts 2014

Key points

- A suite of accounts with land cover as a starting point
- It is complex but it can be done!
- Focuses on assets (e.g. natural capital) rather than services
- Learning by doing

Land cover

Water

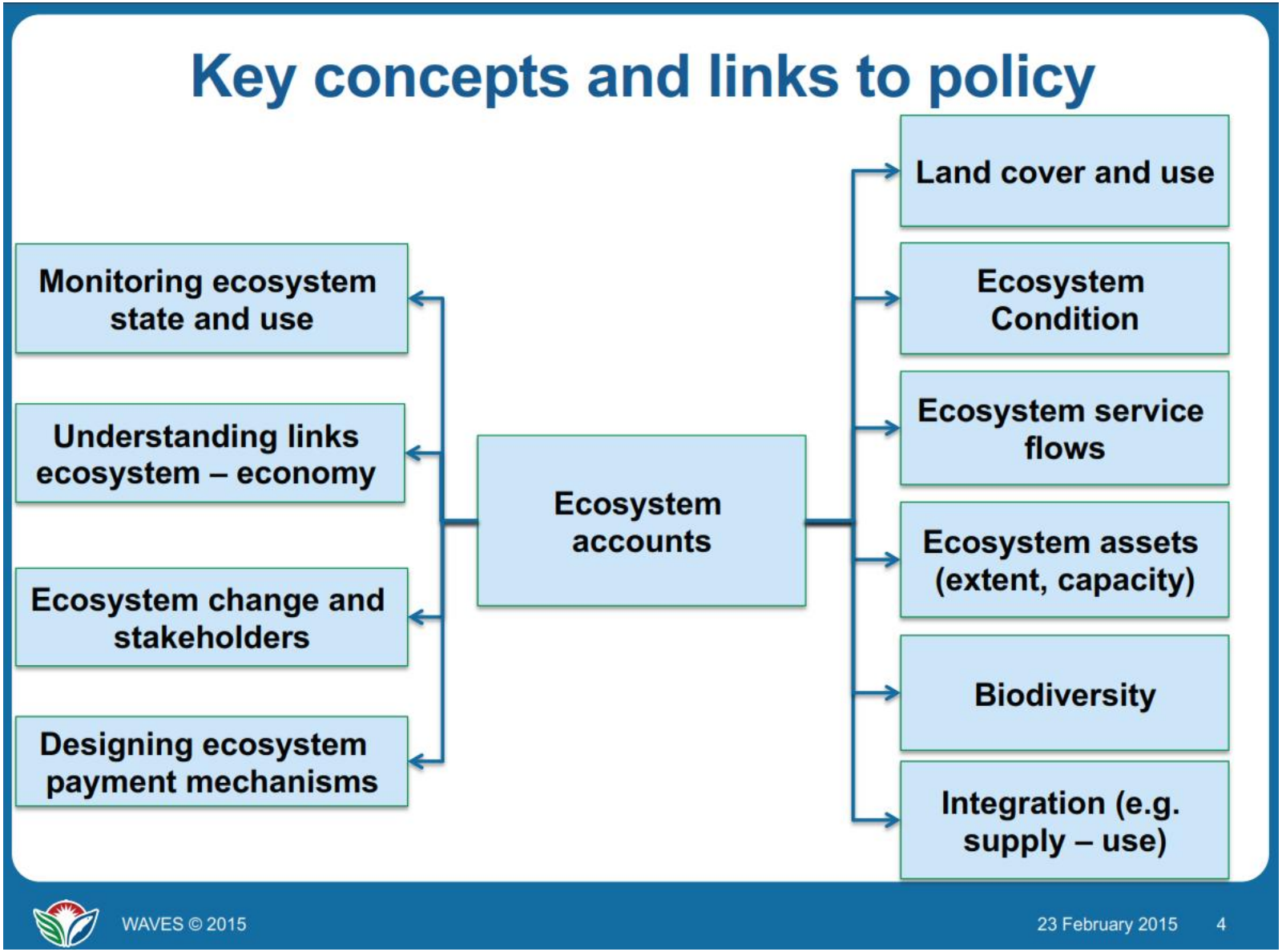
Biomass/Carbon

Biodiversity

Capability

http://commissionoceanindien.org/fileadmin/resources/ISLANDSpdf/Experimental_Ecosystems_Natural_Capital_Accounts_Mauritius.pdf

Source: Michael Vardon's presentation at the World Bank WAVES 1st Knowledge Exchange on Ecosystem Accounting, Manila, the Philippines, 23-27 February, 2015



Source: Lars Hein's presentation at the World Bank WAVES 1st Knowledge Exchange on Ecosystem Accounting, Manila, the Philippines, 23-27 February, 2015

Why accounting for nature is important?

- Accounting = a technique to measure the "true" or net outcome of an activity, based on the complete recording of all entries and outcomes; double-entry accounting, cross-checking data
- Accounts' "balancing items" are key indicators, strictly defined and much used: profit or loss, net income, net savings, accumulation, net worth (assets minus debts)... GDP, National Income...
- Accounting standards allow comparisons between economic agents (International Financial Standards) and between countries (System of National Accounts) as well as the measurement of change (growth, depletion, degradation, time series...)
- Accounts feed models with reliable data and statistics; models outcomes can be compared to the picture of the past and presents situation given by accounts and support policy making
- Physical accounts can be connected to the National Accounts (and to corporate, government accounts...): "carbon/CO2-eq accounts" (IPCC), "material flow accounts" (OECD Green Growth)... now ecosystem accounts

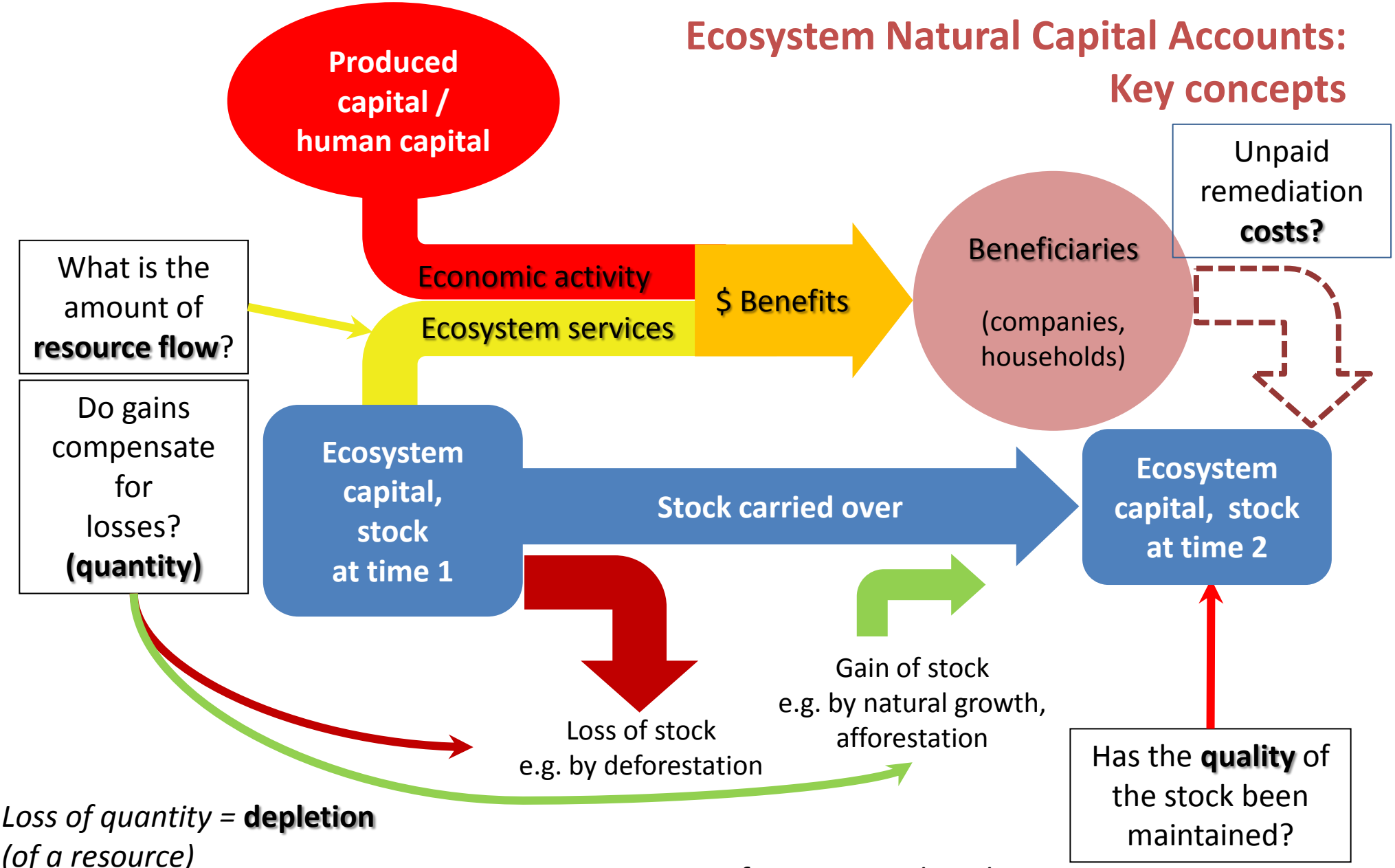
→REMARK: Ecosystem accounts should combine comprehensive and perennial base accounts with more specific and detailed assessments of hot issues

How are Ecosystem Services & Assets recorded in the SNA?

- ES are input to production of goods and services, valued at the purchase price; ES are part of an economy-nature joint production...
- SNA production includes all goods produced for own account (incl. picking up berries, mushrooms, deadwood etc...).
- SNA natural assets are only economic assets, owned and managed for profit; it includes assets owned by governments but excludes ecosystem functions that benefit to others and the public: they are not taken into account.

- **ISSUES: several prices are not rightly set.**
  - Ignored: the ecosystem functions which are not economic assets are not recorded (zero price).
  - Incomplete: unlike consumption of fixed capital, consumption of ecosystem capital is not included in purchasers' prices (because economic agents don't record it – it is for them an externality).
  - Values are not assigned to the right sectors because of rent extortion: Value Added of agriculture is very low, partly because value of food is recorded as Value Added of Agro-food industry and trade; the Value Added of molecules "discovered"via bio-prospecting is recorded as that of Pharmaceutical Industry, not of regions of origin (the ABS paradigm...)

Ecosystem Natural Capital Accounts: Key concepts



Loss of quantity = **depletion** *(of a resource)*

Loss of quantity and quality = **degradation** *(of a system)*

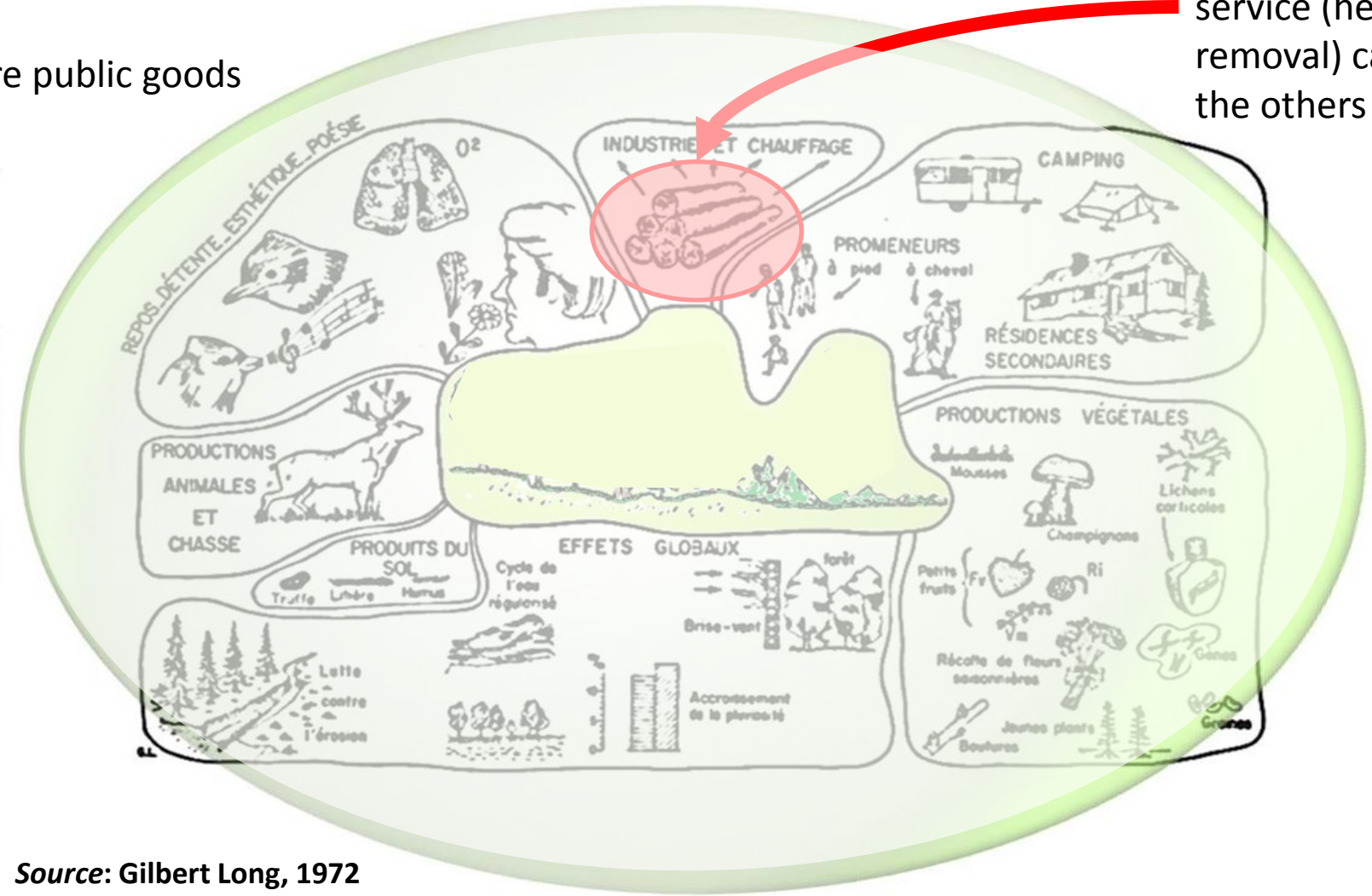
Adapted from Roy Haines-Young, Michael Vardon and Lars Hein

Ecosystems deliver altogether **multiple services**

Some of them are input to economic goods and services

Others are public goods

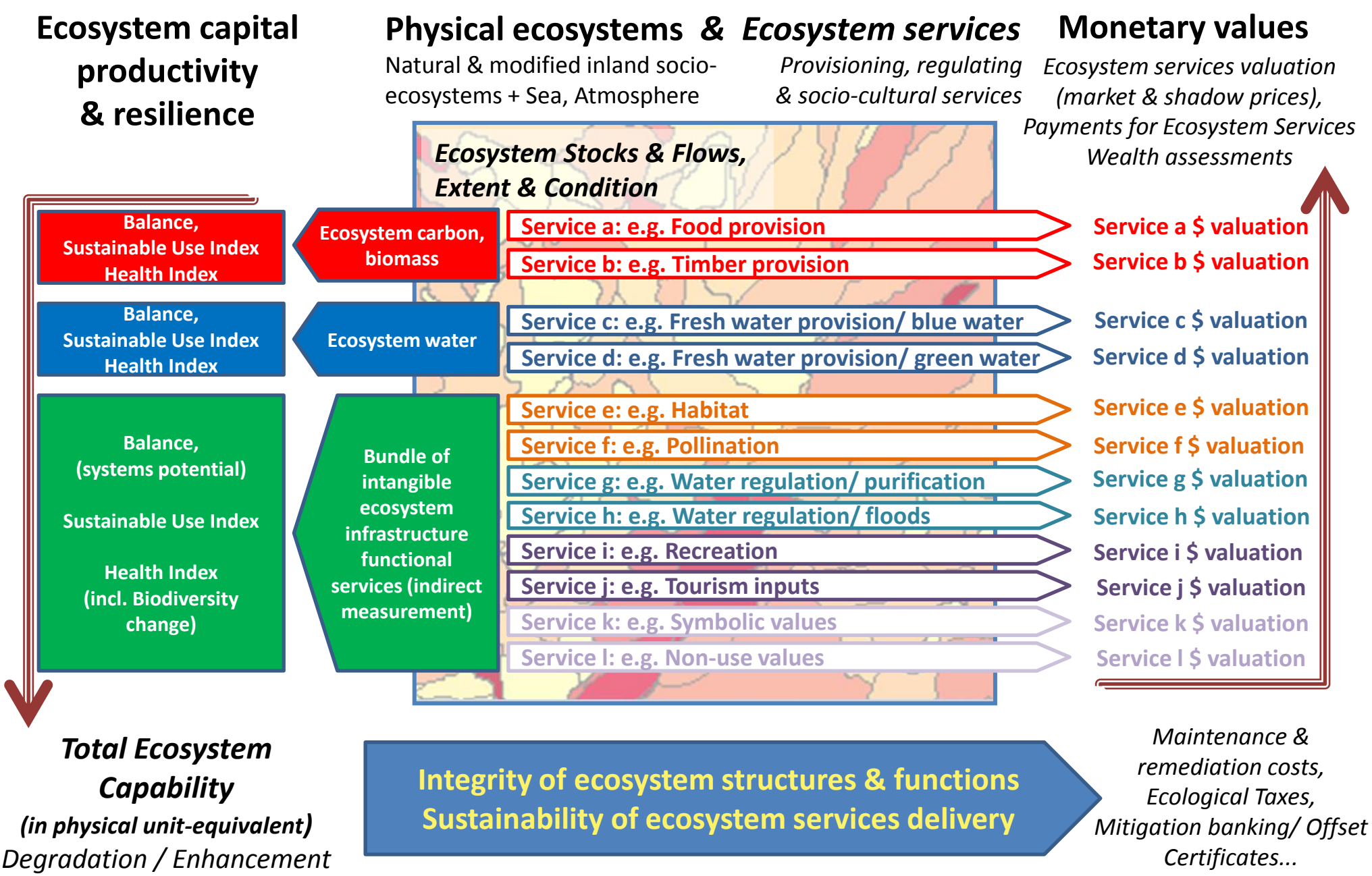
NOTE: Excessive extraction of 1 service (here wood removal) can ruin all the others



***Source*: Gilbert Long, 1972**

A propos du diagnostic écologique appliqué au milieu de vie de l'homme.
Options Méditerranéennes, 13 , CHIEAM, Montpellier, Juin 1972

System and Services approaches



Economic value vs. Ecological value

TEEB Glossary of Terms:

- *"**Ecological value**: non-monetary assessment of ecosystem integrity, health, or resilience, all of which are important indicators to determine critical thresholds and minimum requirements for ecosystem service provision;*

- ***Economic valuation**: the process of expressing a value for a particular good or service in a certain context (e.g. of decision-making) in monetary terms."*

Actual vs. Unpaid maintenance/ restoration costs

Actual expenditure:

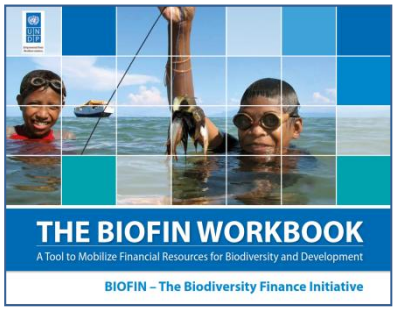
- ***UN SEEA Central Framework***

Chapter IV Environmental activity accounts and related flows /
<u>Environmental protection expenditure accounts</u>

- ***The Biofin Workbook (UNDP)***

➔Workbook 1b : Expenditure review of 1/ national expenditure, 2/ expenditure efficiency

+ 3/ funding needs according to scenarios



Unpaid maintenance/ restoration costs

Estimation at the basis of offset mechanisms

e.g. EU Environmental Liability Directive of 2004

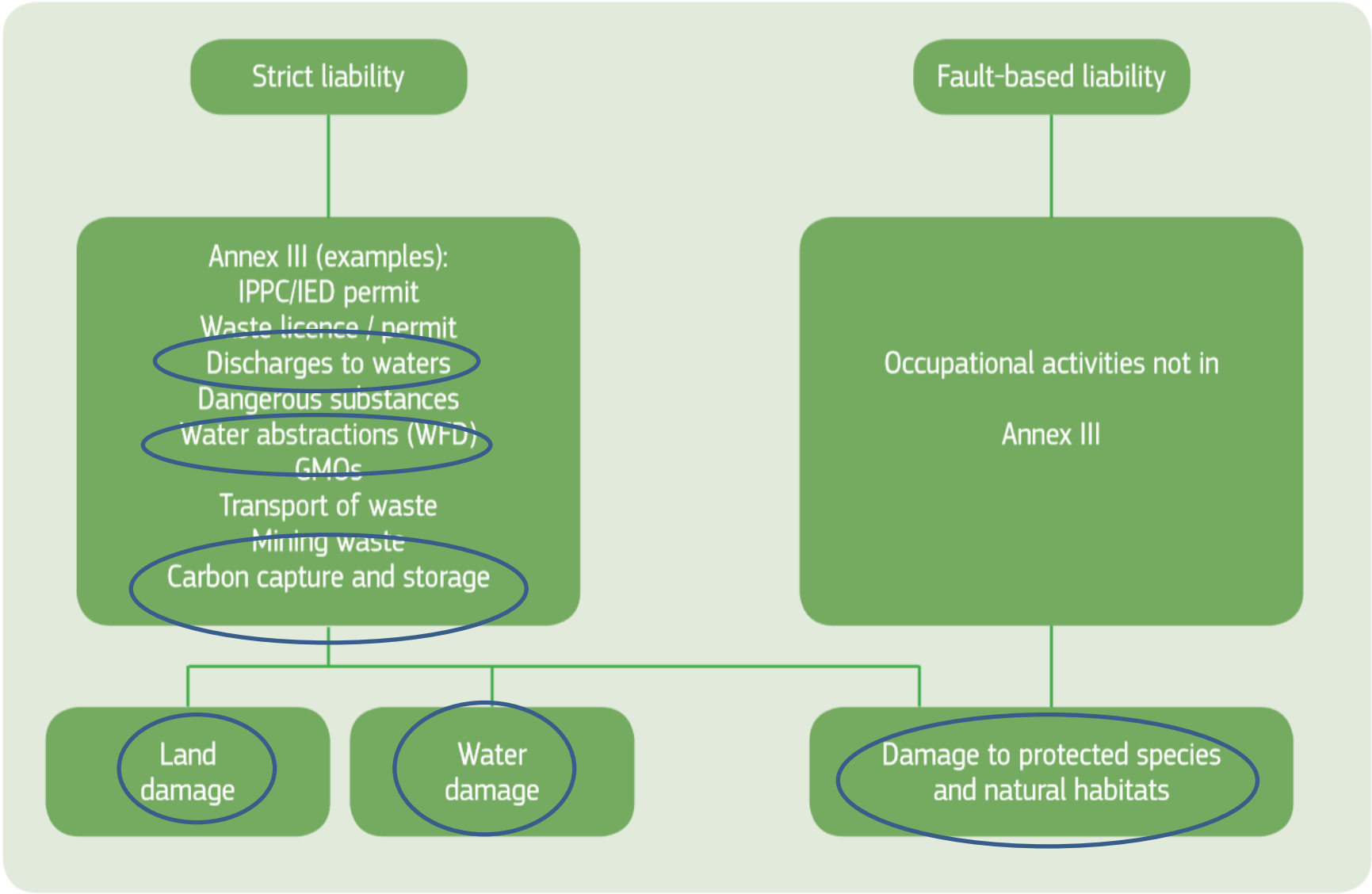
Importance of measuring degradation

Example of the EU Environmental Liability Directive of 2004 (ELD2004): the “Polluter Pays Principle” is enforced regarding environmental damages with 3 purposes:

1. Avoid degradation when possible
2. Repair or restore when 1 is not possible
3. Compensate the damage elsewhere for an equivalent amount when 1 and 2 are not possible

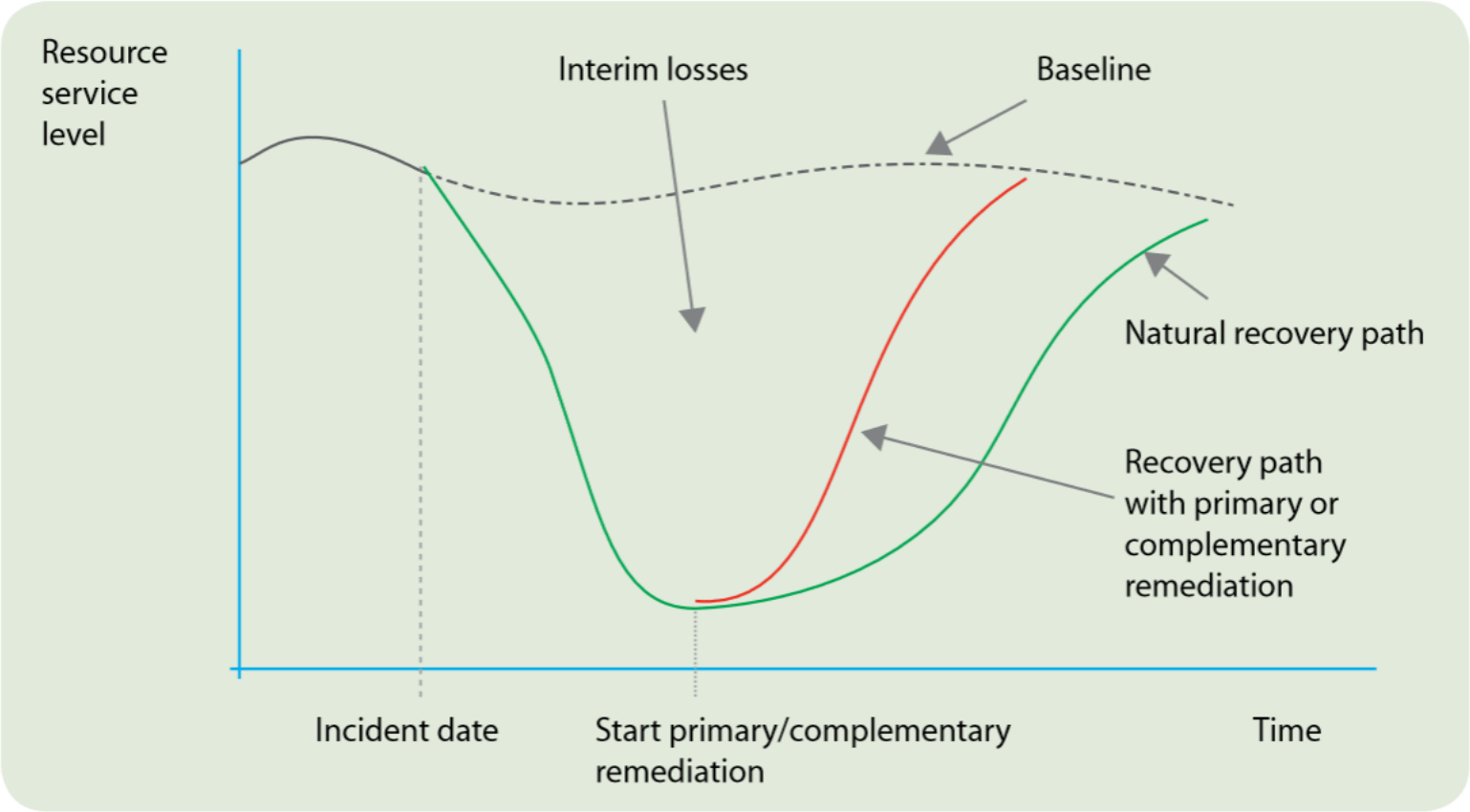
Scope of the ELD 2004 … Similar to ecosystem accounts

Figure 2: Types of environmental liability and damage



The ELD 2004 “accounting” of damage and assessment of remediation

Figure 3: Illustrating baseline, initial damage, interim loss and remediation measures

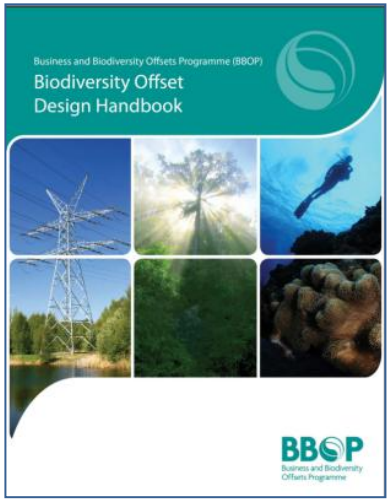


Remediation measures are then converted into Euros

Examples of offset / cap & trade schemes

- ELD2004 is a Directive ➔ country regulations (Natura 2000 context)
- USA: wetlands mitigation banking schemes...
- UNFCCC / Clean Development Mechanism: “carbon” offset permits
- Various private initiatives

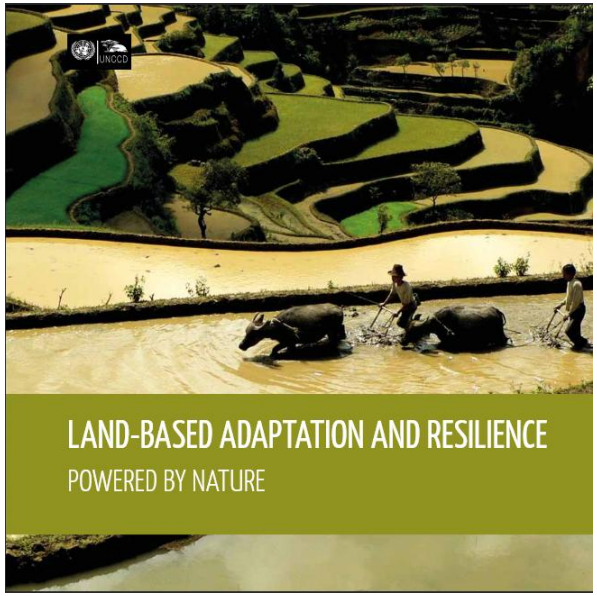
e.g. BBOP (Business and Biodiversity Offset Programme)



UNFCCD: Land-Degradation Neutral World

The LDN concept was first introduced as "zero net land degradation" in a proposal tabled at Rio+20.

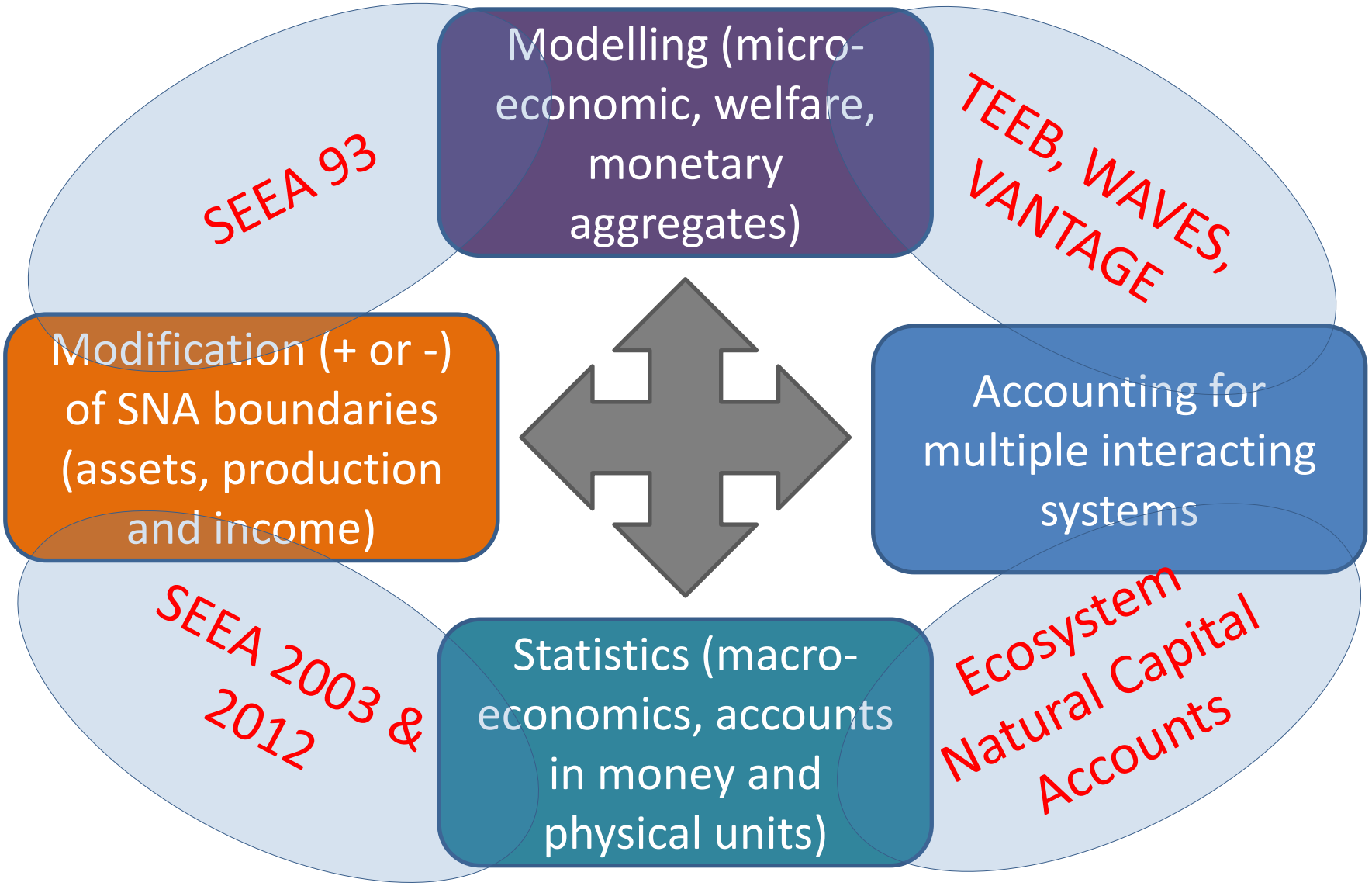
- *"In a land-degradation neutral world, the amount of healthy and productive land resources needed to support vital ecosystem services remains stable or increases in a given time and space."*
- *"Restoring land at large scale improves watersheds and water drainage, refills aquifers, increases tree and plant cover, and helps to recover biodiversity and soil fertility."*



How an integrated accounting system works

- xlsx

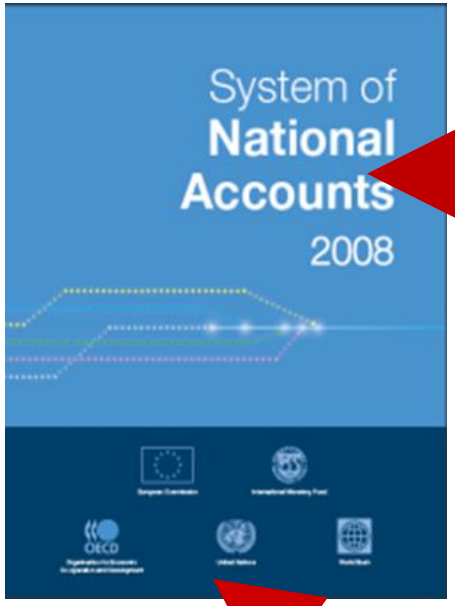
Multiple approaches to environmental accounting



SNA and SEEA volumes 1 & 2

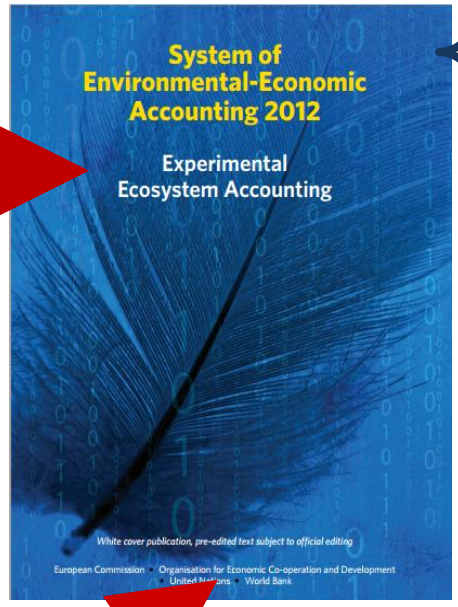
The System of Environmental-Economic Accounts "Central Framework" (SEEA-CF) adopted by the UN Statistical Commission in 2012 as an international statistical standard on par with the System of National Accounts (SNA 2008). 12) has been supplemented in 2013 by a volume on "Experimental Ecosystem Accounting" (SEEA-EEA). While the SEEA-CF is recommended for implementation, the SEEA-EEA which is a conceptual framework is now tested in various projects for which additional methodologies need to be defined. The CBD TS77 ENCA-QSP is a contribution to the development of such tests.

SNA



SEEA volume 1 "Central Framework"

SEEA volume 2 "Experimental Ecosystem Accounting"



SEEA-EEA Experiment

WB WAVES

SEEA-EEA Experiment

EU: ECA & MAES

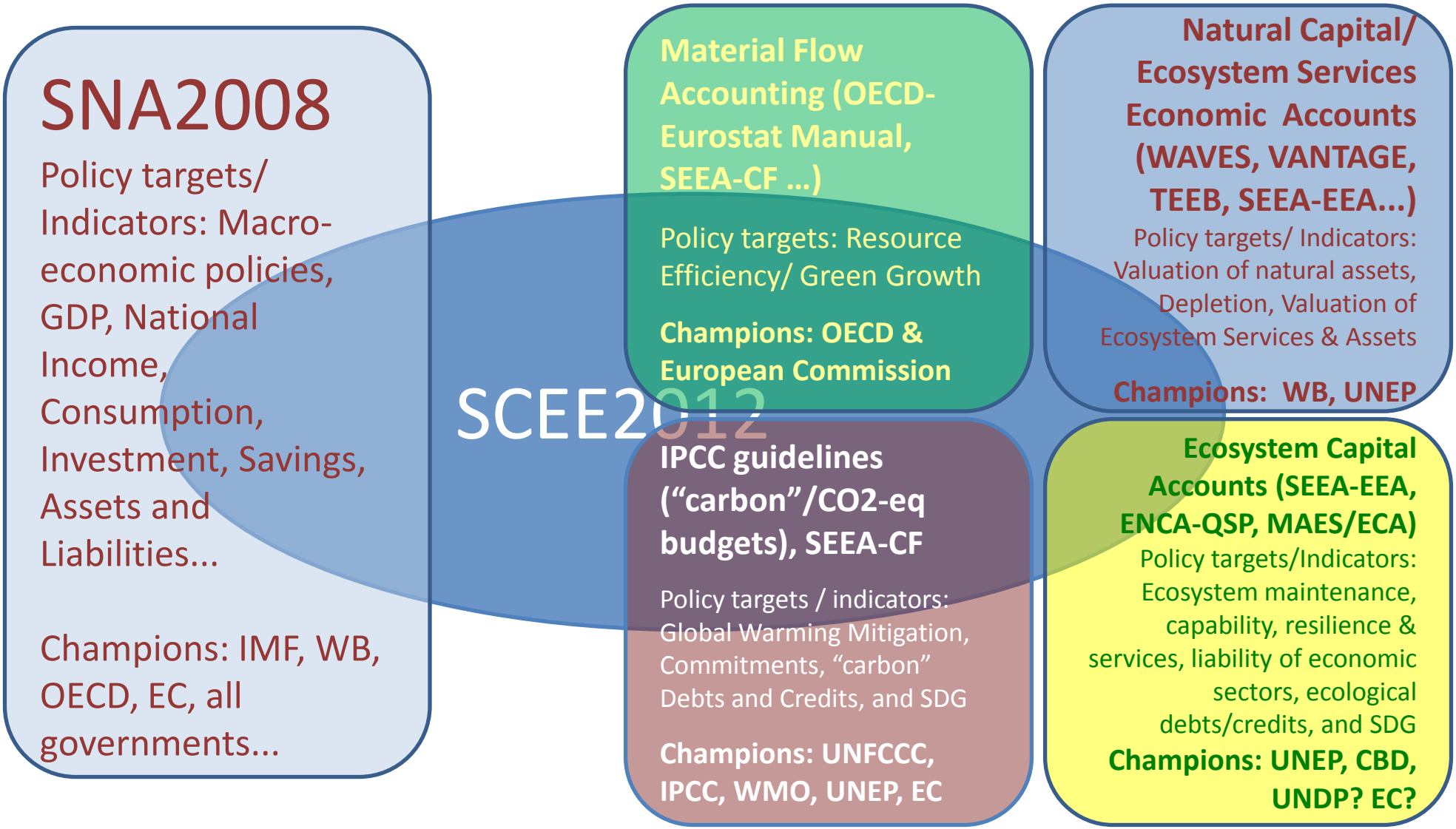
Ecosystem Capital Accounts Mapping and Assessment of Ecosystem Services

SEEA-EEA Experiment

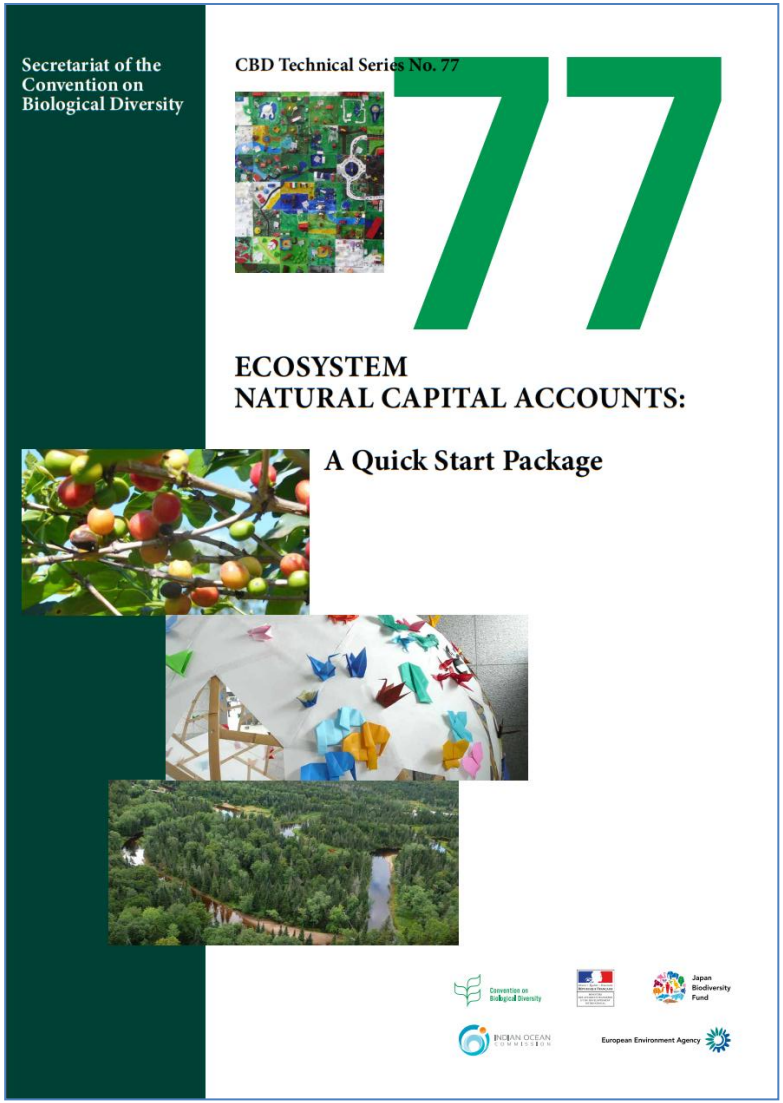
ENCA-Mauritius

Ecosystem/ Natural Capital Accounts

The SEEA and Related Accounting Frameworks

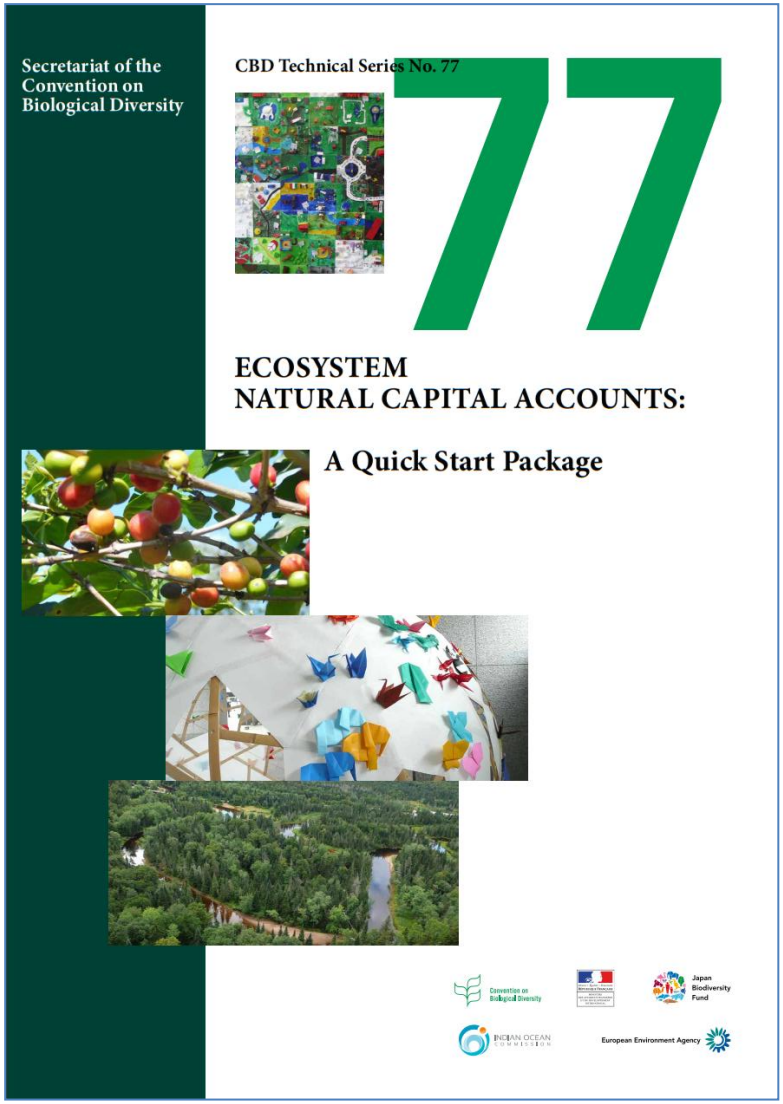


An accounting framework to put the SEEA-EEA to work NOW : Ecosystem Natural Capital Accounts



- A response to the requirement of the CBD Aichi Target 2 call for *incorporating, as appropriate and by 2020 at the latest, biodiversity values into national accounting*.
- A technical accounting framework for measuring ecosystem sustainable capacity, resilience and economic sectors' accountability to the ecosystem. It includes a set of tables and compilation guidance
- A "distribution" (in the sense used for open source software) of the SEEA-EEA, aimed at putting it to work
- A Quick Start Package for experimentations
- Supported by a tutorial for technical training of experts

An accounting framework to put the SEEA-EEA to work NOW : Ecosystem Natural Capital Accounts



- A resp… CBD Aichi T… *appro… biodiv… …ting*.
- A tech… measu… …city, resilie… accou… …udes a set of …
- A "dist… …open source… …ed at puttin…
- A Quic… …tions
- Suppo… …aining of exp…

Close correspondence between SEEA-EEA and ENCA-QSP

Correspondence table between SEEA-EEA Technical Guidance and ENCA Quick Start Package

ENCA-QSP	SEEA-EEA Technical Guidance	Extent account	Condition account	Ecosystem services generation account (by CICES)	Ecosystem services use account (by benefi-ciaries)	Ecosystem capacity and expected ES flows	Ecosystem services supply ($)	Ecosystem services use ($)	Ecosytem asset account ($)	Augmen-ted I-O Table	Integrated sector accounts and balance sheet
QSP Core accounts	Land cover account (ha)										
	River system account (srmu)										
	Core accounts/ biocarbon, water, green infrastructure										
	Basic balances										
	Accessible resource surplus (potential service supply)			[1]							
	Total uses (aggregated by components)				[1]						
	Intensity of use and ecosystem health										
	Ecosystem total capability					[2]					
Extensions	Ecosystem services mapping and assessment (by CICES)										
	Social demand for ecosystem services (by CICES)										
	Valuation of ecosystem services										
	Sectors accountability to ecosystem degradation										[3]
	Sustainable GVA induced by ES									[4]	
	Ecological balance sheet (in capability units)										[5]
	Other								[6]		

	Fair match				
	Partial match	[1] Top-down in QSP Core, detailed in extensions		[3] Need of further discussion	[4] Possible fair match
	No match	[2] Systems vs. Services	[5] Different units	[6] Not addressed in ENCA	

J.-L. Weber, May 2015

Next: Presentation of ENCA-QSP