

The European Commission's science and knowledge service

Joint Research Centre

Servizi ecosistemici: dalla definizione, alla mappatura, alla contabilizzazione

Alessandra La Notte

EVA seminario,
21 Maggio 2020



European
Commission



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- Indipendente da interessi privati, commerciali o nazionali
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- Lavora per oltre 20 DG della Commissione Europea

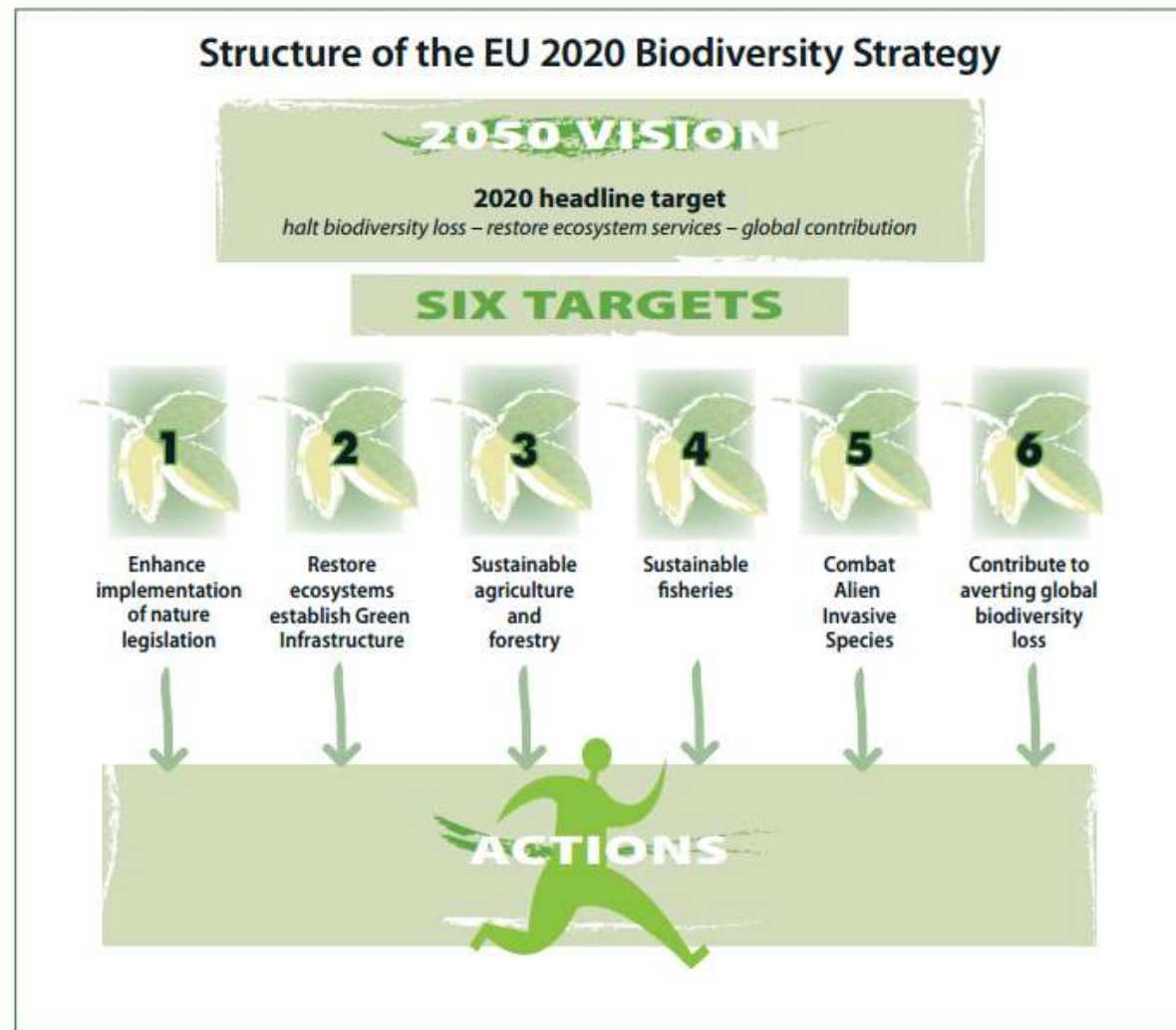


Punto di partenza

EU Biodiversity Strategy

→ porre fine alla perdita di biodiversità e al degrado dei servizi ecosistemici e ripristinarli nei limiti del possibile, intensificando al tempo stesso il contributo dell'UE per scongiurare la perdita di biodiversità a livello mondiale





Obiettivo 2

→ *preservare e valorizzare gli ecosistemi e i loro servizi*

Azione 5

→ **Map and Assess Ecosystems and their Services in Europa**; valutazione economica; contabilizzazione (KIP **INCA** project)

Come funziona MAES

Research community
H2020 projects
www.esmeralda-project.eu

European Commission,
European Environment Agency

Città e regioni
Stakeholders

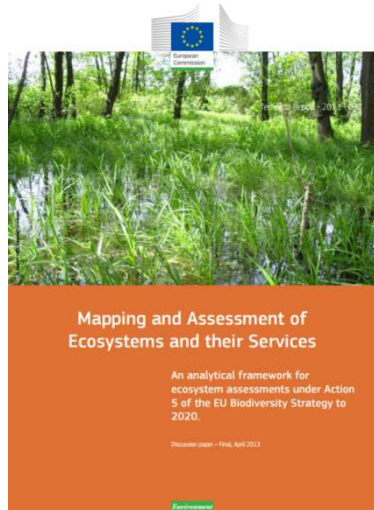
EU Stati Membri
e altri paesi



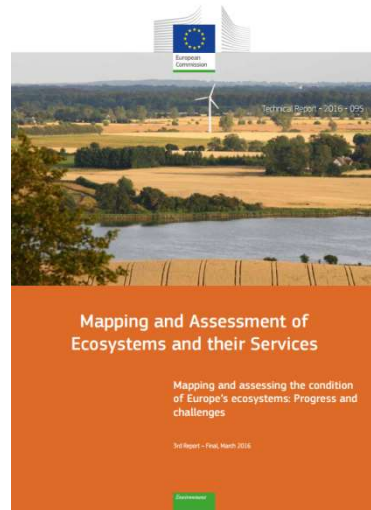
TASKS dei Working group

1. Guida per gli Stati Membri sull'Azione 5
2. Ecosystem assessments and natural capital accounting (INCA)

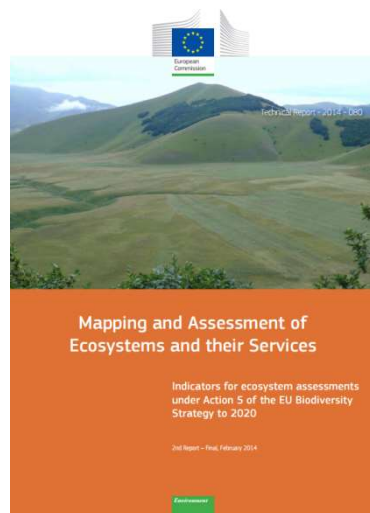
Conceptual framework and typologies



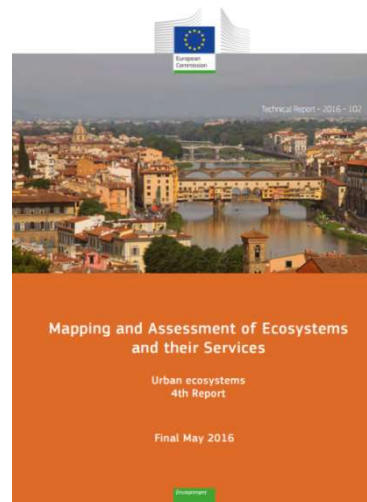
Ecosystem condition assessment



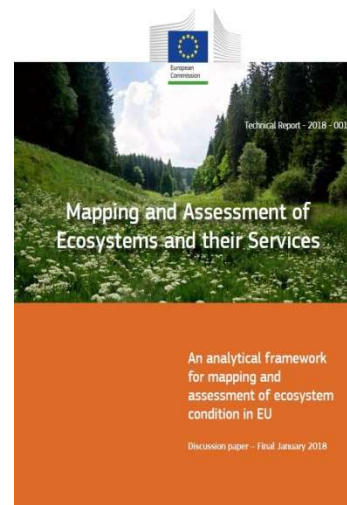
Indicators for ecosystem services



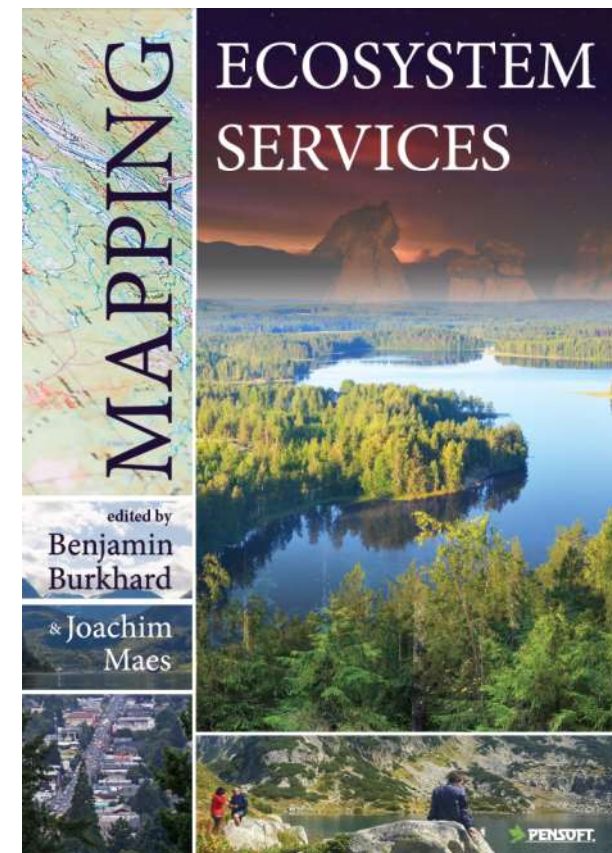
Urban ecosystems



Indicators for ecosystem condition



Documenti guida (MAES)



Integrated system for Natural Capital Accounting (INCA) - Obiettivi

- *Sviluppare un Sistema di contabilità del Capitale Naturale, basandosi sulle linee guida del UN SEEA;*
- *Ref. EU Biodiversity strategy to 2020, EU 7th Environmental Action Plan, Sustainable Development Goals;*
- *Fondato su MAES e a supporto di MAES*



Eurostat:

Coordination of INCA,
data provider, SEEA
EEA alignment/
testing



**European Environment
Agency:**

Developing shared data
platform and ecosystem
extent and condition
accounts, data provider

**INCA
partners**

DG Environment:

Provides policy
context, manages
MAES, principal user
of INCA outputs

**EC Joint Research
Centre:**

Operation of
information systems,
expertise in modelling
ecosystem services,
developing ecosystem
services accounts

**DG Research and
Innovation:**

Coordination between
INCA and EU
research activities



JRC TECHNICAL REPORTS

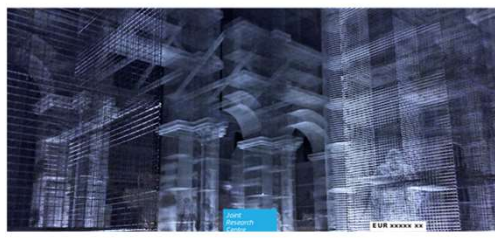
Implementing an EU system of accounting for ecosystems and their services

Initial proposals for the implementation of ecosystem services accounts

Report under phase 2 of the knowledge innovation project on an integrated system of natural capital and ecosystem services accounting in the EU

Alessandra La Notte, Sara Vallecillo, Chiara Polce, Grazia Zullian, Joachim Maes

2017



JRC TECHNICAL REPORTS

Ecosystem services accounting

Part I Outdoor recreation and crop pollination

KIP INCA Report - contribution to the Knowledge and Innovation Project on an Integrated system of Natural Capital and ecosystem services Accounting in the EU

Sara Vallecillo, Alessandra La Notte, Chiara Polce, Grazia Zullian, Nikos Alexandris, Silvia Ferrini and Joachim Maes

2018



Conceptual framework and ES fact sheets

Supply and Use tables for two ES



JRC TECHNICAL REPORTS

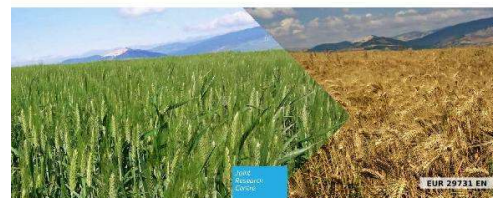
Ecosystem services accounting

Part II Pilot accounts for crop and timber provision, global climate regulation and flood control

KIP INCA Report - contribution to the Knowledge and Innovation Project on an Integrated system of Natural Capital and ecosystem services Accounting in the EU

Vallecillo, S.; La Notte, A.; Kakoulaki, G.; Kamberaj, J.; Robert, N.; Dottori, F.; Feyen, L.; Rega, C.; Maes, J.

2019



EEA Report | No 26/2018

Natural capital accounting in support of policymaking in Europe

A review based on EEA ecosystem accounting work

ISSN 1977-0449



European Environment Agency



Supply and Use tables for four ES

Documenti guida (INCA)

Extent accounts

Brussels, 18.7.2019
SWD(2019) 305 final

PART 1/3

COMMISSION STAFF WORKING DOCUMENT

EU guidance on integrating ecosystems and their services into decision-making

https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

I servizi ecosistemici: modello teorico prima della classificazione

Cosa sono i servizi ecosistemici?

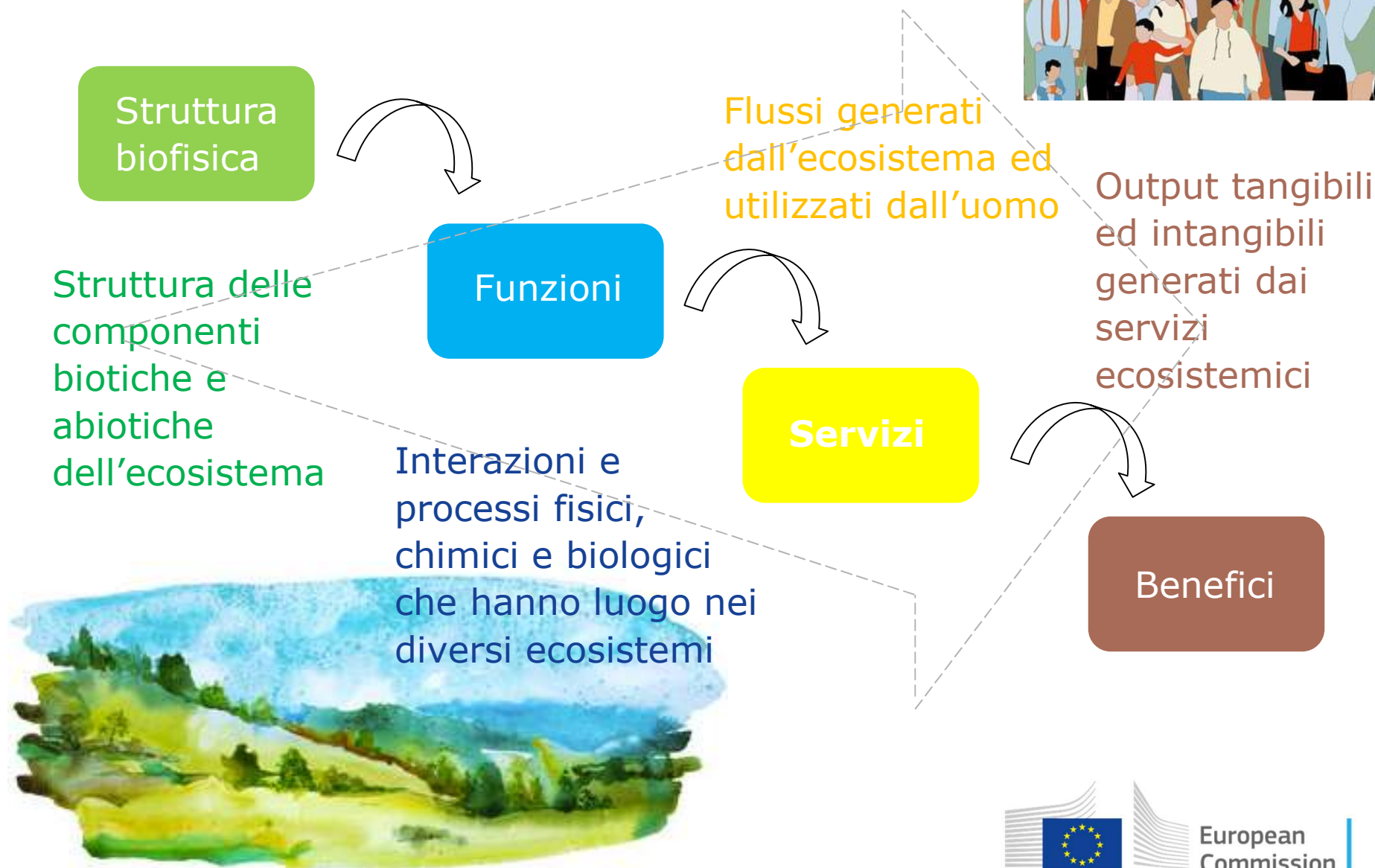
ECOSYSTEM SERVICES Supporting » NUTRIENT CYCLING » SOIL FORMATION » PRIMARY PRODUCTION Provisioning » FOOD » FRESH WATER » WOOD AND FIBER » FUEL Regulating » CLIMATE REGULATION » FLOOD REGULATION » DISEASE REGULATION » WATER PURIFICATION Cultural » AESTHETIC » SPIRITUAL » EDUCATIONAL » RECREATIONAL		Main service-types			
		PROVISIONING SERVICES			
	1	Food (e.g. fish, game, fruit)	Provisioning	Division	Group
	2	Water (e.g. for drinking, irrigation, cooling)		Nutrition	Biomass
	3	Raw materials (e.g. fiber, timber, fuel wood, fodder, fert		Materials	Water
	4	Genetic resources (e.g. for crop improvement and medic			Biomass, Fibre
	5	Medicinal resources (e.g. biochemical products, models	Energy	Water	
	6	Ornamental resources (e.g. artisan work, decorative pla	Regulation & Maintenance	Mediation of waste, toxics and other nuisances	Biomass-based energy sources
		REGULATING SERVICES		Mechanical energy	
	7	Air quality regulation (e.g. capturing (fine)dust, chemic		Mediation of biota	
	8	Climate regulation (incl. C-sequestration, influence of v		Mediation by ecosystems	
	9	Moderation of extreme events (e.g. storm protection and		Mediation of flows	
	10	Regulation of water flows (e.g. natural drainage, irrigati		Mass flows	
	11	Waste treatment (especially water purification)		Liquid flows	
	12	Erosion prevention		Gaseous / air flows	
	13	Maintenance of soil fertility (incl. soil formation)		Maintenance of physical, chemical, biological conditions	Lifecycle maintenance, habitat and gene pool protection
	14	Pollination			Pest and disease control
	15	Biological control (e.g. seed dispersal, pest and disease c	Soil formation and composition		
		HABITAT SERVICES	Water conditions		
	16	Maintenance of life cycles of migratory species (incl. n	Cultural	Physical and intellectual interactions with ecosystems and land-/seascapes [environmental settings]	Physical and experiential interactions
	17	Maintenance of genetic diversity (especially gene pool		Spiritual, symbolic and other interactions with ecosystems and land-/seascapes [environmental settings]	Intellectual and representational interactions
		CULTURAL SERVICES			Spiritual and/or emblematic
18	Aesthetic information			Other cultural outputs	
19	Opportunities for recreation & tourism				
20	Inspiration for culture, art and design				
21	Spiritual experience				
22	Information for cognitive development				

MA (2005): benefici
forniti dagli ecosistemi al
genere umano

TEEB (2010): contributi
diretti ed indiretti forniti
dagli ecosistemi al genere
umano

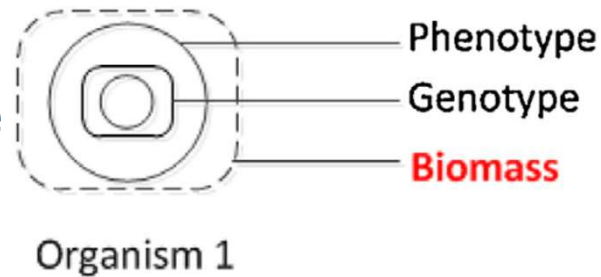
CICES (2013): contributi che
gli ecosistemi apportano al
genere umano, distinti dai
benefici che ne conseguono

Modello a cascata



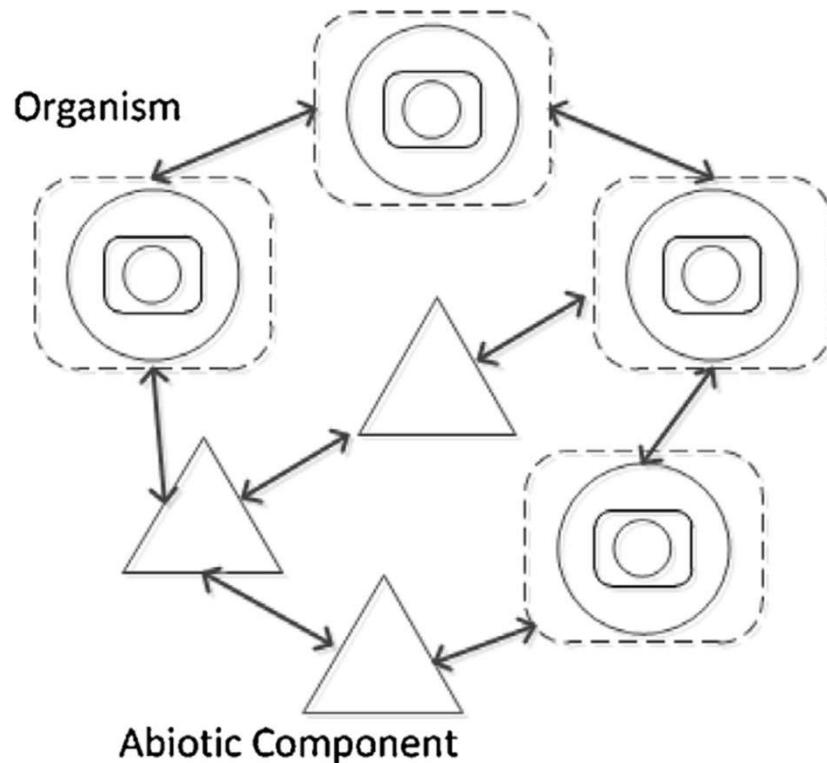
Dall'ecologia sistemica...

Relazioni tra componenti biotiche e abiotiche, che possono essere bidirezionali o multidirezionali



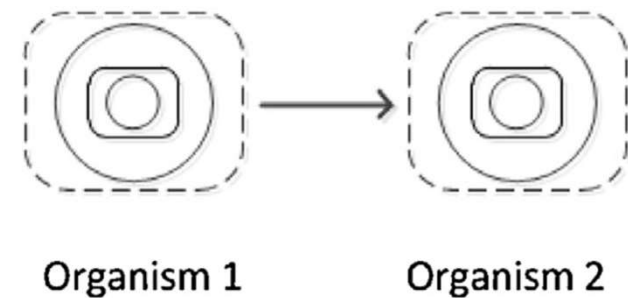
materiale biologico derivato da organismi viventi o morti

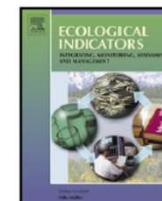
Interaction in Ecological Networks



Relazione monodirezionale che si verifica tra due (o più) organismi quando gli "organismi riceventi" sono in grado di catturare ed elaborare le informazioni del "mittente".

Information



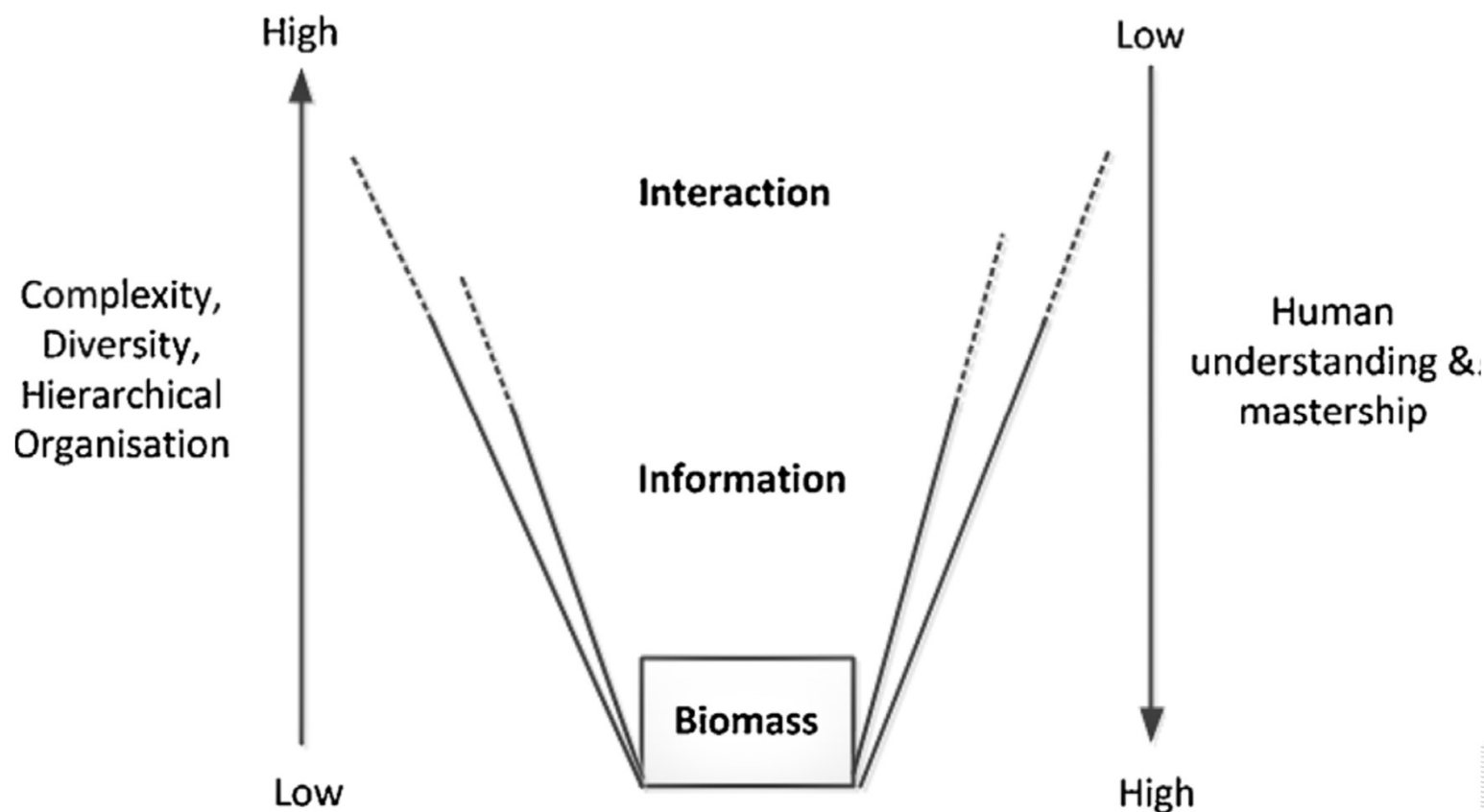


Original Articles

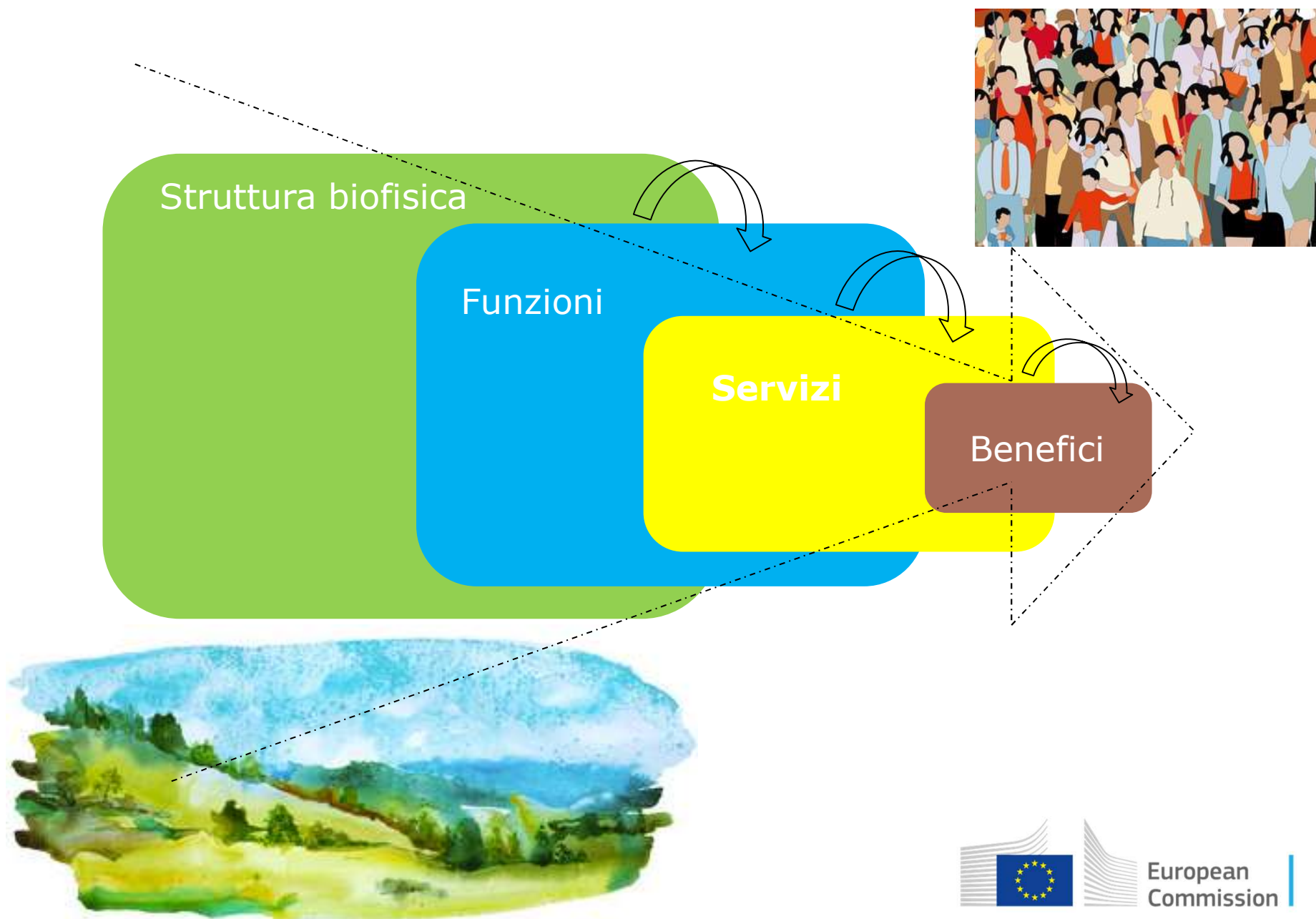
Ecosystem services classification: A systems ecology perspective of the cascade framework



Alessandra La Notte^{a,*}, Dalia D'Amato^{b,*}, Hanna Mäkinen^c, Maria Luisa Paracchini^a, Camino Liqueste^a, Benis Egoh^{d,e}, Davide Geneletti^f, Neville D. Crossman^g

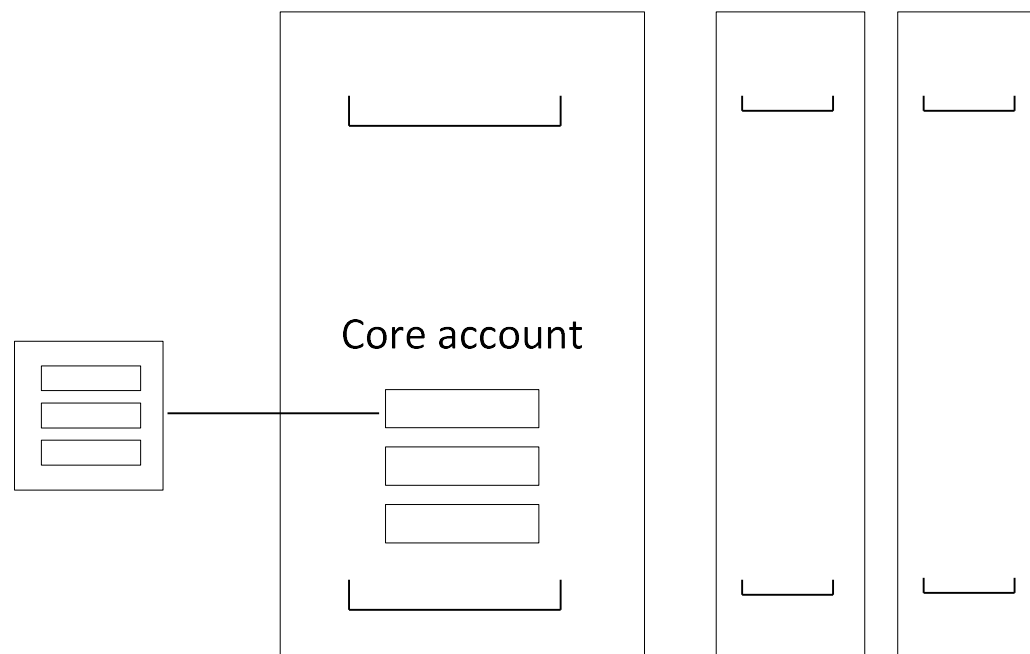


Modello a cascata «telescopica»



I servizi ecosistemici: la classificazione prima della contabilizzazione

Breve introduzione sui conti satellite



C'è bisogno di flessibilità

Conti satellite interni

Conti satellite esterni

Servizi ecosistemici

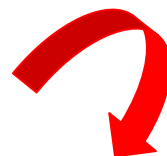
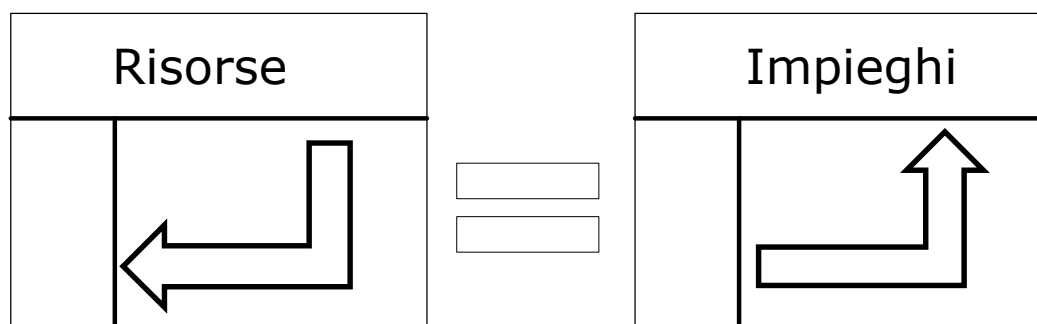


Tabelle Impieghi Risorse

Tali tavole sono matrici per branca di attività economica che descrivono dettagliatamente i processi di produzione interni e le operazioni sui prodotti dell'economia nazionale.

Le due tavole forniscono un quadro dettagliato dell'offerta di beni e servizi, sia di produzione interna sia di importazione, e dell'utilizzo dei beni e servizi per usi intermedi o finali e mostrano, inoltre, il valore aggiunto e tutte le sue componenti generate dalle branche di attività economica



unstats.un.org/unsd/nationalaccount/sna.asp



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You are here: SNA

The System of National Accounts (SNA)

About the SNA

The System of National Accounts (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity. The SNA describes a coherent, consistent and integrated set of macroeconomic accounts in the context of a set of internationally agreed concepts, definitions, classifications and accounting rules.

In addition, the SNA provides an overview of economic processes, recording how production is distributed among consumers, businesses, government and foreign nations. It shows how income originating in production, modified by taxes and transfers, flows to these groups and how they allocate these flows to consumption, saving and investment. Consequently, the national accounts are one of the building blocks of macroeconomic statistics forming a basis for economic analysis and policy formulation.

The SNA is intended for use by all countries, having been designed to accommodate the needs of countries at different stages of economic development. It also provides an overarching framework for standards in other domains of economic statistics, facilitating the integration of these statistical systems to achieve consistency with the national accounts.



System of National Accounts 2008 - 2008 SNA

Final version of the 2008 SNA in PDF format



The System of National Accounts 1993 - 1993 SNA

Final version of the 1993 SNA in PDF format



Historic Versions of the SNA

Historic timeline of development of the SNA from its origin in 1947 until today



Relevant and Supporting Publications

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National accounts (including GDP and regional accounts) - Overview

INTRODUCTION

What are national accounts?

National accounts provide information to analyse the structure of economies and their development over time. They contain a **wide range of statistics** describing an economy in various ways. The **main GDP aggregates** provide an overview about key economic developments. Other national accounts data on [institutional sectors](#), [government finances](#) or [supply, use and input-output tables](#) allow a deeper analysis. A selection of data is also available on a regional level. **These topics are presented in different sections of the Eurostat website.**

Which information can I find here?

This section focuses on a selection of national accounts statistics regarding **core national accounts aggregates** such as gross domestic product (GDP), its main components and employment.

It also includes data on gross value added and gross fixed capital formation and employment broken down





+ Cultura, comunicazione, viaggi

+ Giustizia e sicurezza

+ Vita quotidiana e opinione dei
cittadini

- Conti nazionali

+ Conti e aggregati economici
nazionali annuali

+ Conti e aggregati economici
nazionali trimestrali

+ Conti e aggregati economici
territoriali

+ Conti non finanziari annuali per
settore istituzionale

+ Conti non finanziari trimestrali per
settore istituzionale

+ Conti e aggregati economici delle
Pubbliche Amministrazioni

+ Conti ambientali

+ Misure di produttività

+ Conti della Protezione sociale

+ Sistema dei conti della sanità

+ Conti della branca agricoltura,
silvicoltura e pesca

+ Imprese

Principali aggregati annuali di Contabilità Nazionale ⓘ : Valori pro capite

Personalizza

Esporta

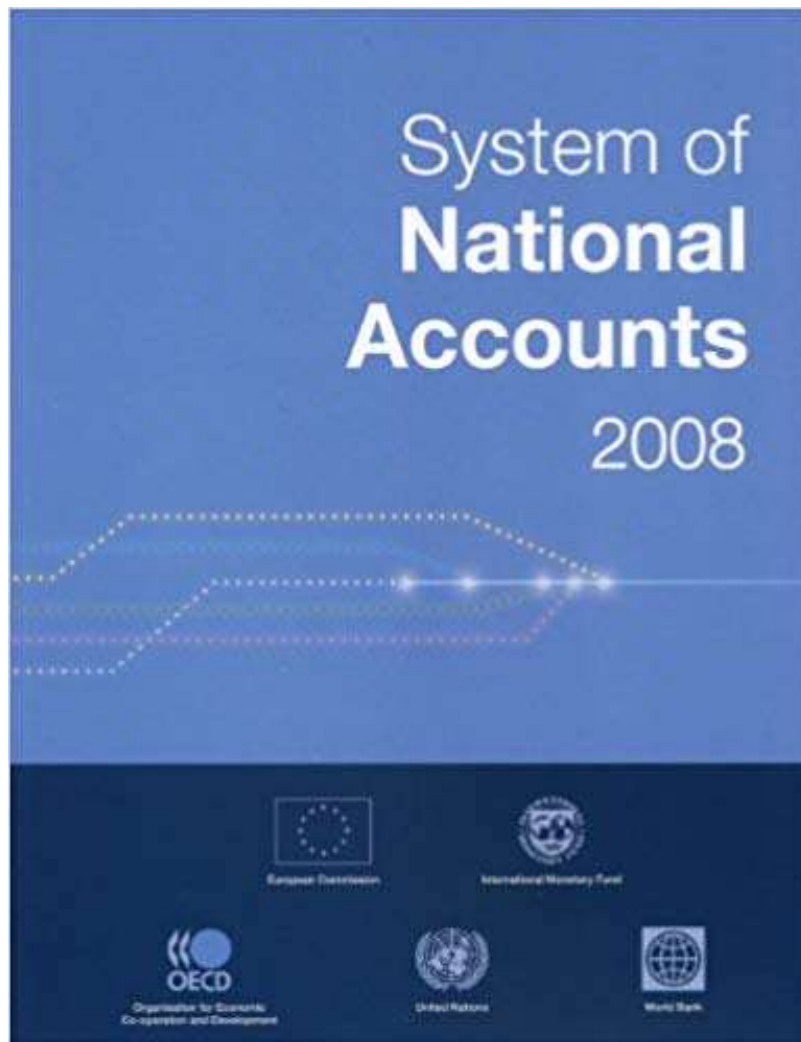
Grafici

La tua interrogazione

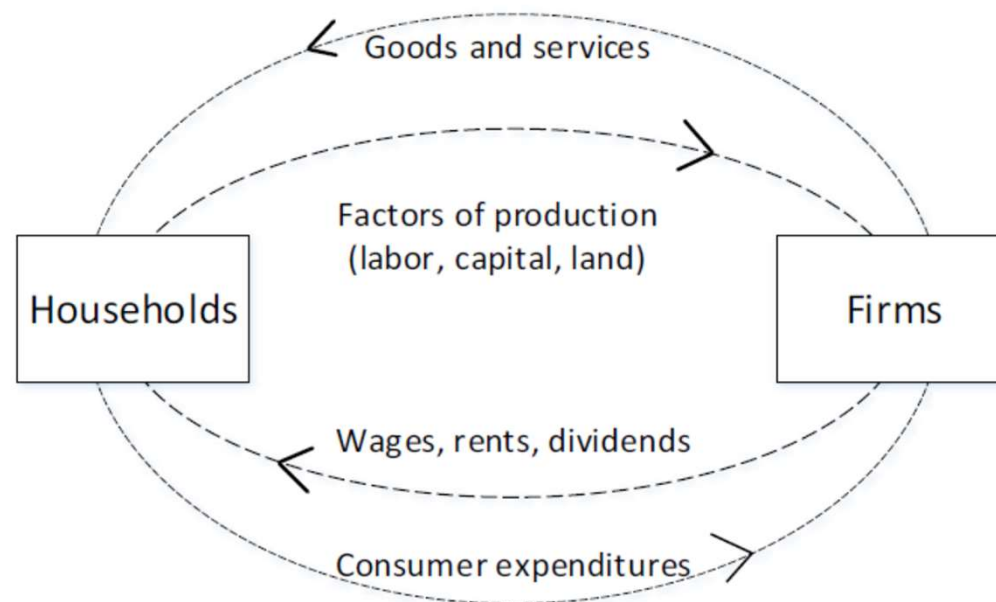
Territorio	Italia	
Valutazione	prezzi correnti	
Correzione	dati grezzi ⓘ	
Edizione	Mar-2020 ▾	
Seleziona periodo	2015	2016
	▲ ▼	▲ ▼
Tipo aggregato (milioni di euro)		
prodotto interno lordo ai prezzi di mercato per abitante	27 257.3	27 97
prodotto interno lordo ai prezzi di mercato per unità di lavoro totali	70 620.6	71 37
prodotto interno lordo ai prezzi di mercato per occupato	67 520.9	68 24
prodotto interno lordo ai prezzi di mercato per ora lavorata	39.3	3
valore aggiunto per unità di lavoro	63 483.0	64 09
valore aggiunto per occupato	60 696.6	61 28
valore aggiunto per ora lavorata	35.3	3
consumi finali nazionali per abitante	21 772.9	22 13
redditi interni da lavoro dipendente per unità di lavoro dipendente	40 188.4	40 27

Dati estratti il 21 mag 2020, 05h41 UTC (GMT) da I.Stat

Core accounts: la struttura contabile di riferimento



Flusso circolare del reddito



Dove inizia il processo di produzione?



Produzione
Consumo
Accumulazione

Tabelle Impieghi-Risorse SNA

SUPPLY TABLE					
	industries	households	government	accumulation	rest of the world
products	output				imports

USE TABLE					
	industries	households	government	accumulation	rest of the world
products	intermediate consumption	final consumption	final consumption	gross capital formation	exports



seea.un.org/content/seea-central-framework

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European Commission > Eurostat > Environment > Methodology

ENVIRONMENT

METHODOLOGY

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▲ Data

[Database](#)

[Main tables](#)

[Air emissions](#)

[Biodiversity](#)

[Energy accounts](#)

[Environmental protection](#)

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[Material flows and resource productivity](#)

[Taxes](#)

[Waste](#)

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- Conti e aggregati economici nazionali trimestrali
- Conti e aggregati economici territoriali
- Conti non finanziari annuali per settore istituzionale
- Conti non finanziari trimestrali per settore istituzionale
- Conti e aggregati economici delle Pubbliche Amministrazioni

Conti ambientali

- Conti dei beni e servizi ambientali
- Conti dei flussi fisici di energia (PEFA)
- Spese per la protezione dell'ambiente
- Emissioni atmosferiche NAMEA (NACE Rev.2)
- Gettito delle imposte ambientali

Benvenuto in I.Stat

Cosa è I.Stat

I.Stat è la banca dati, sempre aggiornata, delle statistiche correnti. Le statistiche sono ricercabili per tema. Il sistema è interrogabile. I dati sono presentati sotto forma di tavole multidimensionali che possono essere personalizzate agendo sulle variabili, il periodo di riferimento.

Attraverso un web service che consente l'interrogazione diretta, è possibile formulare specifiche query sui dati, effettuare il download dei dati. Per maggiori informazioni, visitate il sito [strumenti/web-service-sdmx](https://dati.istat.it/strumenti/web-service-sdmx).

Il glossario dei termini statistici è disponibile all'indirizzo <https://dati.istat.it/glossario>.

Altre banche dati derivanti da I.Stat

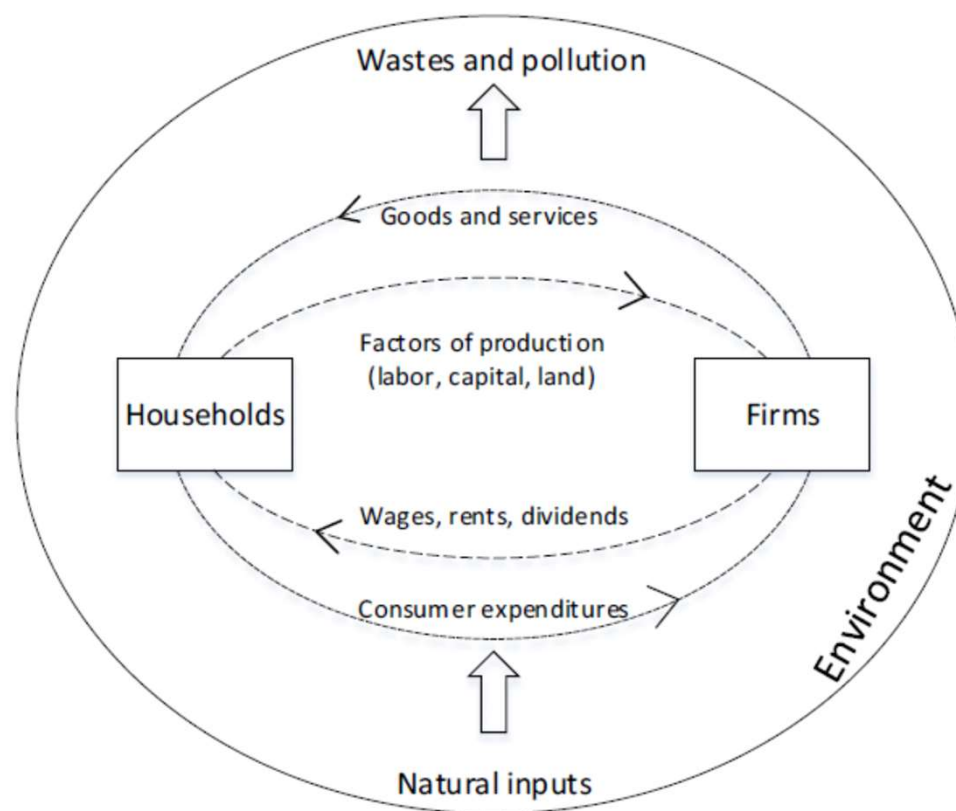
Per alcuni argomenti di particolare interesse, l'Istat ha riorganizzato i dati in seguenti sistemi tematici:

- Giovani.Stat** Vedi anche il Quadro informativo [#Giovani](#)
- Anziani.Stat** Vedi anche il Quadro informativo [#Anziani](#)
- Immigrati.Stat** Vedi anche il Quadro informativo [#Immigrati](#)
- Congiuntura.Stat** Vedi anche il Quadro informativo [#Congiuntura](#) accedi a [#Revisioni](#)
- Pubblica Amministrazione.Stat**

Conti satellite: SEEA Central Framework



Flusso circolare del reddito
«allargato» all'ambiente



Dove inizia il processo di produzione?

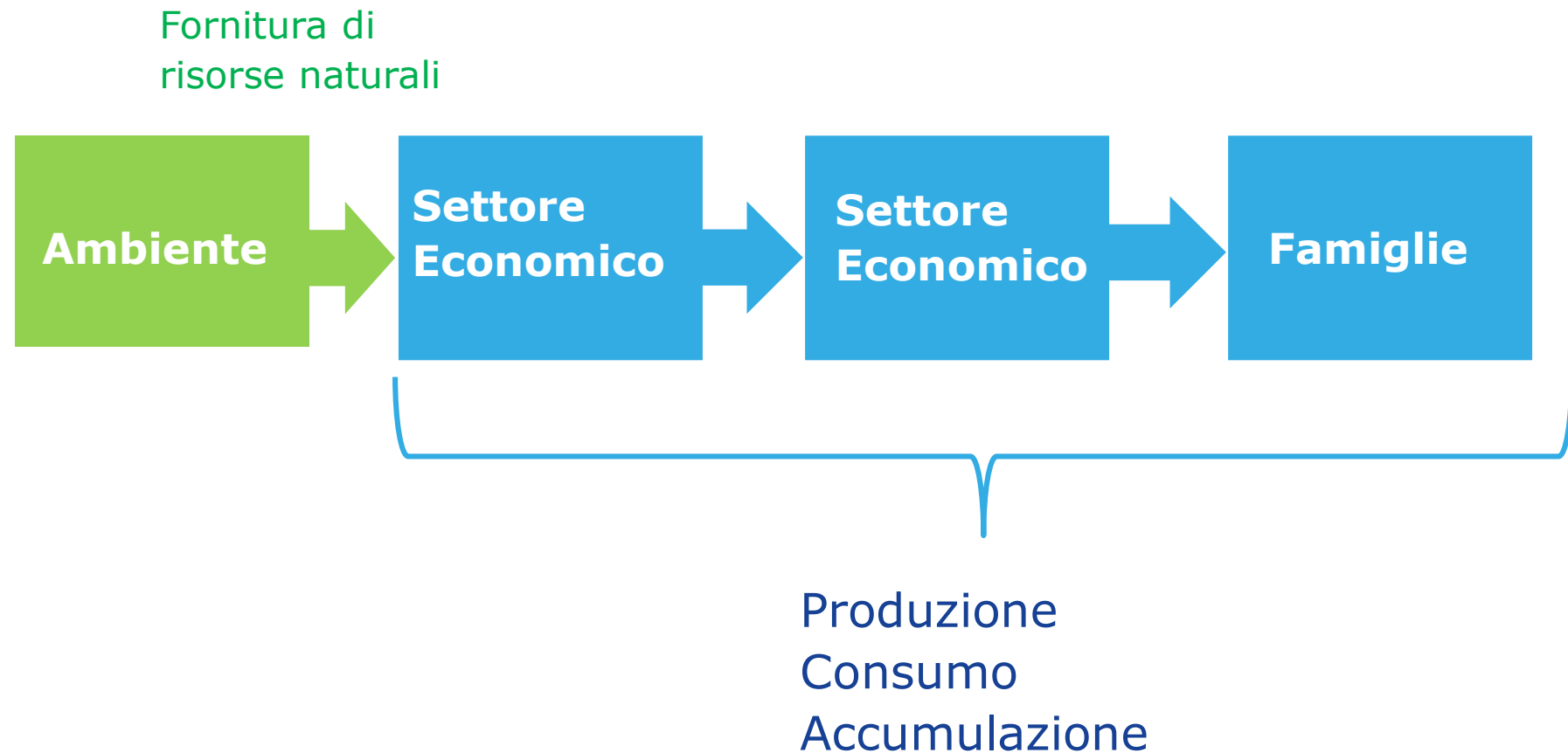


Tabelle Impieghi-Risorse SEEA CF

SUPPLY TABLE

	industries	households	accumulation	rest of the world	environment
natural inputs					mass and biomass
products	output			imports	
residuals	generated by industries	generated by households	from scrapping and demolition	imported	



USE TABLE

	industries	households	accumulation	rest of the world	environment
natural inputs	extraction	extraction			
products	intermediate consumption	final consumption	gross capital formation	exports	
residuals	recycled		landfills	exported	discharged



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Ecosystem Accounting



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METHODOLOGY

Legislation

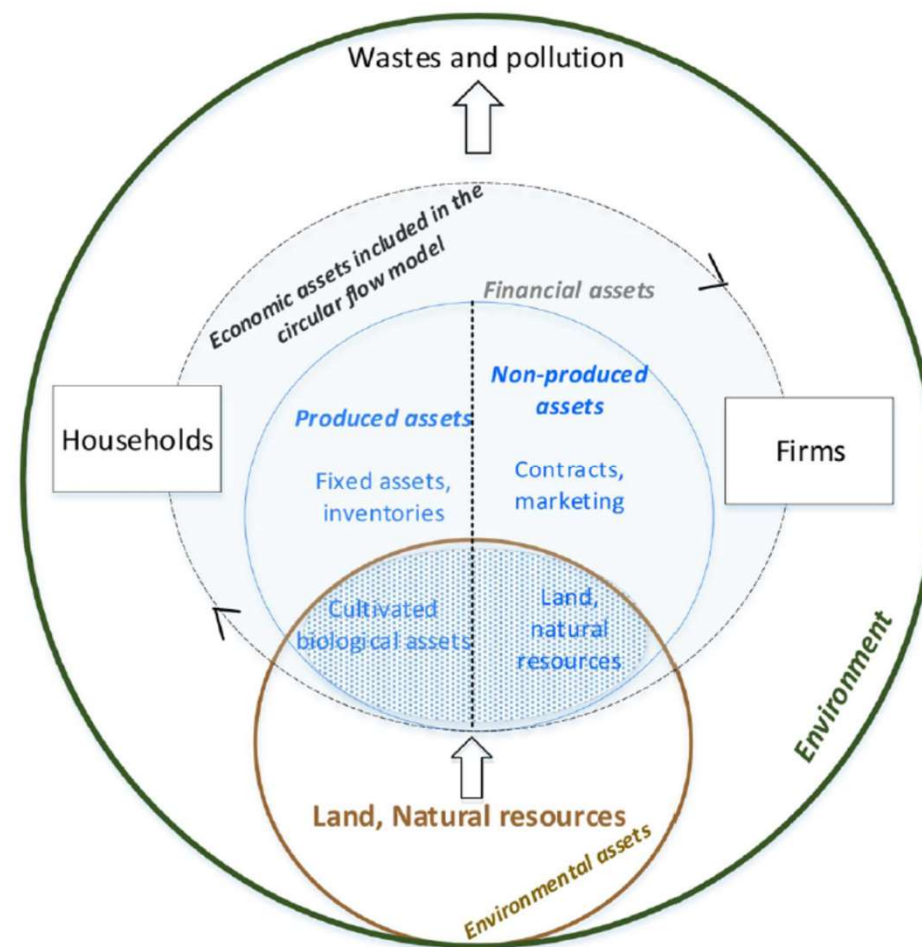
Indicators

– Ecosystem accounts

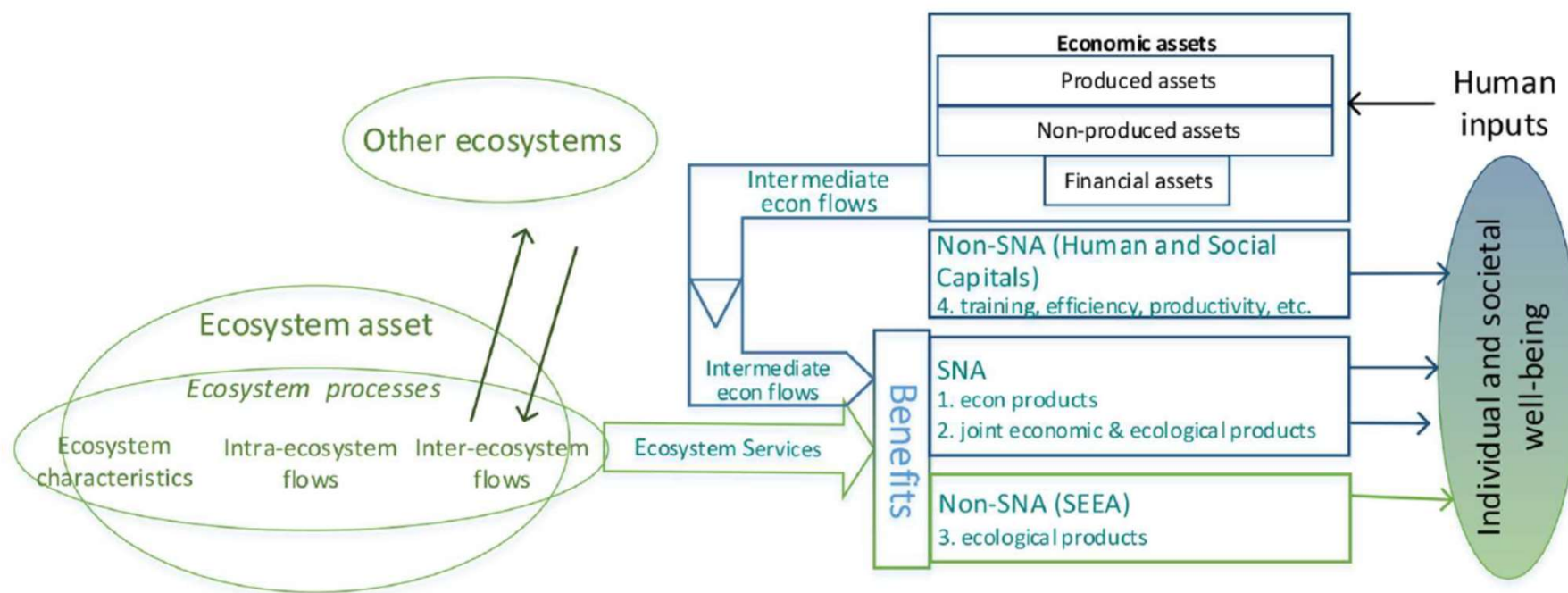
-  [KIP-INCA Phase 1 report](#)
-  [Leaflet 2019 – The INCA project](#)
-  [JRC Technical report - Implementing an EU system of accounting for ecosystems and their services](#)
-  [Technical recommendations in support of the SEEA EEA - white cover publication](#)
-  [JRC \(et al.\) Scientific Article: Sustainability assessment and causality nexus through ecosystem service accounting: The case of water purification in Europe](#)
-  [JRC \(et al.\) Scientific Article: Physical and monetary ecosystem service accounts for Europe: A case study for in-stream nitrogen retention](#)
-  [JRC \(et al.\) Scientific Article: The role of enabling actors in ecosystem service accounting](#)
-  [MAES Technical Report: An analytical framework for mapping and assessment of ecosystem condition in the EU](#)
-  [System of Environmental- Economic Accounting 2012, Experimental Ecosystem Accounting](#)
-  [CICES - Common classification of ecosystem services](#)
-  [DG Environment - Natural Capital Accounting](#)
-  [UK National Ecosystem Assessment](#)
-  [UK Ecosystem Accounts](#)
-  [JRC Technical Report: Ecosystem services accounting - Part I. Outdoor recreation and crop pollination](#)
-  [JRC Technical Report: Ecosystem services accounting - Part II. Pilot accounts for crop and timber provision, global climate regulation and flood control](#)
-  [EEA Report: Natural capital accounting in support of policymaking in Europe – A review based on EEA ecosystem accounting work](#)

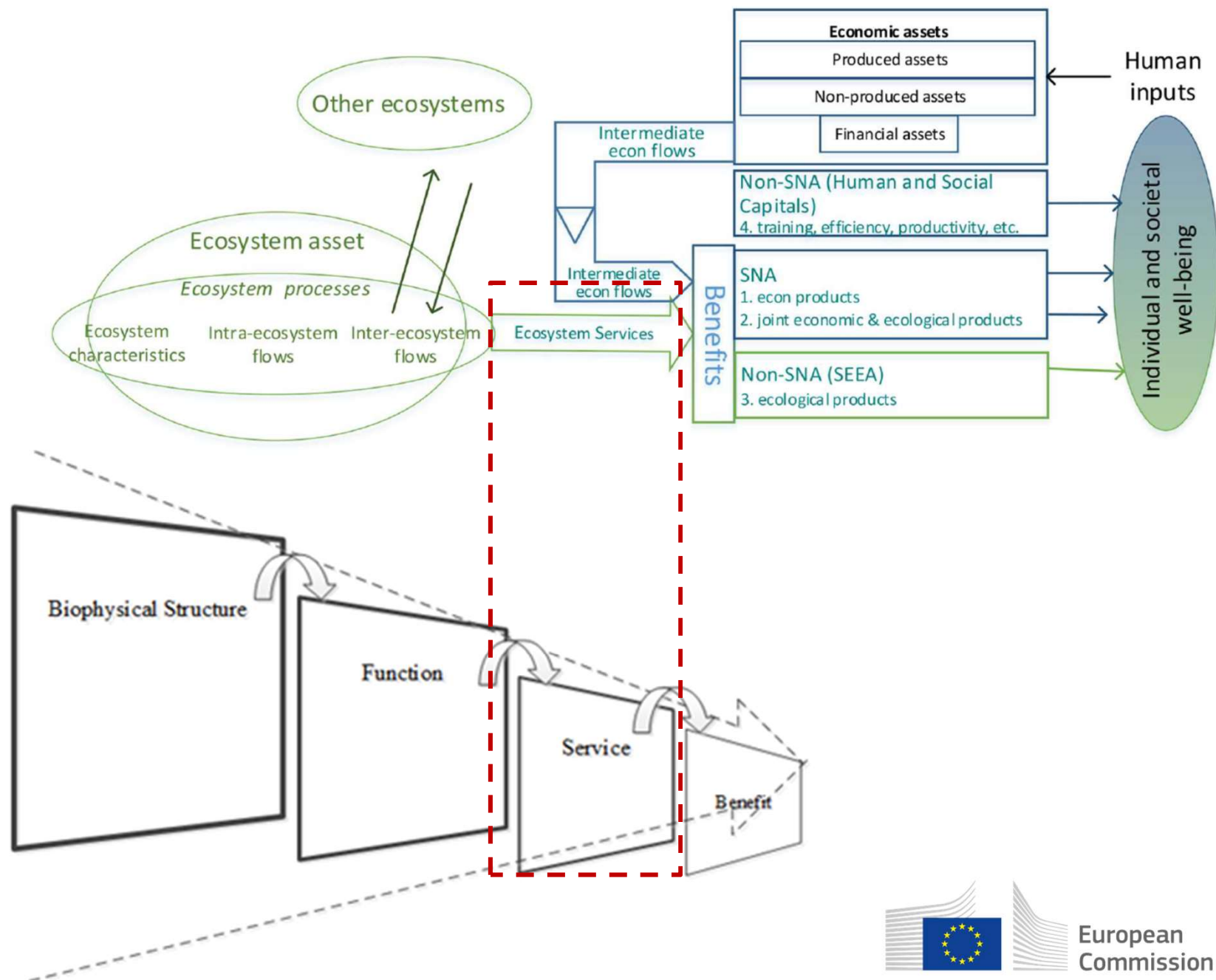
Conti satellite: SEEA Experimental Ecosystem Accounts

Flusso circolare del reddito
«allargato» all'ecosistema



Struttura alla base del SEEA EEA





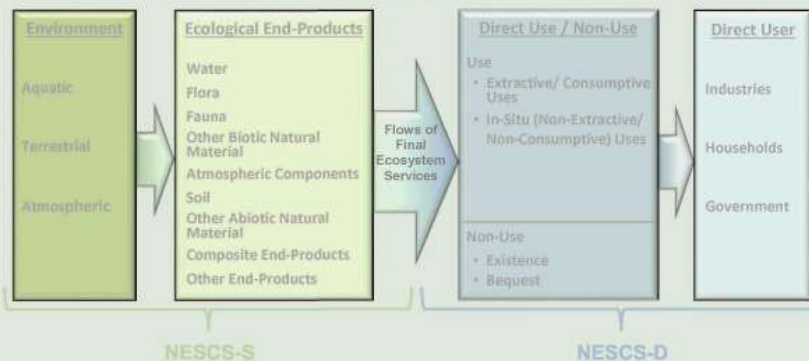
Altri sistemi di classificazione (US EPA)



National Ecosystem Services Classification System (NESCS): Framework Design and



NESCS Four-Group Classification



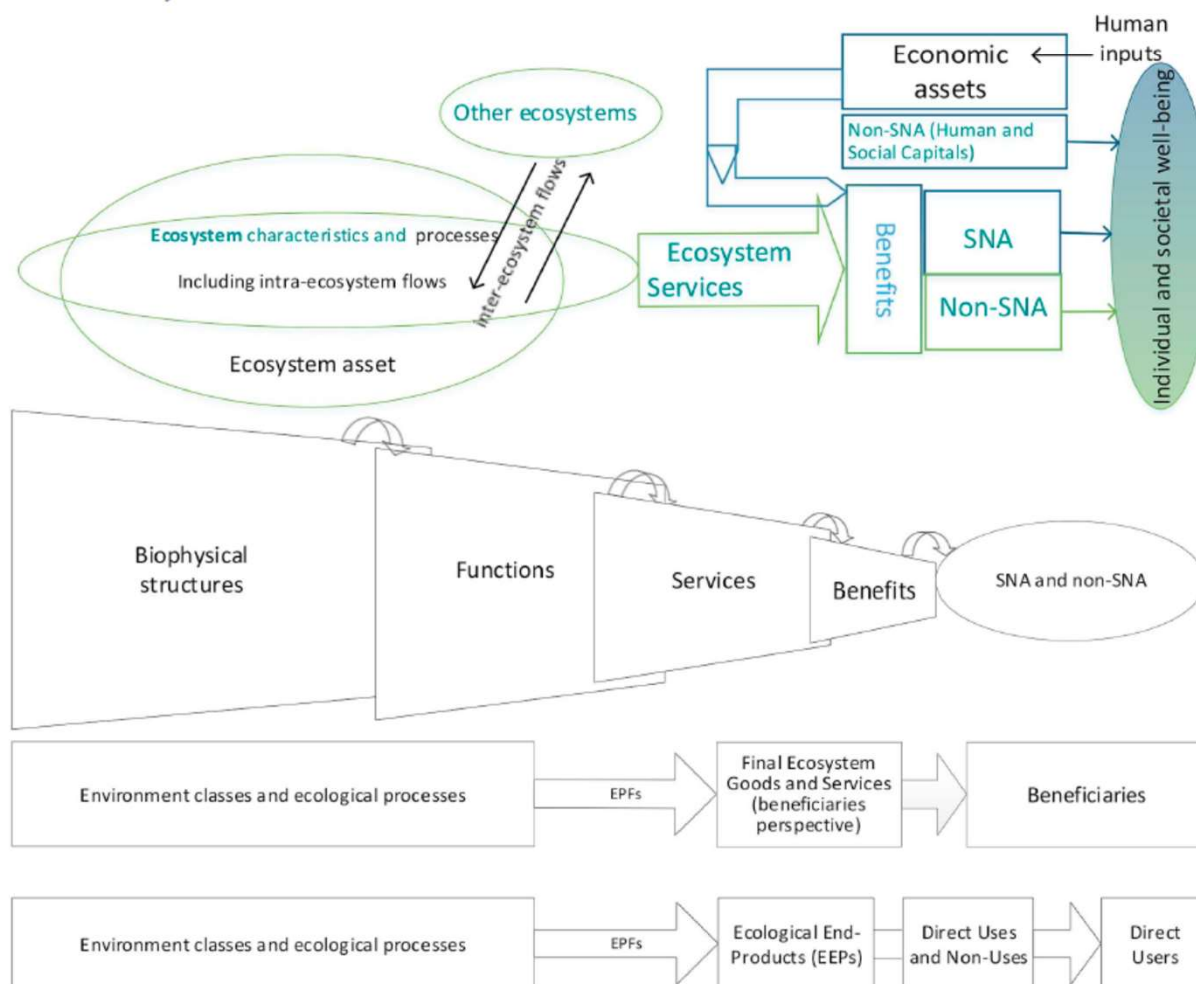
FINAL ECOSYSTEM GOODS AND SERVICES CLASSIFICATION SYSTEM (FEGS-CS)



BY
Dixon H. Landers and Amanda M. Nahlik

The theoretical frameworks behind integrated environmental, ecosystem, and economic accounting systems and their classifications

Alessandra La Notte^{a,*}, Charles Rhodes^b



Dove inizia il processo di produzione?

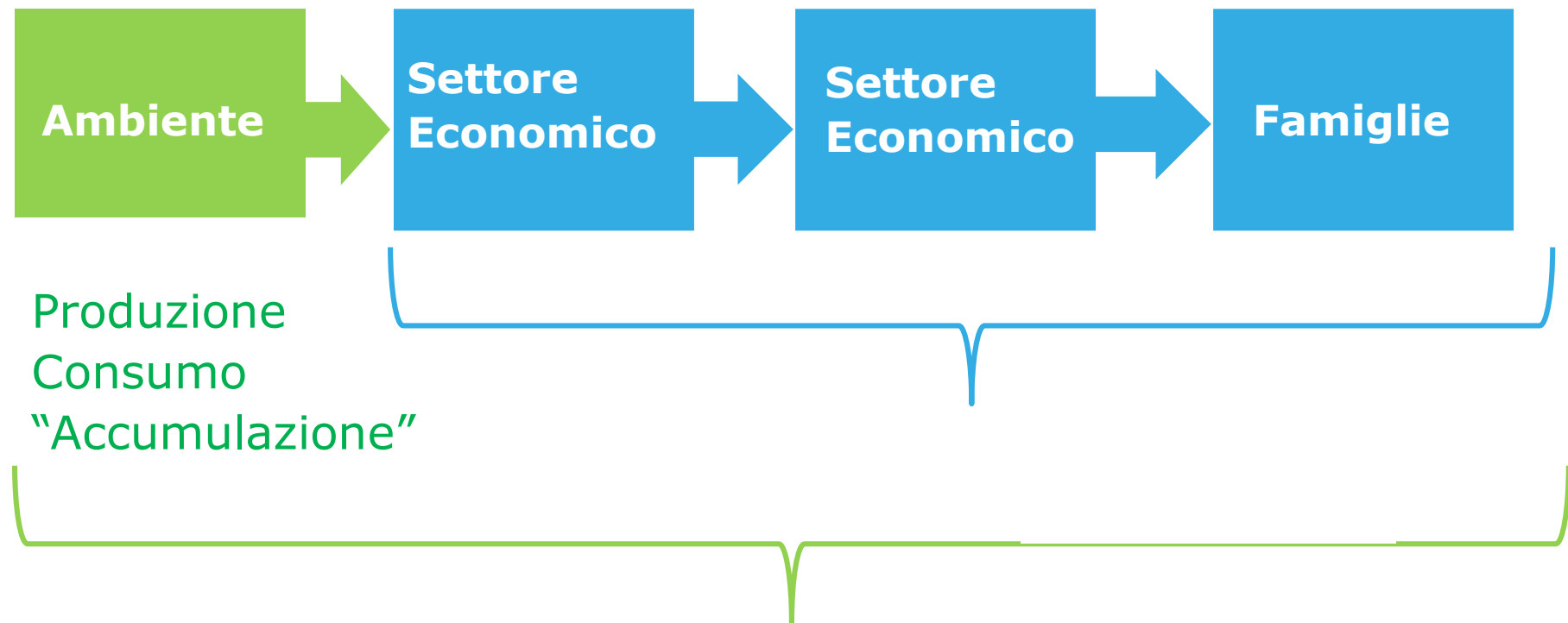


Tabelle Impieghi-Risorse SEEA EEA

SUPPLY TABLE

	industries	households	accumulation	rest of the world	ecosystem units
provisioning services					actual flows
regulating and maintenance services					actual flows
cultural services					actual flows
products	output			imports	

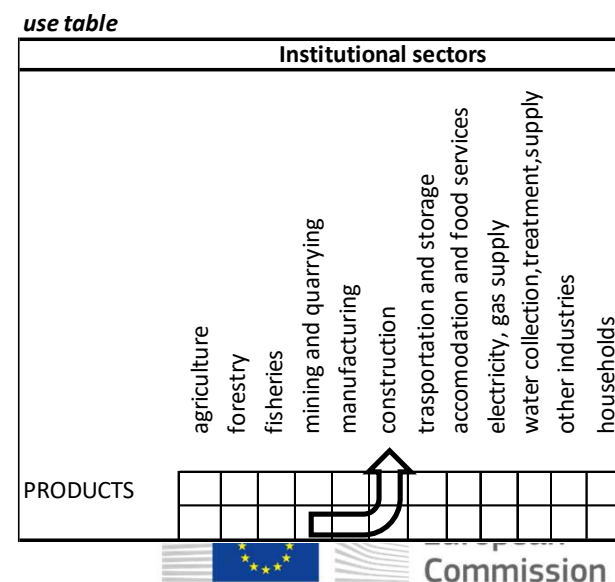
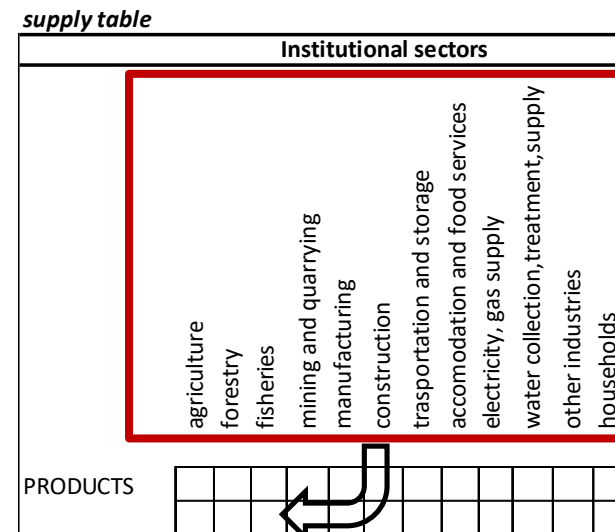
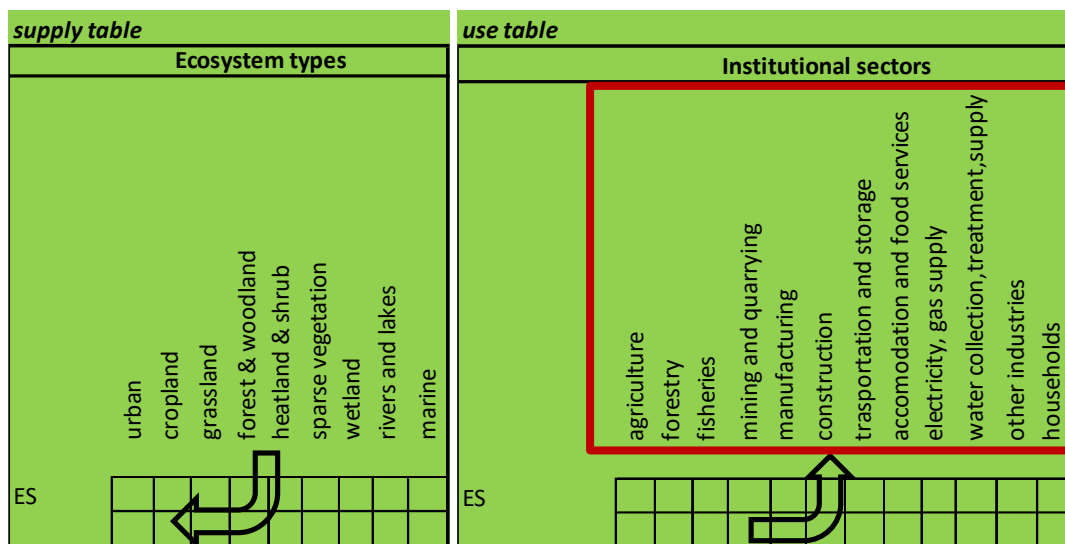


USE TABLE

	industries	households	accumulation	rest of the world	ecosystem units
provisioning services	actual flows	actual flows			inter-ecosystem flows
regulating and maintenance services	actual flows	actual flows			inter-ecosystem flows
cultural services	actual flows	actual flows			inter-ecosystem flows
products	intermediate consumption	final consumption	gross capital formation	exports	



Servizi ecosistemici: punto di entrata degli ecosistemi nel sistema economico



Conti satellite

I servizi ecosistemici: la contabilizzazione

Dalla mappatura alla contabilizzazione

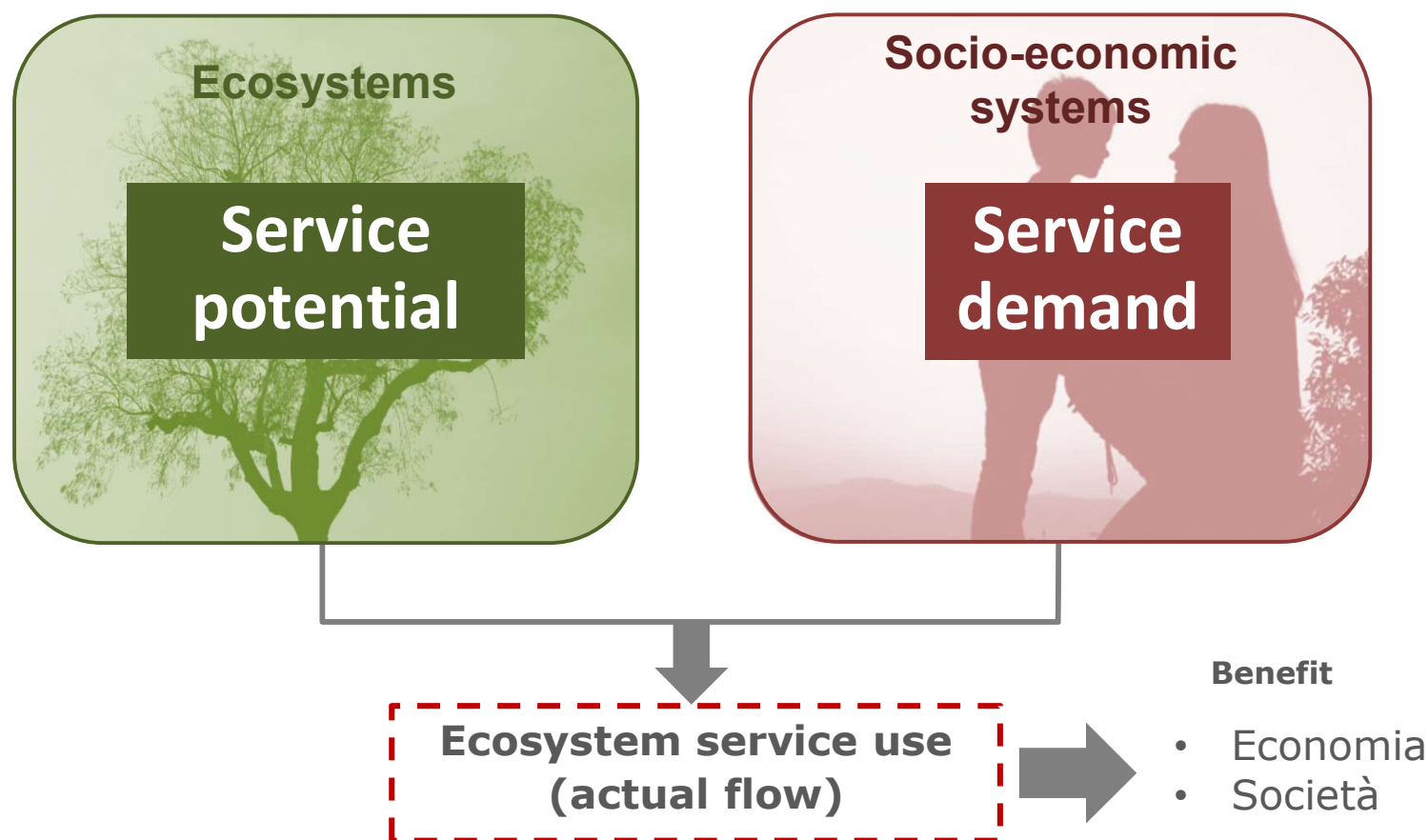
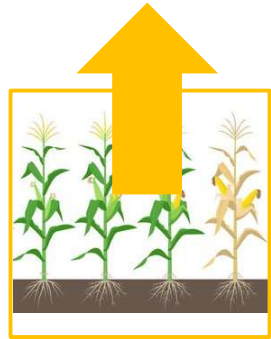


Tabelle Impieghi-Risorse

Tipologie di servizi ecosistemici propedeutiche alla contabilizzazione



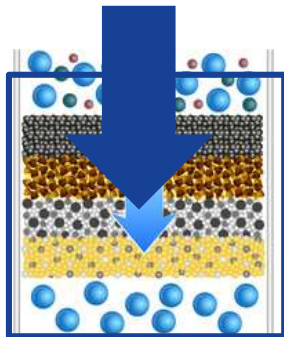
Source: provision

Delivery of biomass eventually leaving the ecosystem



Source: suitability

Delivery of biomass generated within the ecosystem



Sink

Matter or energy absorbed by the ecosystem



Buffer

Matter or energy flowing through the ecosystem

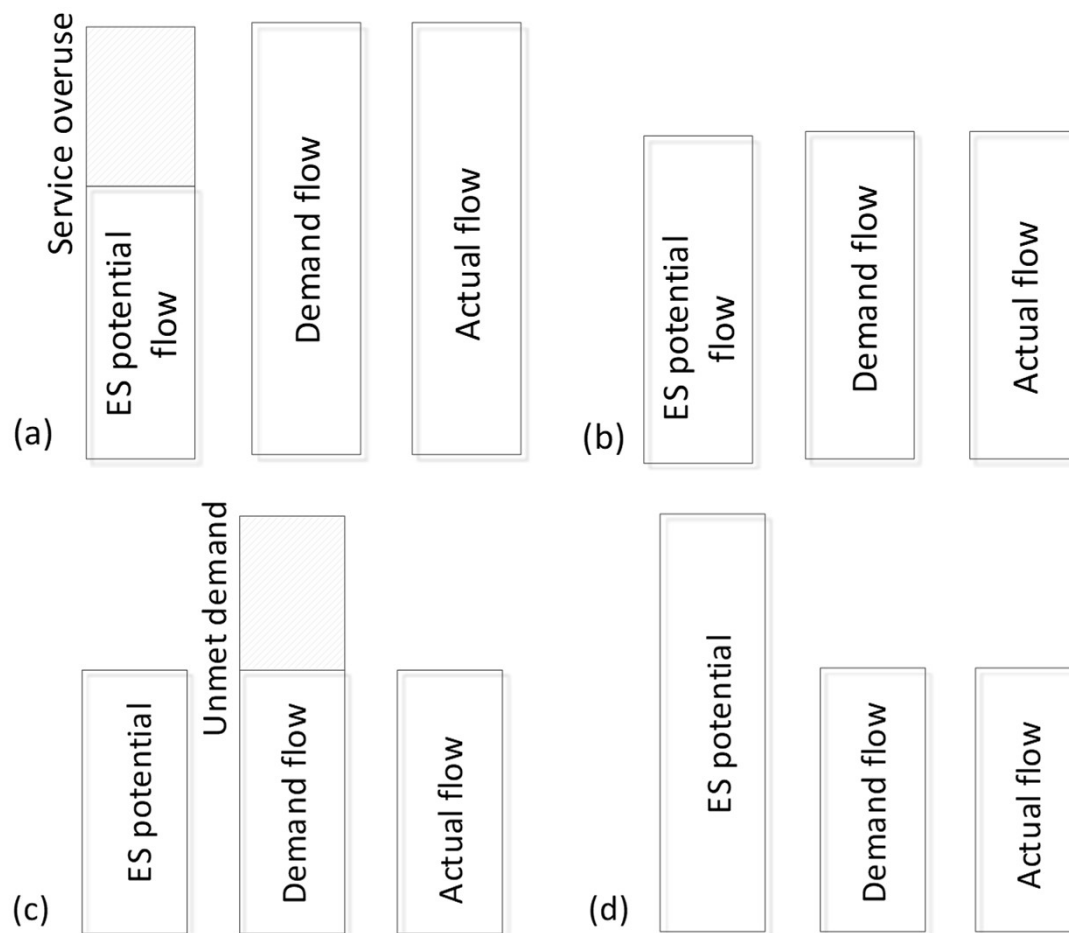


Information

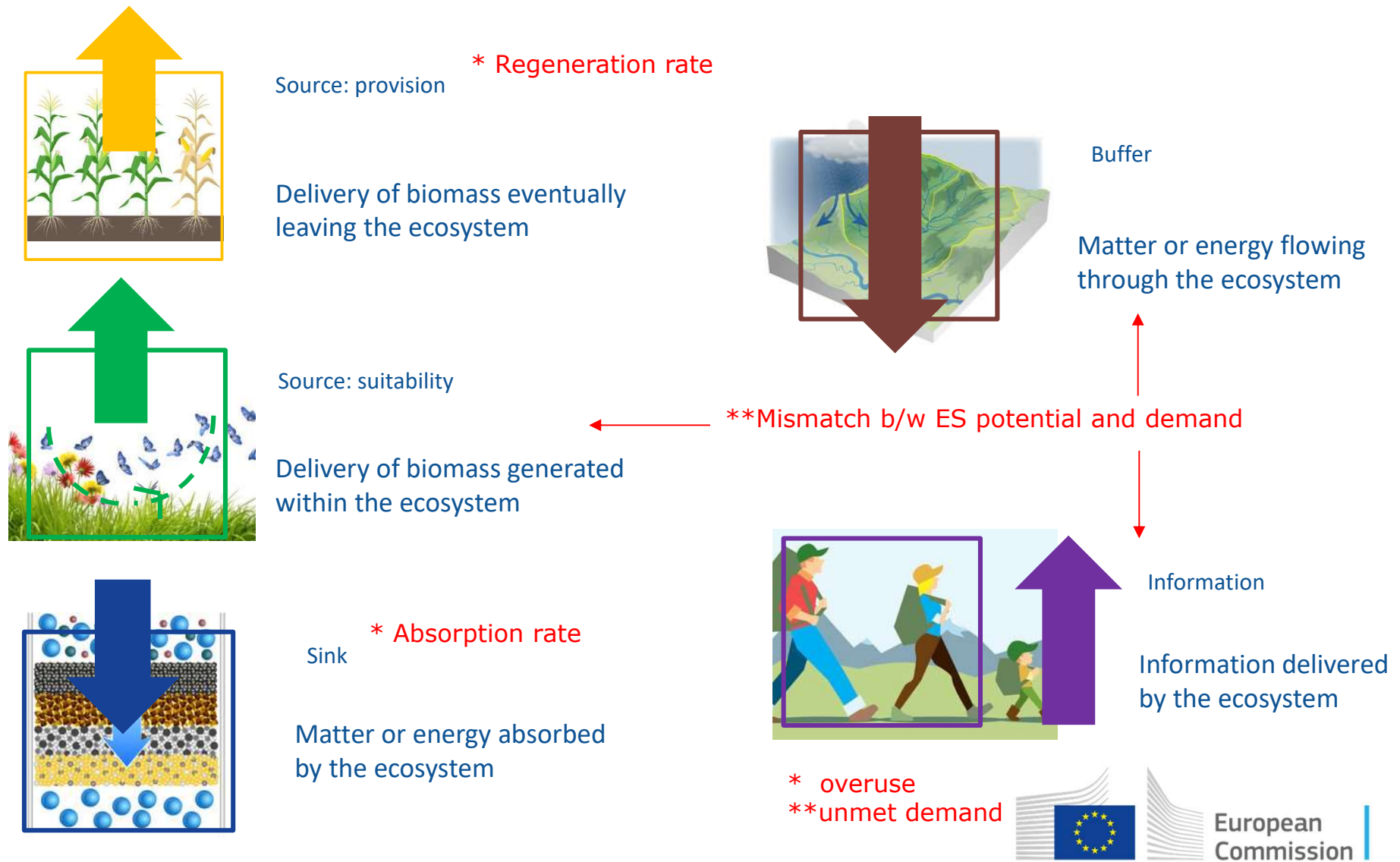
Information delivered by the ecosystem

Beyond the economic boundaries to account for ecosystem services

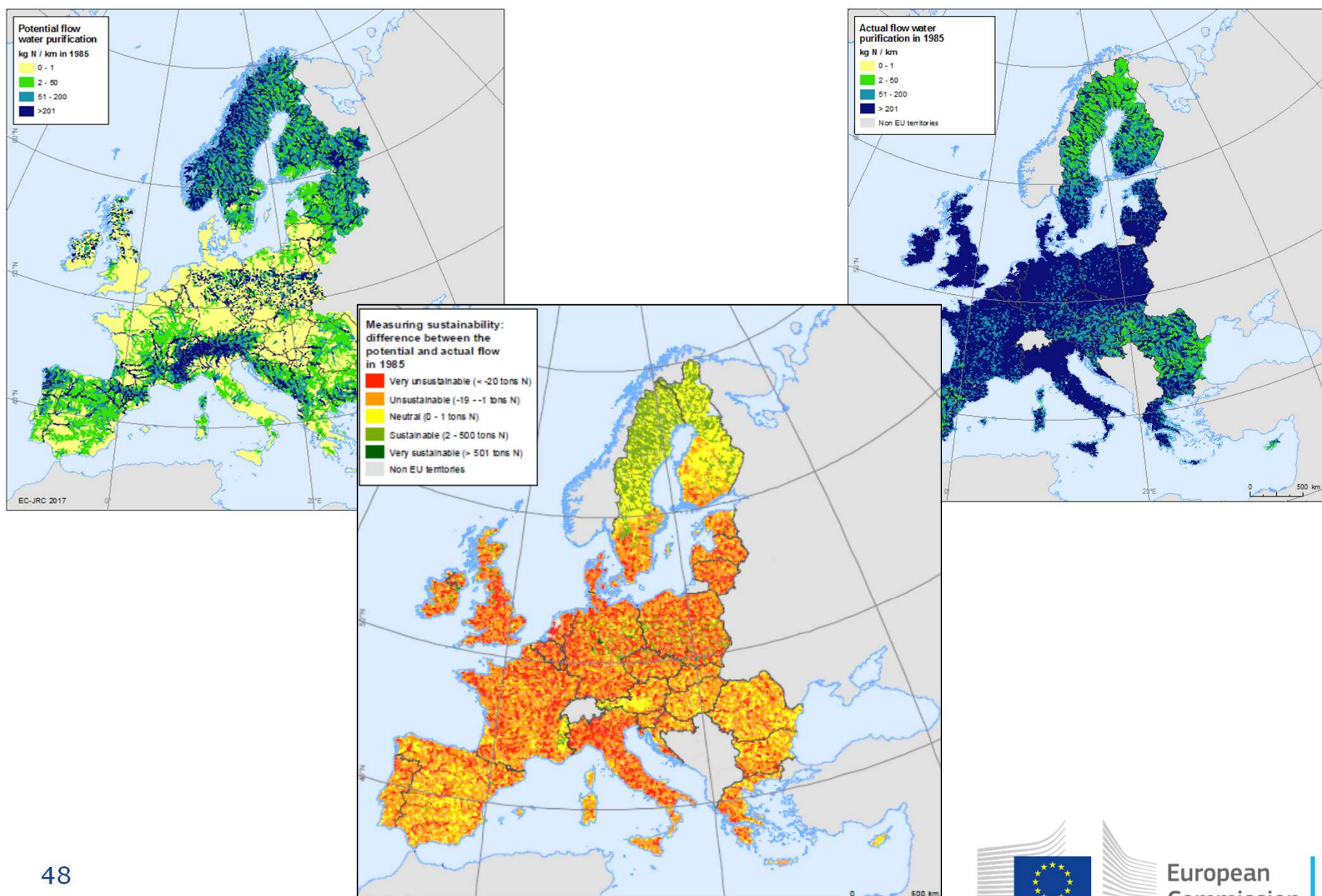
Alessandra La Notte*, Sara Vallecillo, Alexandra Marques, Joachim Maes



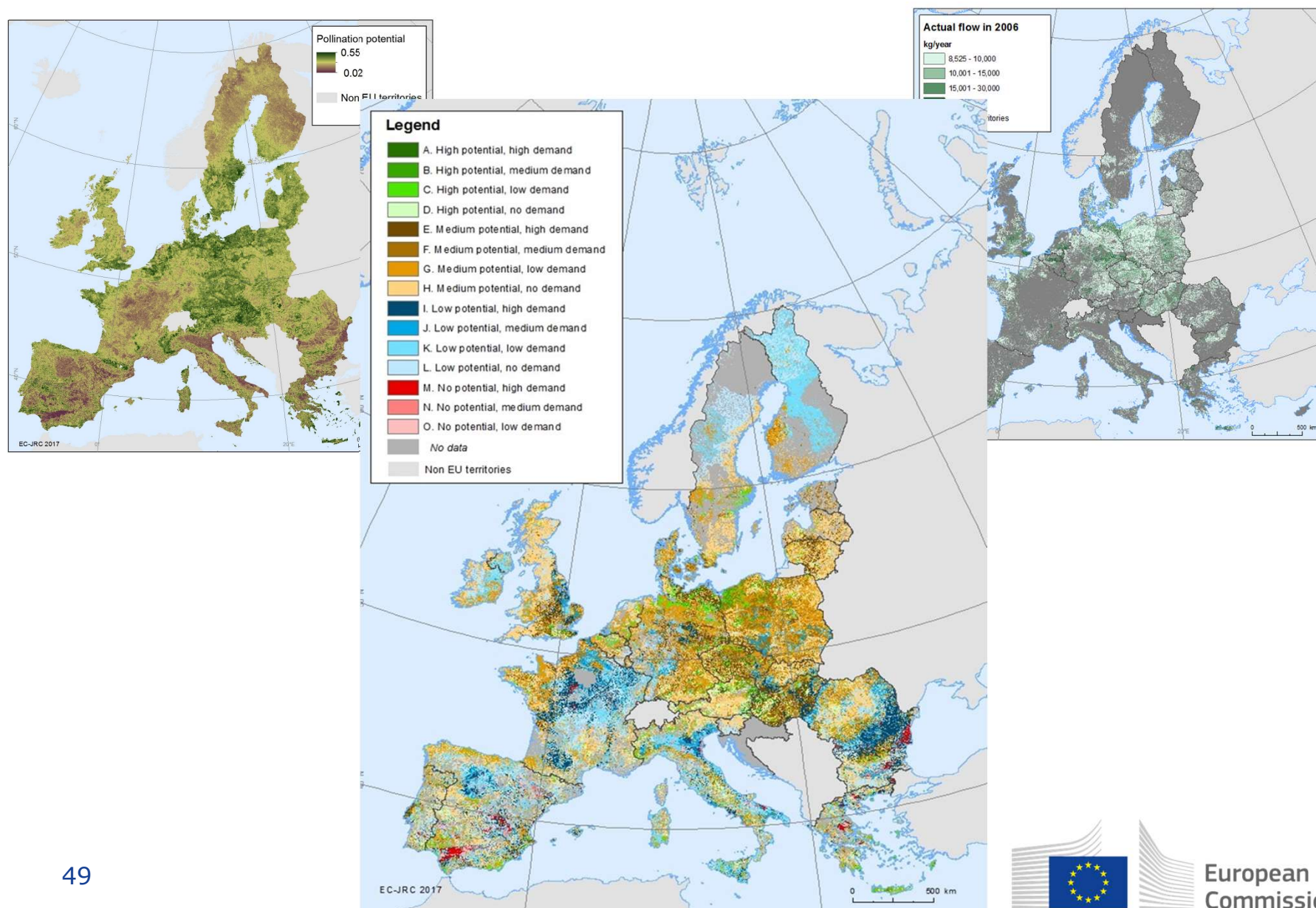
Tipologie di servizi ecosistemici propedeutiche alla contabilizzazione



Esempio caso (a): water purification



Esempio caso (c): crop pollination

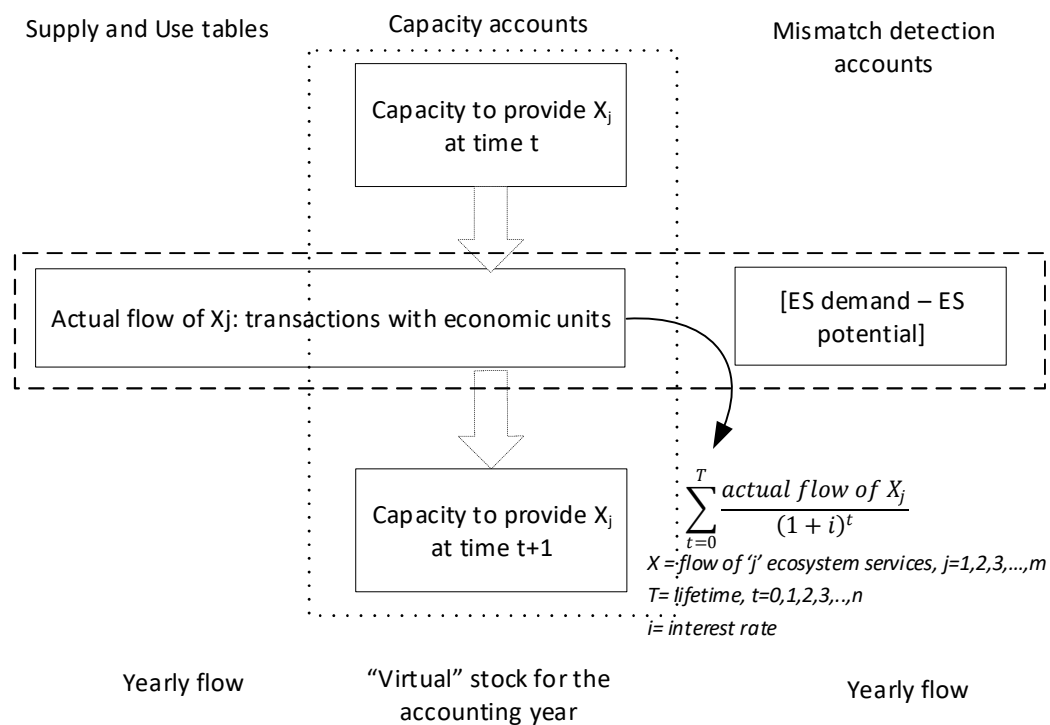


Relazione fra ecosistemi e servizi ecosistemici

		<i>Ecosystem Type</i>					NPV <i>Virtual stock per ecosystem service</i>
		Agricultural land	Forest	Wetland	...	Inland waters	
<i>Ecosystem services</i>	pollination						
	flood control						
	water purification						
	...						
	recreation						
Σ per ecosystem asset							

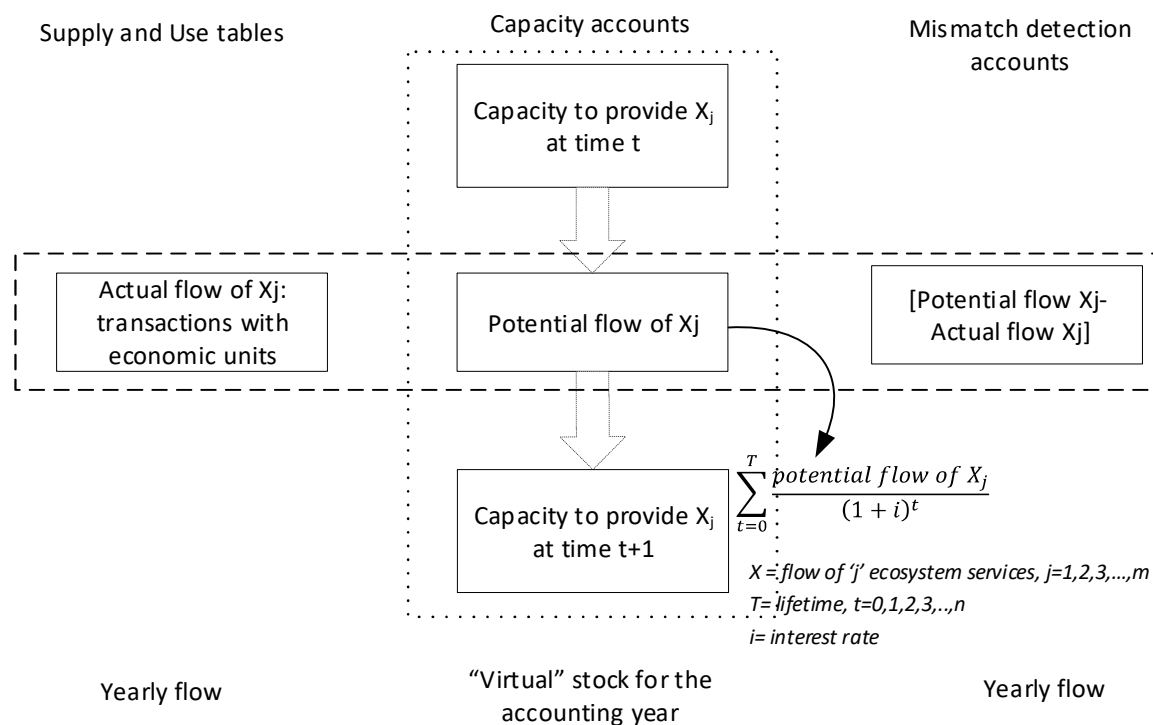
Capacity as “virtual stock” in ecosystem services accounting

Alessandra La Notte*, Sara Vallecillo, Joachim Maes



Capacity as “virtual stock” in ecosystem services accounting

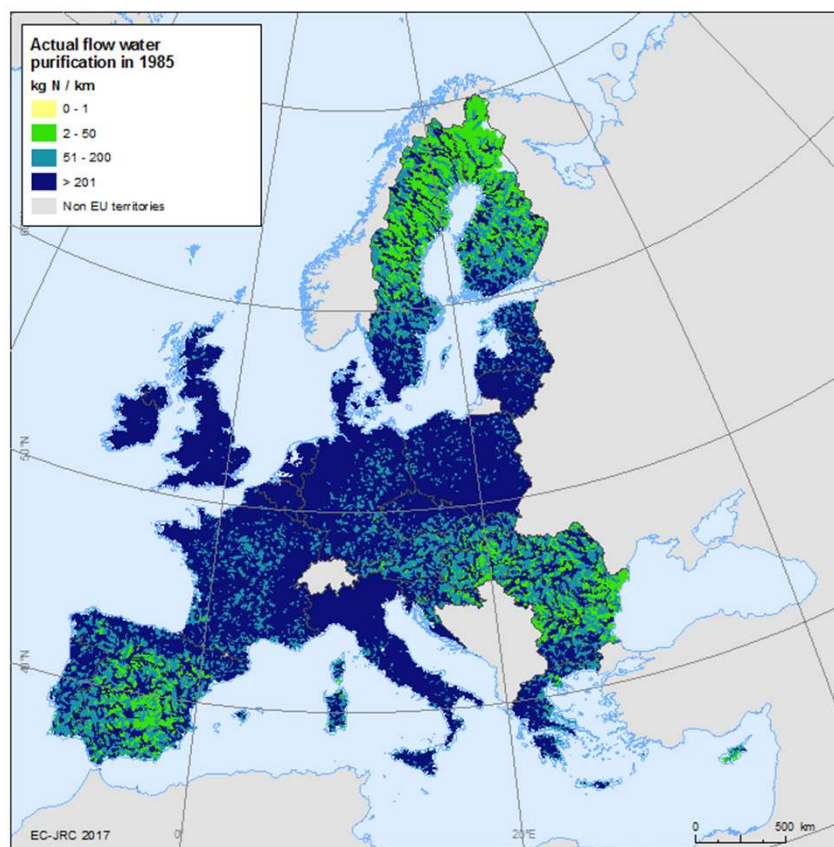
Alessandra La Notte*, Sara Vallecillo, Joachim Maes



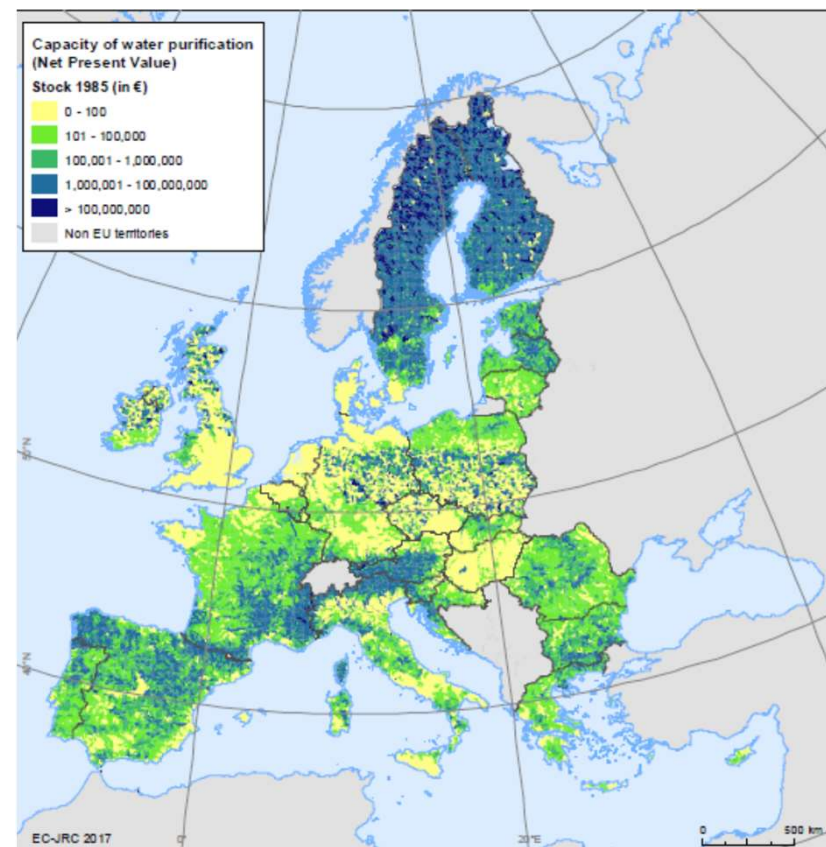
Physical and monetary ecosystem service accounts for Europe: A case study for in-stream nitrogen retention



Alessandra La Notte^{a,*}, Joachim Maes^a, Silvana Dalmazzone^b, Neville D. Crossman^c,
Bruna Grizzetti^a, Giovanni Bidoglio^a



Actual flow



Capacity

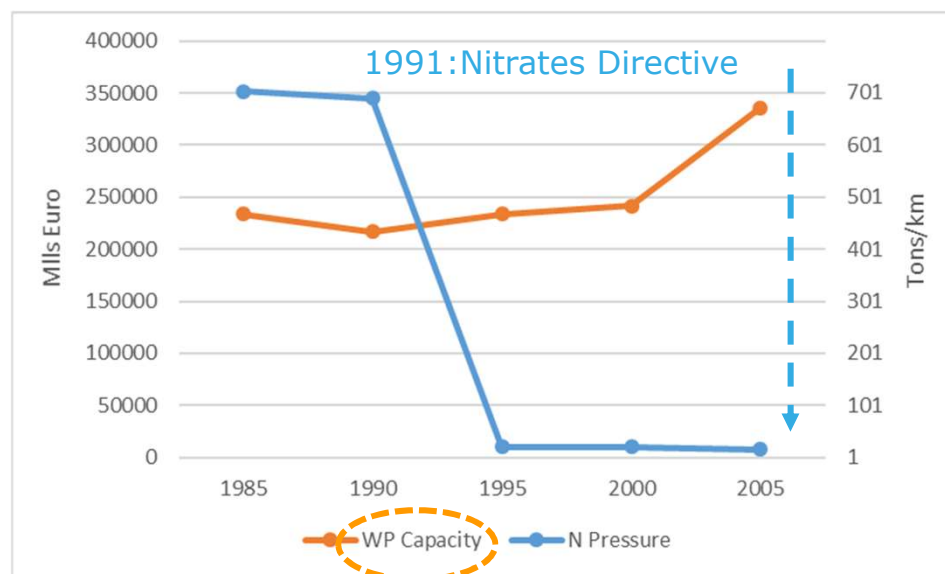


Commission

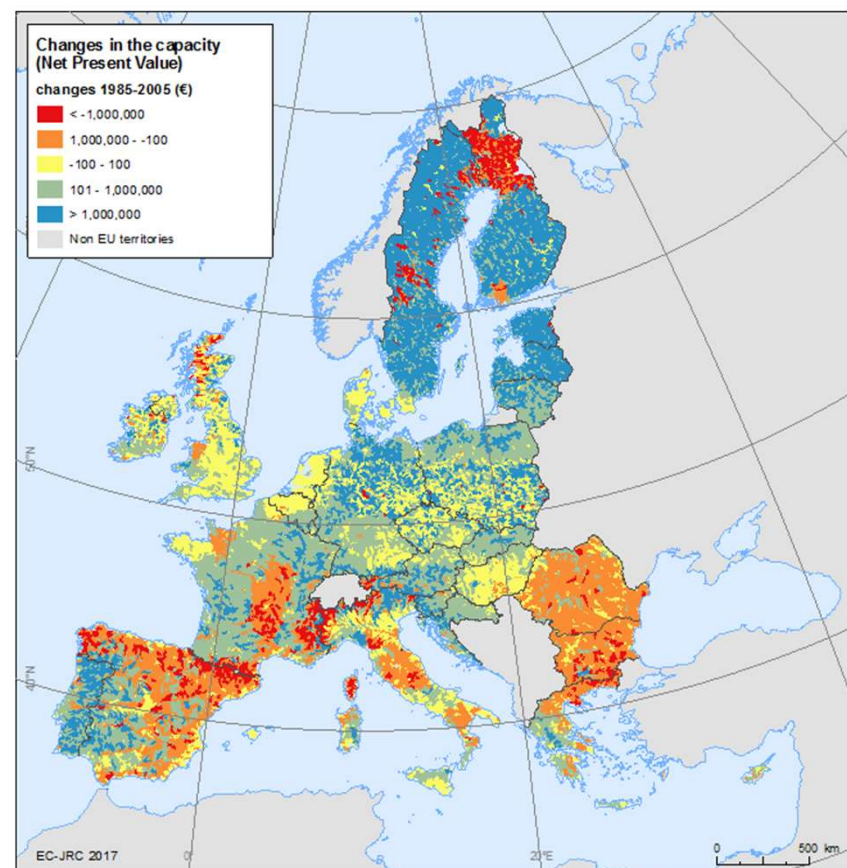
Research article

Sustainability assessment and causality nexus through ecosystem service accounting: The case of water purification in Europe

Alessandra La Notte^{a,*}, Silvana Dalmazzone^b



Long term ability to generate water purification



Grazie per l'attenzione



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