

Natural Capital: Counting It In



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Outline

1. Development challenges
 - Economy vs. Environment
2. Invisibility of nature!
3. Defining natural capital and ecosystem services
4. Interdependence of nature and people
5. Natural Capital Accounting
 - Economy and Environment



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Photo by A. Ferrer



Development Challenges

Economic expansion
at the cost of
degrading the
environment



future is
uncertain!



Development Challenges

1. improving living standards of the people, particularly the poor
2. achieving a sustainable population
3. ensuring sustainability of the ecosystem

Development Challenges

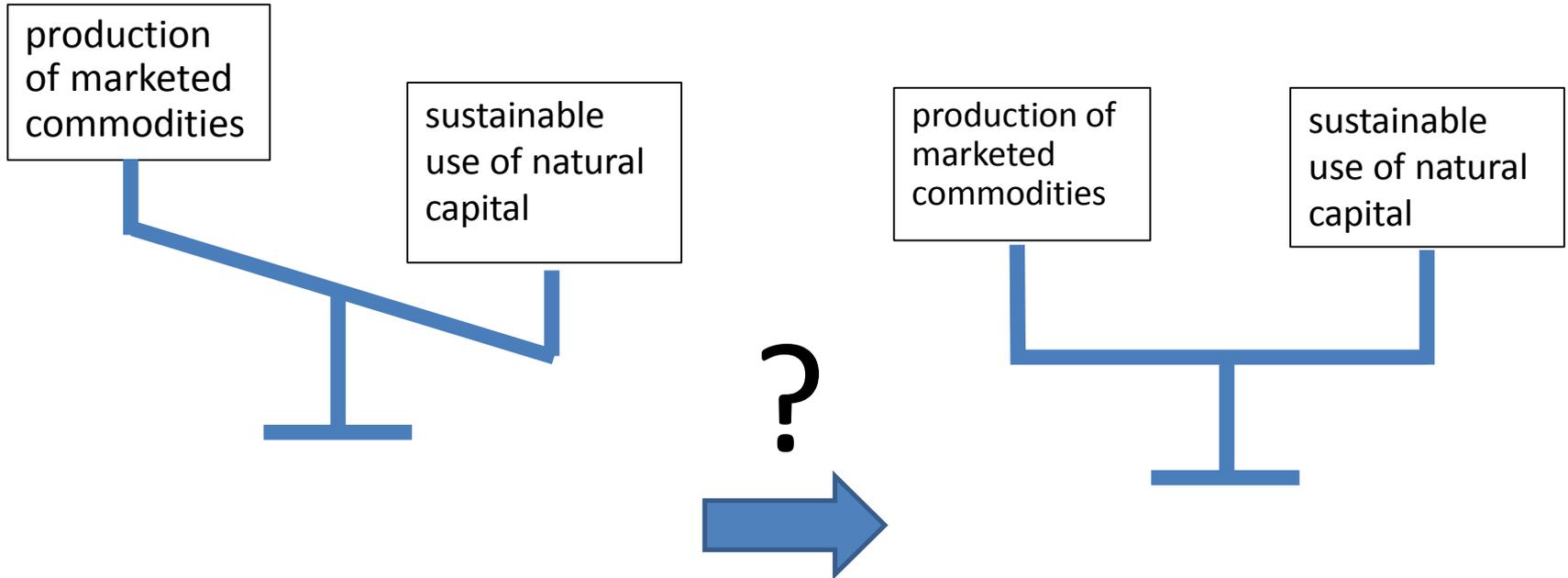
production of
marketed
commodities

sustainable use
of natural capital
necessary to
sustain human
well-being

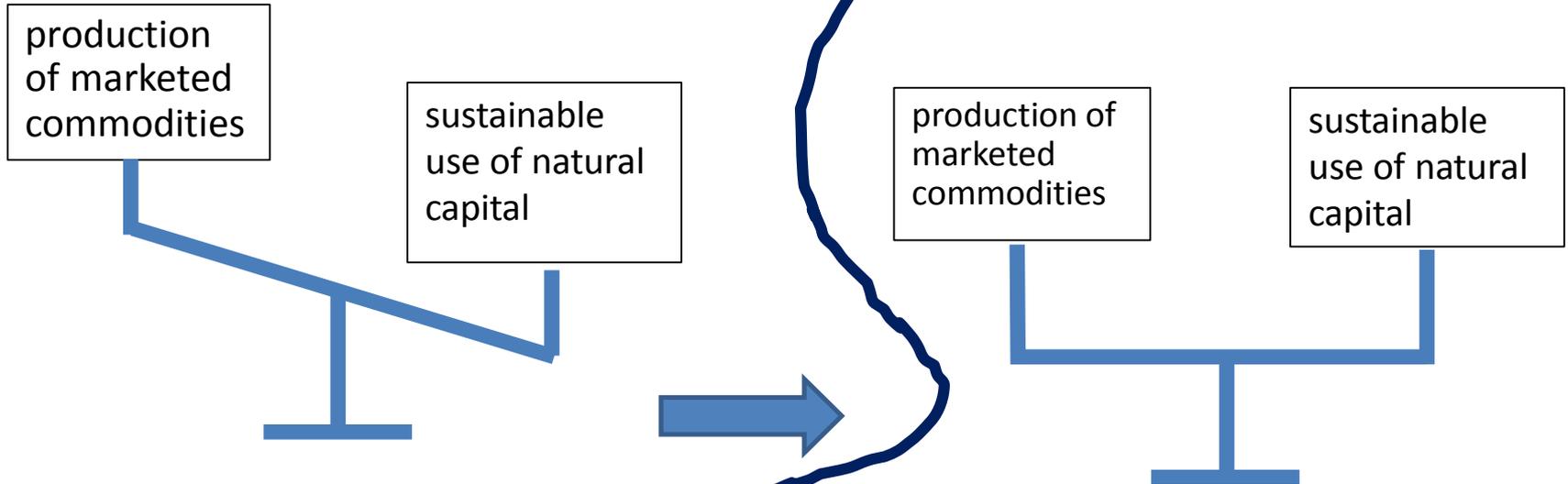
Fundamental asymmetry at
the heart of economic
systems



Development Challenges



Development Challenges



transforming the use of natural capital through better understanding of the role that natural capital plays in sustaining human well-being

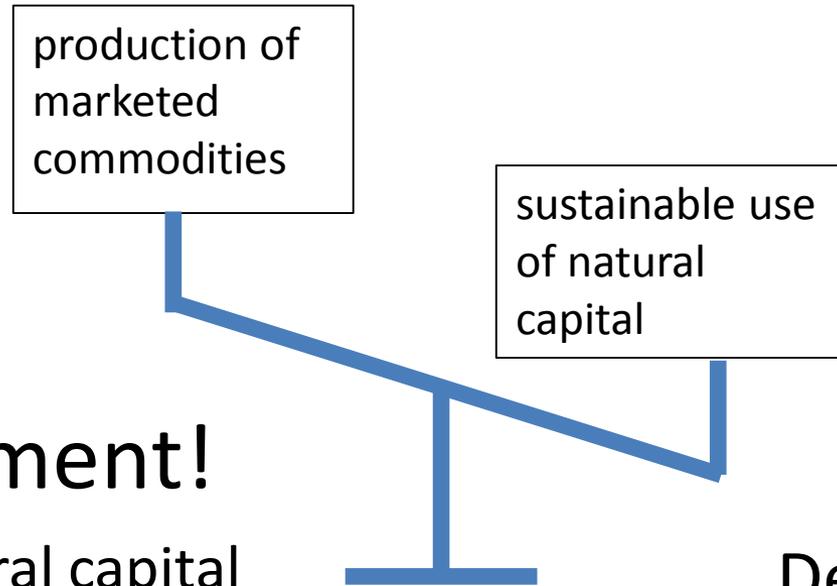
+

integrating this information into decision and policy contexts,

+

and changing institutions, policies, and incentives to reward long-term stewardship

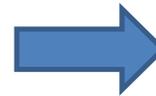
Development Challenges



Mismanagement!

invisibility of natural capital and ecosystem services in policies, decision-making

- microeconomic level
 - market prices
- Macroeconomic level
 - national capital accounts



Degraded natural capital and underprovided ecosystem services



Invisibility of Nature



The elephant in the boardroom!

<https://b-i.forbesimg.com/groupthink/files/2013/11/elephant.jpg>

Invisibility of Nature

'In stark financial terms, all the evidence demonstrates a simple fact: we are failing to run the global bank that we call our planet in a competent manner. We no longer just take a dividend each year; instead, for some time, we have been digging deep into our capital reserves. And, after the near collapse of our entire financial system, we all know that such excessive risk-taking can cause immense havoc. The ultimate bank on which we all depend – the bank of natural capital – is in the red; the debt is getting ever bigger and that is reducing Nature's resilience and considerably impeding her ability to re-stock. It leaves us dangerously exposed.'

**HRH The Prince of Wales,
Speaking at The Prince's Accounting for Sustainability Forum,
St. James's Palace, London, December 2013**

Invisibility of Nature: **WHY?**

1) entire economic and financial system is based on flawed assumptions of infinite resources and perpetual equilibrium in the natural ecosystem.



<http://agrillife.org/capital4-h/curriculum/natural-resources/>

2). thinking and behavior are overly dominated by purely financial measures of progress and 'success'

3) The structures of modern accountancy are derived historically from societies and economies which assumed that nature's abundance would last indefinitely.

Invisibility of Nature: **WHY?**

4) Existing business models and practices do not reflect how business is an integral part of a wider, complex system.

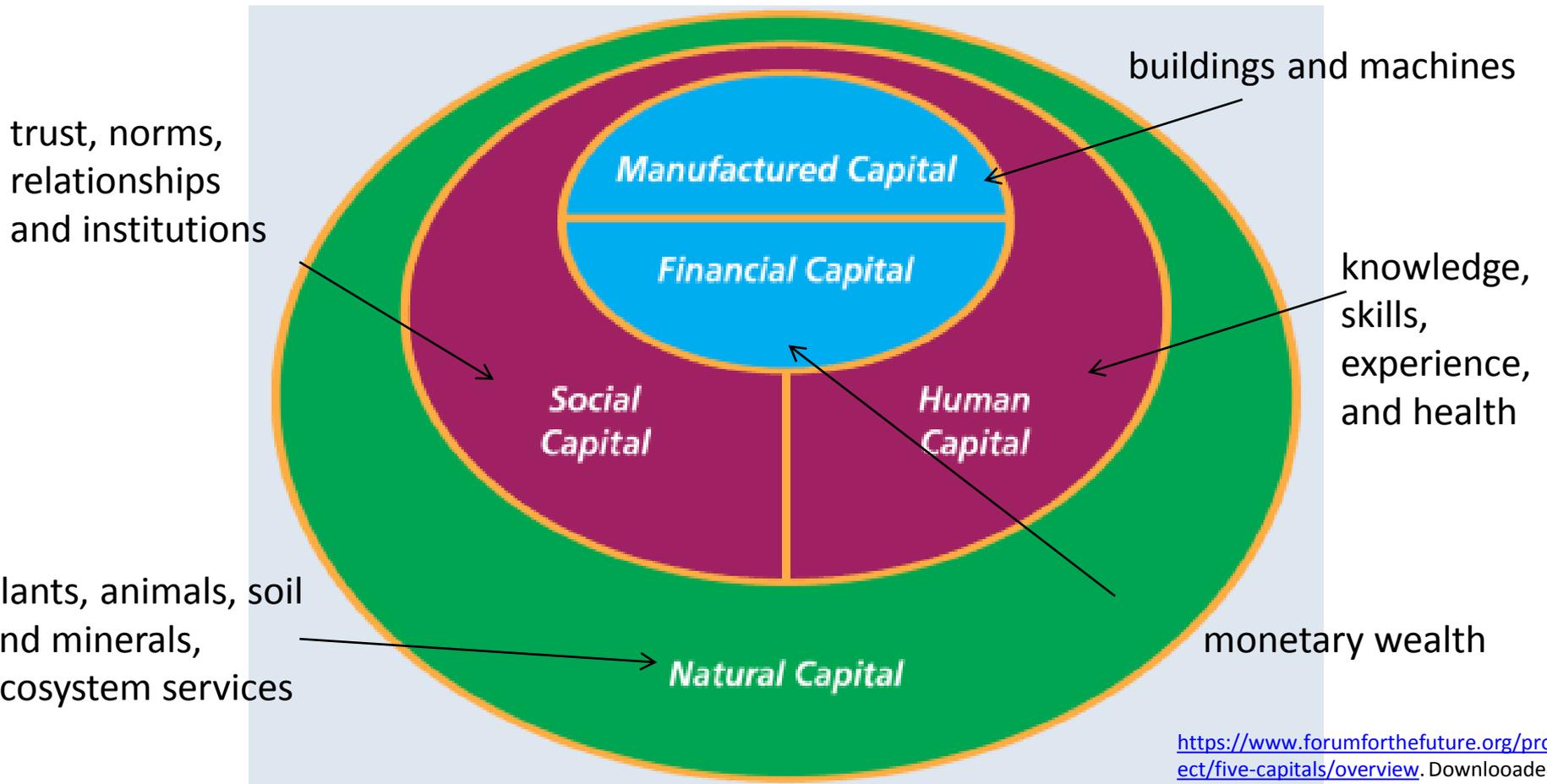


5) The focus of the vast majority of businesses is woefully short-term

6) lack the frameworks and systems needed to account for the relationship between natural capital and business strategy and performance

Natural capital

Essential Elements of the Economy



Capital interact to generate goods and services



Fisher

Boat

fishing gear

Availability
of fish
stocks

high-quality
habitat

RA 10654

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Photo by A. Ferrer

Natural capital

“ ‘Natural capital’ refers to the living and nonliving components of ecosystems—other than people and what they manufacture— that **contribute** to the generation of goods and services of value for people” (Guerry et al 2015)

NC = Ecosystem minus

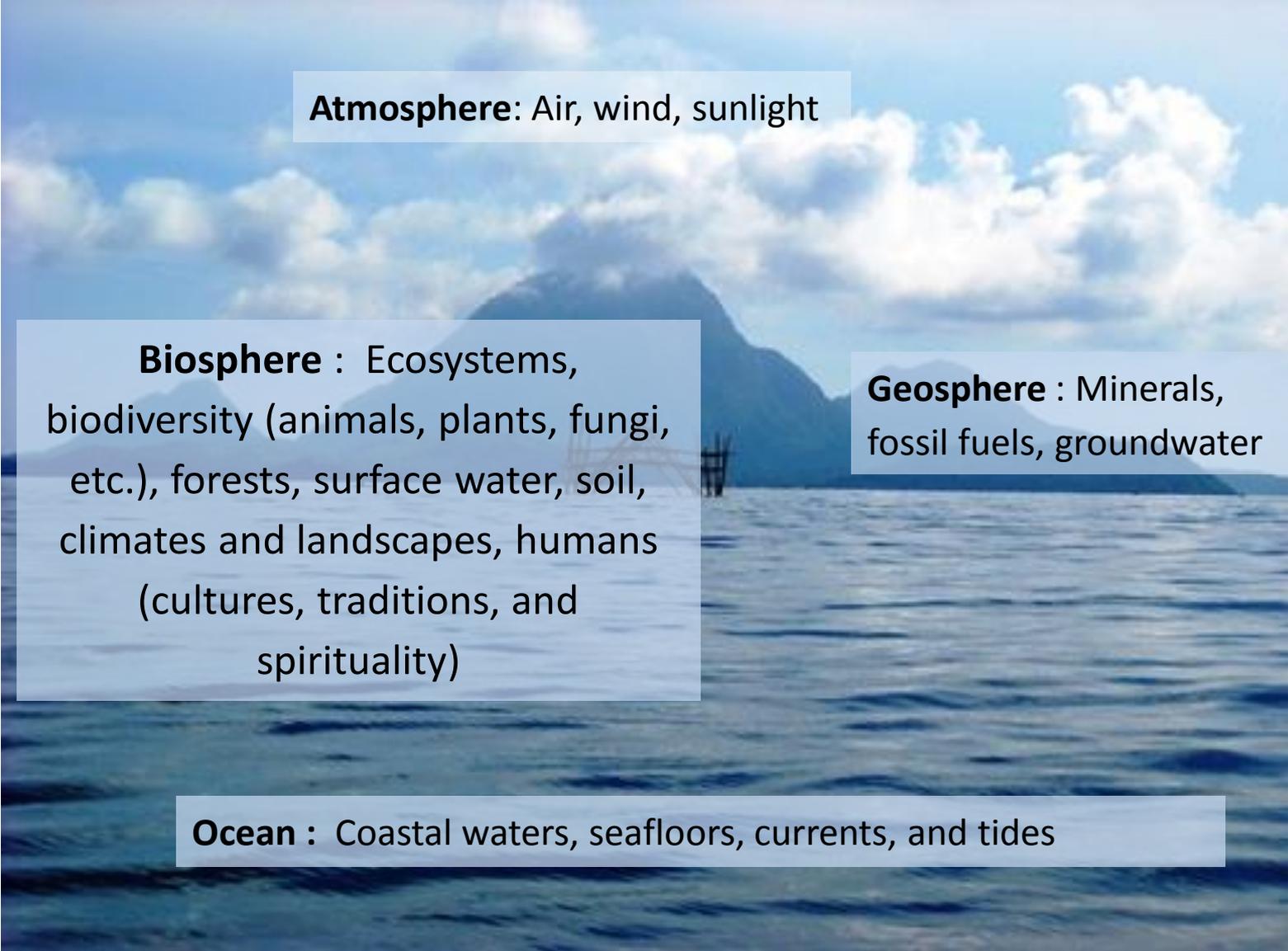
the biological community that occurs in some locale, and the physical and chemical factors that make up its non-living or abiotic environment.



Fisher, boat,
gear



Natural Capital



Atmosphere: Air, wind, sunlight

Biosphere : Ecosystems, biodiversity (animals, plants, fungi, etc.), forests, surface water, soil, climates and landscapes, humans (cultures, traditions, and spirituality)

Geosphere : Minerals, fossil fuels, groundwater

Ocean : Coastal waters, seafloors, currents, and tides

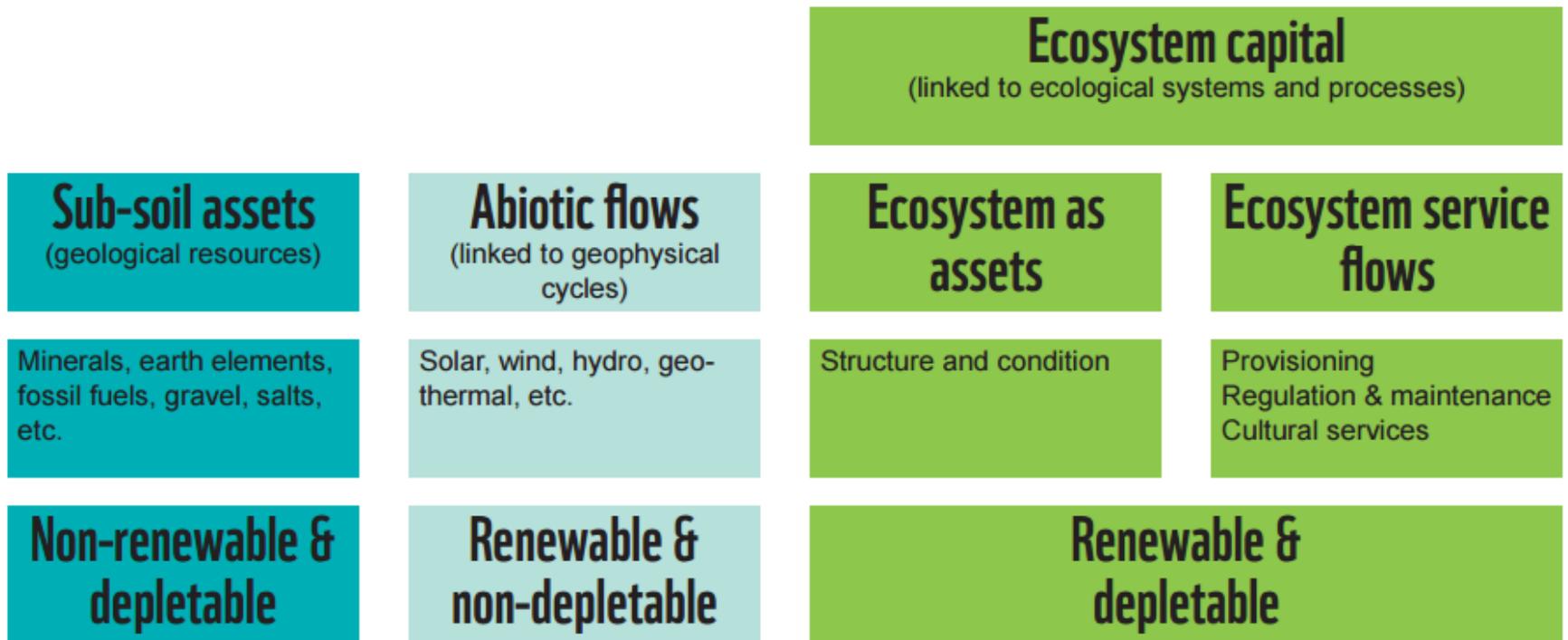
Ecosystem Services

“Ecosystem services are the conditions and processes of ecosystems that generate—or help generate— benefits for people” (Guerry et al. 2015)

- **Final** - produce benefits directly, such as seafood
- **Intermediate** - underpinning final services; e.g., the generation of habitats that support fish populations

Ecosystem services

NATURAL CAPITAL



Source: European Environment Agency

http://awsassets.panda.org/downloads/background_accounting_for_natural_capital_in_eu_policy_decision_making_final.pdf

Ecosystem services

Ecosystem capital

(linked to ecological systems and processes)

Ecosystem as assets

Structure and condition

Ecosystem service flows

Provisioning
Regulation & maintenance
Cultural services

Renewable & depletable

threshold effects (e.g. tipping points),

irreversibility (e.g. extinctions),

acceptability limits (perceptions on what is acceptable loss)

intergenerational equity

Need careful management!



<https://sites.google.com/site/group4projectgroup1/what-is-a-rainforest>

Types of ecosystem services



Types of ecosystem services

- Food Production
- Water
- Wood and Fiber
- Fuel

Provisioning Services

- the products that can be extracted from or harvested in ecosystems
- those that provide basic provisions such as food, water, fuel, and fiber.



Types of ecosystem services

- those that regulate natural processes such as climate control, air and water circulation and purification, waste decomposition, and disease mitigation.

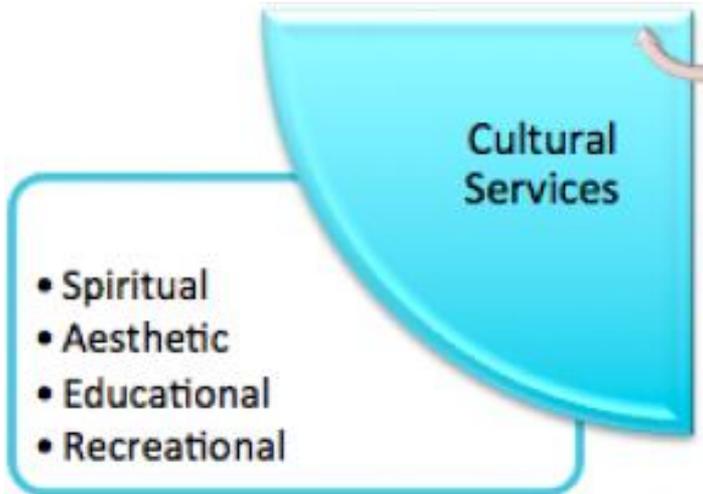


Regulating Services

- Climate Regulation
- Flood Regulation
- Water Purification



Types of ecosystem services



- those that provide intellectual, recreational, and spiritual benefits to people, including outdoor recreation and scientific discovery
- the non-material benefits from ecosystem



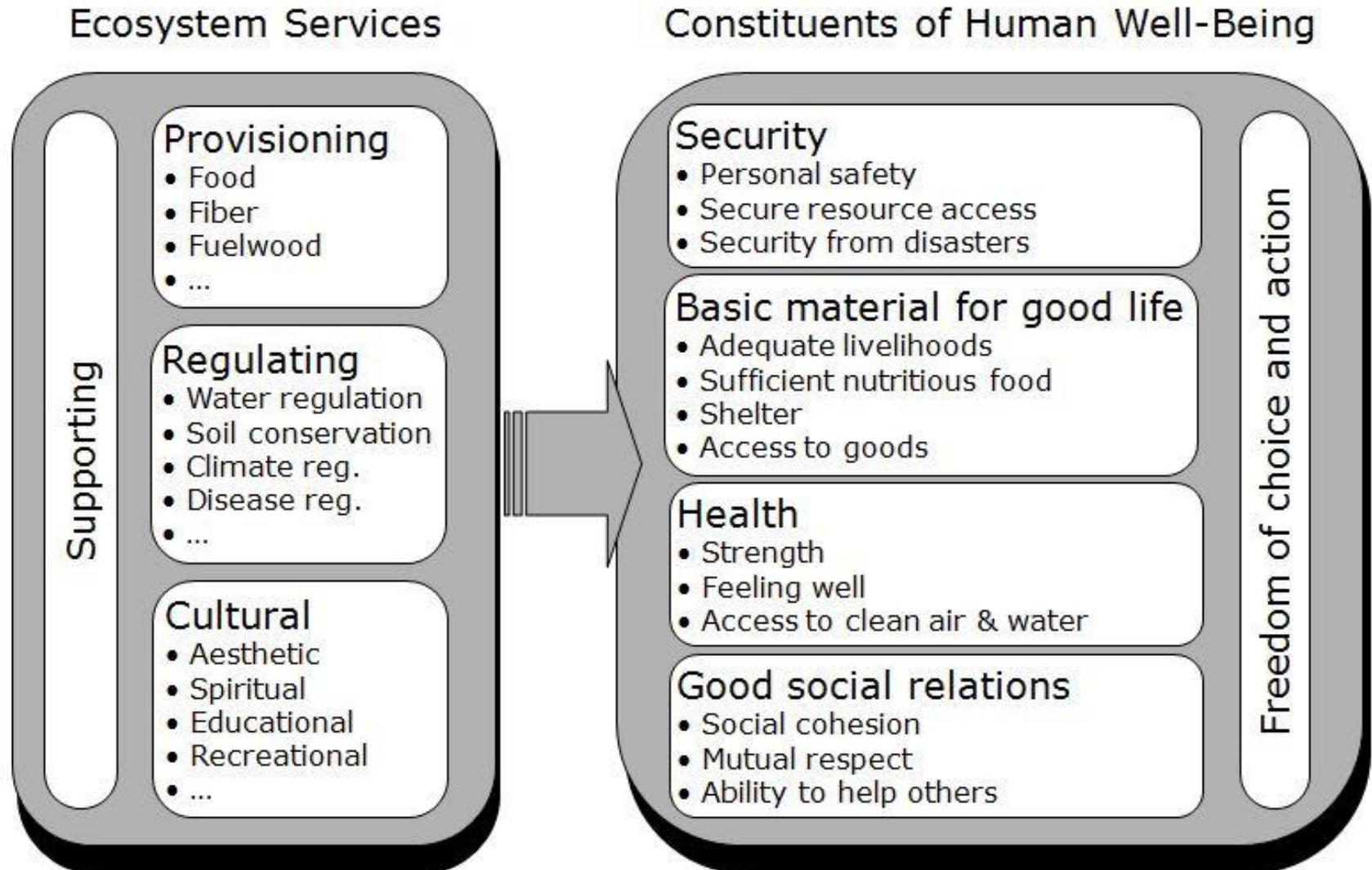
Types of ecosystem services

- Ecosystem services that are necessary for the production of all other ecosystem services or those that provide support to provisioning and regulating services such as nutrient cycling, plant pollination, production of atmospheric oxygen, and provisioning of habitat.



Photos by A. Ferrer

Interdependence of nature and people





CONSTITUENTS OF WELL-BEING



Source: Millennium Ecosystem Assessment

ARROW'S COLOR
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

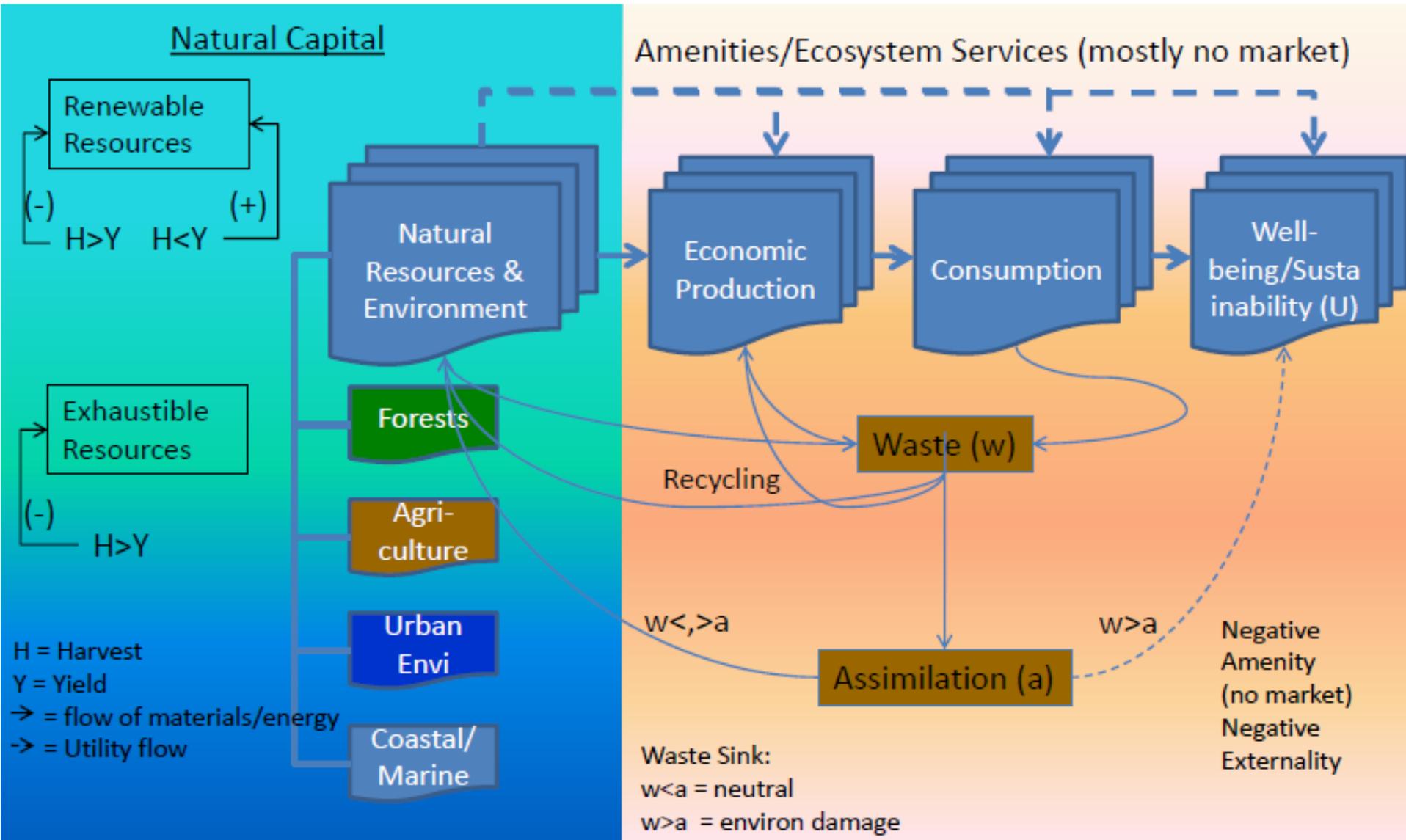
ARROW'S WIDTH
Intensity of linkages between ecosystem services and human well-being

- Weak
- Medium
- Strong

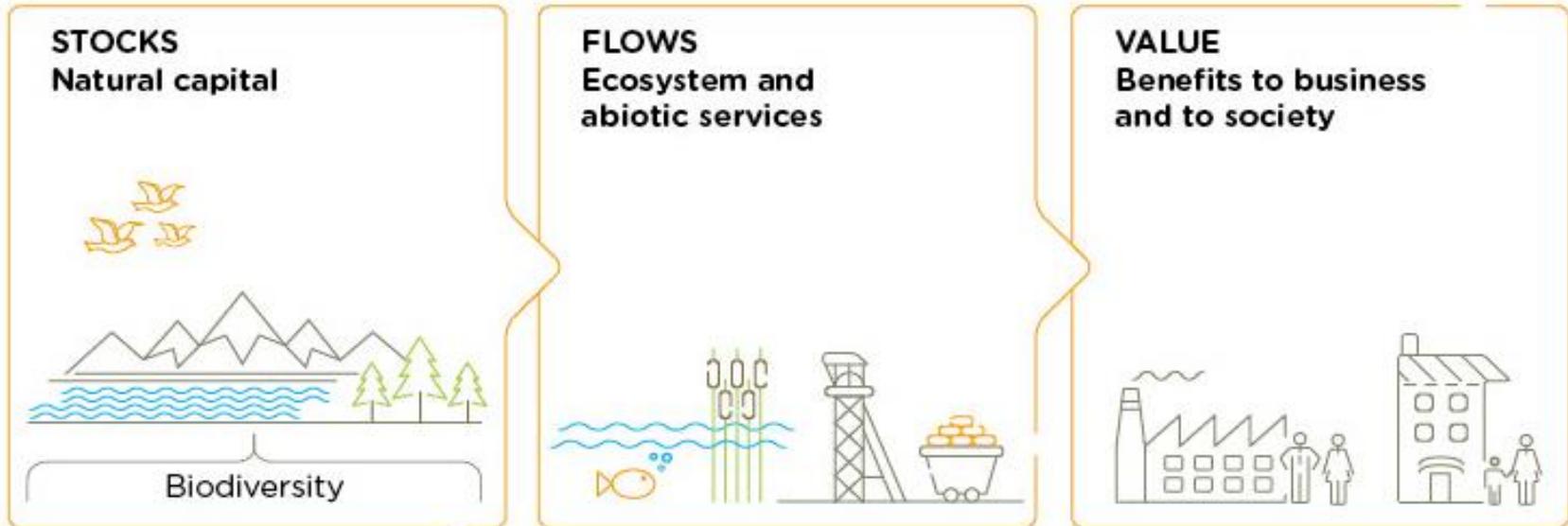
Ecosystem-Economy Linkage

Natural Resources and the Environment

Economy



Natural capital



<http://naturalcapitalcoalition.org/natural-capital/>

Natural capital is the 'stock' of natural assets that yields a 'flow' of valuable services into the future and that provide benefits to humans.

Natural capital accounting is the process of calculating the total stocks and flows of natural resources and services in a given ecosystem or region

Valuing nature

Ecosystem goods and services



- Prices for environmental goods do not exist or do not reflect full value of resource
- **Economic values need to be derived**

Private goods and services

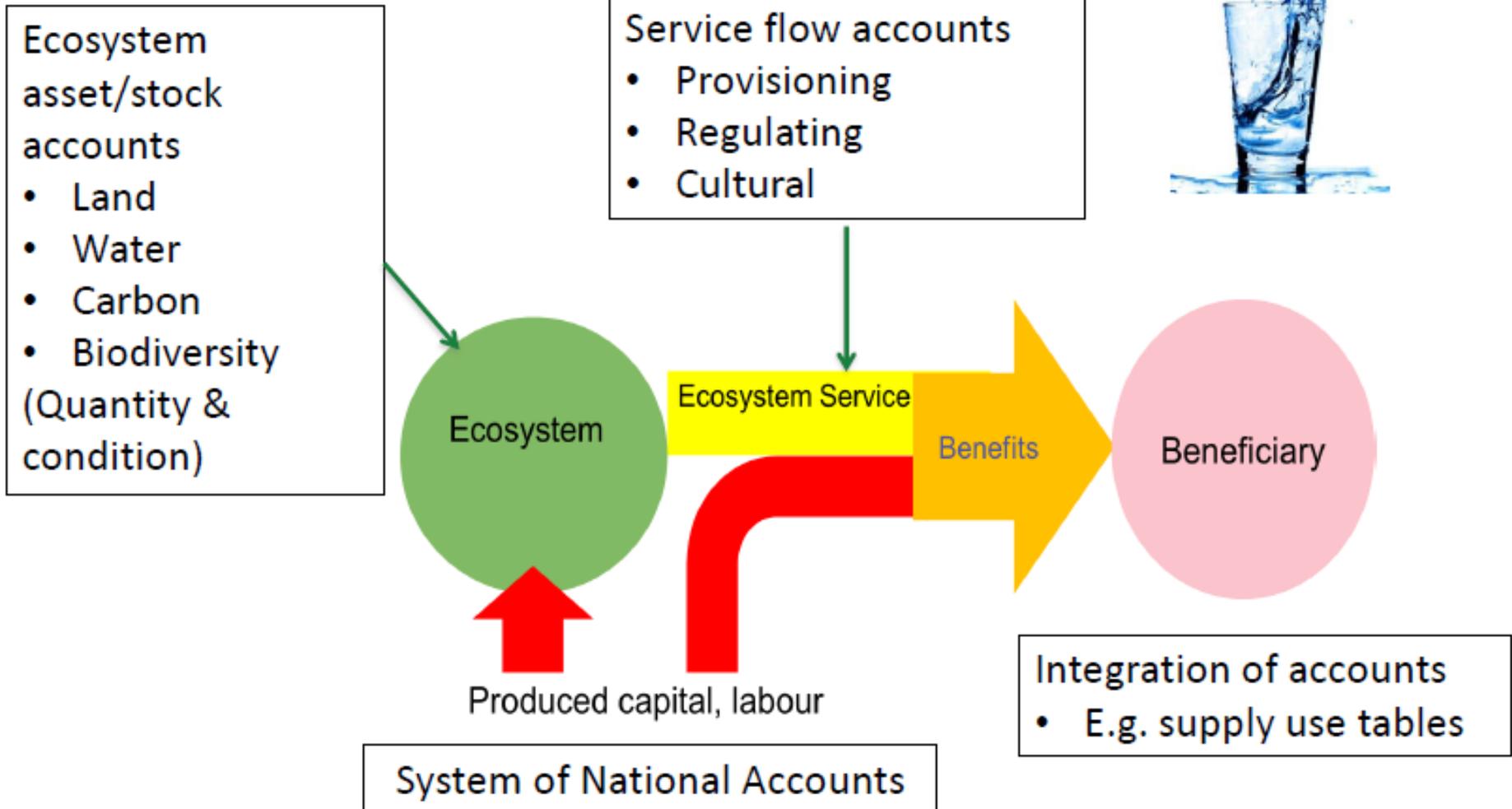


- For private goods, prices reflect relative scarcity and people's willingness to pay

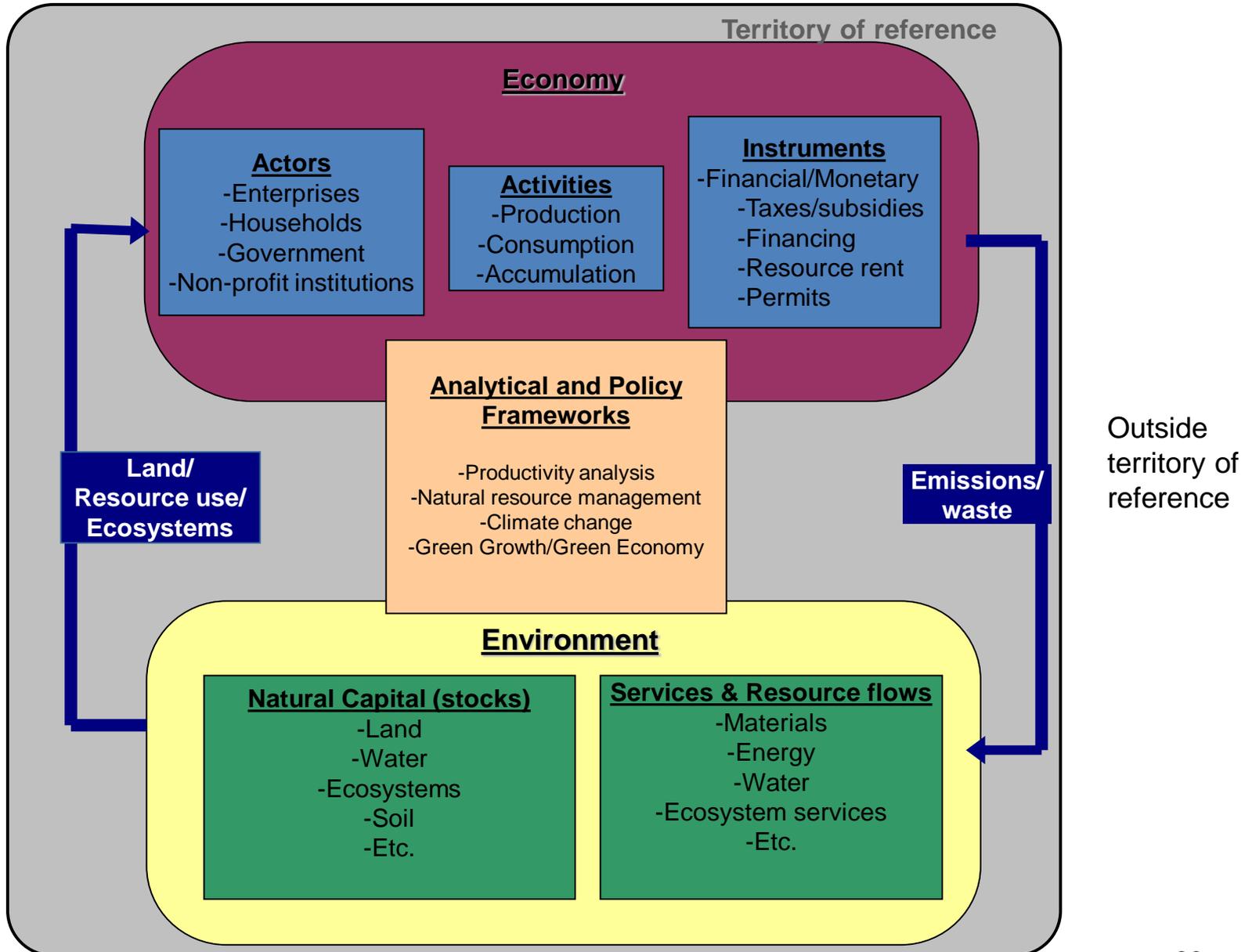
Natural Capital: Counting it in

- Values are not readily captured in markets.
- Regulating and supporting services flowing from natural ecosystems are undervalued by society
- Full value is not reflected in policy trade-offs and economic choices.
- Many human-initiated disruptions of ecosystems are difficult to reverse on a “human relevant” timescale
- A continued lack of awareness will dramatically alter the Earth’s remaining natural ecosystems within a few decades.
- Poorly managed Natural Capital –an ecological, social and economic liability .

Ecosystem accounts: key concepts and accounts



The SEEA Framework



Valuing Nature – Natural Capital Account

- an important additional tool for informing sustainable development.
 - Highlight areas of developing “natural capital deficit” that may require policy intervention
- Accounting frameworks
 - Inclusive wealth – attempts to value all forms of capital assets – human, manufactured, social, natural capital.
 - Means that future generations are endowed with a larger “productive base” to support human well-being.
 - Can be used as gauge of sustainability, although accurate measurement of the value of capital assets is challenging.

Tools to reflect the values of natural capital in decision-making

- **Ecosystem valuation techniques** help assess the contribution of ecosystems to human well-being, especially at the local level.
- **Ecosystem accounting techniques** aim to aggregate information to produce statistical results, especially at the national level.
- reflect the contribution of ecosystems to well-being at the national level

Two Important Phases of Natural Capital and Economy

- Accounting
 - Natural assets in decline pose a potential risk to society
 - Information on the status, trends and costs of recovery and/or replacement of natural assets are therefore of importance to governments, society and businesses
- Valuation
 - To inform decision making natural capital should be assigned a value
 - **Depreciation of natural capital is not covered by national accounts**

NC Accounting and valuation require measurement (and identification)

- There is a set of natural capital stocks
- Each natural capital stock may provide one or more services;
 - these are outputs or features of each stock
- Services, often combined with 'other capital inputs',
 - can be used to produce goods.
- 'Goods' are consumed / used and provide benefits (to people) which can be valued (often in monetary terms).

Uses of natural capital accounts

1. Linking environmental and socio-economic data is essential for policymakers
2. Enables analysis of the impact of economic policies on the environment and vice versa
3. Provides a quantitative basis for policy design

Uses of natural capital accounts

4. Identifies the socio-economic drivers, pressures, impacts and responses affecting the environment
5. Supports environmental regulations and resource management strategies
6. Provides indicators that express the relationships between the environment and the economy

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