Ecosystem Services
& Climate Change Adaptation

Image Source: https://www.globalrealestateexperts.com/wp-content/uploads/2016/03/environment.jpg

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Outline

- What is Ecosystem Services?
- How it can support adaptation and low carbon urban development

Examples and suggestions

- Opportunities and challenges for its implementation
- Conclusions
- Activity

What is Ecosystem Services?

Structure of this section

- Main sources of information
  - “Millennium Ecosystem Assessment” (UN)
  - “The Economics of Ecosystems and Biodiversity” (G8+5)
- Ecosystem Services Definition
  - Ecosystem
  - Biodiversity
  - Human Well-being
  - Drivers of Change of Ecosystems
- Ecosystem values and valuation approaches

What is Ecosystem Services?
Millennium Ecosystem Assessment (MA)

- UN program (from 2001 to 2005)
- To understand the impacts of changes in Ecosystems for human well-being
- Looking for scientific support for actions to improve “conservation and sustainable use of these systems”

- Why this matters?

  “everyone depends on nature and ecosystem services for a decent, healthy and secure life”

  (MA, 2005a, preface pp.v)

What is Ecosystem Services?

Millennium Ecosystem Assessment (MA) - Findings

Finding #1: *Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.*

Finding #2: *The changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.*

Finding #3: *The degradation of ecosystem services could grow significantly worse during the first half of this century and is a barrier to achieving the Millennium Development Goals.*

Finding #4: *The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the MA considered, but these involve significant changes in policies, institutions, and practices that are not currently under way. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services.*

(MA, 2005b)

https://praialimpa.net/

http://www.inea.rj.gov.br/Portal/MegaDropDown/Monitoramento/Qualidadedaagua/Praias/index.htm&lang=PT-BR

What is Ecosystem Services?

Millennium Ecosystem Assessment Reports (MA)

"change of human actions is indispensable to guarantee not only the Millennium Development Goals" (to reduce poverty, hunger and disease) "but to reduce climate change, vulnerability to natural disasters and maintain water supply, among others." (Ezequiel, 2012, pp.5)

"On September 25th 2015, countries adopted a set of goals to **end poverty**, **protect the planet** and **ensure prosperity for all** as part of a new sustainable development agenda.
Each goal has specific targets to be achieved over the next 15 years."
(https://www.un.org/sustainabledevelopment/sustainable-development-goals/)

SUSTAINABLE DEVELOPMENT GOALS

To which SDG Ecosystem Services are related? Pick your numbers!

Source: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

What is Ecosystem Services?

The Economics of Ecosystems and Biodiversity (TEEB)

- G8+5 Environment Ministers study request
- “to assess the economics of biodiversity loss in the globe”
- Reports available since 2008
- What did they find?

    - “investments in healthy ecosystem are important not only to reduce poverty but to enhance climate change mitigation and adaptation.”

    - Markets should consider ecosystem services values “due to its high economic importance to every stakeholder.”

http://www.teebweb.org/ (Ezequiel, 2012, p.5)

What is Ecosystem Services?

Ecosystem Services Definition

Ecosystem

- “a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”

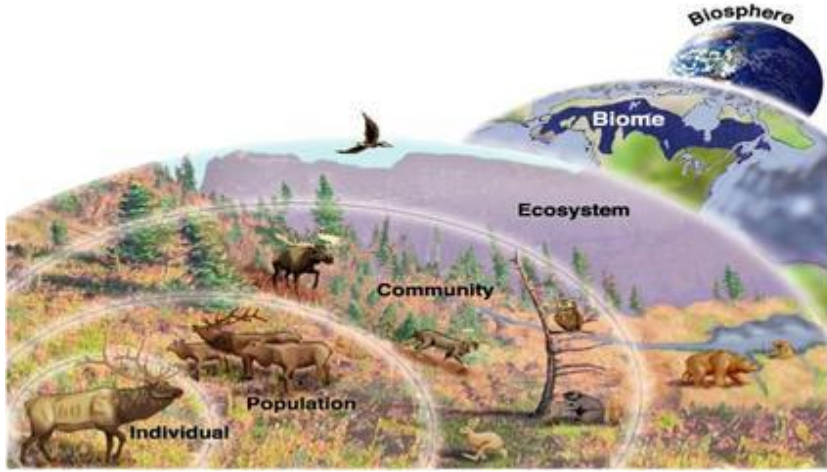
(United Nations 1992: Article 2 in Millennium Ecosystem Assessment 2003 p.51)

What is the biggest ecosystem we have on Earth?

- “the biosphere of the planet is an ecosystem composed of several ecosystems that interact with each other.”

- “Ecosystems have different scales, different levels of interactions”, “can have their limits determined but they also overlay each other composing the environment.”

(Ezequiel, 2012, p.6)



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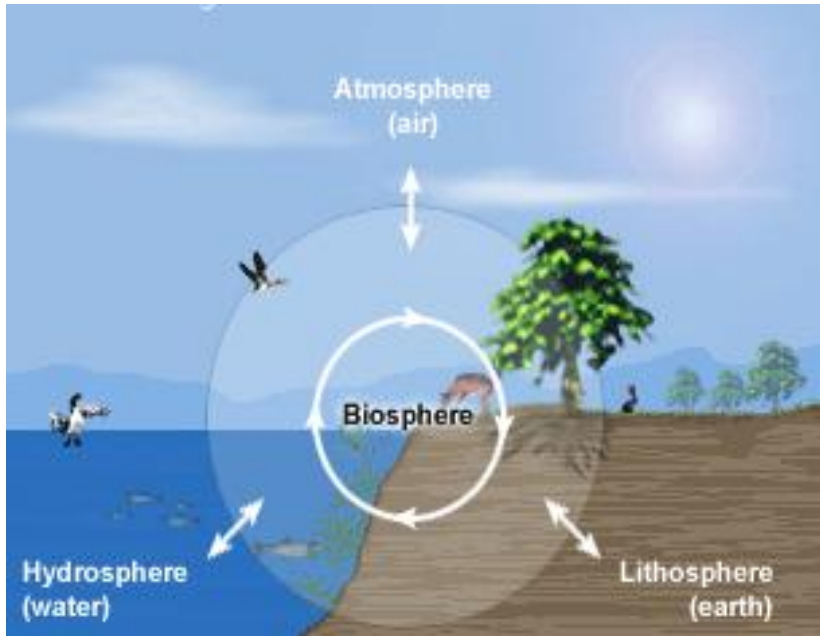
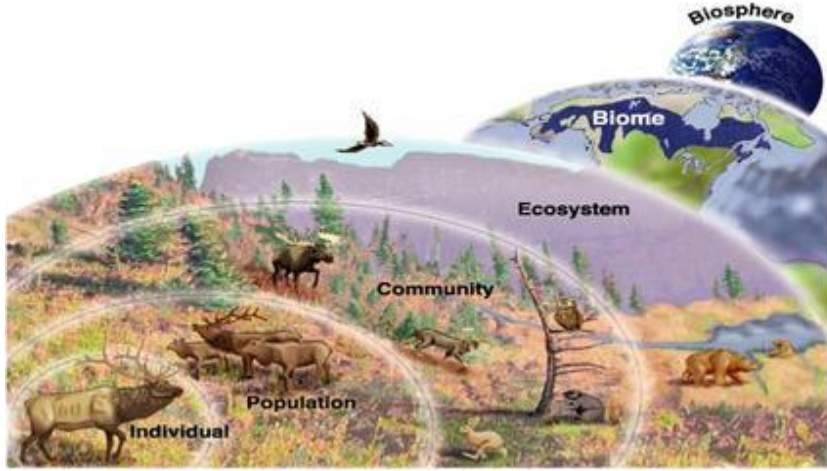


What is Ecosystem Services?

Ecosystem Services Definition



https://d2gne97vdumgn3.cloudfront.net/api/file/GUjIAADzTLWv4s30JR1g

Biodiversity

- “the variability among living organisms … and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”
  (United Nations 1992: Article 2 in Millennium Ecosystem Assessment 2003 p.51)

- Each specie is important for its own ecosystem and for other ecosystems too.

Is it clear how biodiversity is linked to ecosystems?

(Ezequiel, 2012, p.6)

What is Ecosystem Services?

Ecosystem Services Definition

Human well-being

has several definitions, most of them include:

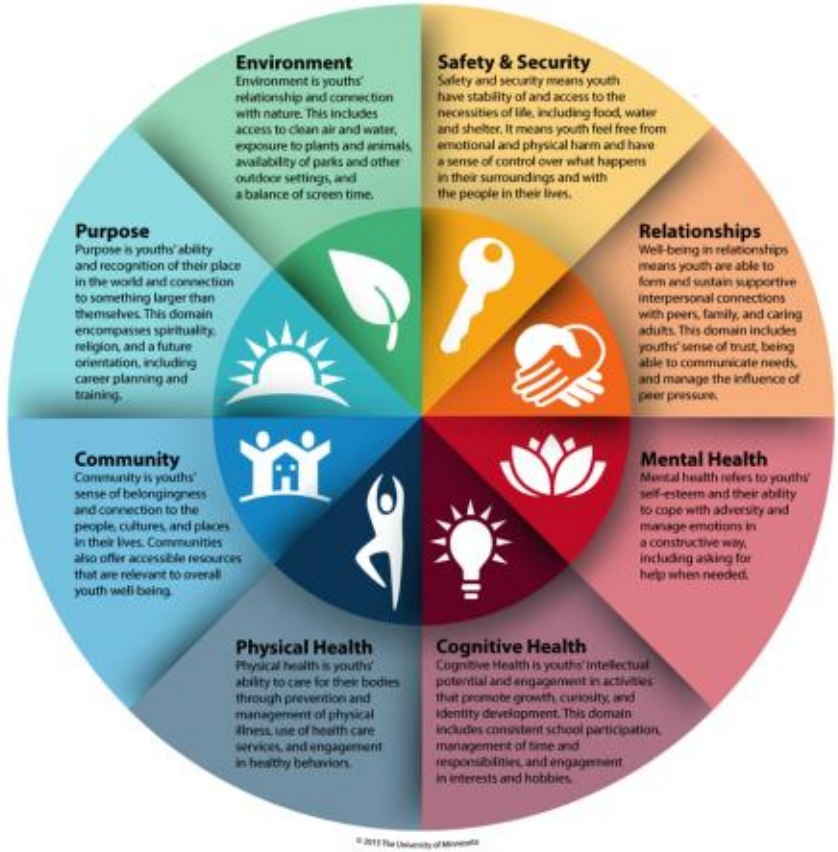
- Basic material needs for a good life
- Freedom
- Health
- Personal security
- Good social relations

All these combined provide physical, social, psychological and spiritual fulfilment

A major privation of these elements can be stated as poverty.

WB defines poverty as “the pronounced deprivation of well-being”

(World Bank in the World Development Report 2000/01 in Millennium Ecosystem Assessment 2003, p.74)



https://i.pinimg.com/236x/c1/fc/0e/c1fc0e5f1b826f8f1e4755497a618f4b--wellbeing-activities-for-adults-motivation-activities-for-teens.jpg

How are ecosystems connected to human well-being?

(Ezequiel, 2012, p.8)

What is Ecosystem Services?

Ecosystem Services Definition

What is Ecosystem Services?

"Ecosystems services are the benefits that people obtain from ecosystems."

(Millennium Ecosystem Assessment 2003, p.53)

If people are benefiting from it, it has an economic value

What kind of benefits?

Goods and Services

Why biodiversity crisis is happening and how it is connected to Ecosystem Services?

> "biodiversity crisis is caused by the unsustainable growth and the undervaluation of Ecosystem Services due to lack of comprehension of its long-term economic benefits."

How to Measure Ecosystems Services?

(Ezequiel, 2012, p.6)

https://i.pinimg.com/originals/88/53/33/88533300cf4243692a4a4c717bdc8804.jpg

What is Ecosystem Services?

Ecosystem Services Definition

Provisioning Services

Products obtained from ecosystems

- Food
- Fresh water
- Fuelwood
- Fiber
- Biochemicals
- Genetic resources

Regulating Services

Benefits obtained from regulation of ecosystem processes

- Climate regulation
- Disease regulation
- Water regulation
- Water purification
- Pollination

Cultural Services

Nonmaterial benefits obtained from ecosystems

- Spiritual and religious
- Recreation and ecotourism
- Aesthetic
- Inspirational
- Educational
- Sense of place
- Cultural heritage

Supporting Services

Services necessary for the production of all other ecosystem services

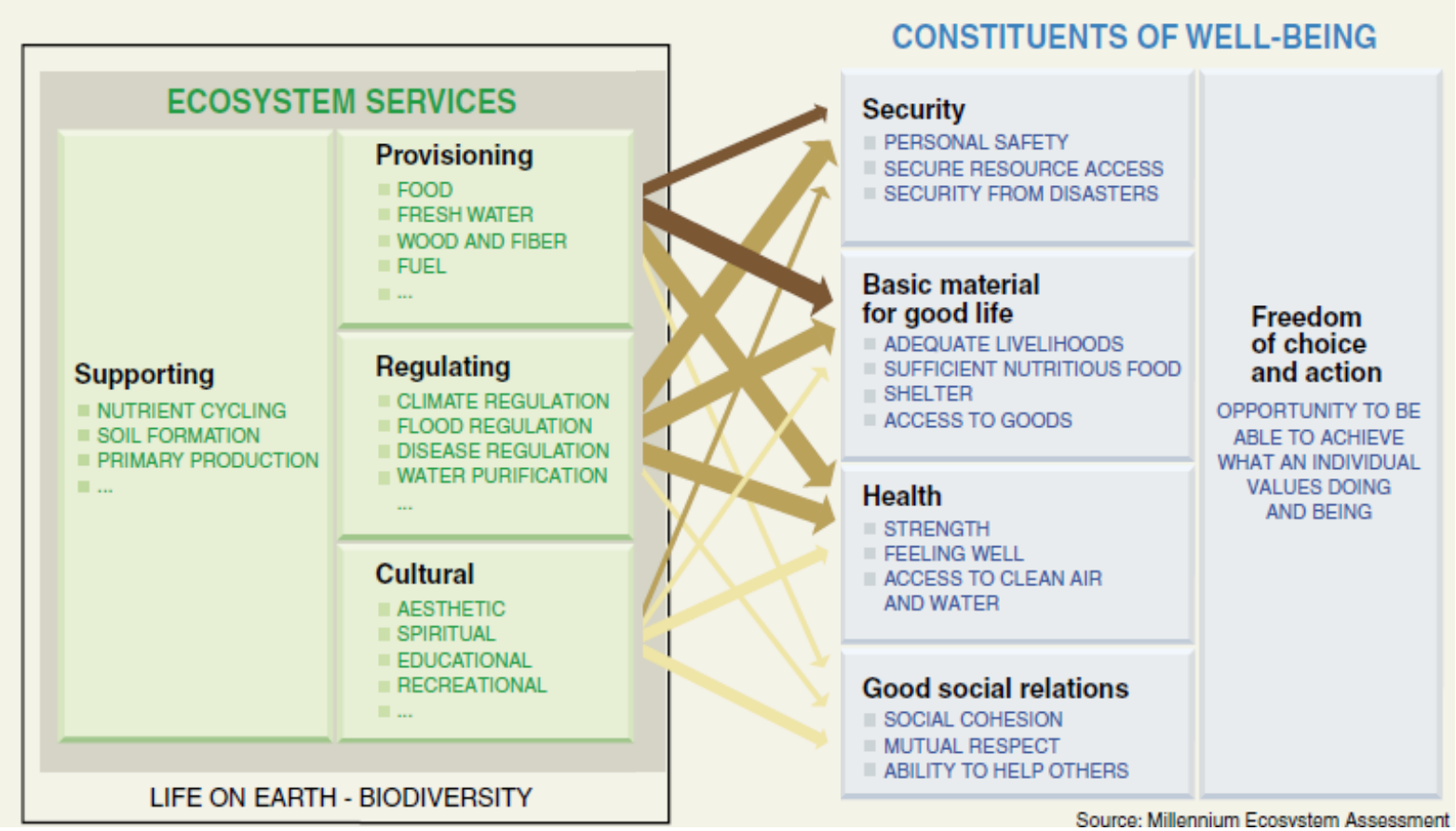
- Soil formation
- Nutrient cycling
- Primary production

(Millennium Ecosystem Assessment 2003 p.57 in Ezequiel, 2012, p.7)

How are Ecosystem Services linked with well-being?

What is Ecosystem Services?

Ecosystem Services and Human Well-being – Ecosystem Approach



possible for socioeconomic factors to mediate the linkage

(Adapted from Millennium Ecosystem Assessment 2005a pp.vi in Ezequiel, 2012, p.9)

What is Ecosystem Services?

Ecosystem Services and Human Well-being – Ecosystem Approach

- Humans are part of Ecosystems
- Ecosystem Approach

"a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way".
(Millennium Ecosystem Approach 2003, p.52)

(Ezequiel, 2012, p.8)

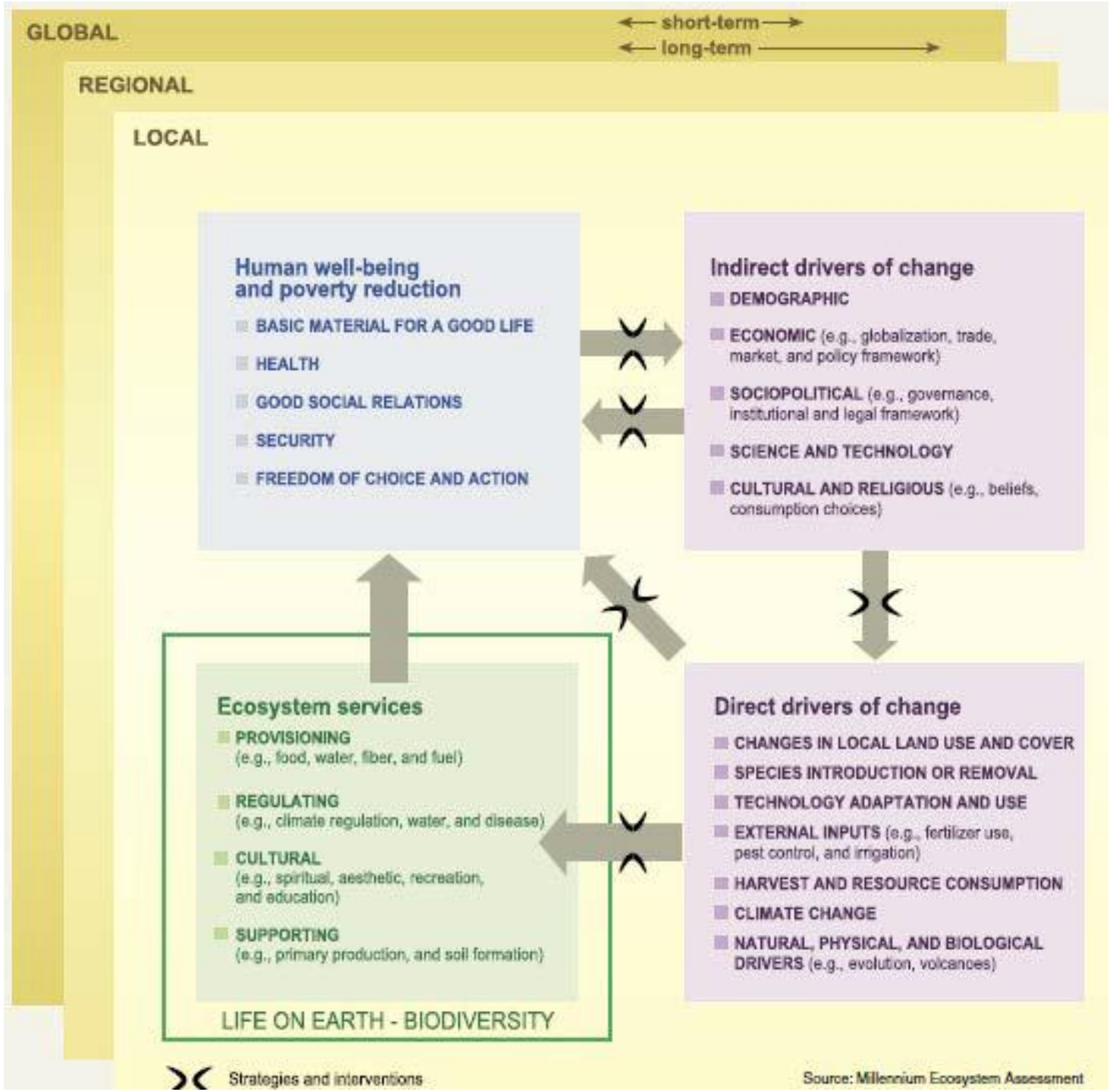
What is Ecosystem Services?

Ecosystem Services – Drivers of Change

- “Each people, nation or company have their own standards of needs
- The level of demand and hence the level of interference on ecosystems are defined by these actors
- Decision makers are pushed by Global Driving forces”

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/image_data/file/68936/s300_Business_people.jpg

(Ezequiel, 2012, p.10)


GLOBAL
short-term
long-term
REGIONAL
LOCAL
Human well-being
and poverty reduction
BASIC MATERIAL FOR A GOOD LIFE
HEALTH
GOOD SOCIAL RELATIONS
SECURITY
FREEDOM OF CHOICE AND ACTION
Indirect drivers of change
DEMOGRAPHIC
ECONOMIC (e.g., globalization, trade, market, and policy framework)
SOCIOPOLITICAL (e.g., governance, institutional and legal framework)
SCIENCE AND TECHNOLOGY
CULTURAL AND RELIGIOUS (e.g., beliefs, consumption choices)
Ecosystem services
PROVISIONING
(e.g., food, water, fiber, and fuel)
REGULATING
(e.g., climate regulation, water, and disease)
CULTURAL
(e.g., spiritual, aesthetic, recreation, and education)
SUPPORTING
(e.g., primary production, and soil formation)
LIFE ON EARTH - BIODIVERSITY
Direct drivers of change
CHANGES IN LOCAL LAND USE AND COVER
SPECIES INTRODUCTION OR REMOVAL
TECHNOLOGY ADAPTATION AND USE
EXTERNAL INPUTS (e.g., fertilizer use, pest control, and irrigation)
HARVEST AND RESOURCE CONSUMPTION
CLIMATE CHANGE
NATURAL, PHYSICAL, AND BIOLOGICAL DRIVERS (e.g., evolution, volcanoes)
Strategies and interventions
Source: Millennium Ecosystem Assessment

What is Ecosystem Services?

Ecosystem Services – Drivers of Change

“These drivers of change can affect ecosystems and its services:

directly or indirectly
with more or less intensity
in a shorter or longer term
at local, regional and (or) global level
generate positive or negative externalities”

(Ezequiel, 2012, p.10)

What is Ecosystem Services?

Ecosystem values and valuation approaches - Importance

Why do we have to price nature?

- Part of the total wealth of nations and flow benefits come from its ecosystems
- Conventionally, many ecosystem values are not included because they are not traded
- Depletion or appreciation values are usually not taken into account
- Well-being indications are then wrongly stated what can lead to wrong decisions
- More adequate indicators are important to guarantee:
  - well-fare
  - sustainable use
  - inter-temporal allocation of natural resources
  - intergenerational equity

(Ezequiel, 2012, pp.11)

Cost for Amazon Forest: http://jpe.library.arizona.edu/volume_24/Hoelle.pdf

Source of image: https://inhabitat.com/wp-content/blogs.dir/1/files/2014/12/Jarrimber-Deforestation-Infographic-2.jpg

What is Ecosystem Services?

Ecosystem values and valuation approaches

Therefore, it is important to:

- “assess the overall contribution of ecosystems to social and economic well-being
- understand how and why economic actors use ecosystems as they do
- assess the relative impact of alternative actions to help guiding decision-making”

(MA 2003)

(Ezequiel, 2012, p.11)

Image Source: https://www.globalrealestateexperts.com/wp-content/uploads/2016/03/environment.jpg

What is Ecosystem Services?

Ecosystem values and valuation approaches

Knowing the value of ecosystems services leads to more cost-efficient decisions and can avoid inappropriate trade-offs.

http://assets.panda.org/img/original/3_150.jpg

For instance:

- land use policies can better determine how much of the ecosystem of an area should be conserved or converted to other use

https://industrialecologyateur.wordpress.com/projects-2/multifunctional-land-use-in-the-roofpark-rotterdam/

Reports by The Economics of Ecosystems and Biodiversity (2009a, 2009b), (Ezequiel, 2012, p.11, 12)
Image Source: https://www.globalrealestateexperts.com/wp-content/uploads/2016/03/environment.jpg

What is Ecosystem Services?

Ecosystem values and valuation approaches

- “can be valued differently according to different ways to understand it”
- “several methods and Measures to assess it in order to know its value.”
- It is necessary a multi-sectorial approach

https://madprime.org/articles/2014/02/17/real-people-silhouettes/

Analyse its condition, supply and interactions binding it in space and time

- How well is this Ecosystem?
- How it performs in provide certain service?

(Ezequiel, 2012, p.7)

What is Ecosystem Services?

Ecosystem values and valuation approaches – valuation techniques

Total Economic Value

"framework for looking at the utilitarian value of ecosystems"

(Millennium Ecosystem Assessment 2003, p.132)

Several valuation methods:

- Cost based approaches:
  Opportunity cost; Cost of alternatives/substitute goods;
  Replacement cost method (also known as shadow project costs)

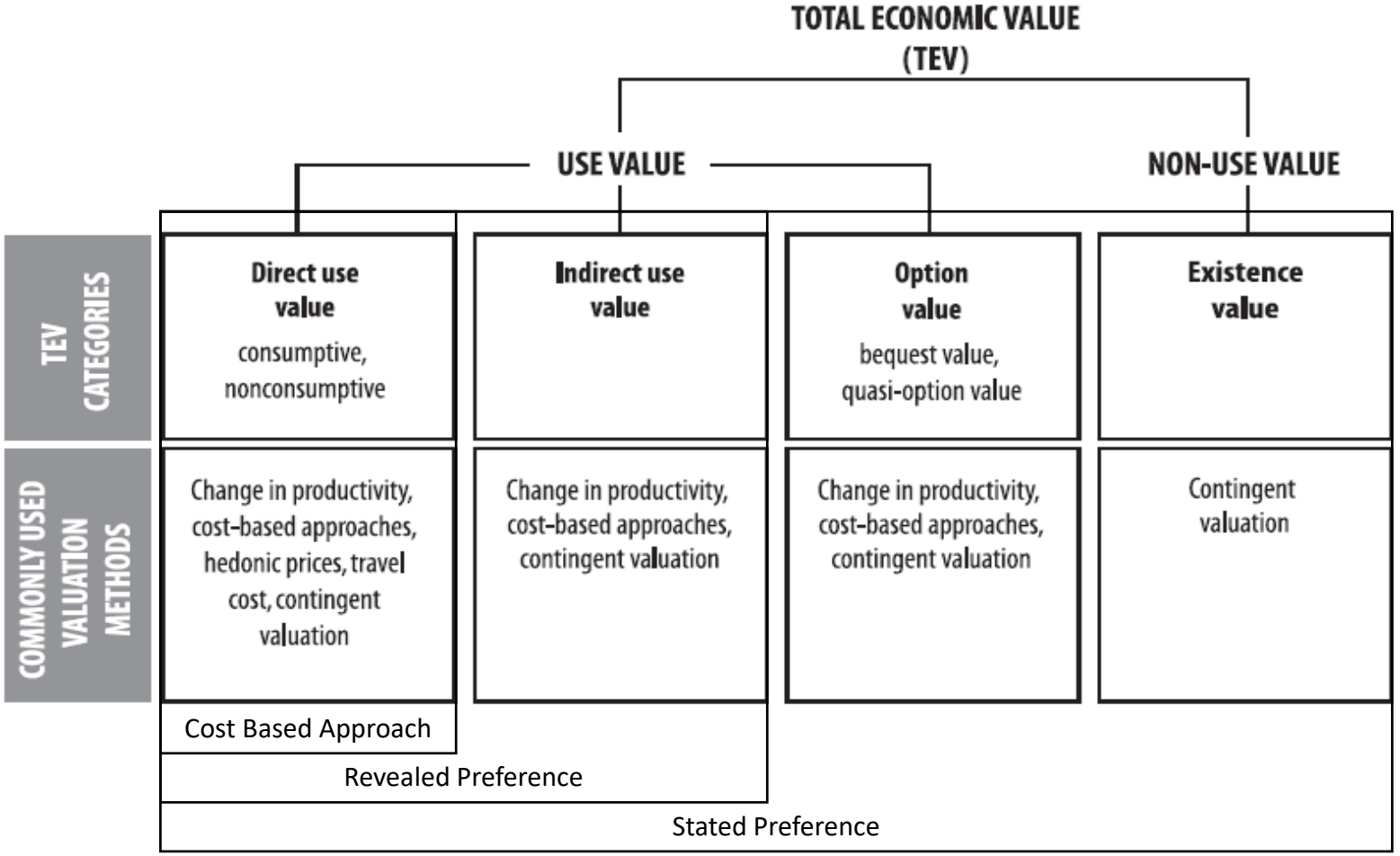
- Revealed Preference Methods:
  Market prices; Averting behaviour; Productions functions approach;
  Hedonic pricing; Travel cost method; Random utility models.

- Stated Preference methods:
  Contingent valuation; Choice modelling;

Ezequiel, 2012, p12

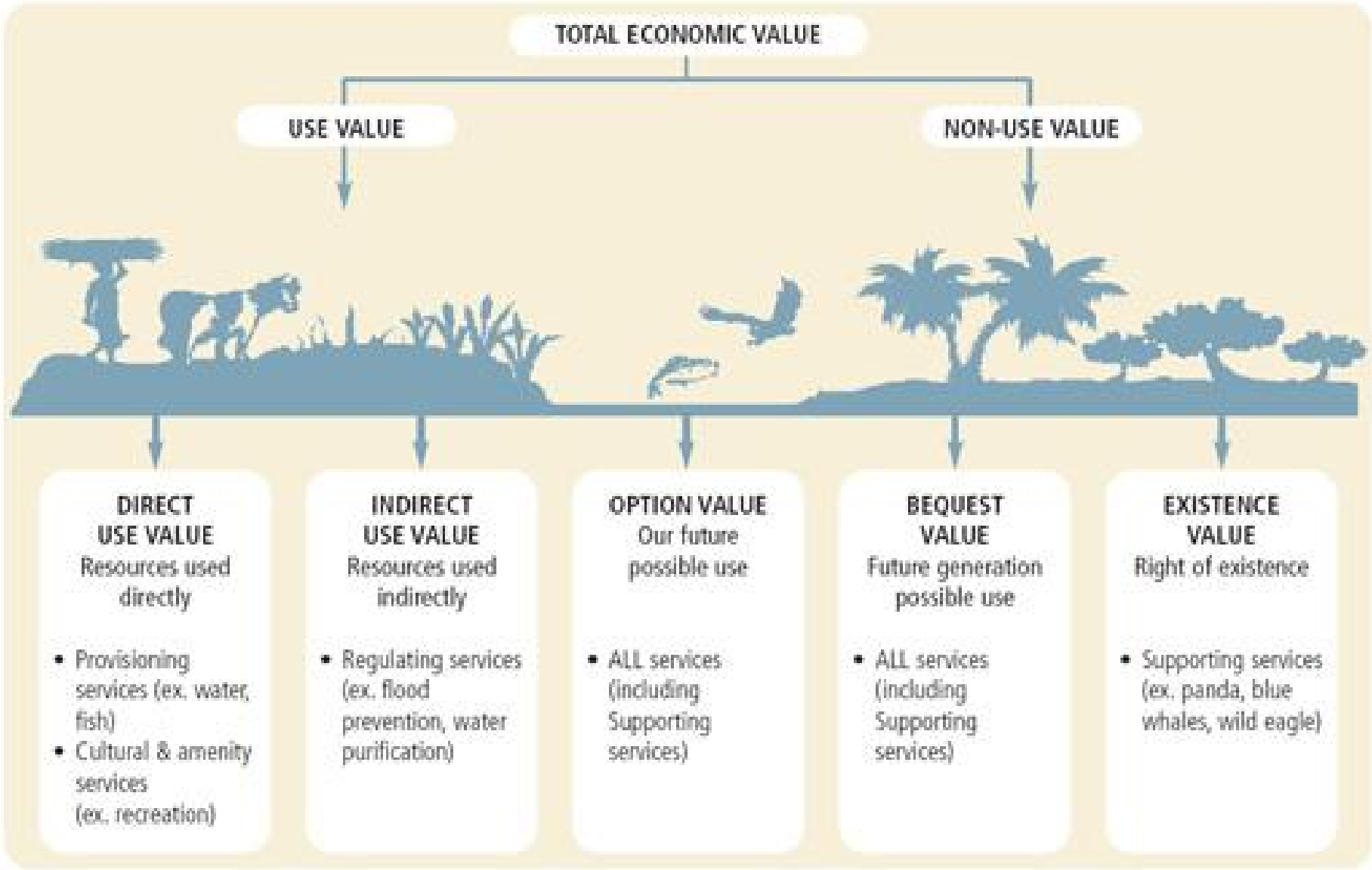
What is Ecosystem Services?

Ecosystem values and valuation approaches

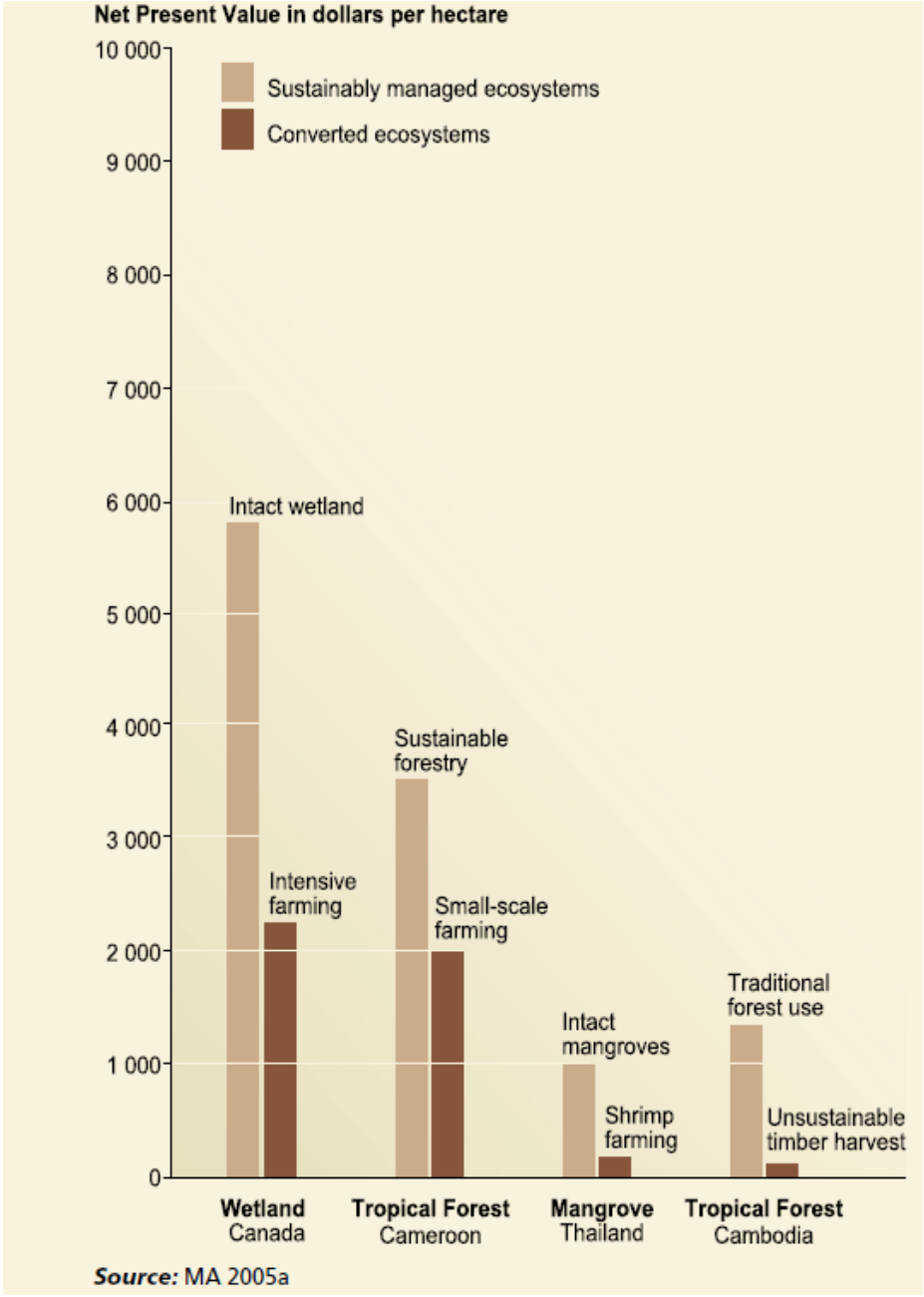


Source: M EA 2003, p.132

Adapted by the Author 2012 from Defra "An introductory guide to valuing ecosystem services" (2007)



https://mjmerrick.files.wordpress.com/2012/03/iucn_pay_ecosystem-values1.jpg


Net Present Value in dollars per hectare
10 000
9 000
8 000
7 000
6 000
5 000
4 000
3 000
2 000
1 000
0
Sustainably managed ecosystems
Converted ecosystems
Intact wetland
Intensive farming
Sustainable forestry
Small-scale farming
Intact mangroves
Shrimp farming
Traditional forest use
Unsustainable timber harvest
Wetland Canada
Tropical Forest Cameroon
Mangrove Thailand
Tropical Forest Cambodia
Source: MA 2005a

Amount that could enhance

net present value by adopting

green economic growth (conservation and restauration)

instead of

Business as usual development

Mainly related to

carbon sequestration

and

water (quality and flow regulation services)

CAMBODIA

US$2.63 bn

is the amount that green economic growth policies could potentially enhance the net present value of ecosystem services from natural forests, freshwater wetlands, mangroves and coral reefs - a 15.6 percent increase over a business as usual economic growth scenario.

The value of carbon sequestration services of these ecosystems will benefit most from green economic growth, by over 21 percent.

LAO PDR

US$3.31 bn

is the amount that green economic growth policies could potentially enhance the net present value of ecosystem services from natural forests and freshwater wetlands, an increase of 8.5 percent over a business as usual economic growth scenario.

The biggest gains would be associated with water quality and flow regulation services from these ecosystems, which green economic growth may boost by over 11.2 percent.

THAILAND

US$2.06 bn

is the amount that green economic growth policies could potentially enhance the net present value of ecosystem services from natural forests, freshwater wetlands, mangroves and coral reefs - a 7.8 percent increase over a business as usual economic growth scenario.

Biggest gains from green economic growth would be associated with water quality and flow regulation services of these ecosystems, which may increase by over 84 percent

VIETNAM

US$2.44 bn

is the amount that green economic growth policies could potentially enhance the net present value of ecosystem services from natural forests, freshwater wetlands, mangroves and coral reefs - a 84 percent increase over a business as usual economic growth scenario.

The biggest gains would be associated with watershed protection and water quality and flow regulation services of these ecosystems.

For more info, visit www.mekongarcc.net

USAID ARCC

ECOSYSTEM SERVICES VALUATION COUNTRY CASE STUDIES

These four USAID Mekong ARCC case studies demonstrate how ecosystem services valuation (ESV) can be employed to ascertain monetary values of natural resources to support green growth policies in the Lower Mekong Basin.

https://www.weadapt.org/knowledge-base/economics-of-adaptation/valuing-ecosystem-services-in-the-lower-mekong-basin

What is Ecosystem Services?

Ecosystem values and valuation approaches - Challenges

Main reasons that limit monetary valuation:

- it is an expensive procedure - costly and requires expertise
- values can vary over time due to market changes – scarcity or demand that are increasing every year

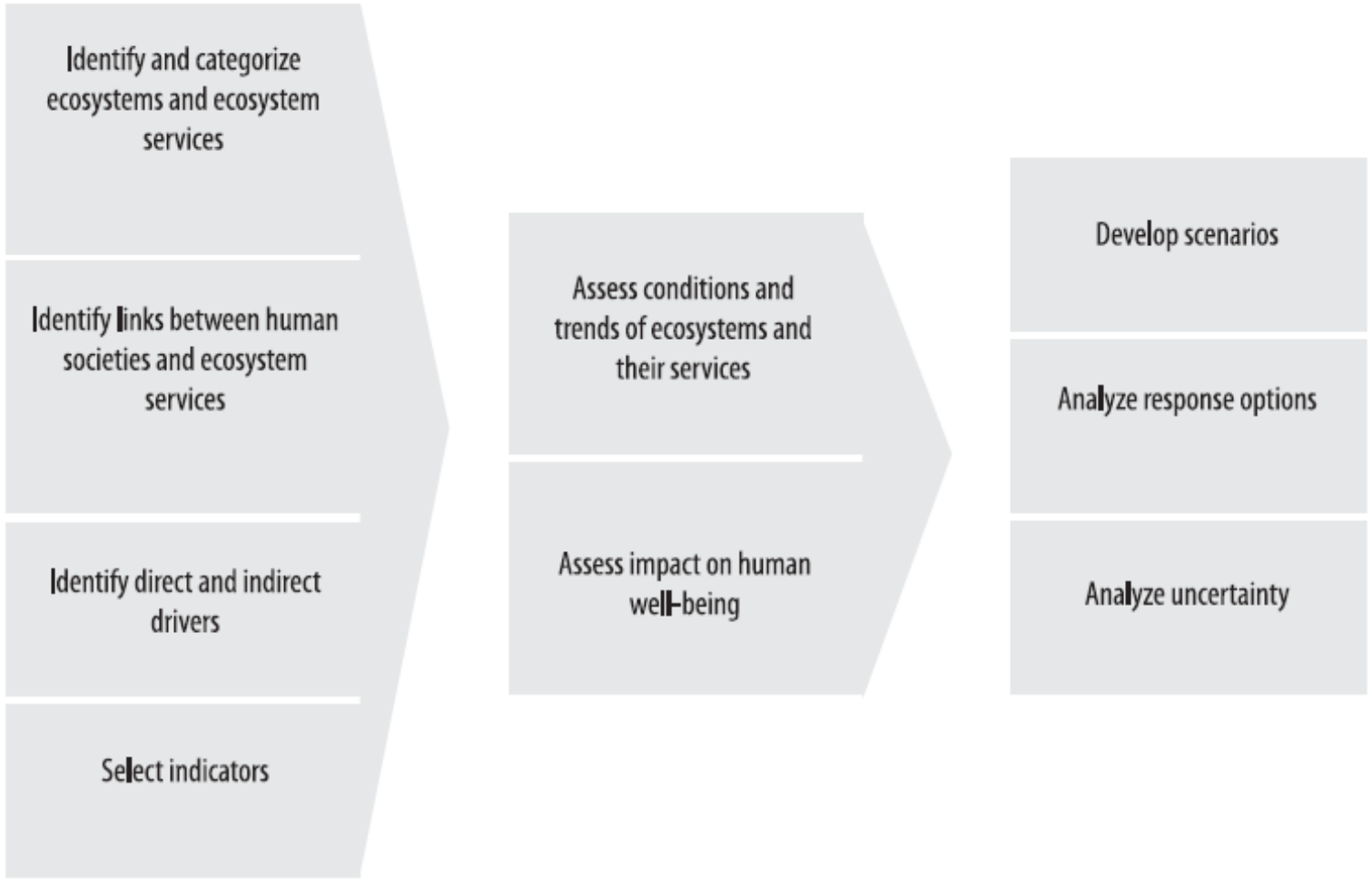
(The Economics of Ecosystems and Biodiversity (2009a)

What is Ecosystem Services?

Ecosystem values and valuation approaches - Steps

- Identify ecosystem services
- Identify it’s values
- Plan and analyse strategies based on evaluation and options available

FIGURE 7.1 The Analytical Approach of the Millennium Ecosystem Assessment and Its Main Tasks



MA 2003 pp.149

What is Ecosystem Services?

Ecosystem values and valuation approaches - Examples

- Plan and analyse strategies based on evaluation and options available for example:
  - Invest on conservation or restauration
    - Can include economical tools (fees, tariffs, fines)
      eg: entrance fee in a natural protected area or
      global investment for preservation
      (by preserving – gain ecosystem services that can be priced)
    - Reduced investments on health and social programs
    - Generation of income and resource for local inhabitants

“We are running down our natural capital stock without understanding the value of what we are losing.”

(The Economics of Ecosystems and Biodiversity (2009a)

Outline

- What is Ecosystem Services?
- How it can support adaptation and low carbon urban development

Examples and suggestions

- Opportunities and challenges for its implementation
- Conclusions
- Activity

Ecosystem Services and Adaptation
What is adaptation?

- Actions or strategies to turn a system resilient to climate change effects
- climate-resilient development
  (emphasising “the strong links between adaptation and economic development”)
- IPCC “defines resilience as the ability of a system to anticipate, absorb, accommodate or recover from a hazardous event”

Fankhauser, S. 2016. Adaptation to Climate Change. *Annual Review of Resource Economics 2017,* 9 (1), pp. 209-230 Available at: https://www.annualreviews.org/doi/abs/10.1146/annurev-resource-100516-033554 [Accessed 15 June 2018].

Ecosystem Services and Low Carbon Development

What is low carbon urban development?

- Development planning that adopts solutions with lower carbon emission (mitigate emissions – with alternative infrastructure and spatial planning)

(Morita et al. 2001)

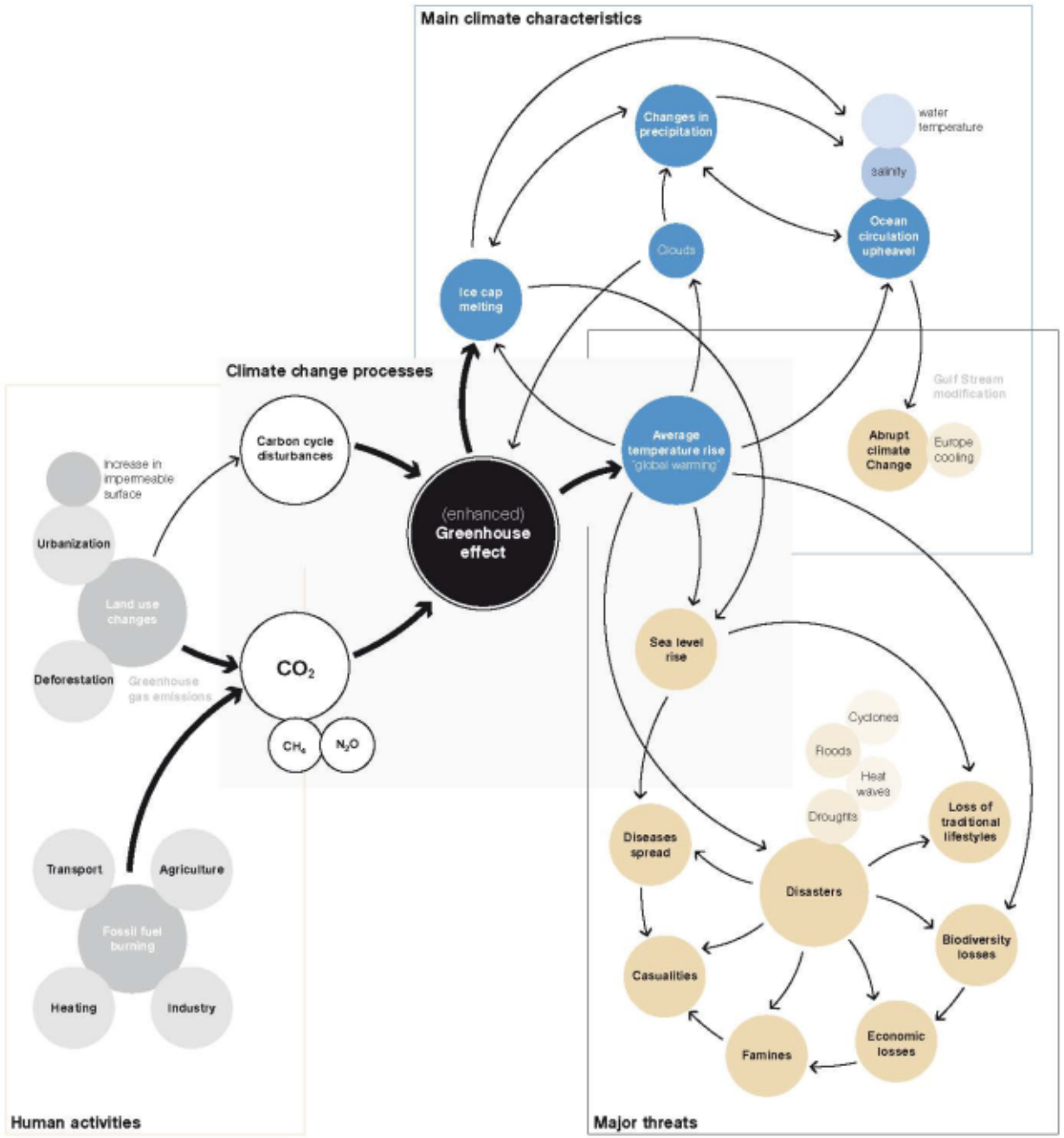
- LEDS - Low-carbon development strategies
  forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient with economic growth

(OECD - Organisation for Economic Co-operation and Development, IEA – International Energy Agency Report 2010)

https://sustainabledevelopment.un.org/index.php?menu=1448

Figure II-1. **Climate change: processes, characteristics and threats**

http://unfccc.int/resource/docs/publications/impacts.pdf



Mitigate

Adapt

Ecosystem Services and Adaptation

Examples of adaptation strategies

There are several adaptation strategies options, some of them are:

- using scarce water resources more efficiently
- building flood defences and raising the levels of dykes
- setting aside land corridors to help species migrate
- adapting building codes to future climate conditions and extreme weather events

(Source: https://ec.europa.eu/clima/policies/adaptation_en)

Ecosystem Services and Adaptation

Examples of adaptation strategies

How can Ecosystem Services support adaptation?

Adaptation strategy

- using scarce water resources more efficiently

1. Identify Ecosystems and its services
2. Assess its condition
3. Analyse Alternatives

➢ Demand control, losses reduction and water management efficiency

- Provision of information
- use economic tools (water taxes, fines)
- infrastructure improvement (reduce leakage, water reuse systems)
- Smart use of water cycle (rain water collection/use systems water purification, low water consumption agriculture techniques)
- use of green infrastructure

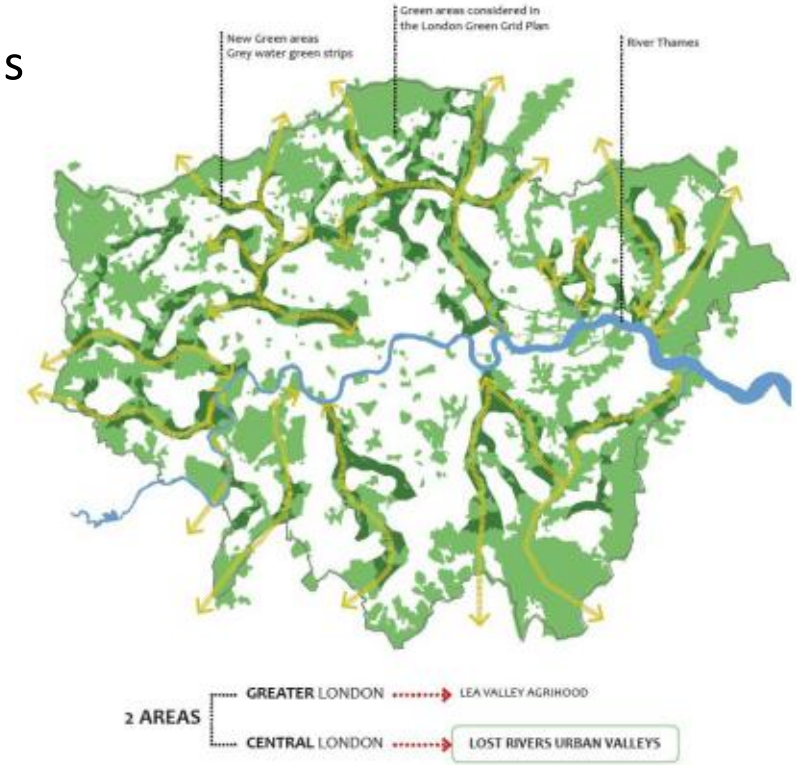
Source: https://www.greenfacts.org/en/water-resources/l-2/6-sustainable-management.htm

Ecosystem Services and Adaptation
Green Infrastructure

- network of natural and semi-natural areas in rural and urban areas
  - terrestrial, freshwater, coastal and marine areas
  - parks, forest reserves
  - restored and intact wetlands and marine areas
  - man-made features, such as ecoducts and cycle paths

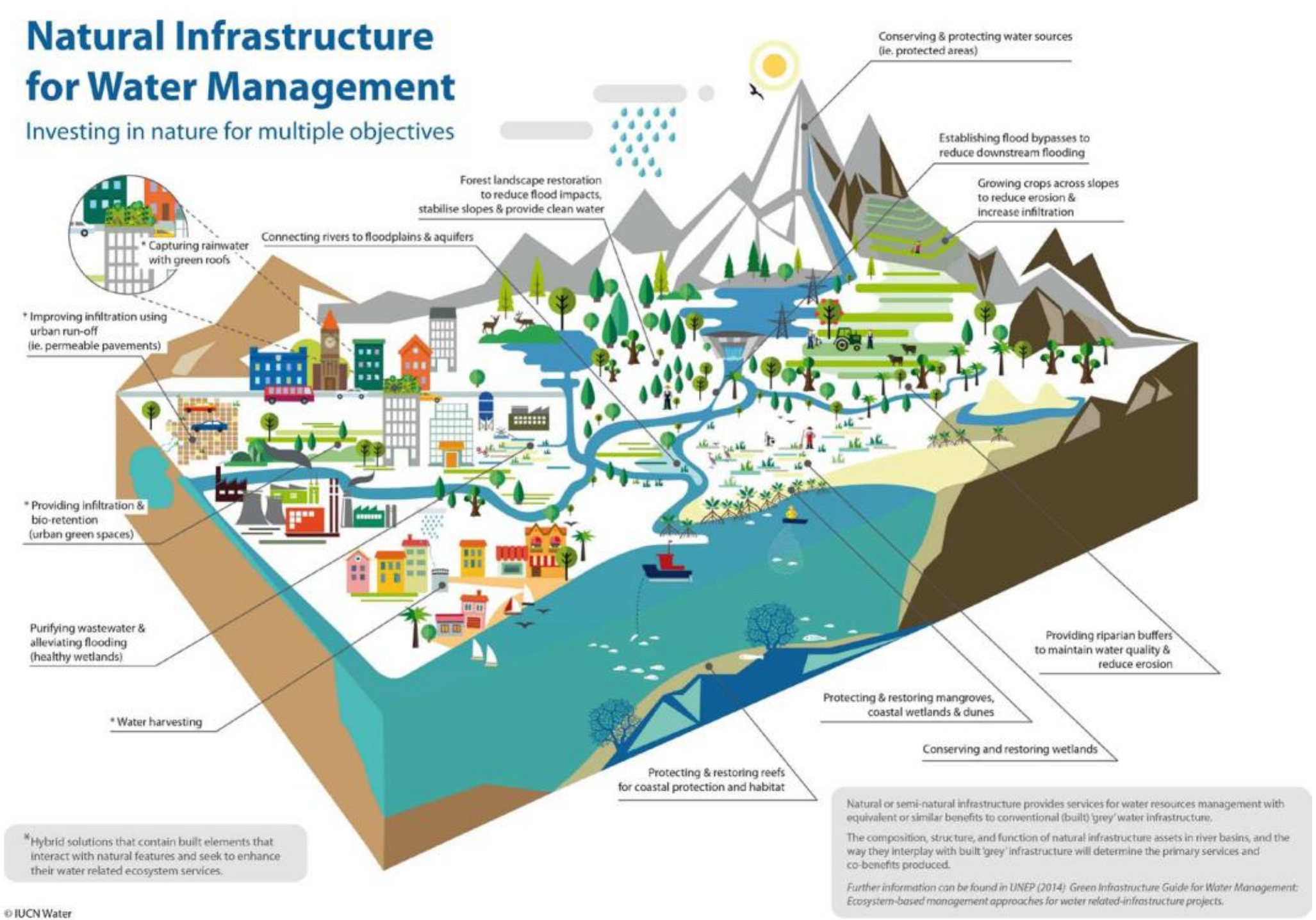
- It aims to
  - promote ecosystem health and resilience
  - contribute to biodiversity conservation
  - enhance ecosystem services

Every green area counts!



https://landscapeiskingston.files.wordpress.com/2014/02/proposal-idea-1.jpg

Source: Naumann et al., 2011a in European Commission's Directorate-General Environment, 2012. Science for Environment Policy In-depth Reports: The Multifunctionality of Green Infrastructure. Edited by the Science Communication Unit, the University of the West of England (UWE), Bristol [Online] Availabe at http://ec.europa.eu/environment/nature/ecosystems/docs/Green_Infrastructure.pdf [18 June 2018]



IUCN – International Union for Conservation of Nature - https://www.iucn.org/downloads/a3_natural_infrastructure_final.jpg

Ecosystem Services and Adaptation?
Ecosystem-based Adaptation (EbA)

EbA protects communities from the effects of climate change while simultaneously providing a variety of ecological benefits so crucial for human well-being, such as clean water and food.

Healthy, well-functioning ecosystems enhance our resilience to the adverse impacts of climate change. Eg.:

- Coastal habitats provide natural flood defences
- Well-protected lakes retain water sources during droughts

http://szzljy.com/images/spring-water/spring-water4.jpg

https://www.unenvironment.org/explore-topics/climate-change/what-we-do/adaptation-and-resilience/ecosystem-based-adaptation

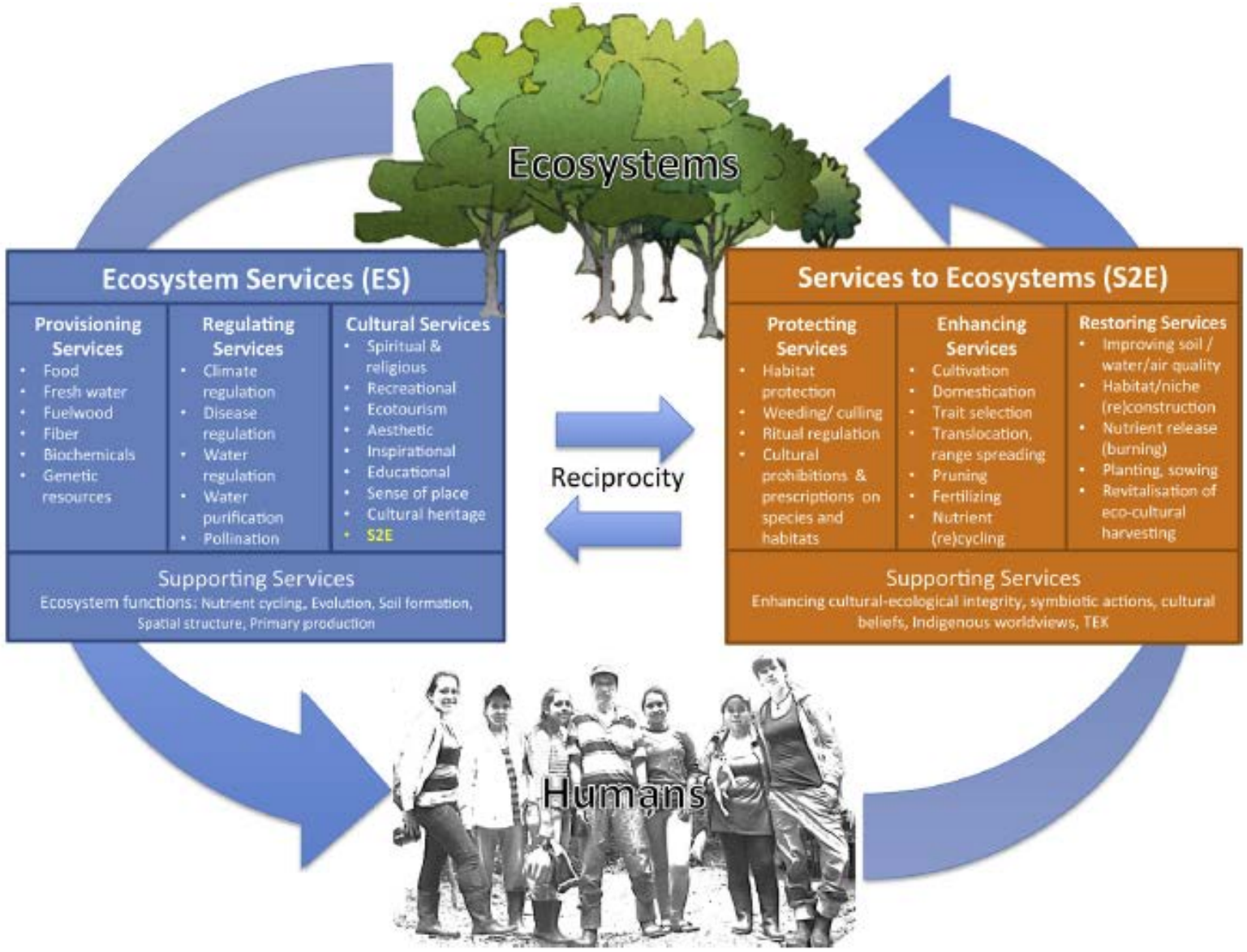
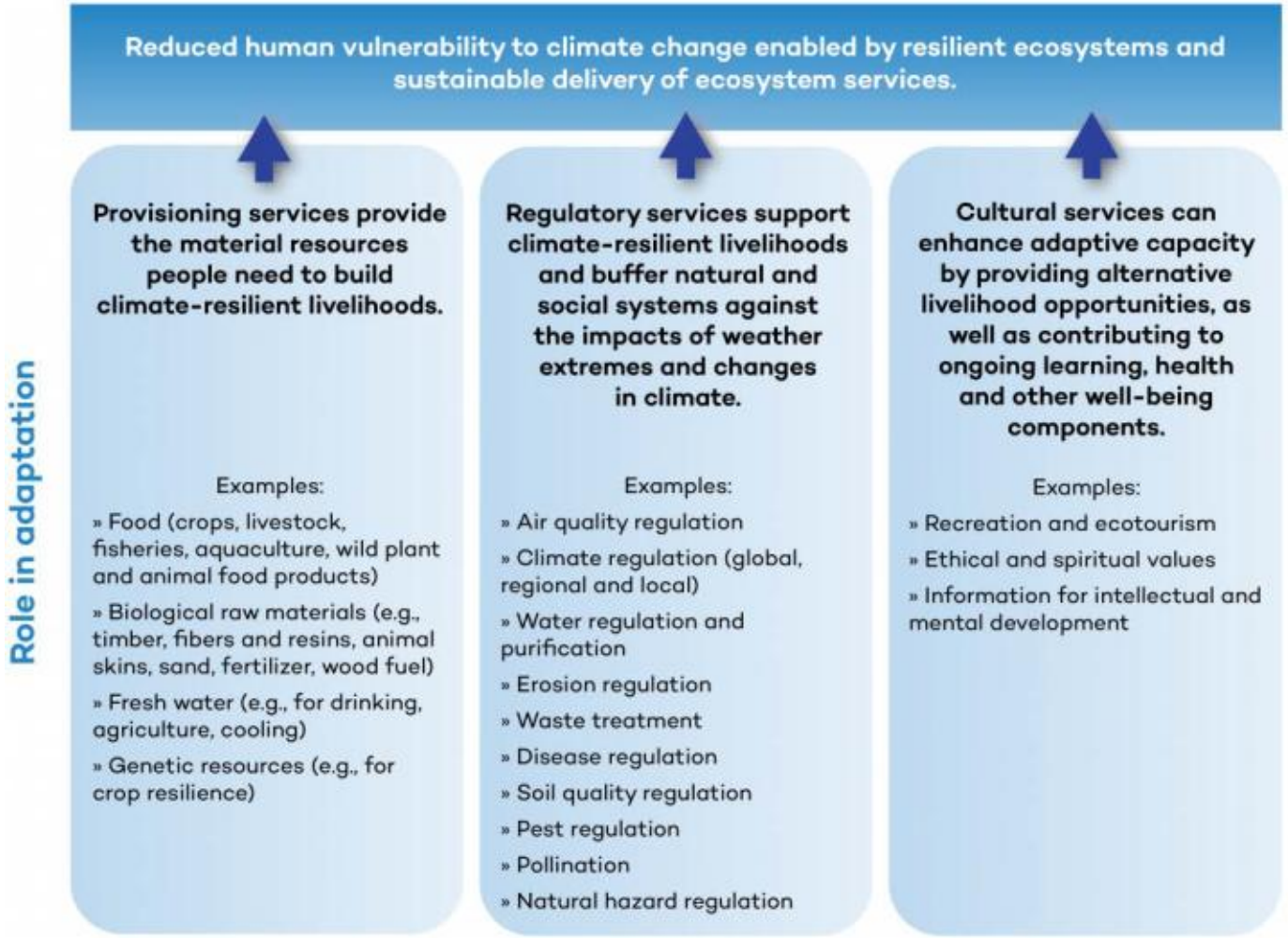


Fig. 1. A revised framework showing the ES-S2E loop of reciprocity.

Source: Combertia, C et al, 2015. Ecosystem services or services to ecosystems? Valuing cultivation and reciprocal relationships between humans and ecosystems.

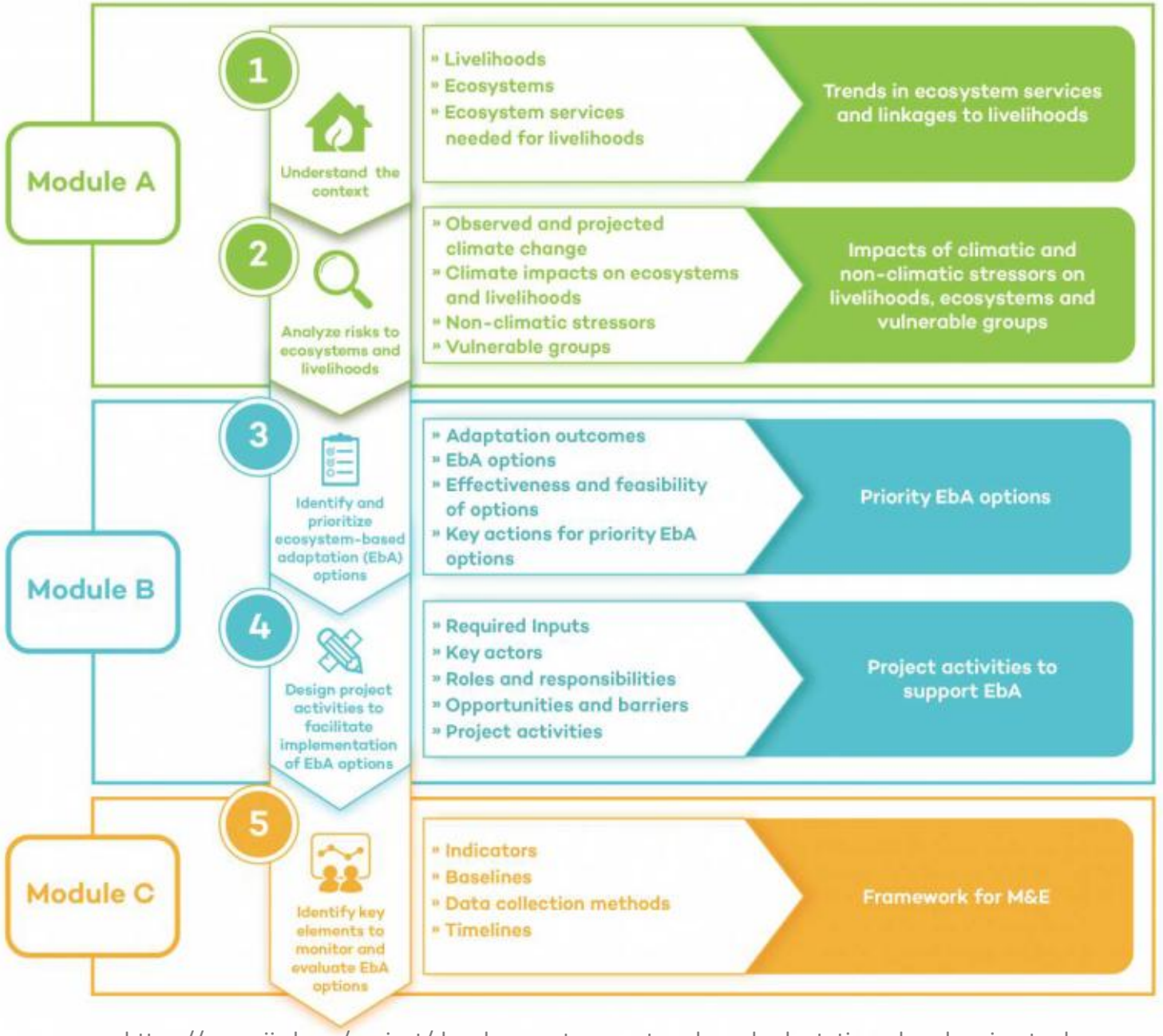
Ecosystem Services and Adaptation

Ecosystem-based Adaptation (EbA) - example



Working framework for Ecosystem-based Adaptation (EbA) in Mountain Ecosystems (EbA flagship) Project, recently implemented by IUCN in the Panchase Protected Forest Area of Western Nepal

Source: https://www.iisd.org/blog/connecting-dots-how-ecosystem-services-support-adaptation-climate-change

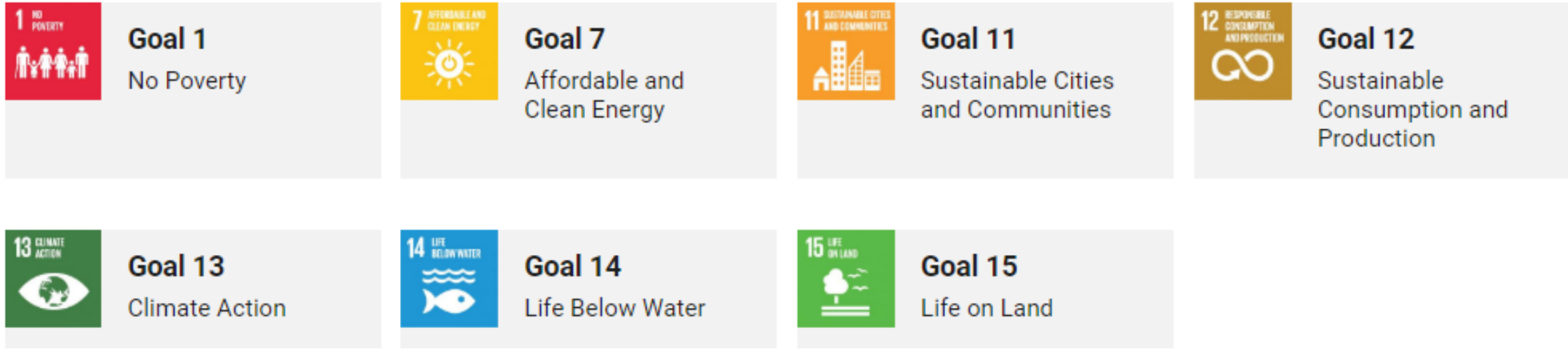


https://www.iisd.org/project/development-ecosystem-based-adaptation-eba-planning-tool

Ecosystem Services and Adaptation

Ecosystem-based Adaptation (EbA)

Related Sustainable Development Goals



(https://www.unenvironment.org/explore-topics/climate-change/what-we-do/adaptation-and-resilience/ecosystem-based-adaptation)

Ecosystem Services and Low Carbon Development

Based on the definitions and examples presented, is possible to conclude that most of the Ecosystem-based Adaptation strategies also contributes to low carbon development.

https://www.wur.nl/upload_mm/b/b/5/1fa15283-2256-490f-9837-941e2e67833b_metropolitan_4aadd465_530x299.jpg

Opportunities and Challenges

- Opportunities
  - Can bring economic benefits (how – including taxes for visiting preserved area, benefit from carbon trade)
  - Reducing pollution - several benefits (health, tourism etc), reduces costs and bring investments
  - Can guarantee life on earth by reducing global warming

- Challenges
  - Depends on several professionals and scientists
  - Demands investments (time and money)
  - Depends on government willingness, enforcement and community participation
  - Can take time to see results
  - Maintenance (can be also opportunity as it can be implemented with self-maintenance)

Opportunities and Challenges

Economic Opportunities

- Rewarding benefits through payments and markets
  - PES – Payment for Ecosystem Services
    - water provision
  - REDD-Plus proposals for Reduced Emissions from Deforestation and Degradation (also afforestation, reforestation, and effective conservation)
  - greening the supply chain, reducing impacts on natural capital
    - product certification, green public procurement, standards, labelling and voluntary actions
- Reforming environmentally harmful subsidies (stop investing in not sustainable production)
- Adding value through protected areas
  - robust regulatory frameworks that establish environmental standards and liability regimes
  - “polluters pay”, “full cost recovery”

Opportunities and Challenges

- Economic Opportunities
  - Investing in ecological infrastructure
    - Cost-effective
    - Meet policies' objective
    - increases resilience to climate change
    - reduce risk from natural hazards
    - improved food and water security as a contribution to poverty alleviation
    - Up-front investments in maintenance and conservation are almost always cheaper than trying to restore damaged ecosystems
    - Social benefits from restoration can be several times higher than the costs

TEEB, 2009a

Conclusion

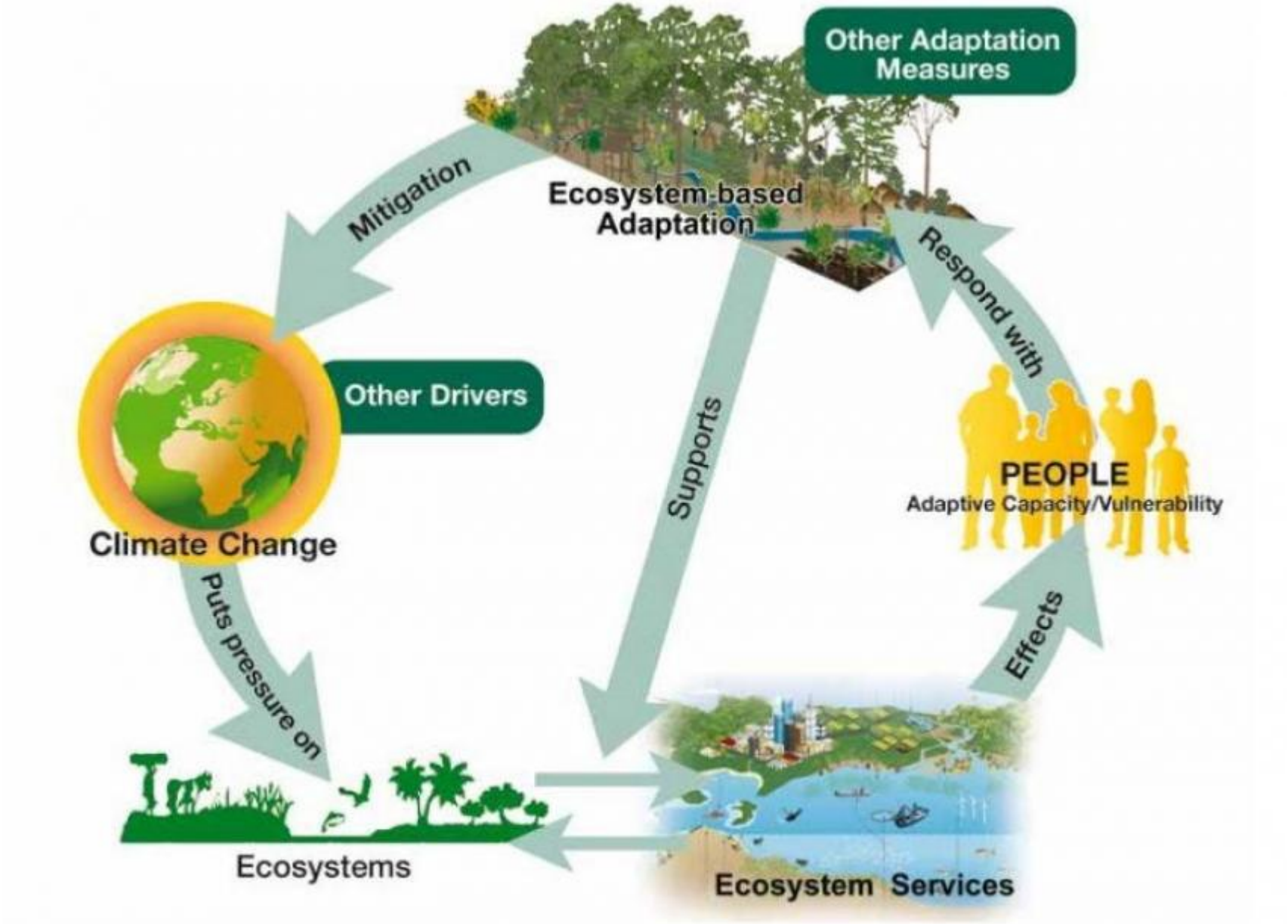
How can Ecosystem Services support adaptation and low carbon urban development?

> "biodiversity crisis is caused by the unsustainable growth and the undervaluation of Ecosystem Services due to lack of comprehension of its long-term economic benefits." (TEEB)

Understanding Ecosystem Services long-term economic benefits allows its correct valuation leading to a sustainable growth and biodiversity preservation

- Acknowledge Ecosystem Services and identifying vulnerabilities
- Implement adaptation strategies that also enhance ecosystem services while supports low carbon development
- Ecosystem Services enhancement creates a loop of benefits

TEEB, 2009a



https://www.iucn.org/resources/issues-briefs/ecosystem-based-adaptation

Activity

- In a group of 3, make a note of 5 adaptation measures that can contribute to ecosystem services.
- Check with the other groups if anyone has a different solution than yours.
- Class Representative makes a single list with all different measures highlighting the ecosystem service benefited. How far can your creativity goes?
- Present the list

Where do you want to live?

I may say THANK YOU,
depending on your answer ;)

THANK YOU!

https://www.globalrealestateexperts.com/wp-content/uploads/2016/03/environment.jpg

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