

## **ELD Campus**

**Module: Environmental economics and  
ecosystem valuation – the rational behind**



## In this module you will learn about:

- *Value, wealth and wellbeing- what is the role of nature in economies?*
- *Terrestrial national capital- environmental goods and services from land*
- *Hidden benefits or costs (externalities) of land use*
- *Typical (economic) assessments related to land use*
  - *Natural capital accounting and assessment*
  - *Cost-benefit analysis*
- *The perspective of different stakeholders on natural capital*
- *Options for integration of ecosystem services into policies and planning*

If you want to deepen your know-how on natural capital and the rationale behind ecosystem services valuation, further information is provided in the script. Further links are provided at the end of this presentation.

## The economic invisibility of nature

*“If you can’t measure it, you can’t improve it.”*

*P.Ducker*

- Land degradation has devastating ecological and social consequences. However, stakeholder behavior – so far – hardly changed.
- In the short-term, job opportunities and income are valued more than ecological sustainability and livelihood opportunities in the future.
- An underlying reason for this is the **perception of wealth and respective measurement frameworks** like the gross domestic product (GDP)

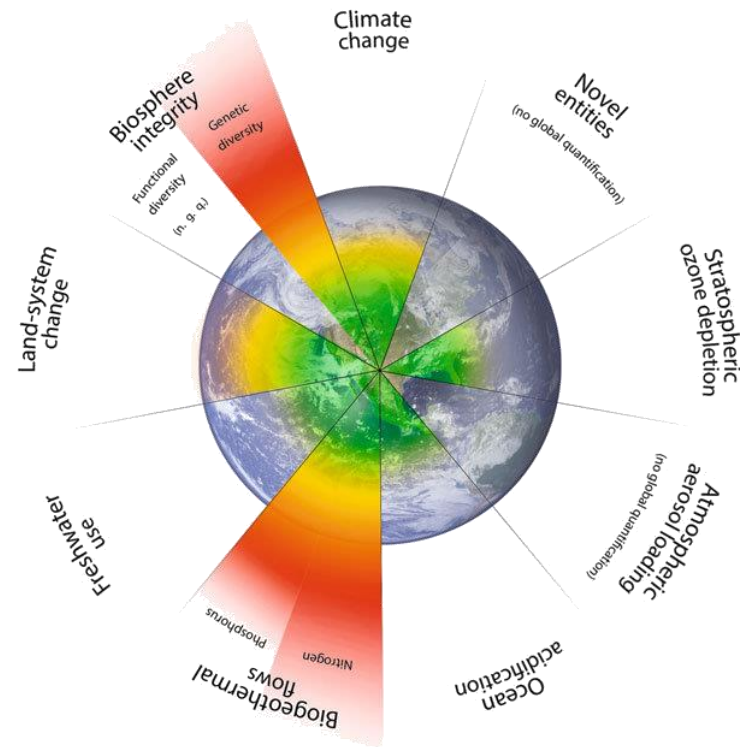


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# Limitations of the GDP to measure wellbeing



© FRED Economic Data



©Lewandowski et al. 2018

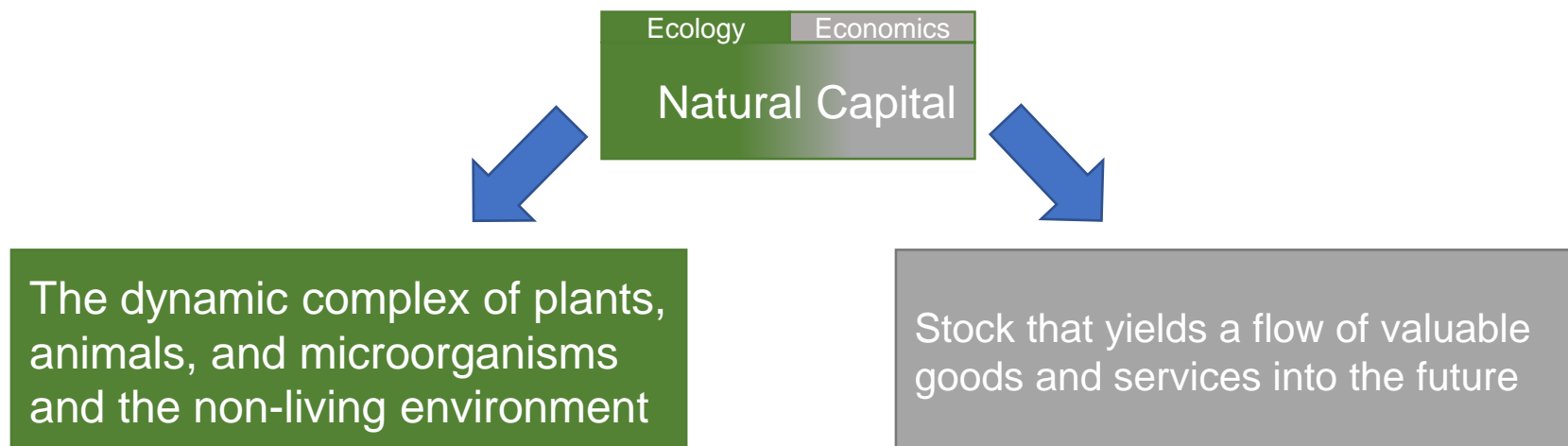
<p><b>Manufactured capital</b></p>	<p><b>Financial capital</b></p>	<p><b>Natural capital</b></p>	<p><b>Social capital</b></p>	<p><b>Human capital</b></p>
<p>Machinery, tools, infrastructure</p>	<p>Cash, loans, shares</p>	<p>Minerals, fish, forests, soils and ecosystems</p>	<p>Institutions, laws, norms, networks</p>	<p>Jobs, Education, Knowledge,</p>

**Invisible!**

**Invisible!**

## Terrestrial natural capital- goods and services from land

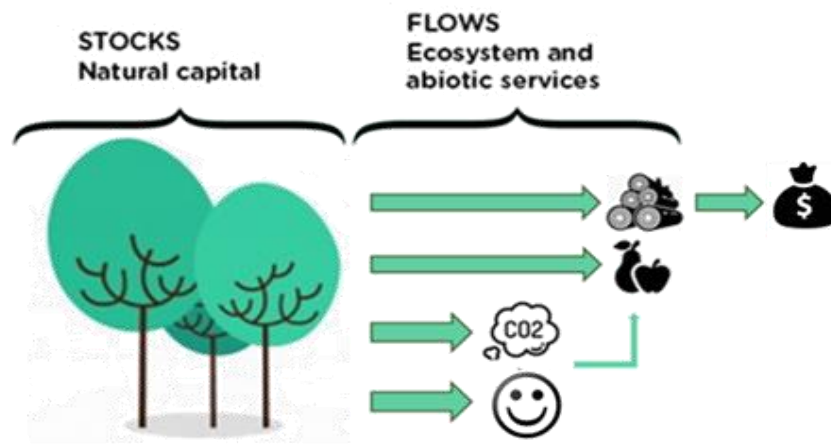
- Ultimately, all things that we as individuals and society value are relying on a functional natural environment.
- In order to translate ecologic and biological contributions into the realm of economic decision-making, we need to look at nature through an economic lens
- **Natural capital** is an economic metaphor for the limited stocks of physical and biological resources found on earth



## Distinction between environmental goods and services

- **Environmental goods:** *Elements of nature which produce value to people.*

Natural capital, which exist in a (relatively) fixed quantity, i.e. land, minerals, ore, trees.

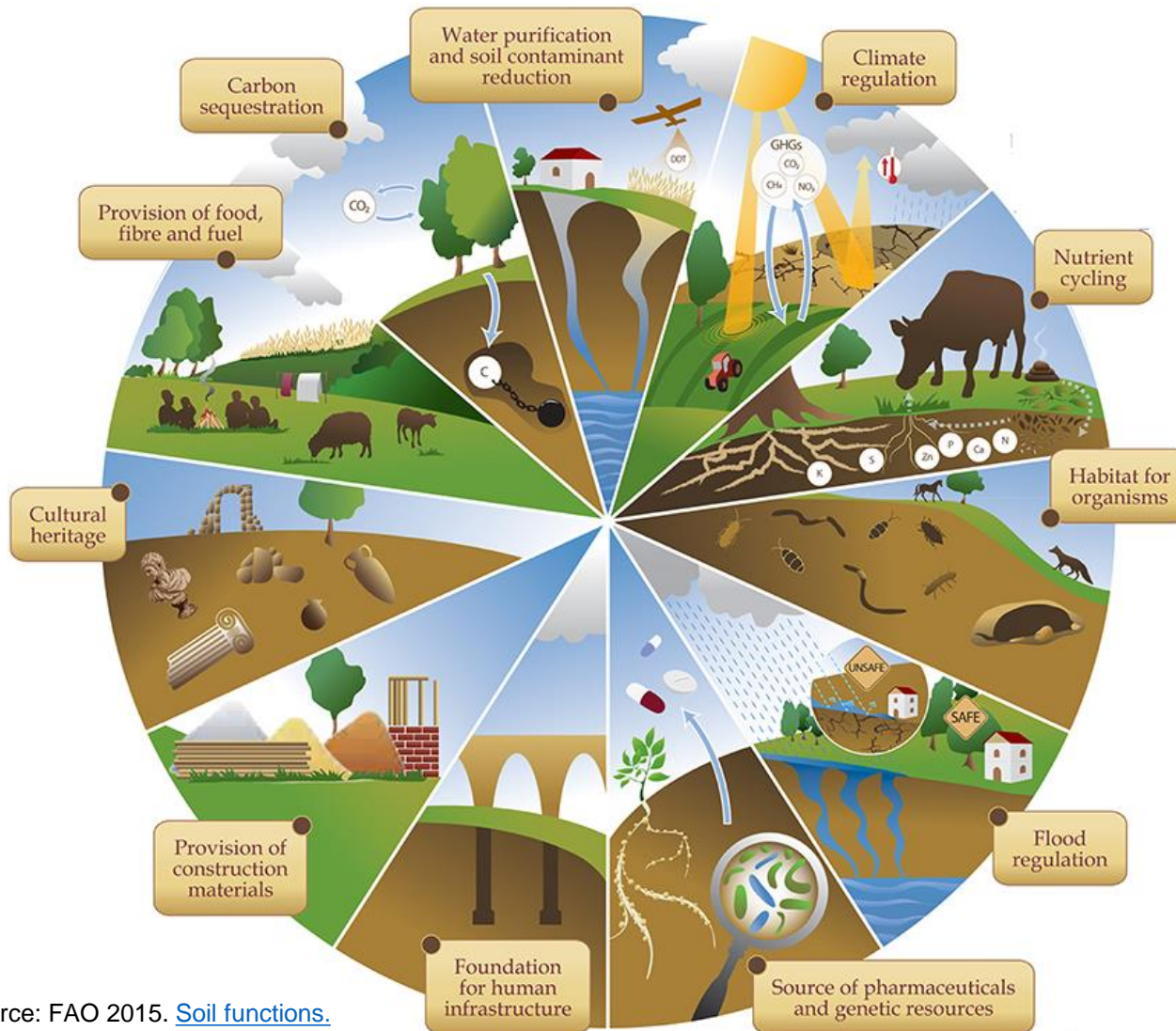


© Hannes Etter

- **Environmental services:** *Contributions of nature to benefits used in economic or other human activity*

Flow of resources, in which quantity is renewed with time, i.e. groundwater recharge, flood control, water purification, timber harvest and aesthetic or cultural benefits.

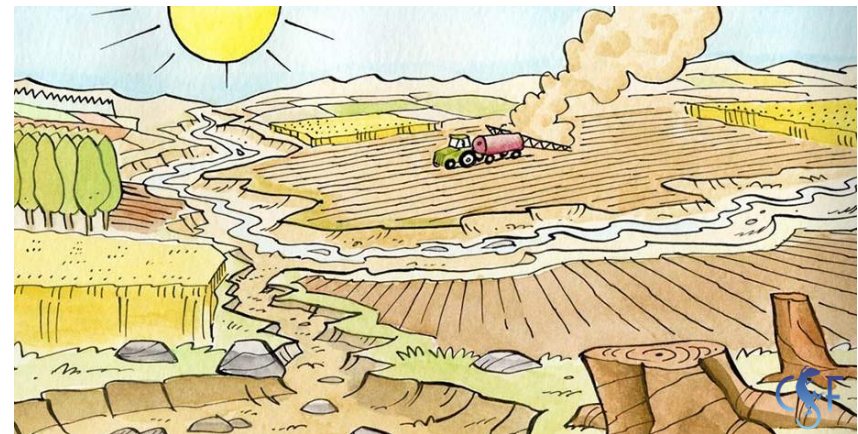
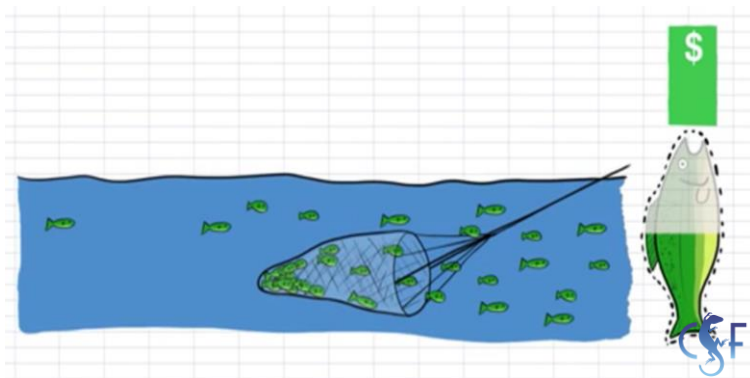
## Goods and services from land



Source: FAO 2015. [Soil functions](#).

## Loss of natural capital = limitation of economic activities

- Capital is defined as “**stock that yields a flow of valuable goods and services into the future**”
- Particularly in nature-based industries, the **increasing scarcity of natural resources** has become a **major limitation to economic activity**





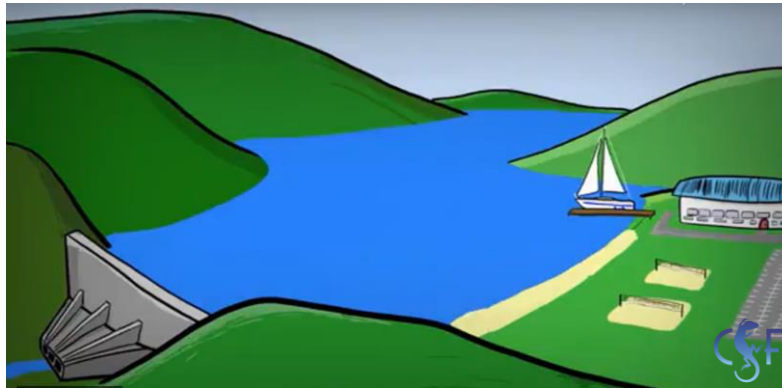
## Loss of natural capital = limitation of economic activities

- When the land-based natural capital degrades the functions and related services are reduced, which is associated by different costs
- **Monetary expressions represent a helpful vehicle to make costs and benefits of different land uses comparable**
- Values expressed in monetary terms reflect the society's preferences for the goods and services provided
- It is important to note however, that physical and economic benefits from land do not always overlap, **sometimes losses in natural capital mean increase of human or physical capital**
  - ➔ example: water treatment infrastructures necessary due to water pollution

## Trade-offs

Situational decision that involves the reduction of an ecosystem service as a consequence of increased use of another

→ example: energy production versus tourism



© Conservation Strategy Fund

- Monetary expressions help us to understand the trade-offs and to understand costs and benefits associated to them

## Price vs. Value: Understanding a good's worth

*"Nowadays people know the price of everything and the value of nothing."*

*Oscar Wilde*

In economics, a **price** is determined by the market as the result of **interaction between demand and supply**.



Prices reflect the true economic value allocated by society to this good or service **but only under specific market conditions**.

*What about:* Subsidies?  
Tariffs?  
Monopolies?  
High competition?



Not all costs are included in the price of a product or good!

The **economic value** of a good or service reflects the **preferences that society as a whole has for this good or service**.

## Price vs. Value: Market failures and externalities of land use

- Markets often do not take **externalities** into account.

Externalities are those costs a third person suffers from as a result of an economic transaction.

examples: groundwater pollution due to the deposition of nitrogen from agricultural production

or

gully erosion caused because of deforestation up-stream



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## Price vs. Value: Market failures and externalities of land use

- Markets often do not take externalities into account.
- Market prices might thus not reflect true economic costs or true economic benefits and thus the perspective of the society as a whole.
- This is why externalities need to be internalised = corrected for, for example by using taxes or subsidies to correct for externalities

→ Several initiatives like the ELD initiative already attempted to correct calculations regarding true costs of land degradation and true value of sustainable practices based on the above logic.

*You can find more details on the respective studies in the script!*

## Assessment tools for political decision-making related to land use

- Land use planning
- Environmental impact assessment
- Damage assessment
- Sustainability assessment
- Natural resources or capital accounting **Economic method**
- Cost-benefit analysis / Cost-effectiveness analysis (if physical rather than economic benefits are considered) **Economic method**
- Multi-criteria analysis

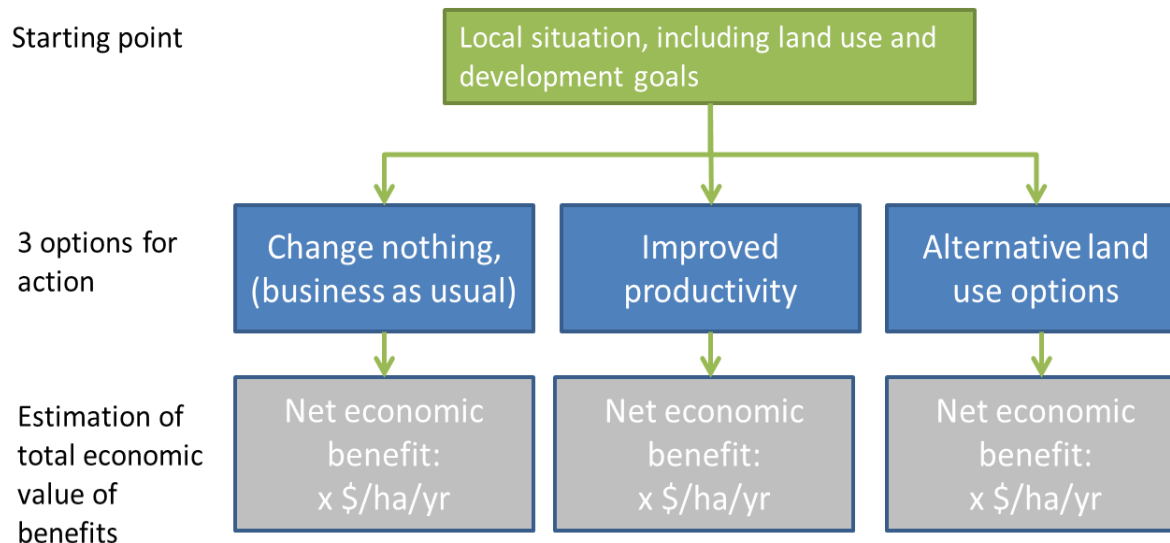
**Natural capital accounting and cost-benefit analysis directly derive from accounting and ecosystem services and values can be included here.**

## Difference between natural capital accounting and assessment

Natural capital accounting	Natural capital assessment
Compatible with the GDP; calculation of a "green" GDP possible	Not compatible with GDP; calculation of a "green" GDP is not possible
Economic evaluation to record the contribution of ecosystems to economic value creation and welfare in the long term	Economic evaluation to facilitate trade-offs of policy alternatives: cost-benefit analyses, evaluation of scenarios
Systematic and comprehensive consideration of ecosystems, ecosystem services and socio-economic environment; physically and monetary	Focus on economic evaluation of ecosystem services, increasingly also beyond purely ecologic assessments
Planned as an international statistical standard	Guides available, but no standardisation
Little experience; currently testing phase	Numerous international best practices

## Cost-benefit analysis

Cost-benefit analysis always compares action scenario(s) to business-as-usual scenarios to assess whether an investment leads to net benefits.



Choose option with greatest net economic benefit for action (or inaction) and adapt the political and economic context to facilitate change

*Cost-benefit analysis is described in detail in a separate module!*

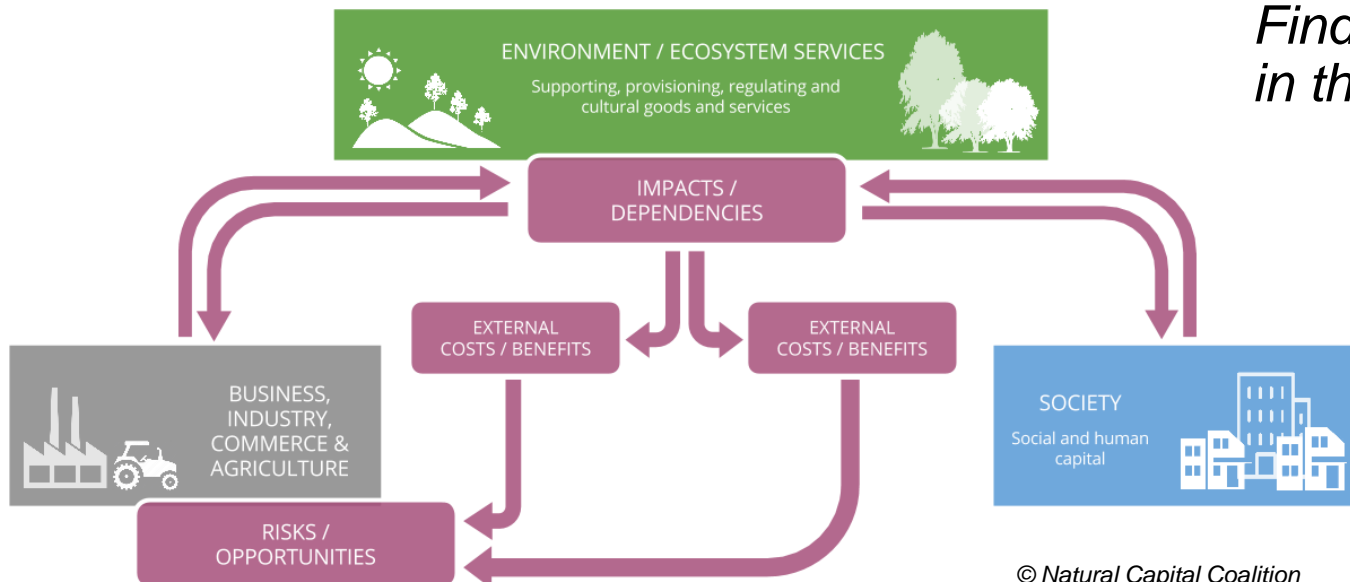


## Stakeholders related to natural capital

A real change will require collaboration between different stakeholders, which vary in terms of their perspective on the topic

### Private sector:

Especially production and processing industries invest into sustainable land management in order to safe their natural capital in the long-run.



*Find a list of examples in the script!*

## Perspective of different stakeholders on natural capital

### Public sector:

Environmental degradation might directly influence job creation, food availability, energy production, water security, migration, climate change etc., which play a vital role for economic development and sustainable growth

Economic arguments regarding this inter-connectivity can help to promote investments into SLM from public side.



## Options for integration of ecosystem services into policies and planning

Available instruments can be broadly divided into

- **regulatory mechanisms** and
- **market-based approaches**, including price-based instruments (subsidies, taxes, etc.) and quantity-based instruments such as tradable emission permits or biodiversity offset schemes.

**Existing markets can be improved** by lowering transaction costs and enhancing information, e.g. eco-labelling

**New markets can be created**, for instance, through payments for environmental services schemes

# Options for integration of ecosystem services into policies and planning

Figure 1. The spectrum of incentives to improve productivity and enhance ecosystem services



Convention on Biological Diversity

Responding to CBD COP 13 Decision #3; 32 Biodiversity Mainstreaming in Agriculture through a mix of regulatory and incentive measures

## Further information and reading:

### Script for this module

### Videos

*What is the price of nature?*

<http://vimeo.com/16961590> - TEEB “Your Invoice”

<http://vimeo.com/20061382> - TEEB “Little Things”

[http://www.ted.com/talks/pavan\\_sukhdev\\_what\\_s\\_the\\_price\\_of\\_nature.html](http://www.ted.com/talks/pavan_sukhdev_what_s_the_price_of_nature.html)

Let’s talk about soil <http://www.youtube.com/watch?v=LrYShHzbmD4>

## Further information and reading:

### **Literature:**

#### *Ecosystem Services*

A sustainability framework for assessing trade-offs in ES

<https://pdfs.semanticscholar.org/44b2/8ad22155c9182ff123d102b41db07fe64382.pdf>

A quantitative review of relationships between ecosystem services

<https://www.sciencedirect.com/science/article/pii/S1470160X1630019X?via%3Dihub>

#### *Payment for Ecosystem Services*

<http://www.youtube.com/watch?v=gzNWnREZ2xl&feature=c4-overview&list=UUB2PfWp-S9y35luR3rrn-ZQ>

#### *Natural capital accounting*

[https://www.unep-wcmc.org/system/dataset\\_file\\_fields/files/000/000/377/original/Natural\\_Capital\\_Report\\_WEB.pdf?1460119504](https://www.unep-wcmc.org/system/dataset_file_fields/files/000/000/377/original/Natural_Capital_Report_WEB.pdf?1460119504)

[http://www.eld-initiative.org/fileadmin/pdf/ELD-UserGuide\\_07\\_web.pdf](http://www.eld-initiative.org/fileadmin/pdf/ELD-UserGuide_07_web.pdf)

#### *Natural capital protocol*

<https://naturalcapitalcoalition.org/natural-capital-2/>

If you have questions, please contact us:  
[info@eld-initiative.org](mailto:info@eld-initiative.org)

You can find further information on our  
website:  
[www.eld-initiative.org](http://www.eld-initiative.org)

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