Economia circolare nei sistemi verdi

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What does Economy mean?

It has different meanings:

- ✓ the system of trade and industry by which the wealth of a country is made and used.
- ✓ the state of a country or region in terms of production and consumption of goods and services and supply of money.
- ✓ Careful (efficient) management of resources to avoid unnecessary expenditure or waste.

What is happening?

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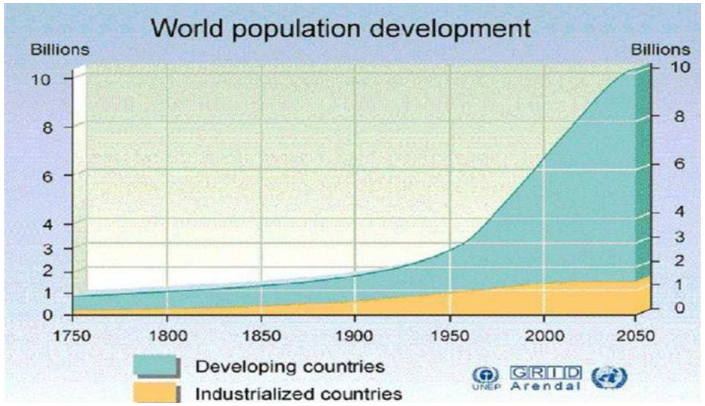
What is happening?

World population is increasing rapidly → 9 billions by 2050:

- ✓ Increasing demand for goods
- ✓ Intensification of global competition
- ✓ Unsustainable use of resources
- ✓ Dwindling supplies of energy



- o By following our current trend in resources withdrawal, in 2050 we will extract five times more resources than we do today…
- o We are consuming resources up faster than their replacement by the ecosystems

we are storing up problems for the future!!!

We need to use natural resources more efficiently since the environment has limits in the amount it can provide and absorb

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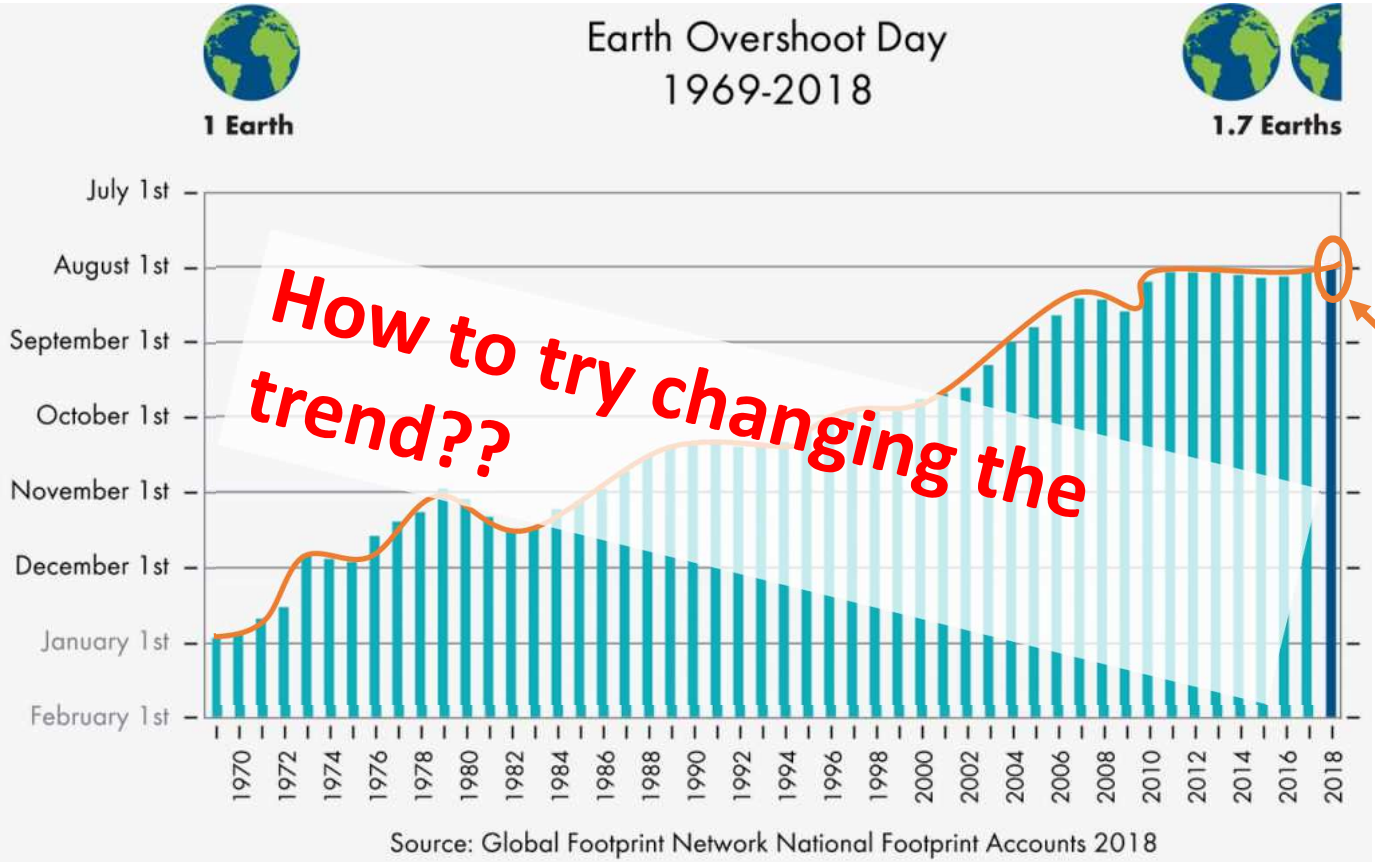
EOD: an issue about Earth's health



EOD (**Earth Overshoot Day**) is the calculated calendar date in which human resource consumption (Ecological Footprint) overtakes the Earth capacity to regenerate those resources (Biocapacity)

1st August 2018!!!!!

$$\textbf{Earth Overshoot Day} = \frac{World\ Biocapacity}{Ecological\ Footprint} \times 365$$

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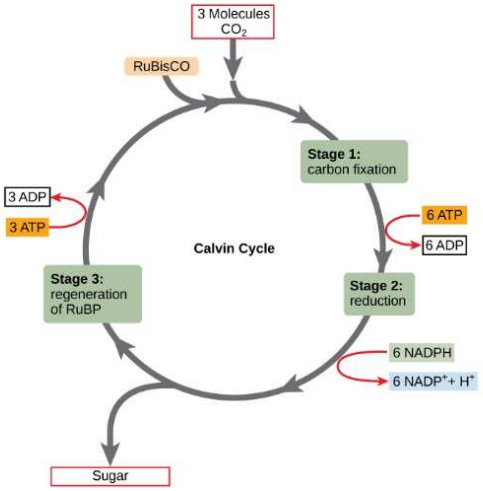
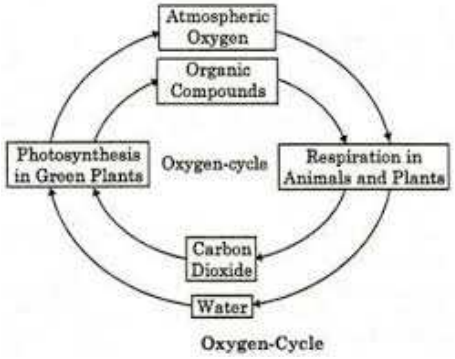
Considering life needs...a lot of phenomena show circularity!!!

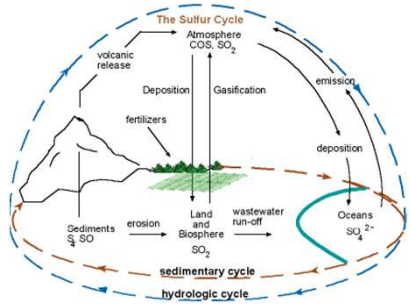
Life itself has existed for billions of years and has constantly adapted to the effective use of materials.

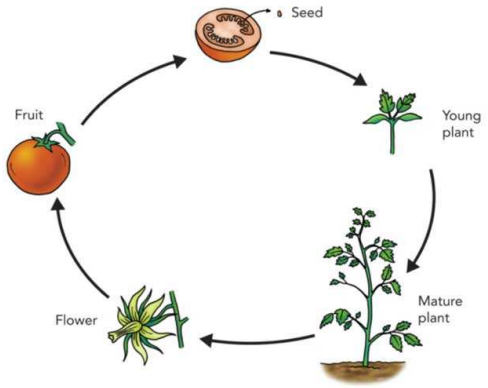
It's a complex system, but within it, there is no waste. Everything is metabolized in a circular path.

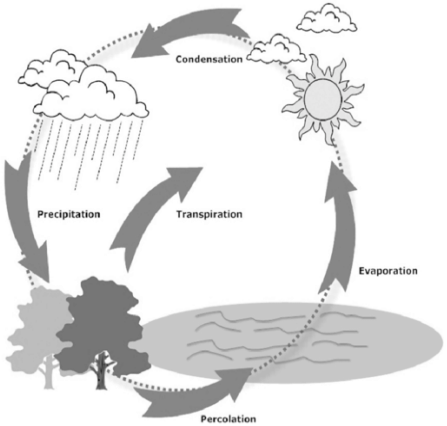


BC1









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Diapositiva 5

BC1 tienili tutti e cinque e sopra ognuno di essi fai entrare il nome del ciclo in grande in modo che sia visibile alle persone

Bianca Colombo; 14/10/2018

MC2
MC4

Moving from a linear to a circular economy

LINEAR ECONOMY

CIRCULAR ECONOMY

- ✓ **Restore technical materials and regenerate biological materials**
- ✓ Resources are used again and again: **the waste of a process becomes the raw material for the next**
- ✓ **"Closing the loop" has become the watchword for building a resilient, resource efficient and low-carbon society**

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Diapositiva 6

MC2 Marcello Chiodini; 12/10/2018

MC3 From linear to circular economy, the new and needed strategy to allow a better life for us and for our future generation

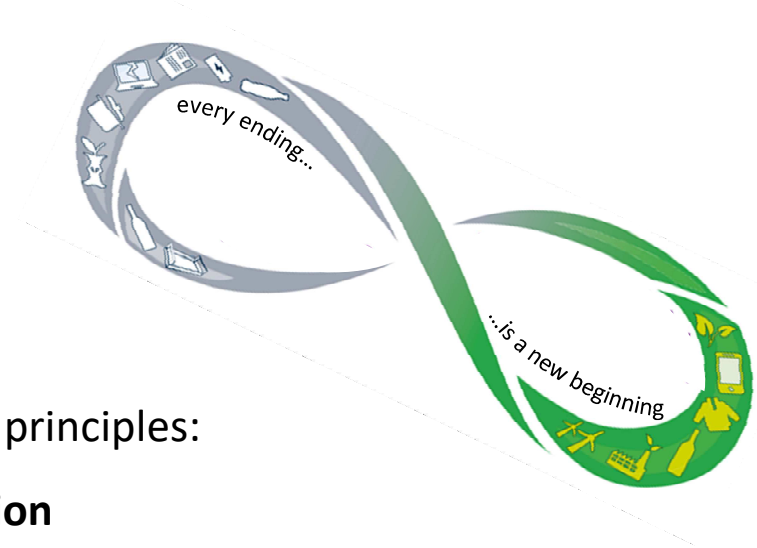
We have to think an do as much as possible in order to preserve our planet because is the only one in which we are sure to live
Marcello Chiodini; 12/10/2018

MC4 The circular economy aims to ‘close the loop’ of product lifecycles by keeping resources within the economy, which leads to better use of raw materials, products and waste.
Marcello Chiodini; 12/10/2018

Circular Economy according to European Union

In the Circular Economy Package (2nd December 2015) the European Commission set an «Action Plan for Circular Economy» in which some actions for transition were outlined:

- ✓ Product design
- ✓ Production process
- ✓ Consumption
- ✓ From waste to resources (secondary raw materials)
- ✓ Innovation and investments



The transition is based on three principles:

- ➢ **Design out waste and pollution**
- ➢ **Keep products and materials in use**
- ➢ **Regenerate natural systems**

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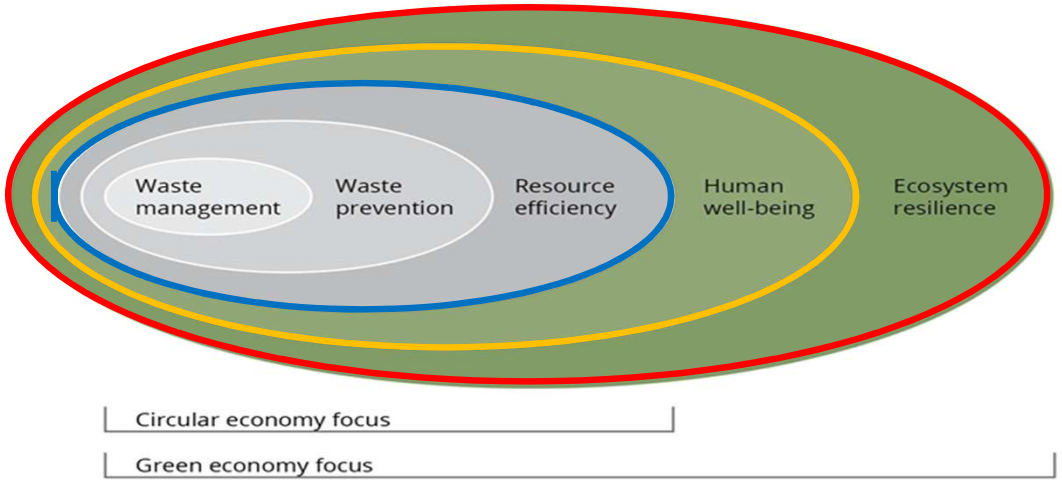
Circular Economy and Green Economy

GREEN ECONOMY is an economy in which policies and innovations enable society to generate more value each year, while maintaining the natural systems, reduce scarcity of resources and improves human well-being.



According to the EU, in a Green Economy approach we have to consider:

- The EFFICIENT USE of RESOURCES
- The HUMAN WELL-BEING
- The ECOSYSTEMS as NATURAL CAPITAL: their value is the BIODIVERSITY that determines the RESILIENCE of the ecosystems

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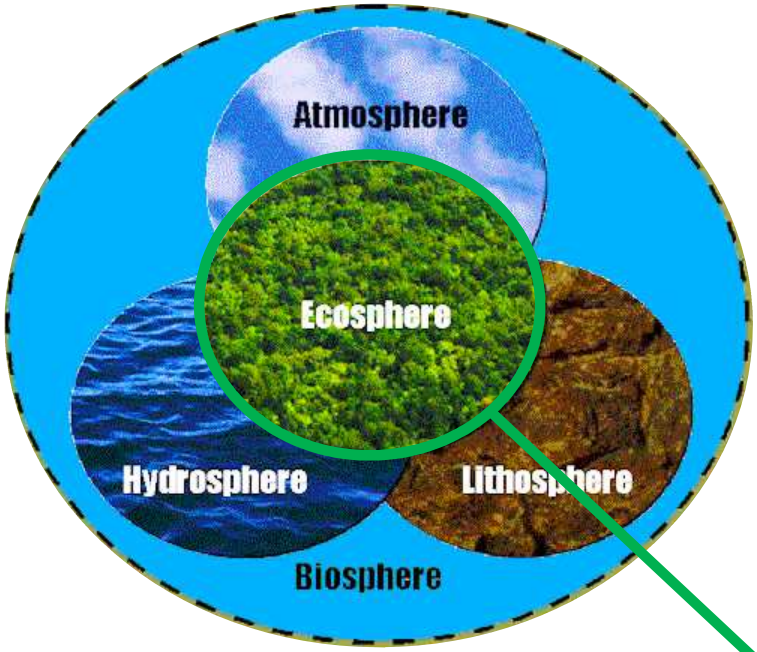
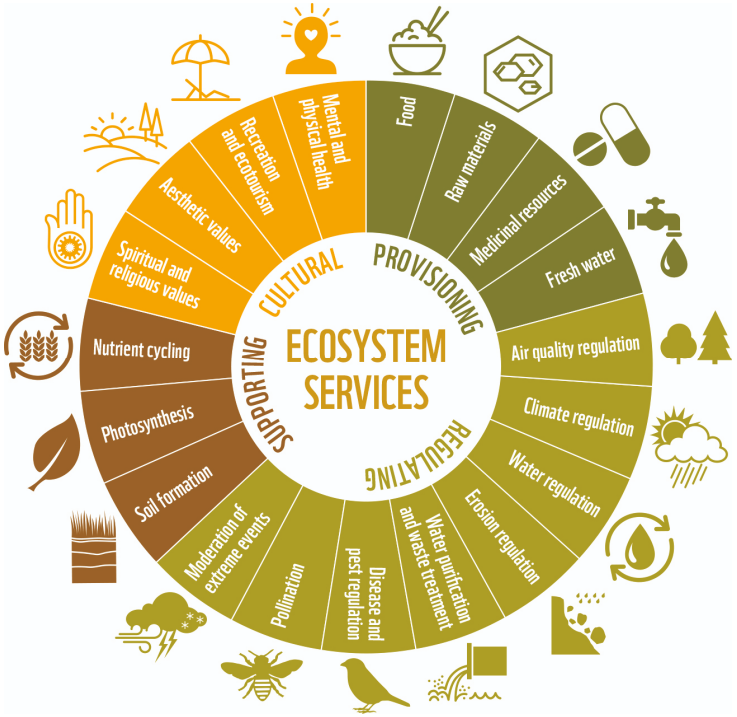
Green Economy and Natural Capital



BIOSPHERE = NATURAL CAPITAL

BIODIVERSITY*

RESILIENCE



ECOSYSTEMIC SERVICES

Green Infrastructure (GI)

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* EU biodiversity strategy to 2020 aims to halt the loss of biodiversity and ecosystem services

Forests: Green Infrastructure as Natural Capital

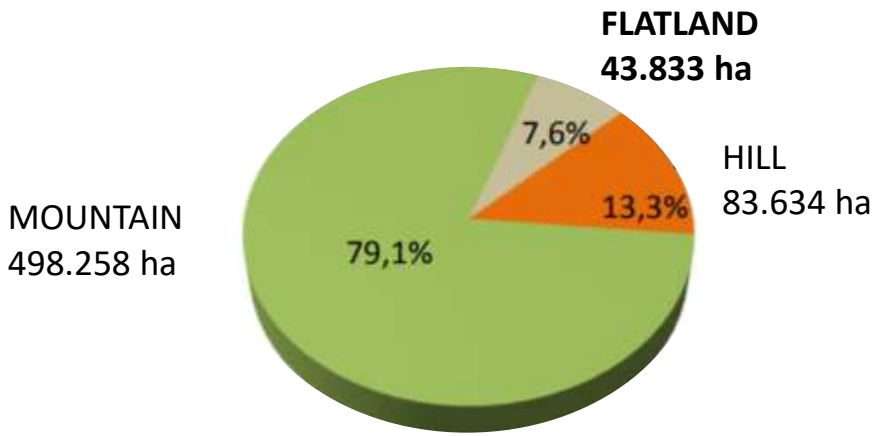
Hundreds definitions of forests are used throughout the world, incorporating factors such as tree density, tree height, land use, legal standing and ecological function

Italian law defines «Forest» as a territory having at least:

- ✓ 2000 m^2 of area,
- ✓ 20 % of that area covered with trees or shrubs
- ✓ 20 m of width

Forest surface in Lombardy region:

- ✓ 629.725 ha (2016)
- ✓ ↑ 3.981 hectares (+ 0,63 % compared to 2015)
- ✓ 629 m^2 per capita area
- ✓ 26,4% Lombardy territory
- ✓ 2,1 % more than the last decade (2007 → 2016)



LOMBARDY FOREST AREA DIVIDED FOR ELEVATION BANDS (2016)

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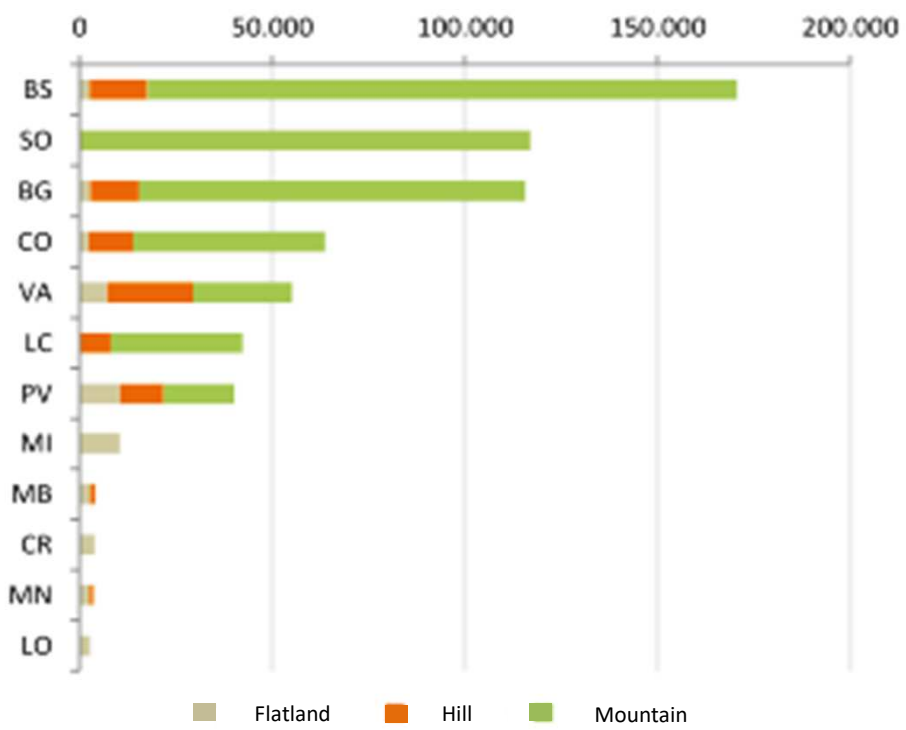
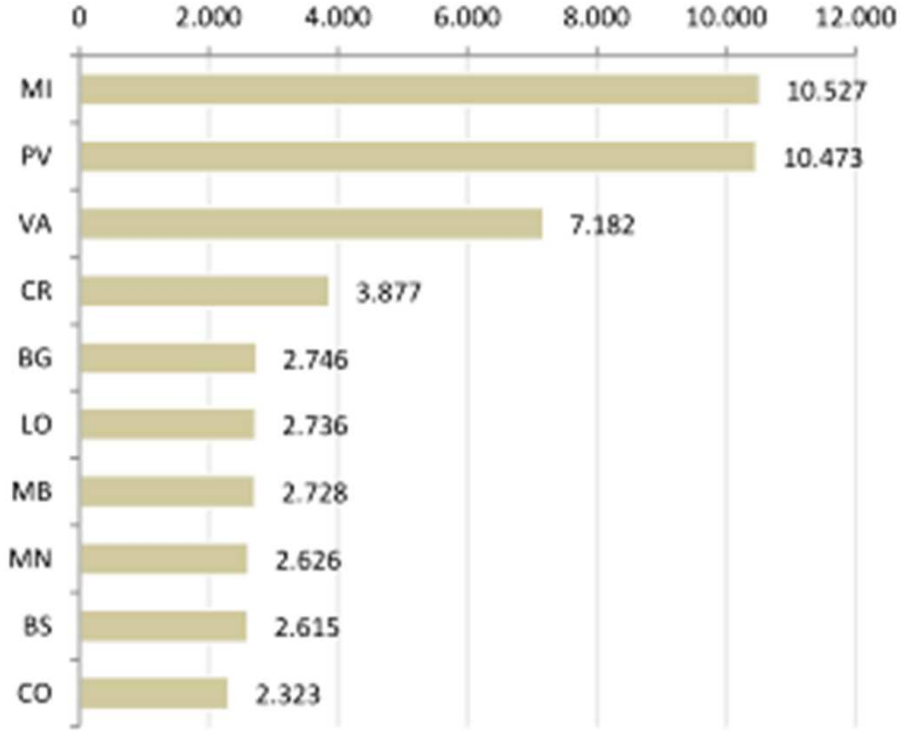
Forest: Green Infrastructure as Natural Capital



Lombardy forest area divided for districts and elevation bands
(31 December 2016)



Flatland forest surface divided for districts
Total forest flatland area of 47.883 hectares
(31 December 2016)

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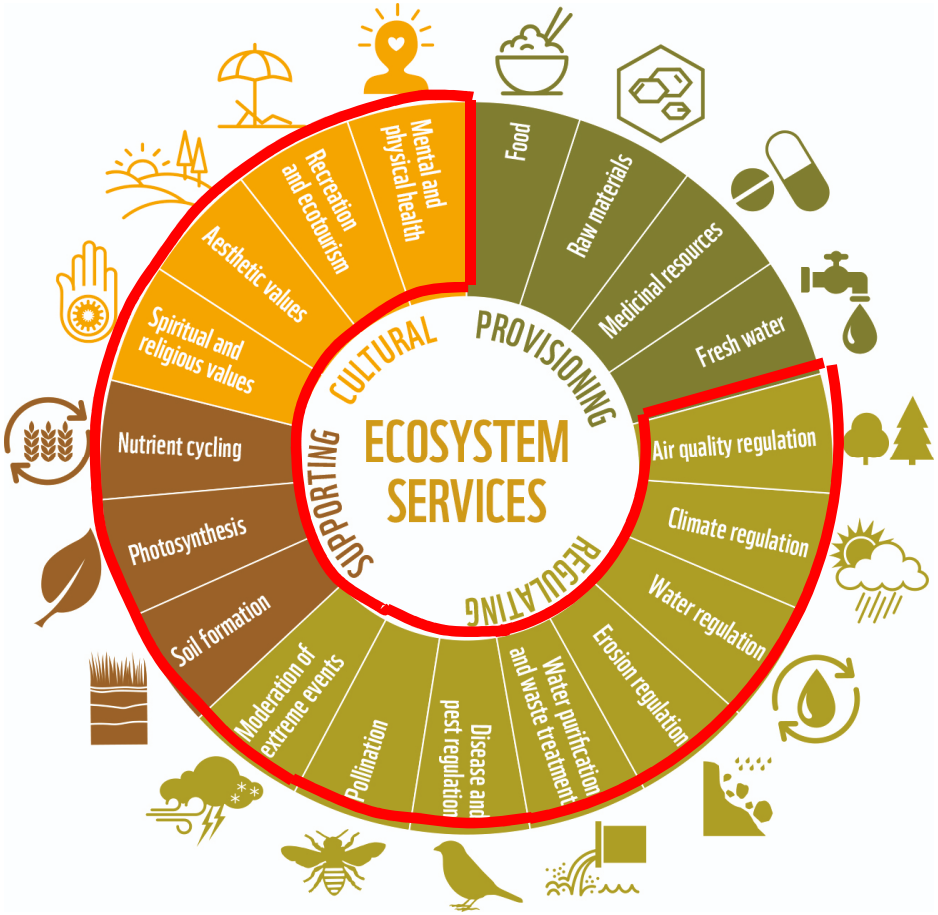
Forest ecosystemic services



MAIN FOREST ECOSYSTEMICS SERVICES

<u>Forest ecosystemic services….main effects:</u>

- ✓ To preserve and increase biodiversity: plants, animals, microorganisms
- ✓ Beneficial effects in countering climate change: C storage, temperature mitigation, reducing air pollution
- ✓ To increase human well-being

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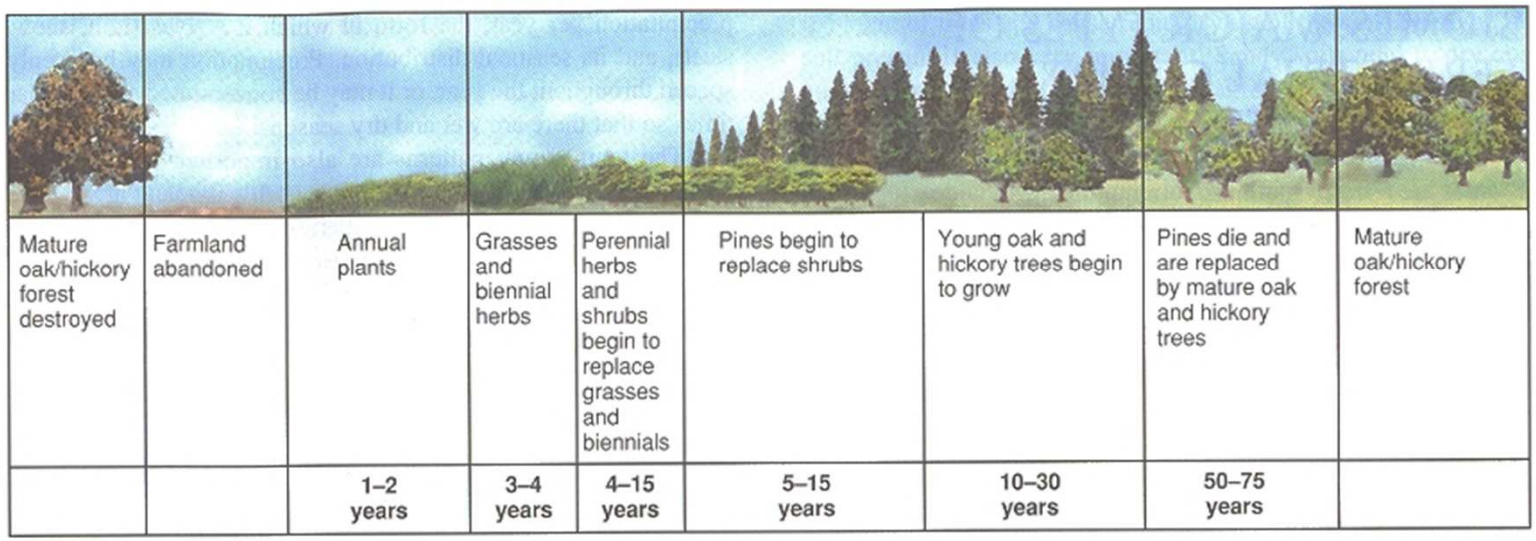
Reforestation and circular economy

Reforestation: natural or intentional restocking of existing forest depleted because of human activities or natural events.



Mature oak/hickory forest destroyed	Farmland abandoned	Annual plants	Grasses and biennial herbs	Perennial herbs and shrubs begin to replace grasses and biennials	Pines begin to replace shrubs	Young oak and hickory trees begin to grow	Pines die and are replaced by mature oak and hickory trees	Mature oak/hickory forest
		1–2 years	3–4 years	4–15 years	5–15 years	10–30 years	50–75 years	

Example of forest succession

By intentional forest replacement we can save some time of the woods succession growth by planting suitable plants into the defined area

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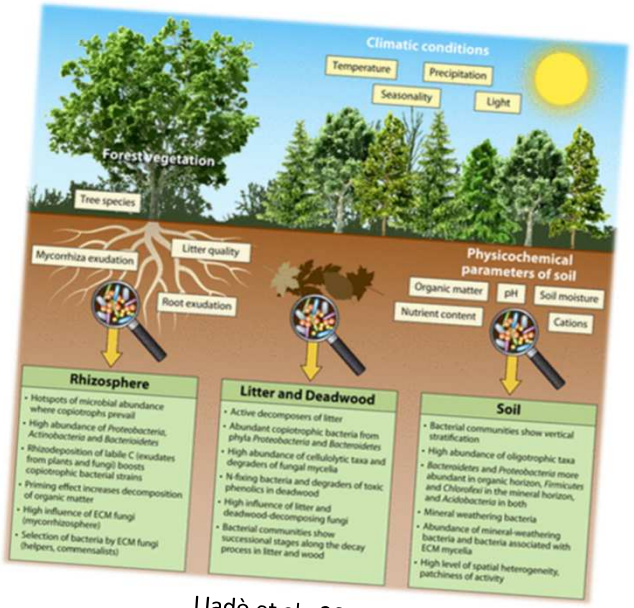
Fertilizer and reforestation in circular economy

Before new reforestation, some considerations are needed:

- ✓ Climatic characteristics of the area
- ✓ Trees species and density
- ✓ Forest management after planting
- ✓ Soil condition and chemical characteristics



Lladò et al., 2017

- **Fertility** status and **biodiversity of the soil** are **very important for plant growth** especially for young plant planted in degraded areas → **nature builds soil slowly**, and may not be able to rebuild the soil if the environment is seriously damaged

- In order to **rebuild soil fertility**, allow **better growth** of young plants and **speed it up**, the **addition**, **only before planting**, of organic matter by using **organic fertilizers** is a very important operation before new forest realization

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Fertilizer and reforestation in circular economy

- Considering a **circular approach**, **organic fertilizers** and **amendants** could be **made by** organic compounds coming from different **byproducts** of human activity after suitable stabilization and sanitation processes

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RICE FIELDS MARGINS, a GI in Neorurale rice fields areas

The Cassinazza evolution began in the mid-90s', with an extensive application of the agro-environmental policies, creating woods and wetlands instead of seeding crops for at least 15 years on entire plots of land.

"**Rice field margin**": example of green infrastructure built at the margin of rice fields with a width variable between 15 and 30 m.

They represent areas rich in elements such as little woods, flowers, grasslands and wetlands. This context allows to concentrate different ecosystems in a relative small area, enriched also by several ecotones (intermediate spaces between two ecosystems) and to rapidly develop plant and animal related biodiversity.

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Take care of the nature, take care of the planet…take care of us!

BEDANKT VOR JE AANDACHT!!

THANKS FOR YOUR ATTENTION!!

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