



Nature in cities, how to face the challenges of tomorrow ?



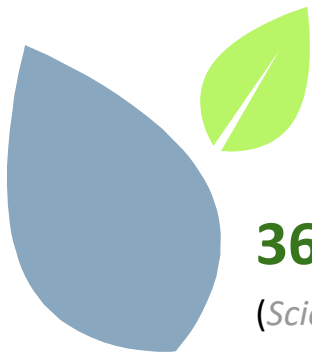


Impacting figures

Sustainable urban ecosystem

Nature-Based Solutions

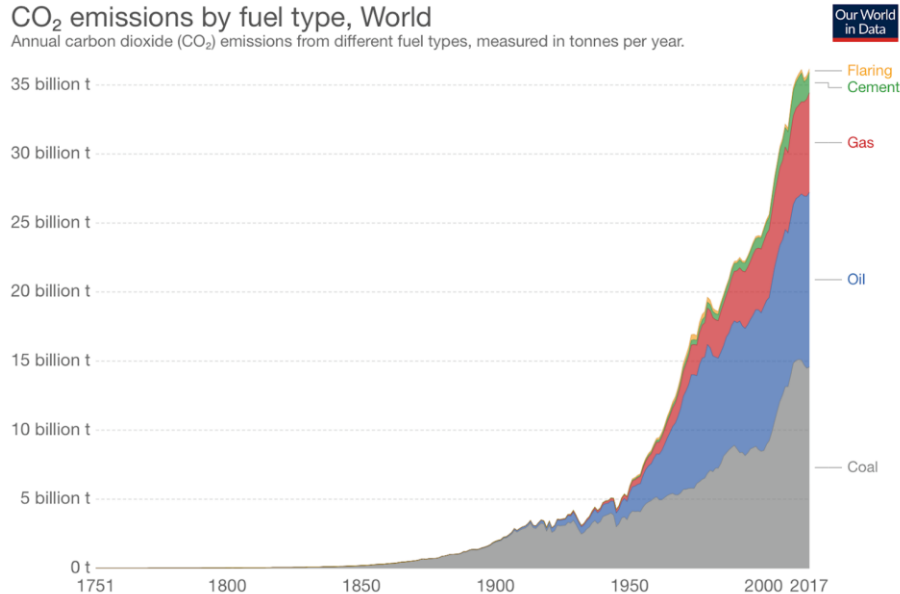




Climate change

36.8 billion tons of global gas emissions in the world in 2018

(Science Advisory Group to UN Climate Action Summit 2019 report)



Source: Global Carbon Project (GCP); CDIAC

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

1900-now

+ 1,4°C



now-2100

+ 3-5°C



Source: IPCC 2019 report

Consequences

72,843 fires
in Brazil this year



In June 2019, France experienced
46 °C for the first time in its history

1 000 000 animal and vegetal species are
endangered. (*IPBES, May 2019*)

Biodiversity



Between 1970 and 2012, the evolution of WWF's Living Earth Index which measures world biodiversity shows a **58% reduction of vertebrates populations abundance.** (*WWF, 2019*)

Some figures: ***world hunger***



Although global food production can meet **1.5** times the food needs of **7.6 billion** people,

1/3 people don't eat enough

30% of food is lost or wasted

If we continue to waste so much and over-consume, we will have ***to double the world's agricultural production*** to feed the ***9 billion people in 2050.***

Source: WWF, 2019

Some figures: ***social***

Humans, a species of lightning growth



7.6 billion people

50% living in the cities



11 billion people

1945

2019

2050

2100

2.1 billion people



**⅔ of the population live
in the city**

increase of 20% to 30% of
drinking water request by
2050



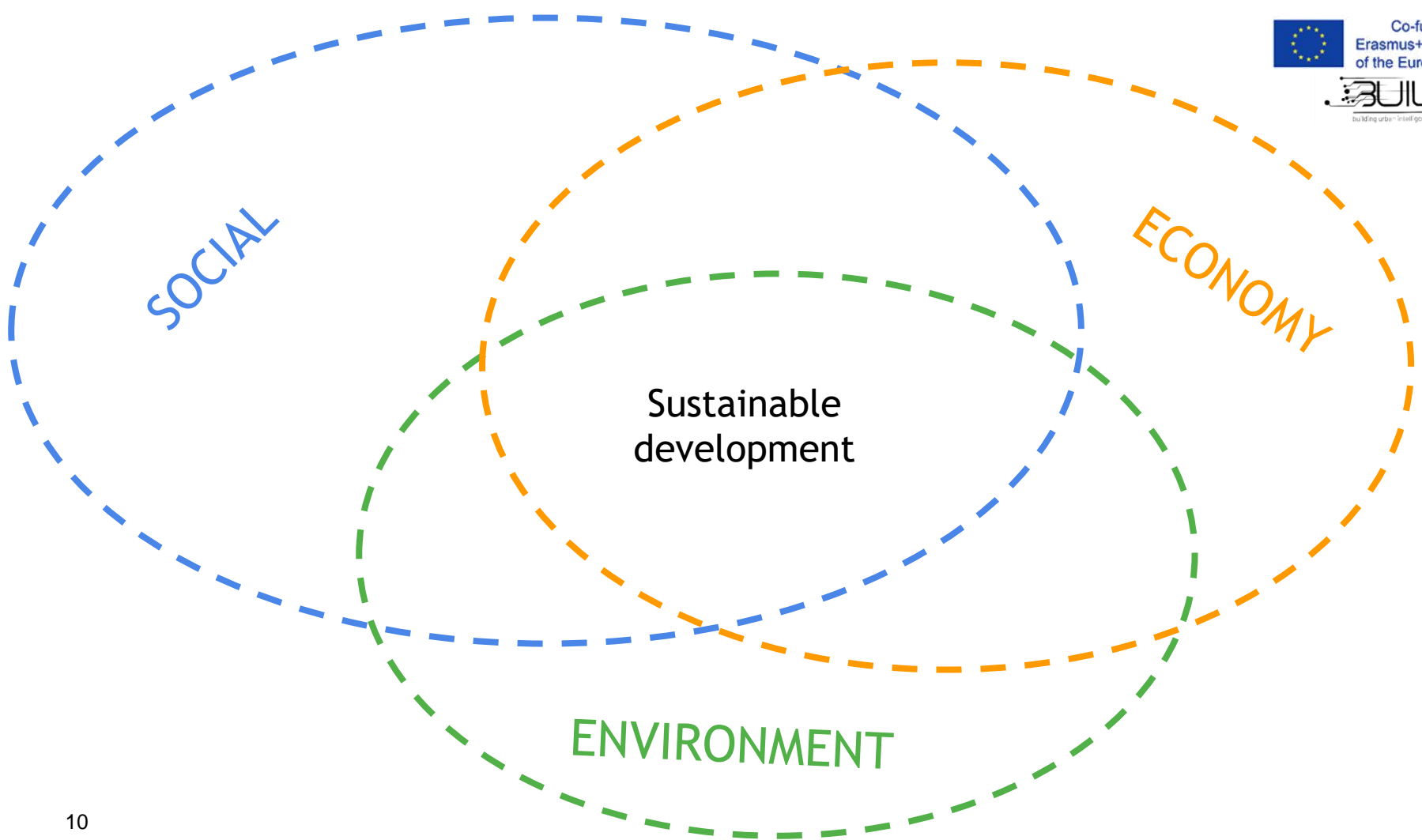
These phenomena are amplifying
faster than ever.

What solutions can we find?



Sustainable development

“A development which satisfies the **needs** of the **present** without **compromising** the capacity of **future** generations to answer their **own needs**, and guaranteeing the balance between **economic growth**, care for the **environment** and **social well-being**.”

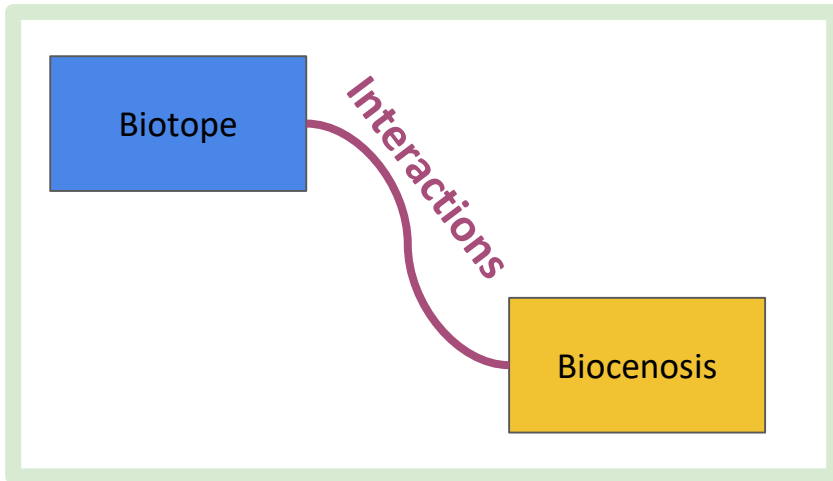




Source : Sustainable development goals,
UN's website

Working scale: urban areas

Ecosystem

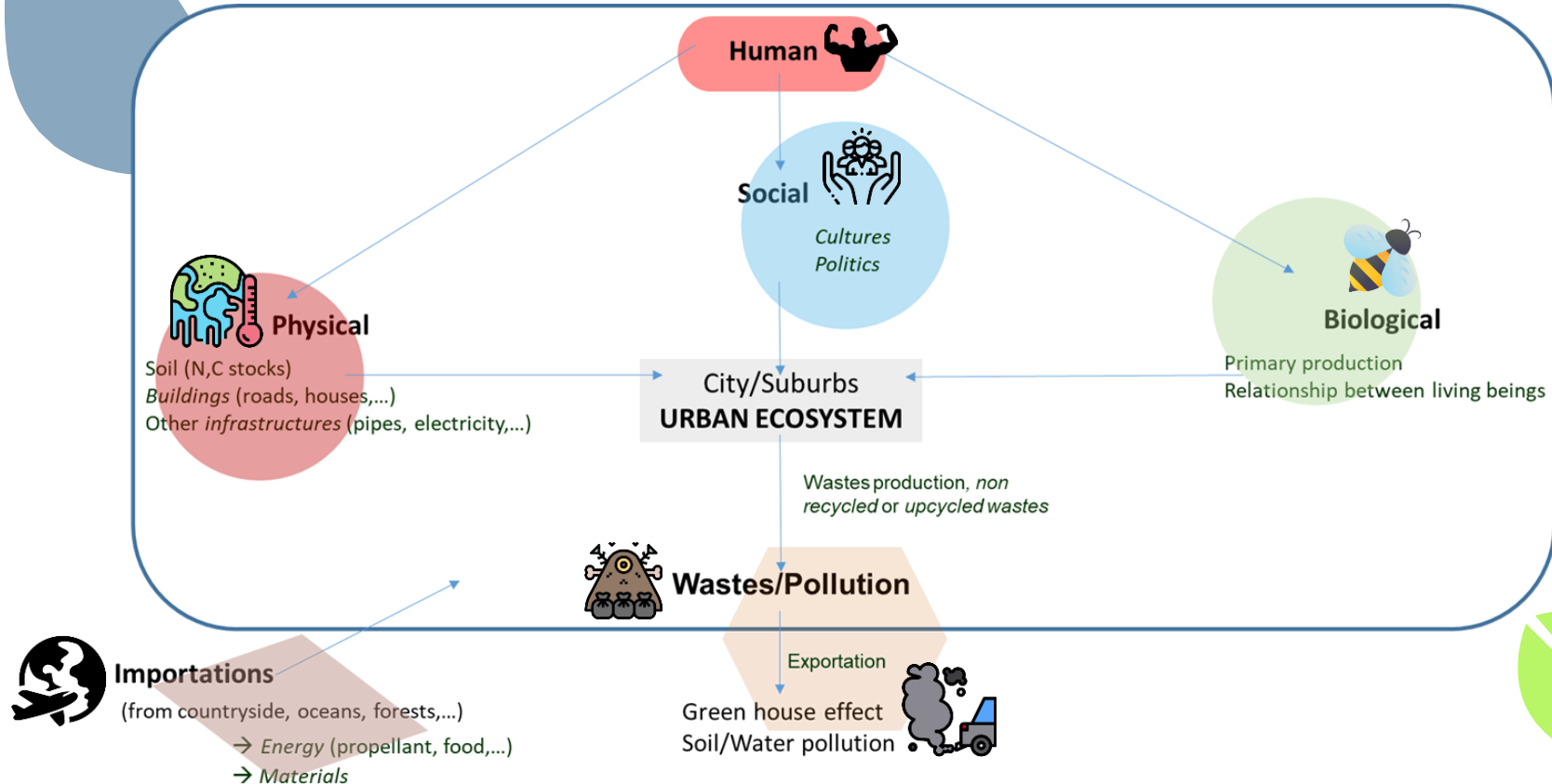


A city is an ecosystem.

Urban ecosystem = all the areas where:

- human buildings are presents
- surface of buildings >> natural surface

Urban ecosystem





Ecological functions	Ecosystem services
Biological processes allowing the functioning and maintenance of the ecosystem	Human benefits from the biological processes
Ecocentric view	Anthropocentric view



Ecosystem services

4 categories of ecosystem services :

- **Supporting**
Creating basic conditions for the development of life on Earth (soil formation, primary production...)
- **Provisioning**
Production of marketable goods (food, drinking water, fuel...)
- **Regulating**
Regulation of natural phenomena (flood risks, climate...)
- **Cultural**
Heritage, aesthetics, education, religion...



Examples of Ecological Functions

Water retention

Gas exchange

Source of raw
material

Biomass production

Hosting biodiversity



Source : over-blog.com

Ecological Functions

Ecosystem services

UN Goals

Water retention

Regulating services

Providing services

6. Clean water and sanitation

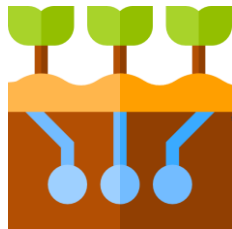
13. Climate action

2. Zero hunger

3. Good health and well being

12. Responsible consumption and production

11. Sustainable cities and communities



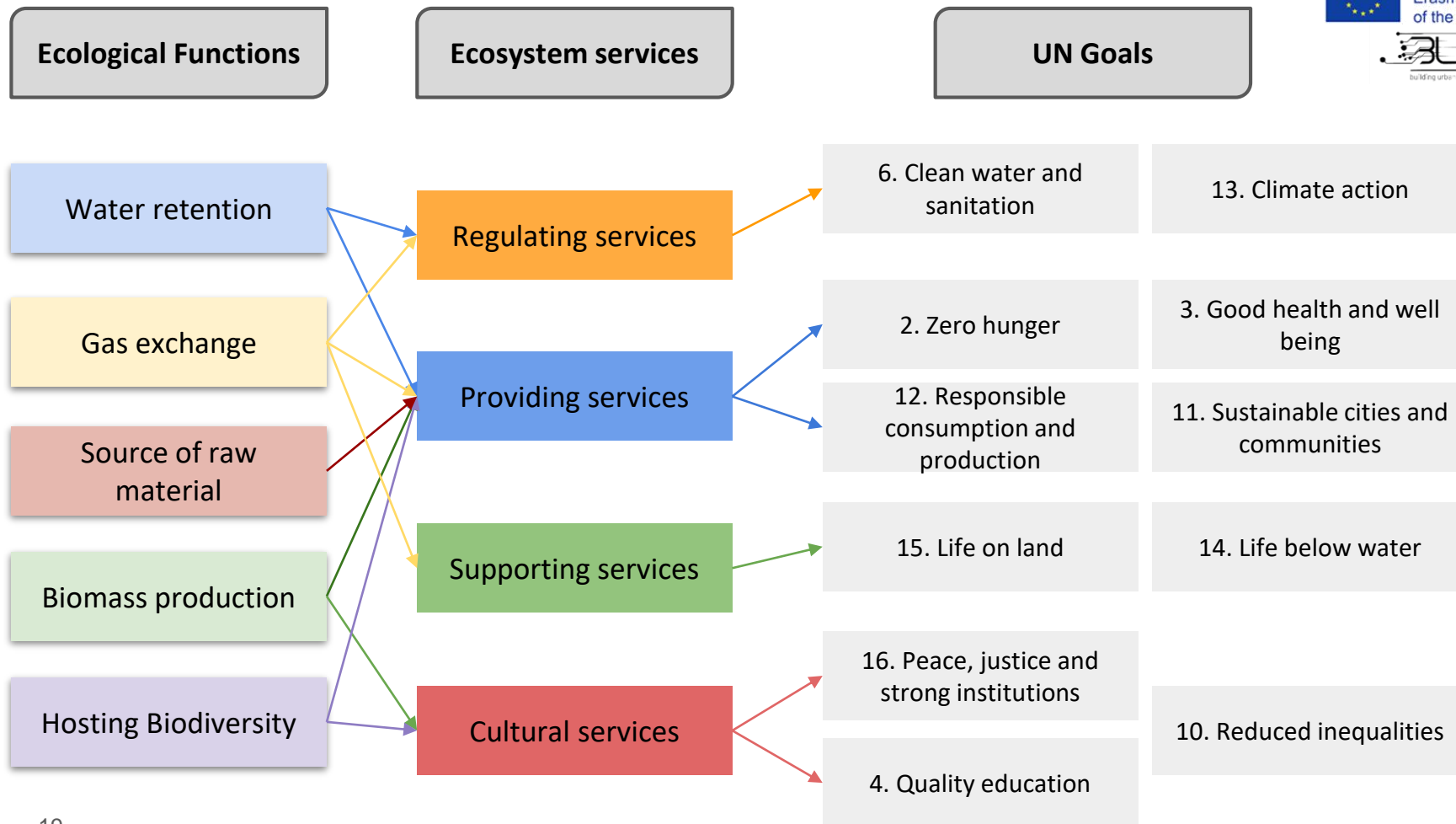
Erosion



Flood



Source : K. Adhikari, A.E. Hartemink(2015) Linking soils to ecosystem services — A global review, Madison : Geoderma 262 (2016) 101–111





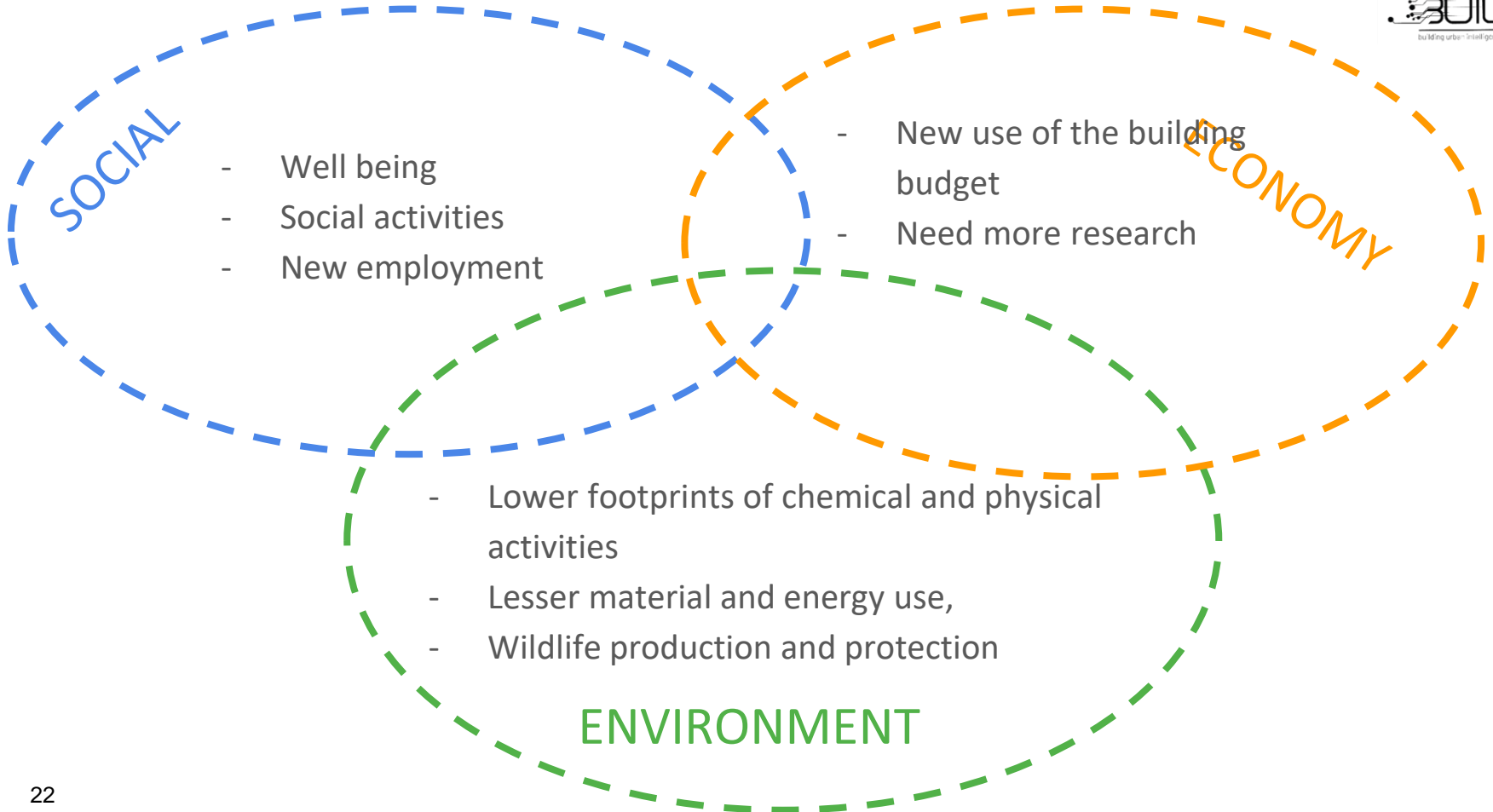
To face those challenges we can take
advantage of what nature already offers



Nature-based solutions

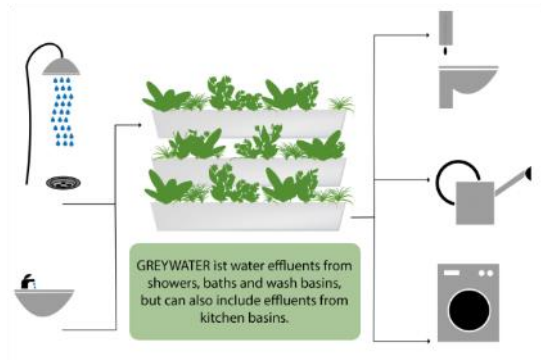
Actions to **protect**, sustainably **manage**, and **restore** natural or modified **ecosystems**, that address societal challenges effectively and adaptively, simultaneously **providing human well-being** and **biodiversity benefits**.

Positive effects of NBS





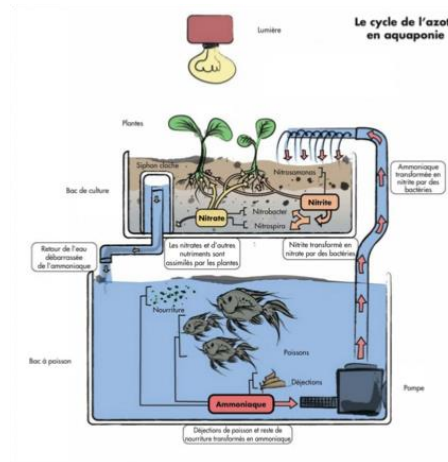
Some examples



VertEco

Wastewater treatment
by plants

Plants/fish production



Aquaponics



La Caverne

Underground
mushroom/chicory
production.





Some gaps remain on the ecological level in urban areas





Thank you for your attention !





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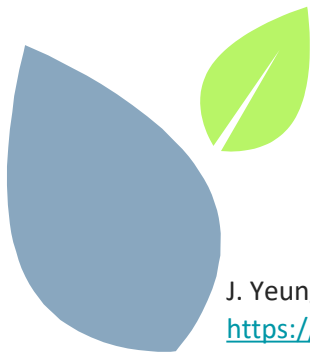
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