



Regenerating Nature's Operating System

Why we should care about Biodiversity

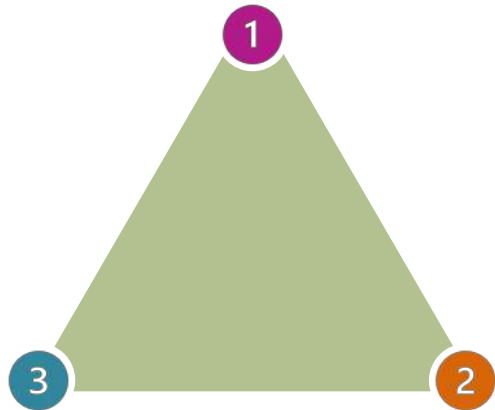
Ursula „Uzzy“ Arztmann | uzzy@recelio.org | [#recelioUzzy](https://twitter.com/recelioUzzy)



DEFINITION

What is Biodiversity and why are we losing it?

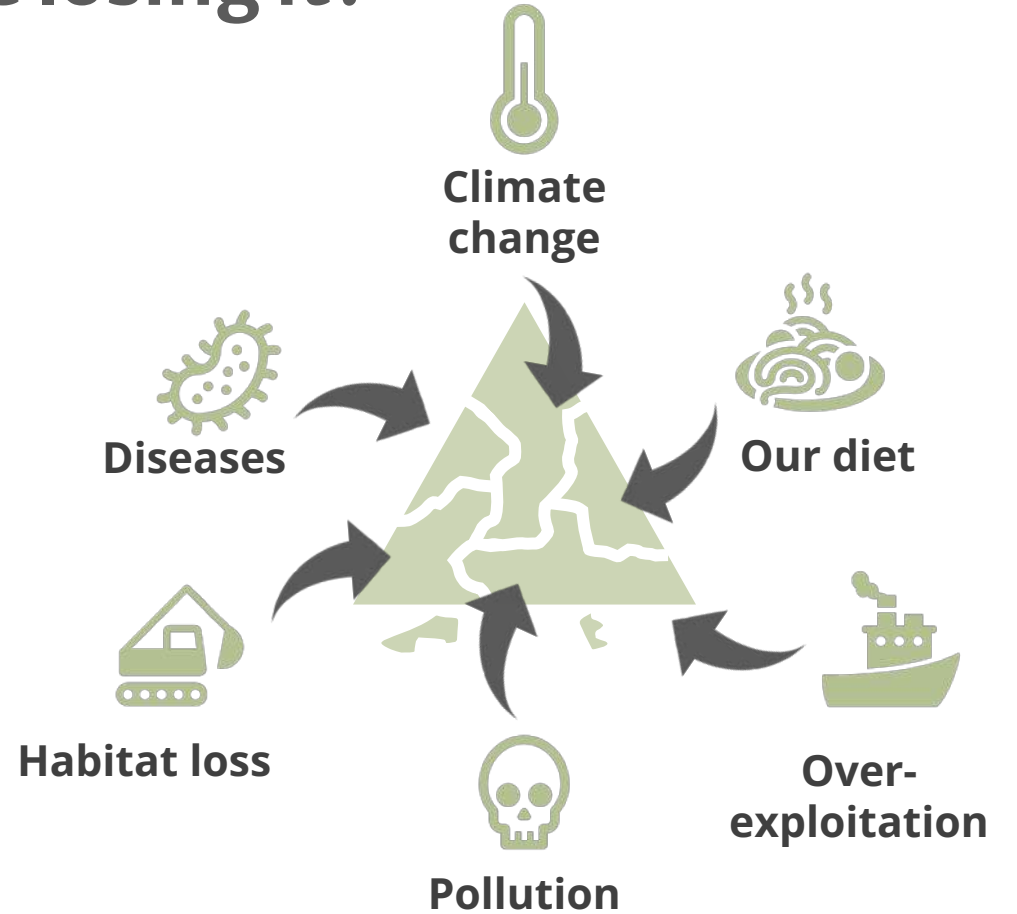
biosphere integrity
functioning ecosystems and biomes



genetic diversity
building blocks of life

functional diversity
the roles organisms play in an ecosystem

biodiversity = resilience



biodiversity loss = collapse

So, we're losing Biodiversity – why should we care?

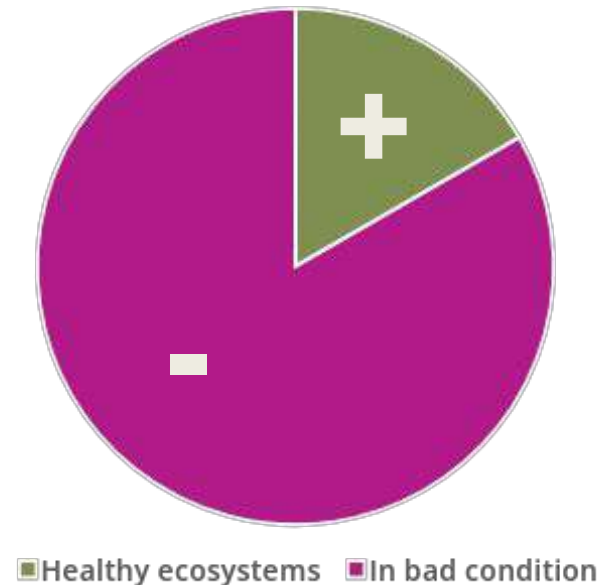
Biodiversity = operating system of the planet

- **Loss of resilience**
(ability to keep health/survivability)
- **Collapse of ecosystems** and the services they provide

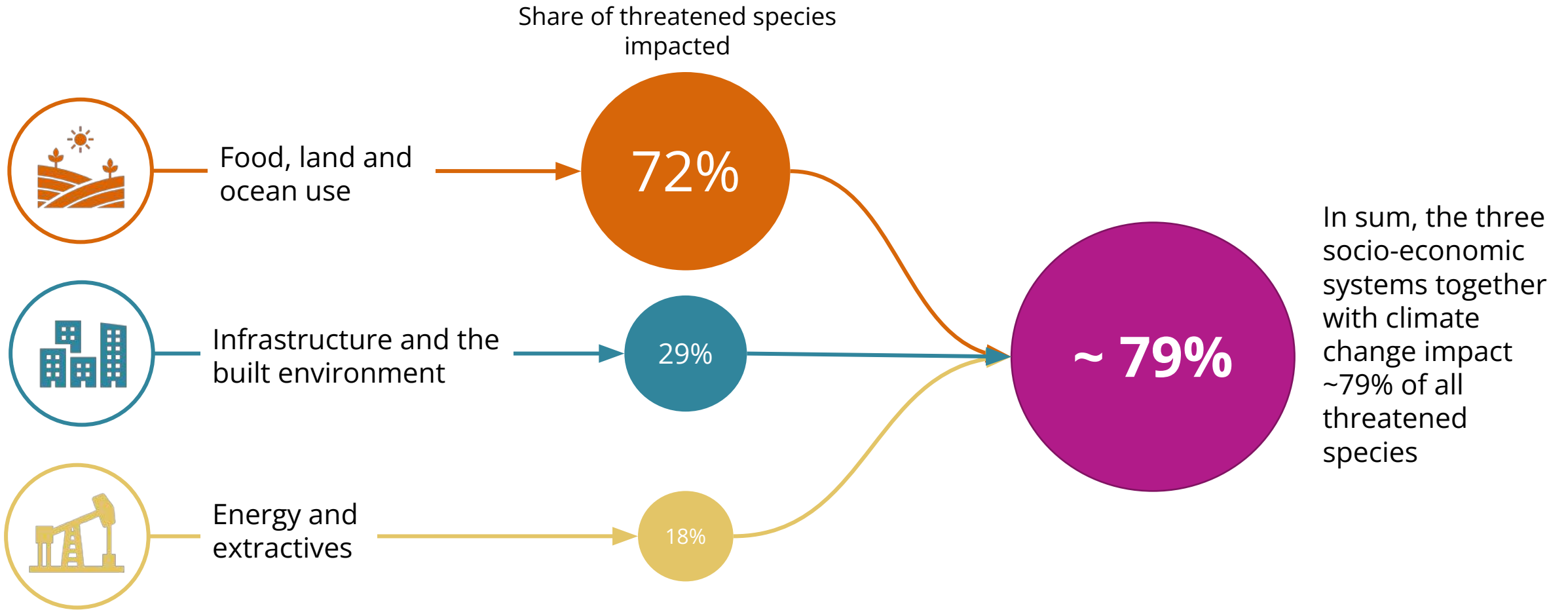


- **Deteriorating health**
- **Accelerating Climate change**
- **More zoonotic diseases**
- **Mass extinction**

Ecosystem health status in the EU (2021)

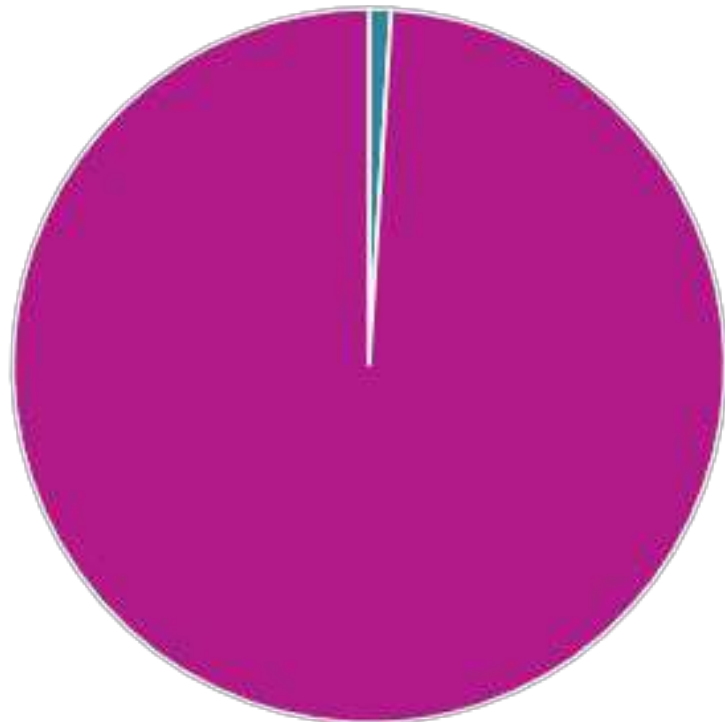


Three main drivers cause nearly 80% of the threats



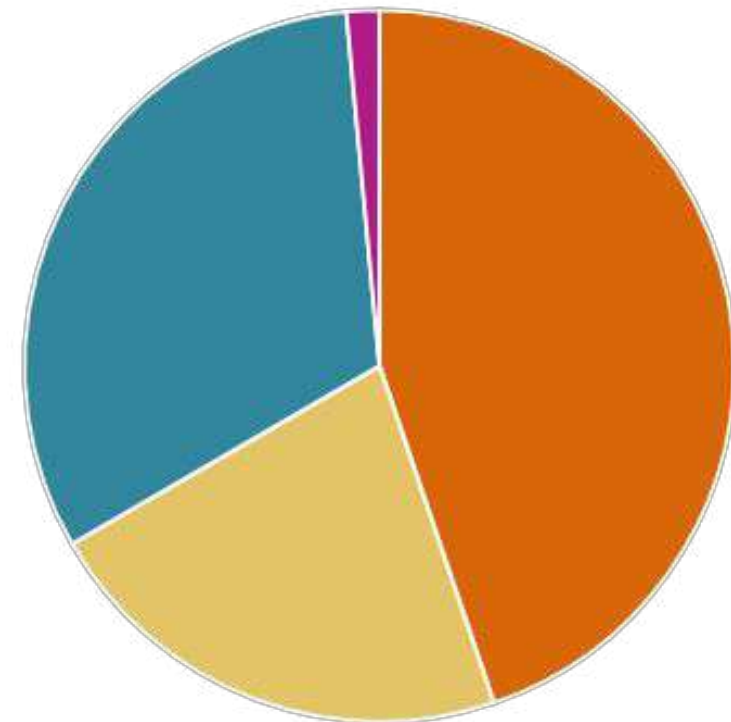
Plummeting biodiversity due to our diet

Terrestrial mammal biomass **10'000 years ago**



■ ■ ■ Humans ■ Wild mammals

Terrestrial mammal biomass **2015**



■ Livestock: Cattle ■ Livestock others ■ Humans ■ Wild mammals

The severity of biodiversity loss



Humans have actively changed 77% of all land and 87% of all oceans



This led to a **loss of 83% of the wild mammal biomass and 50% of the planet's plant biomass**



Currently more than a million species are threatened with extinction



This causing the Earth's **sixth mass extinction event**

What does it mean?

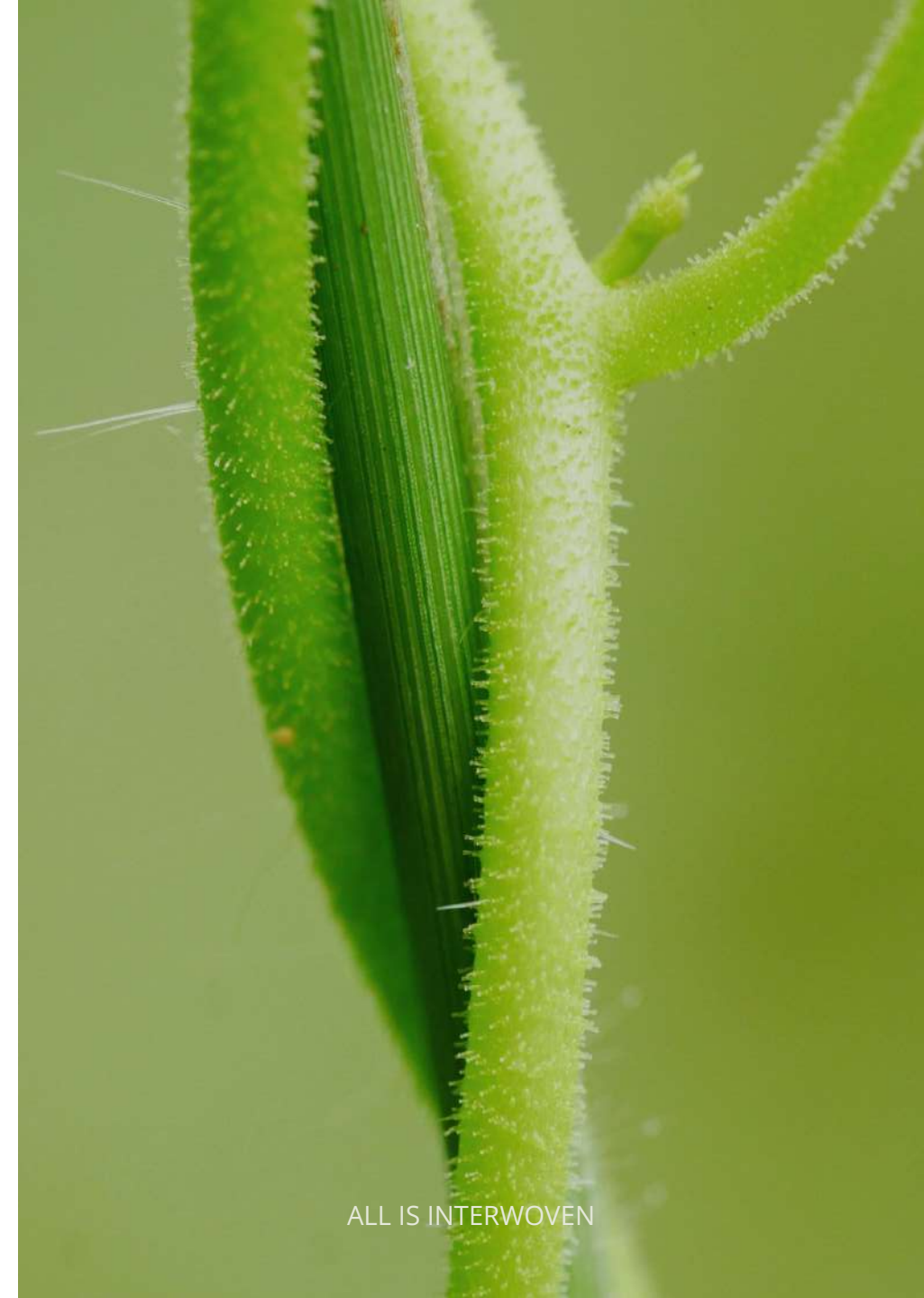
Loss of biodiversity means **loss of planetary health** and **loss of the ability to create ecosystem services = collapse of living systems**



We are dependent on biodiversity for **food, energy, medicine, economic security and our overall well-being.**



Biodiversity is the **living web** of genes, species and ecosystems that **form the basis of life** on Earth



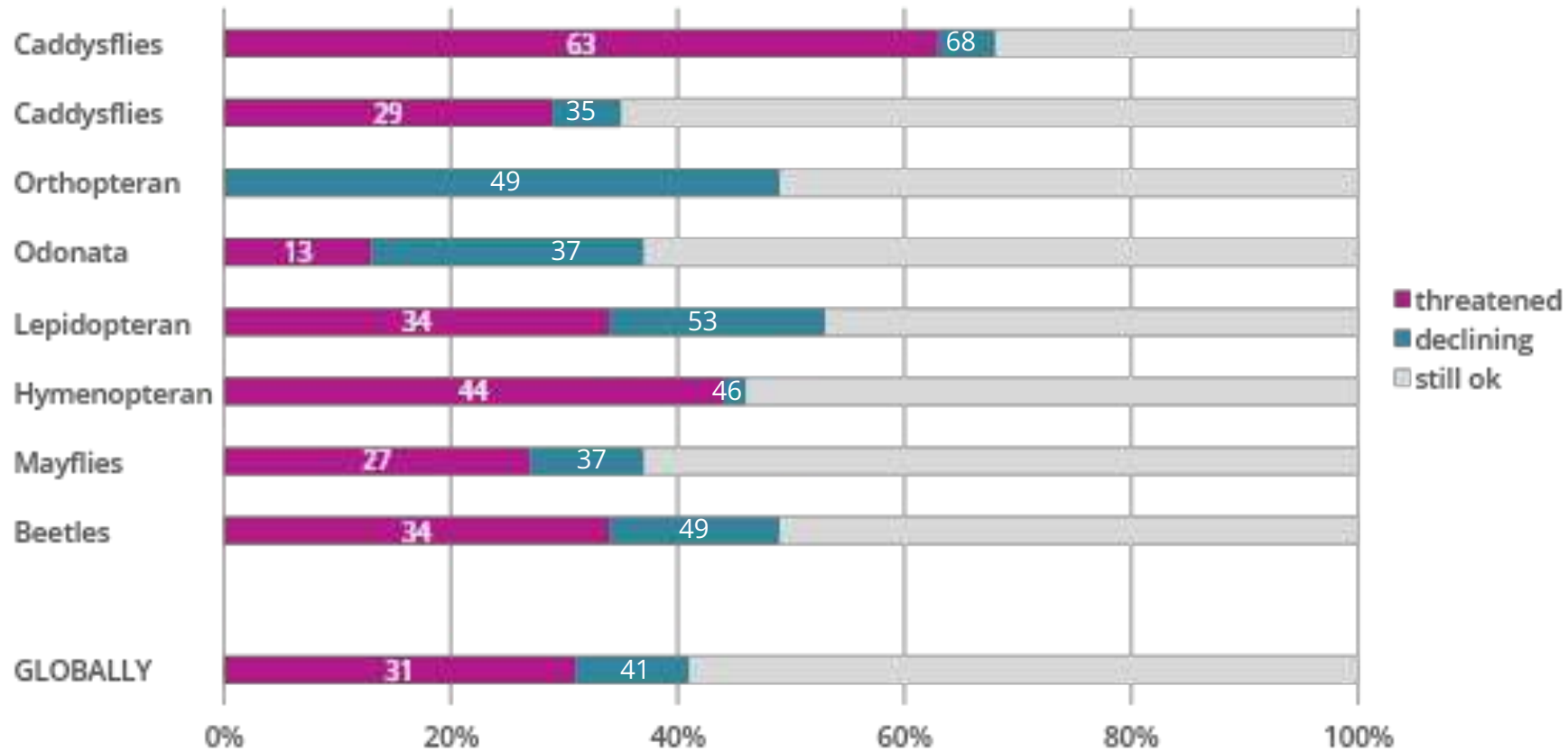
Biodiversity loss: the relevance of the insect apocalypse

**76% loss of
biomass
of flying insects
in german
conservation areas**
(between 1989 – 2014)

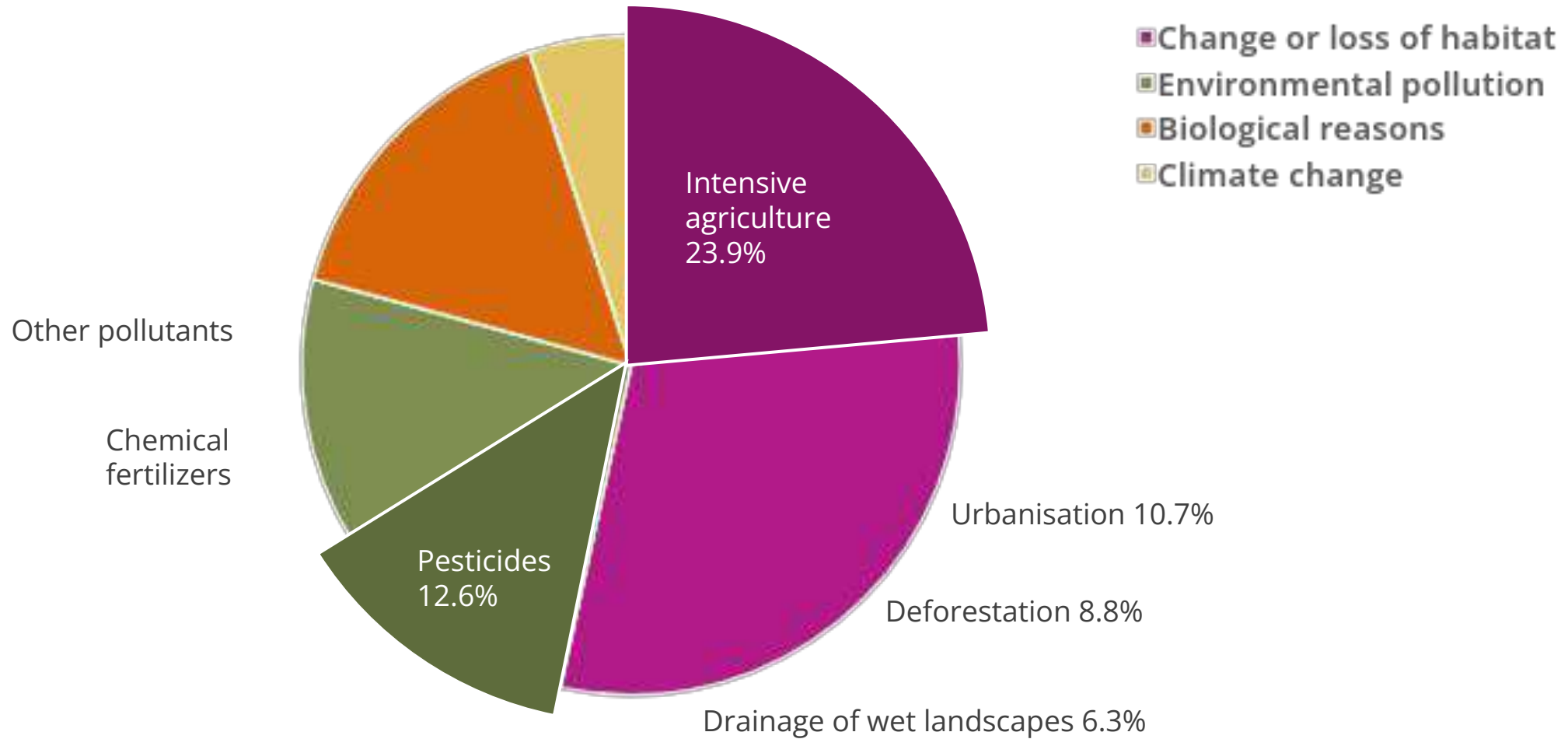


Not only loss of biomass but also species extinction

Loss of insect species globally based on 73 studies, 2019



Reasons for the insect apocalypse

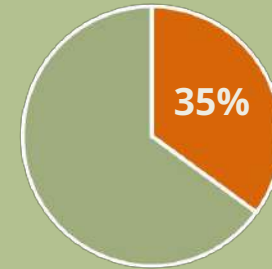
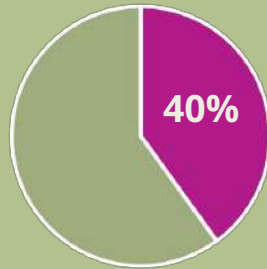
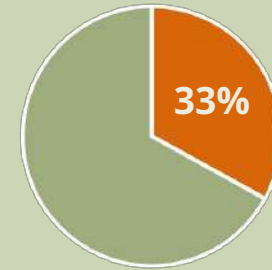
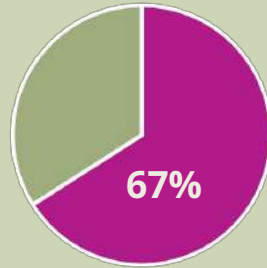


Arthropode* loss by landscape type

Seibold Study (*Arthropodes = insects plus spiders, milipedes etc.), TU Munich, between 2008 - 2017

Loss of biomass

Loss of species



Effects of insect loss

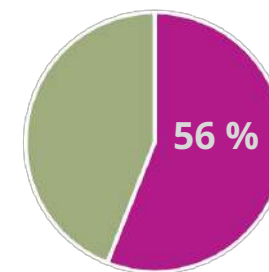
For example: **Bird biomass and species decline**



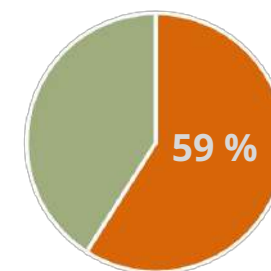
80%

Need animal proteins,
50% prefer insects

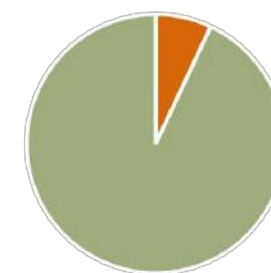
Population decline
since 1980



Loss of species



Birds of
agricultural open
landscapes

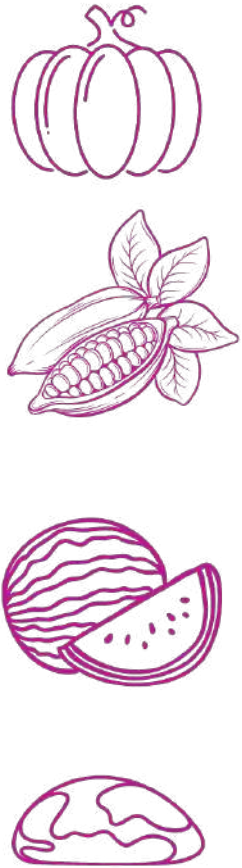


Birds of forest
landscapes

Effects of insect loss

For example: **Loss of harvests** due to missing pollination

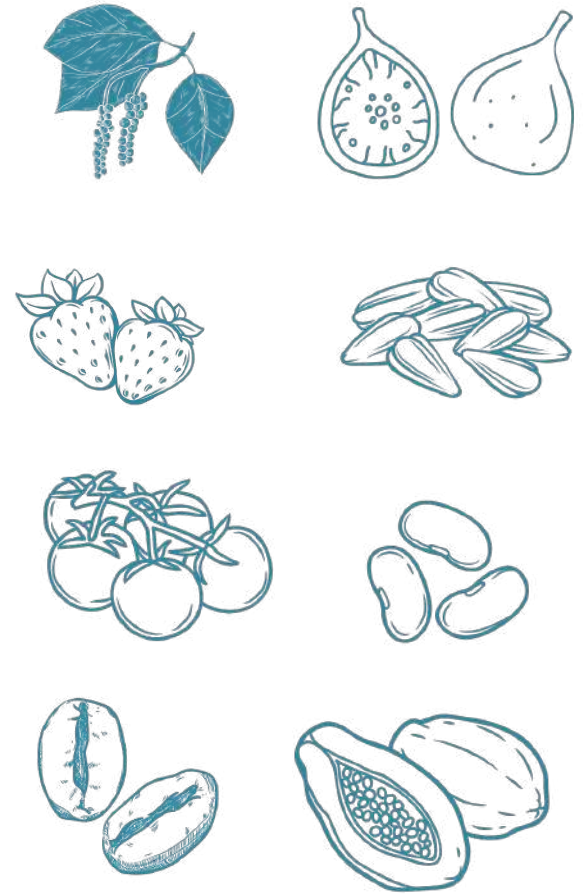
Loss of harvests > 90%



Loss of harvests 40 – 90%



Loss of harvests 10 – 39%

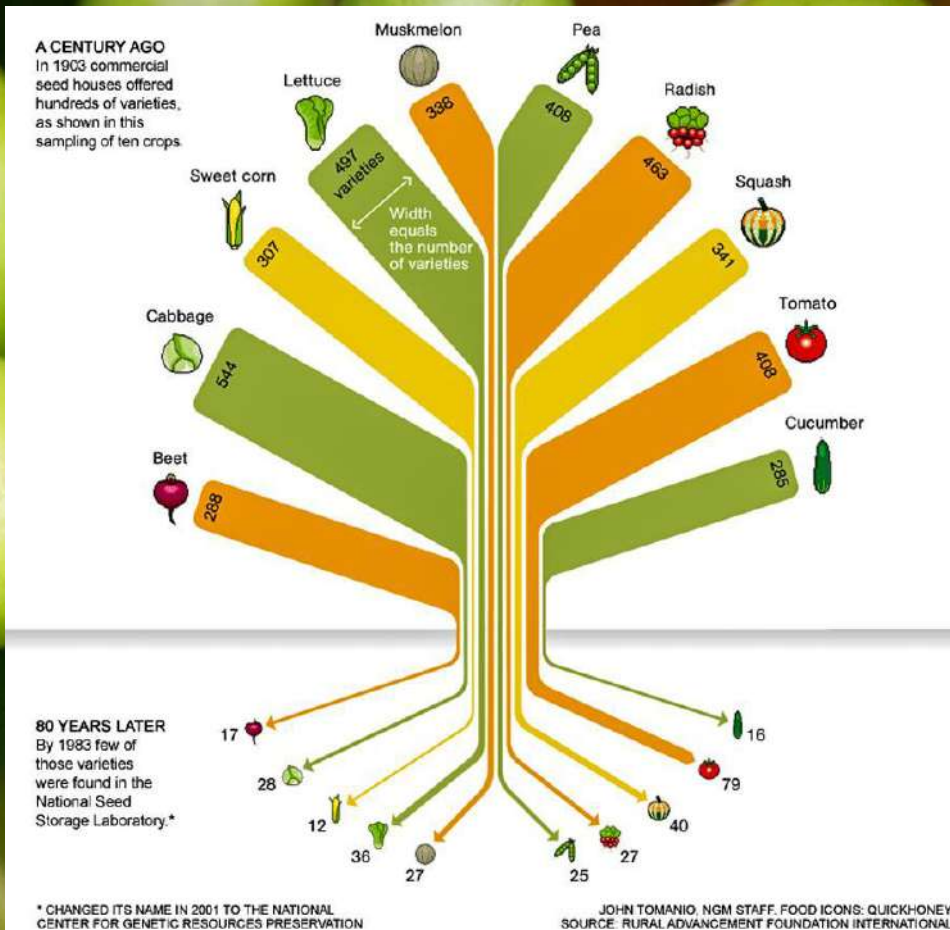


SOURCE: FAO

FOOD SECURITY RISKS

Food diversity loss

- Since the Second World War, we've created a highly productive but **incredibly fragile food system**.
- The Green Revolution helped feed a surging global population, but at the cost of **impoverishing crop diversity**.
- **75 percent of food crops have become extinct** since 1900.
- From the 4% of the 300,000 known edible plant species **only 150 to 200 are used** by humans.
- Today, **75% of the global food supply** comes from **only 12 plant species**—particularly rice, maize, and wheat.

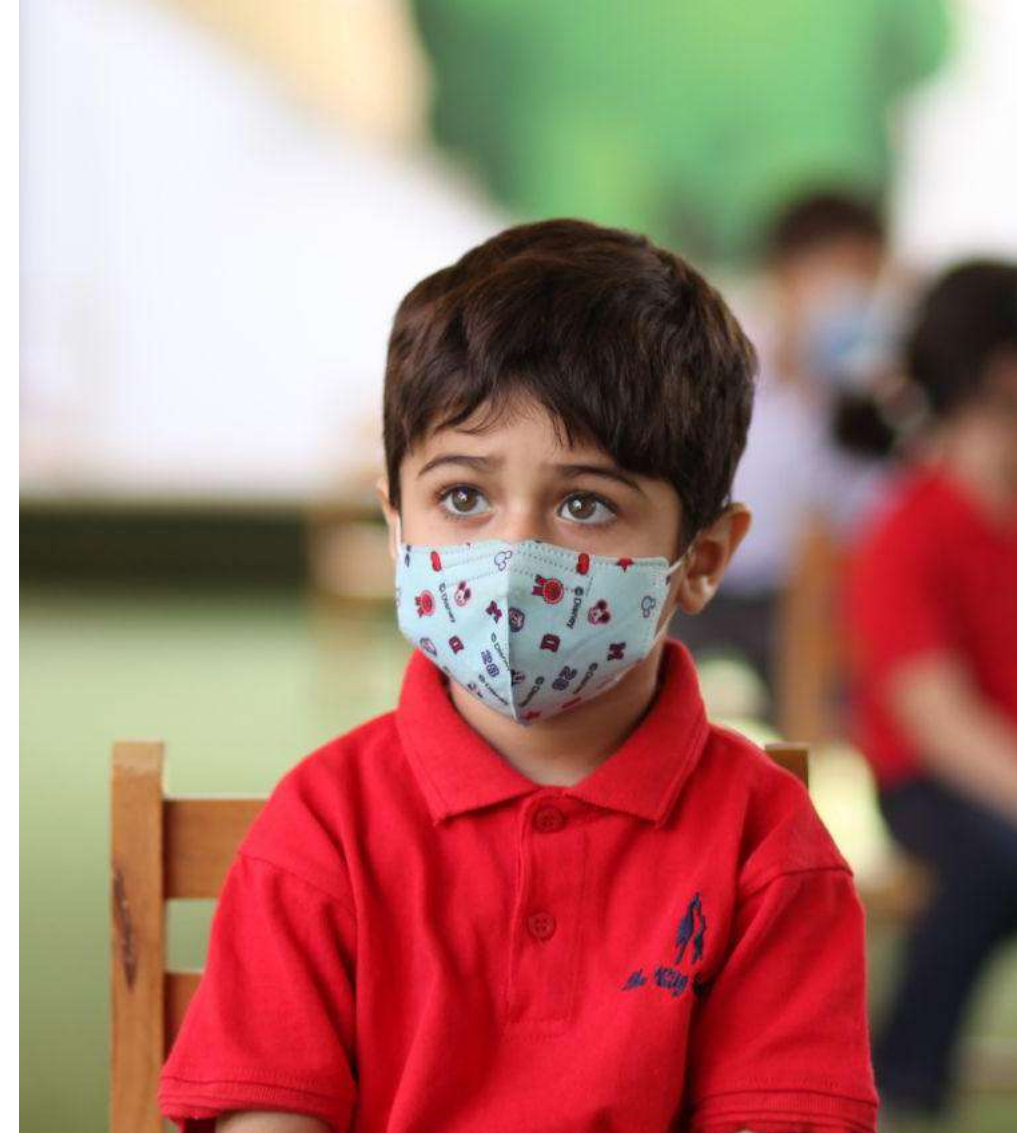


Want more pandemics?

Biodiversity loss increases the **risk of human exposure** to both new and established **zoonotic pathogens**.

Restoration of biodiversity is an important frontier in the management of zoonotic disease risk.

Biodiversity is relevant for finding **new cures** in the vast genetic reservoir of life – the loss of it, deprives us of options.



PERSONAL VIEW | VOLUME 5, ISSUE 11, E840-E850, NOVEMBER 01, 2021



PDF [771 KB]



Figures



Save

The COVID-19 pandemic is intricately linked to biodiversity loss and ecosystem health

Odette K Lawler, MConsBiol • Hannah L Allan, BSc (Hons) • Peter W J Baxter, PhD • Romi Castagnino, MConsSci • Marina Corella Tor, MSci • Leah E Dann, MSc • et al. [Show all authors](#)

Open Access • Published: November, 2021 • DOI: [https://doi.org/10.1016/S2542-5196\(21\)00258-8](https://doi.org/10.1016/S2542-5196(21)00258-8)

“Climate change

will define

how we will live...

Biodiversity loss

will define

whether we will live...”

What has been done so far?



“ UN report shows: **World fails to meet a single target to stop destruction of nature**”

“Humanity at a crossroads after a decade in which **all of the 2010 Aichi goals** to protect wildlife and ecosystems **have been missed**”

What is planned: EU Biodiversity strategy

Establishing a larger EU-wide network of protected areas on land and at sea

The EU will enlarge existing Natura 2000 areas, with strict **protection for areas** of very high biodiversity and climate value.

Launching an EU nature restoration plan

Through concrete commitments and actions, the EU aims to **restore degraded ecosystems** by 2030 and manage them sustainably, addressing the key drivers of biodiversity loss.

As part of this plan, the Commission will propose binding nature restoration targets

Introducing measures to enable the necessary transformative change

The strategy highlights **unlocking funding for biodiversity**, and setting in motion a new, strengthened governance framework to

- ensure better implementation and track progress
- improve knowledge, financing and investments
- better respecting nature in public and business decision-making

Introducing measures to tackle the global biodiversity challenge

These measures will demonstrate that the EU is ready to lead by example to address the global biodiversity crisis. In particular, working towards the successful adoption of an ambitious global biodiversity framework under the Convention on Biological Diversity.

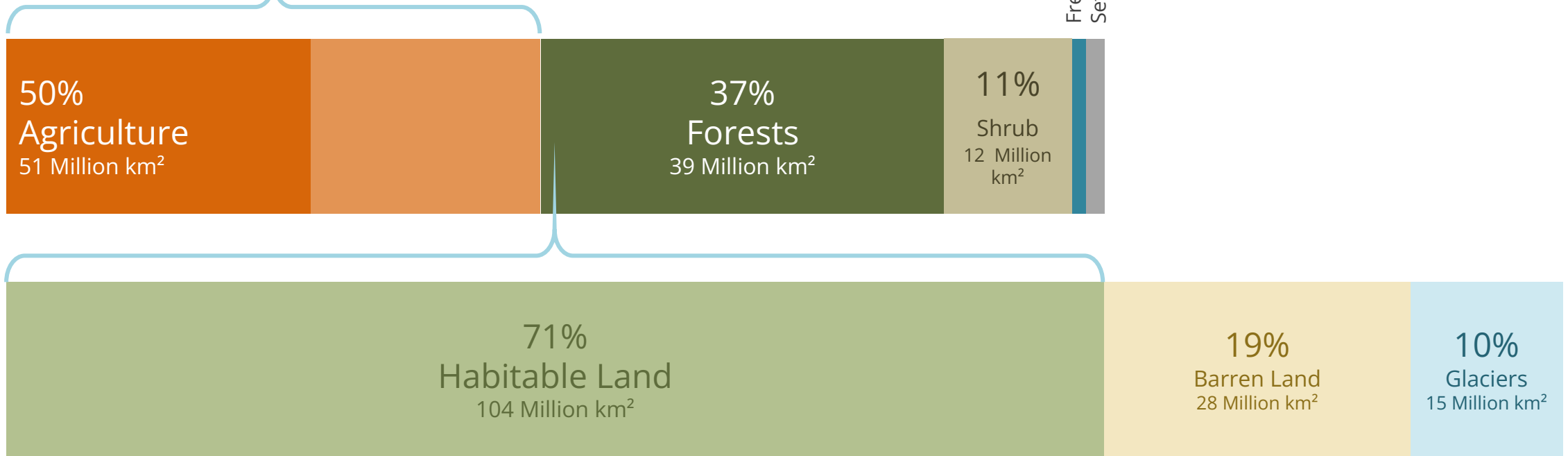
EU Nature restoration concerning agriculture

- Target 5 - The decline of **pollinators** is reversed.
- Target 6 - The **risk and use of chemical pesticides is reduced by 50%**, and the **use of more hazardous pesticides is reduced by 50%**.
- Target 7 - **At least 10% of agricultural area is under high-diversity landscape features.**
- Target 8 - **At least 25% of agricultural land is under organic farming management**, and the uptake of agro-ecological practices is significantly increased.
- Target 9 - **Three billion additional trees are planted** in the EU, in full respect of ecological principles.
- Target 10 - Significant **progress in the remediation of contaminated soil** sites.
- Target 11 - **At least 25,000 km of free-flowing rivers are restored.**
- Target 13 - The **losses of nutrients from fertilisers are reduced by 50%**, resulting in the **reduction of the use of fertilisers by at least 20%**.

Where can we increase biodiversity?



Of which we have degraded 40% (>20 Million km²) already



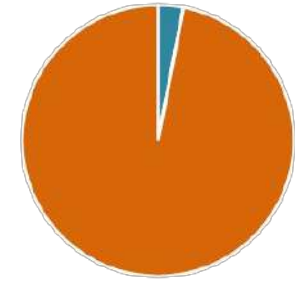
With the current climate change trajectory towards 3 – 4 degrees global warming, the **habitable area of the world will shrink dramatically**

Total global landmass:
29% = 149 Million km²

Restoration on agricultural land?

- Biodiversity action is happening in separation of agriculture (strips, windows, edges)
- Is mostly temporary
- Is done in fields where biocides are used all around
- Often use one-size-fits all plant mixtures
- Management is often lacking or not done well

Actions on biodiversity in agriculture



■ What we do ■ What we could do





AGRICULTURAL BIODIVERSITY

Livestock as biodiversity drivers?

- Grazing animals (such as cattle, sheep, goats) are usually **treated prophylactically** against internal and external parasites using **phenylpyrazole**. The **toxicity and systemic impact** is equal to neonicotinoids which have been banned in Europe.
- Pastures are often **sown with specific, low diversity mixes** to ensure efficient milk/meat production.
- Honeybees are a domesticated species. Each hive contains around 20'000 individuals. They **outcompete natural bee populations easily** and thereby threaten the biodiversity of local insects.
- Honeybees often **transmit diseases** to natural bee populations as they are transported around the globe.

What we could do...

Building **habitat** and **functioning (agro-)ecosystems** while producing healthy food and increasing **genetic diversity**.

Long-term establishment of system.

One hectare of **Syntropic Farming** systems contain:

- 1000 – 3000 trees and shrubs
- 10 – 25 species of trees of different families
- Sometimes over 50 species of herbs/shorter lifecycle species
- Locally adapted, wild tree species for biomass production
- Locally adapted, wild herb species to support succession

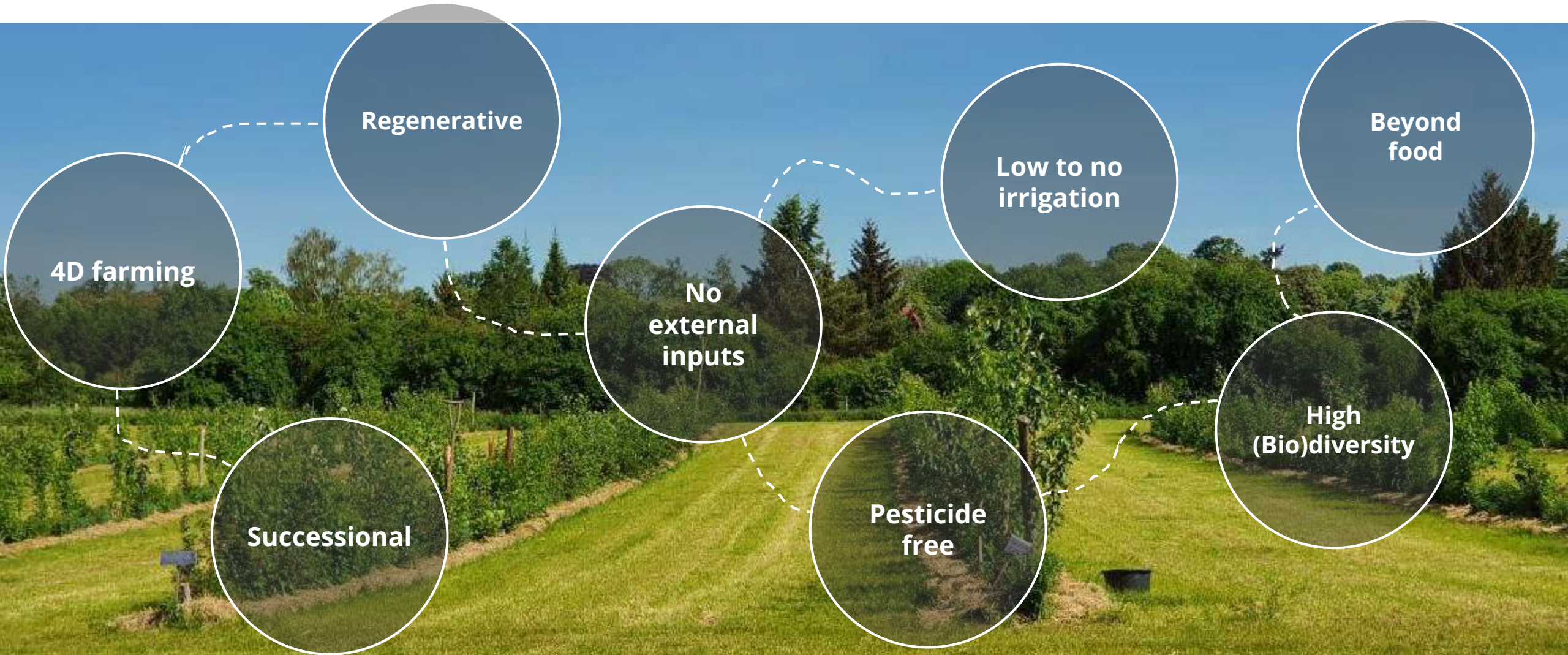
After setup: **no external inputs needed**
(fertilizers, pesticides, irrigation)

Biodiversity as a core function
by design:

Syntropic Farming



Syntropic Farming – leading edge of biodiversity and regeneration



Mapping systemic impact

TFFR 2011

ECOSYSTEM SERVICES

SUPPORT

PROVISIONING

REGULATING

CULTURAL

ECOSYSTEM SERVICES	SUPPORT			PROVISIONING				REGULATING										CULTURAL					TOTAL ES SUPPLY							
	Habitats for species	Biodiversity	TOT (%)	Food	Fiber	Wood	Genetic resources	Others (biochemicals, natural medicines, pharmaceuticals, fresh water, etc...)	TOT (%)	C stock, climate regulation	Local climate	Air quality	Metastabilità ecosistemi	Connectivity	Water regulation	Soil fertility	Erosion regulation	Trophic chain - biological control	Pollination	Water purification	Natural hazard regulation	TOT (%)		Spiritual experience, sense of place	Aesthetic, culture, art, design	Knowledge and education	Recreation, eco-tourism	Mental and physical health	TOT (%)	
NATURAL SYSTEM																														
area incolta in stato di abbandono	2	2	50.0	1	1	1	1	1	25.0	2	1	1	1	1	2	2	2	1	3	1	1	37.5	1	1	1	1	1	1	25.0	34.4
area boccata da ricolonizzazione spontanea	3	2	62.5	1	1	2	1	1	30.0	2	3	3	2	2	2	2	2	2	2	2	2	66.7	1	1	1	1	2	1	30.0	47.3
giovane rimboscimento (1-2 yrs)	2	3	62.5	1	1	1	3	1	35.0	2	1	1	2	2	1	2	1	1	3	2	2	39.6	2	1	2	1	1	1	35.0	43.0
giovane rimboscimento (5 yrs)	3	3	75.0	1	1	2	3	1	40.0	3	3	2	3	3	2	2	2	2	3	2	2	60.4	3	3	3	3	3	3	75.0	62.6
siepe arborea arbustiva spontanea	3	2	62.5	1	1	2	1	1	30.0	2	2	2	1	2	2	2	2	2	2	2	2	56.3	1	2	1	2	1	1	35.0	45.9
siepe arborea-arbustiva spontanea discontinua	3	1	50.0	1	1	1	1	1	25.0	2	2	1	2	2	2	2	2	1	2	2	2	43.8	1	1	1	1	1	1	25.0	35.9
siepe igrofila (inserita)	1	2	37.5	1	2	1	2	1	35.0	2	1	1	2	2	1	3	1	1	2	1	1	35.4	1	1	3	2	1	1	40.0	37.0
siepe mesofila (inserita)	1	2	37.5	1	2	1	2	1	35.0	2	1	1	2	2	1	2	1	1	2	1	1	35.4	1	1	3	2	1	1	40.0	37.0
vegetazione arborea-arbustiva spontanea discontinua	3	1	50.0	1	1	1	1	1	25.0	2	1	1	2	2	1	2	1	1	2	2	2	39.6	1	1	1	1	1	1	25.0	34.9
vegetazione arborea-arbustiva spontanea lungo fossato	3	1	50.0	1	1	2	1	1	30.0	3	3	2	2	3	2	2	1	1	2	1	1	52.1	1	1	1	2	1	1	30.0	40.5
vegetazione arborea-arbustiva spontanea lungo fossato discontinua	3	1	50.0	1	1	1	1	1	25.0	2	1	1	2	2	2	2	1	1	2	2	2	39.6	1	1	1	1	1	1	25.0	34.9
vegetazione erbacea spontanea lungo fossato	1	1	25.0	1	1	1	1	1	25.0	1	1	1	1	1	1	1	2	1	2	1	2	31.3	1	1	1	1	1	1	25.0	26.6
vegetazione erbacea-arbustiva spontanea lungo fossato	3	1	50.0	1	1	1	1	1	25.0	2	1	1	2	2	2	2	1	1	2	2	2	39.6	1	1	1	1	1	1	25.0	34.9
fascia erbacea di margine	2	2	50.0	1	1	1	1	1	25.0	2	1	1	1	2	2	2	2	1	3	1	1	39.6	1	1	1	1	1	1	25.0	34.9
prato alberato	3	2	62.5	1	1	1	1	1	25.0	2	2	2	1	3	2	2	2	2	3	1	2	50.0	1	1	1	2	1	1	30.0	41.9
AGRICULTURAL SYSTEM																														
prato da fieno	2	2	50.0	1	1	1	1	1	25.0	2	1	1	1	1	2	2	2	1	3	1	1	37.5	1	1	1	1	1	1	25.0	34.4
seminalivo	1	1	25.0	4	1	1	1	1	40.0	1	1	1	1	1	1	1	1	1	1	1	1	25.0	1	1	1	1	1	1	25.0	28.8
orti urbani	2	1	37.5	4	2	1	3	1	50.0	1	1	1	1	2	2	2	1	2	2	1	1	35.4	4	3	3	4	4	4	90.0	54.5
orticoltura produttiva	2	1	37.5	4	2	1	3	1	50.0	1	1	1	1	2	2	3	1	2	2	1	1	37.5	4	3	4	4	4	4	95.0	56.3
orticoltura produttiva protetta	1	1	25.0	4	2	1	3	1	50.0	1	1	1	1	1	1	2	1	2	2	1	1	31.3	3	2	4	4	2	1	75.0	46.6
area incolta	2	2	50.0	1	1	1	1	1	25.0	2	1	1	1	1	2	2	2	1	3	1	1	37.5	1	1	1	1	1	1	25.0	34.4
sistema agroforestale multistrato	3	3	75.0	4	3	3	3	1	70.0	3	3	2	2	3	3	3	3	3	2	2	3	66.7	4	4	4	4	4	4	100.0	77.9
ANTHROPIC SYSTEM																														
parco urbano	2	2	50.0	1	1	1	1	1	25.0	3	4	3	2	3	3	1	2	1	3	2	2	60.4	4	3	2	4	4	4	85.0	55.1
verde privato	2	1	37.5	1	1	1	1	1	25.0	2	4	3	1	2	3	1	2	1	3	2	2	54.2	2	2	1	2	4	4	55.0	42.9
verde privato in stato di abbandono	3	1	50.0	1	1	1	1	1	25.0	2	2	2	2	2	2	3	2	1	2	1	1	45.8	1	1	1	1	1	1	25.0	36.5
prato ad uso pubblico	1	1	25.0	1	1	1	1	1	25.0	2	1	1	1	1	2	1	2	1	1	1	1	31.3	4	3	4	4	4	4	95.0	44.1

Ready to invest in Biodiversity?



recelio

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Join the journey!

Regeneration of biodiversity is a collective effort and the chance to co-create a resilient, thriving future for all life.

CONTACT DETAILS

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