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Soils support life: let's keep them healthy

Prof. Pandi Zdruli – EIP-AGRI Service Point



13-14 April 2021

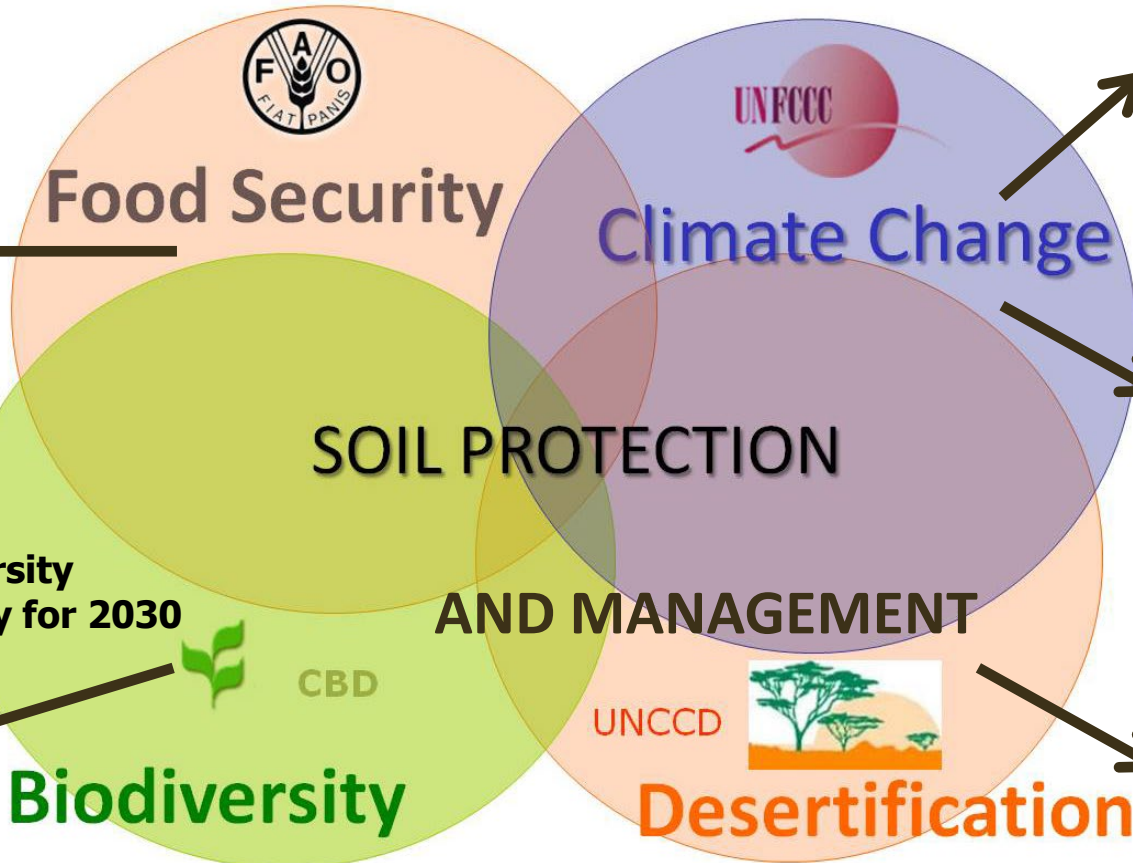
EIP-AGRI Seminar 'Healthy soils for Europe:
sustainable management through knowledge and practice'



Soil is at the centre of ecosystems

The crucial role of soil at UN conventions and in the EU

Healthy soils produce healthy and nutritious food
95% of food



Soils actually contain more carbon than the atmosphere and vegetation combined and are the second largest C pool after oceans

Soils could represent up to 25 % of the total global potential for natural climate solutions
Bossio et al., 2020

Land Degradation Neutrality
Economics of Land Degradation

EU Biodiversity Strategy for 2030



CBD

Biodiversity

AND MANAGEMENT

UNCCD



Desertification



GLOBAL SOIL BIODIVERSITY INITIATIVE

Bach et al., 2020

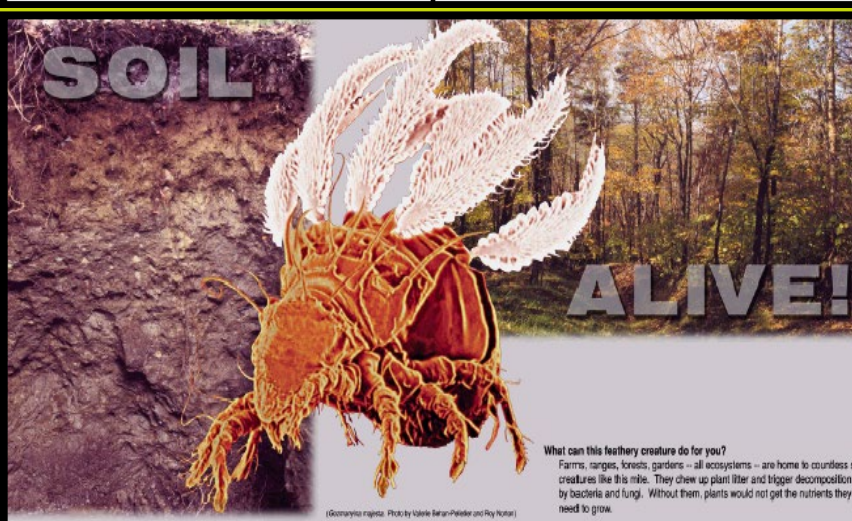
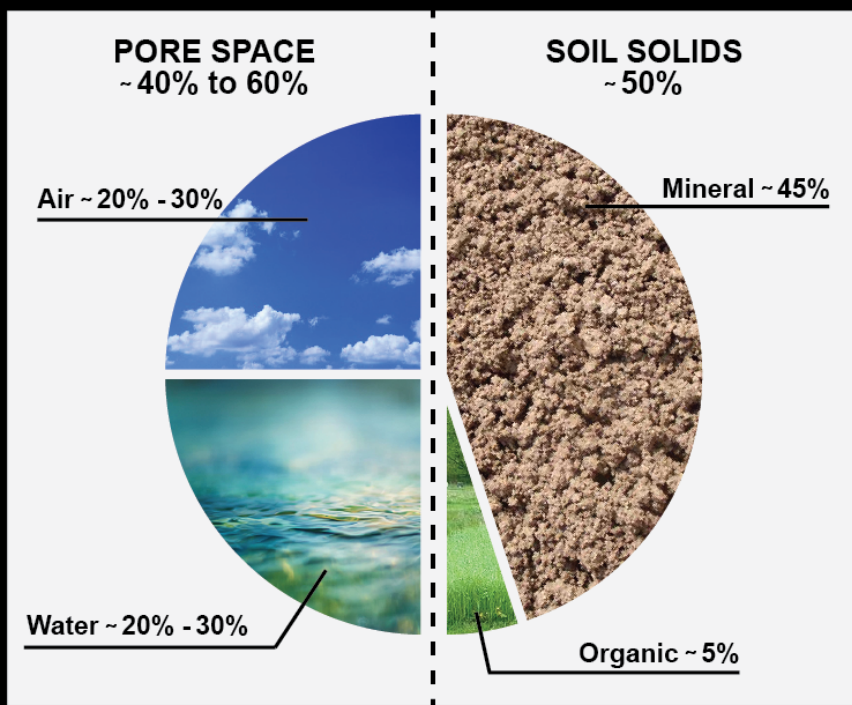
Only 1 % of soil microorganisms have been identified

The crucial role of soil at UN conventions and in the EU



**The proposed EU mission:
“Caring for soil is caring for life” in the area of Soil Health and Food**

Soil Components with Overall Averages



Soil: a non-renewable and crucial resource

Why is soil so important for farmers, consumers and society?

Farmers need to make a profit, consumers need healthy food and society needs good water, infrastructure facilities, biodiversity conservation, climate change actions, etc

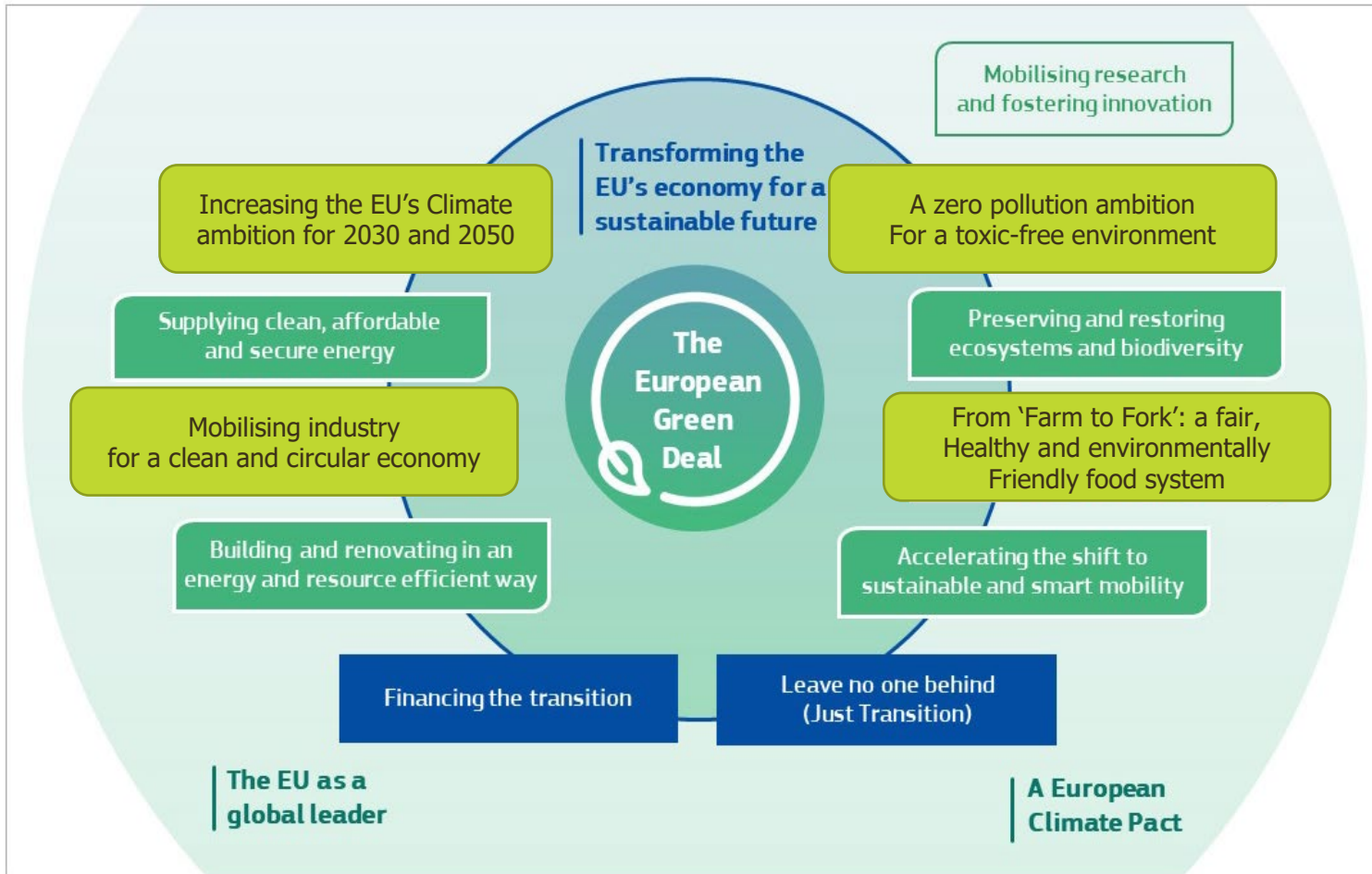
Investing in soil health is a short, medium and long term investment

It takes 500 years to form 1 cm of soil, that could be lost in a few minutes. Soil health takes time to build up but it pays off over the long term, nevertheless soil is also very fragile and can be damaged easily (i.e. compaction)

Agricultural and forest productivity and profitability depend on healthy soils

Biomass (crop and forest) production is supported by healthy soils, biodiversity promotes sustained food, fibre, fodder and timber production

Soil agenda in the EU



- **European Joint Programming in Soil (EJP Soil)**
- **EU Soil Thematic Strategy (revised)**
- **EU Soil Observatory**
- **European Soil Data Centre (ESDAC)**
- **LUCAS soil monitoring system**

Goal: make 75 % of EU Soils healthy by 2030!

The urgency to act

Soils are threatened: **60-70% of all soils in Europe are unhealthy** due to current management practices;
Indirect effects of air pollution and climate change add to that pressure.

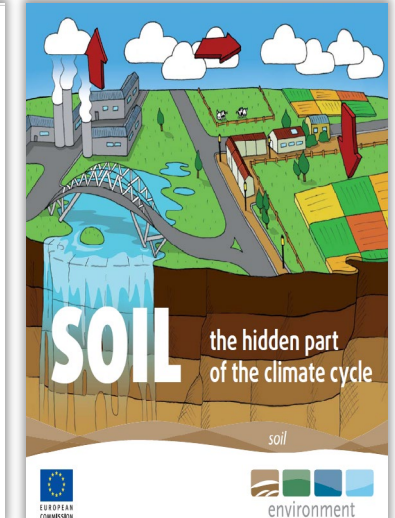
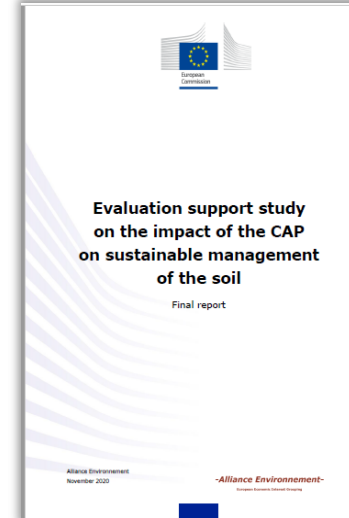
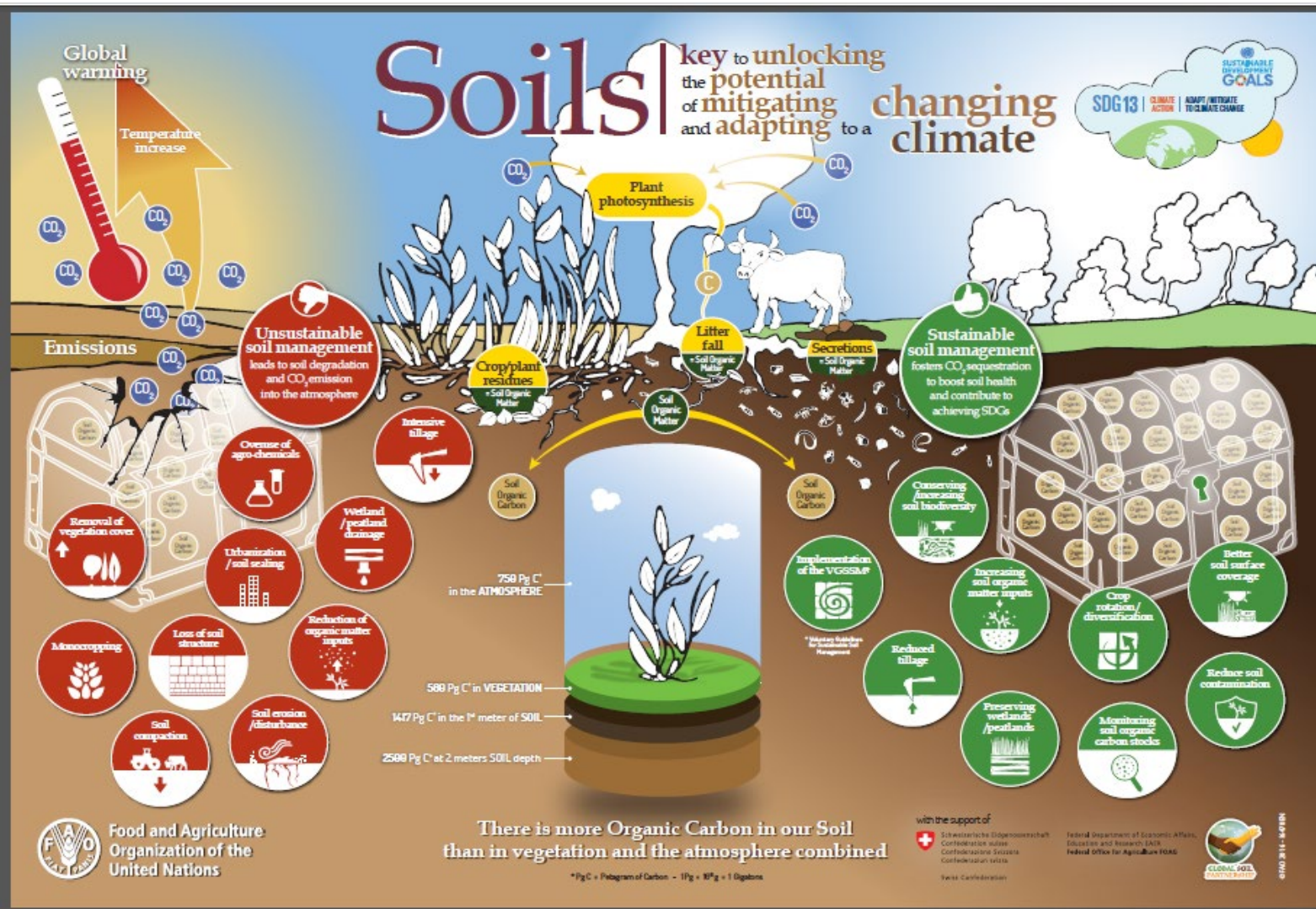
EU Examples:

- 2.8 million potential **contaminated sites**, but only 24% inventoried;
- 65-75% of agricultural soils with nutrient inputs at levels risking **eutrophication of soils and water** affecting biodiversity;
- Cropland soils **losing carbon** at a rate of 0.5% per year and 50% of peatlands drained and losing carbon
- 24% of land with **unsustainable water erosion rates**;
- 25% of land at High or Very High risk to **desertification** in Southern, Central and Eastern Europe in 2017
- The **costs associated with soil degradation in the EU exceed 50 billion € per year.**



Credit: "Caring for soil is caring for life" report








Soils: the best remedy to climate change



<https://op.europa.eu/en/publication-detail/-/publication/85bd465d-669b-11eb-aeb5-01aa75ed71a1/language-en>



Management practices for soil conservation

Low erosive		Medium erosive			High erosive		
0.05	0.15	0.20	0.22-0.25	0.30 -0.32	0.35	0.38	0.50
Permanent Grasslands	Other fodder areas (Alfa,etc)	Wheat, Barley	Olives, other Fruits..	Energy crop, sunflower	Sugar beets, Potatoes	Maize, Tobacco	
							

You will hear much more during the seminar

-65%	-12%	-20%	-25%	-10-15%(density)	-40% - 5%(slope)
Reduced Tillage	Plant Residues	Cover Crops	Stone walls	Grass margins	Contour farming
					

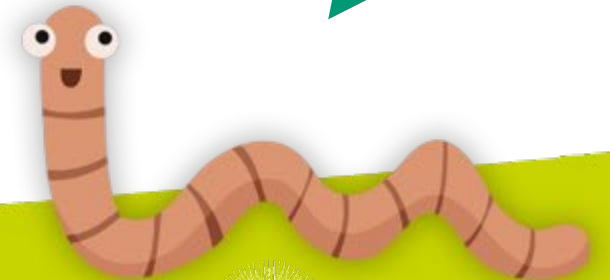
Credit:
Montanarella, 2020

Themes for discussion in this seminar

- **Soil productivity and nutrient cycling**
- **Soil carbon sequestration**
- **Soil water interface**



**They are
interrelated
and
complementary**



Can the soil maintain its ecosystem services and functions? YES but only through sustainable management

The “power” of fence

There is not a “fit for all” strategy.....it has to be locally tested and validated



No degradation

Degradation just started

It's all degraded

Sardinia, Italy, 2011
Photo: Zdruli

Can the soil maintain its ecosystem services and functions? YES but only through sustainable management

It's all about management: Farmers are at the centre!!!

WOCAT

Soil-centric approach to innovative farming

Organic Farming

Living Labs and Lighthouses

Conservation agriculture

Regenerative agriculture

Agro-ecology

Integrated Financing Strategies for SLM

Carbon Farming

Integrated soil fertility management

EverGreen agriculture

Reduced or No tillage

Payment for Ecosystem Services

Climate smart agriculture

Conservation tillage

Urea deep placement

Land Degradation Neutrality

Precision agriculture

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Thank you
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