Effect of desealing on soil quality

Webinar

«Sfide e prospettive della deimpermeabilizzazione dei suoli»

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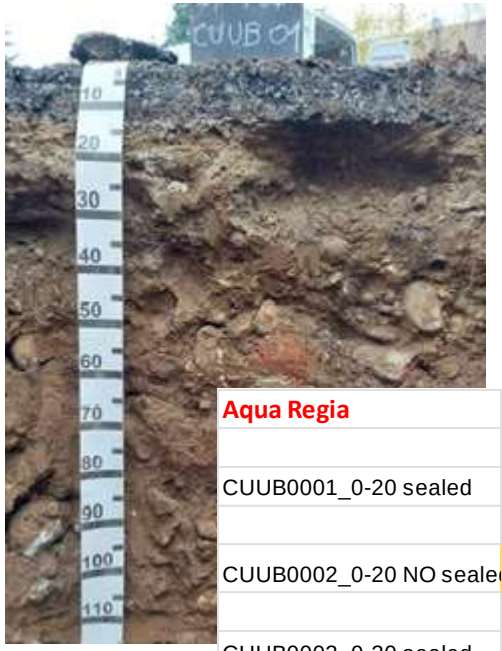
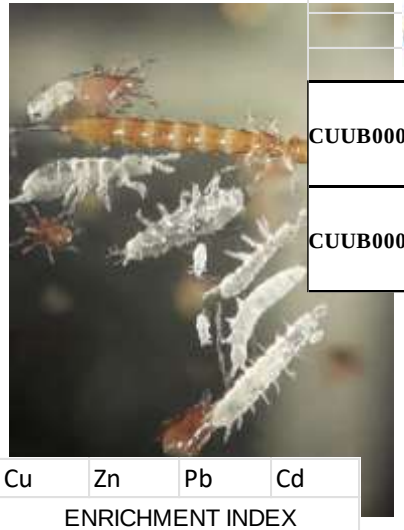
What does **soil quality** mean?

"The capacity of a soil to function within ecosystem and land-use boundaries to sustain biological productivity, maintain environmental quality, and promote plant and animal health" (Doran and Parkin, 1994, 1996)





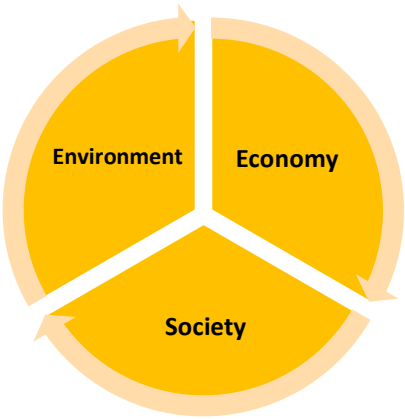
Aqua Regia	Cu	Zn	Pb	Cd
	ENRICHMENT INDEX			
CUUB0001_0-20 sealed	0,88	0,89	0,72	0,95
CUUB0002_0-20 NO seale	1,28	1,32	1,55	1,13
CUUB0003_0-20 sealed	0,53	0,57	0,63	0,75
CUUB0003_0-20 NO seale	1,17	1,31	1,40	1,06

crea ipla QBS-ar siss

	QBS indice	R1	R2	R3	TOT
CUUB0001	QBS-ar	50	31	40	81
	Classe	2	1	2	4
	QBS indice	R1	R2	R3	TOT
CUUB0002	QBS-ar	136	71	106	152
	Classe	5	4	5	5

Strongly connected to FUNCTION or USE

ECOSYSTEM SERVICES



Chemical
Biological
Physical

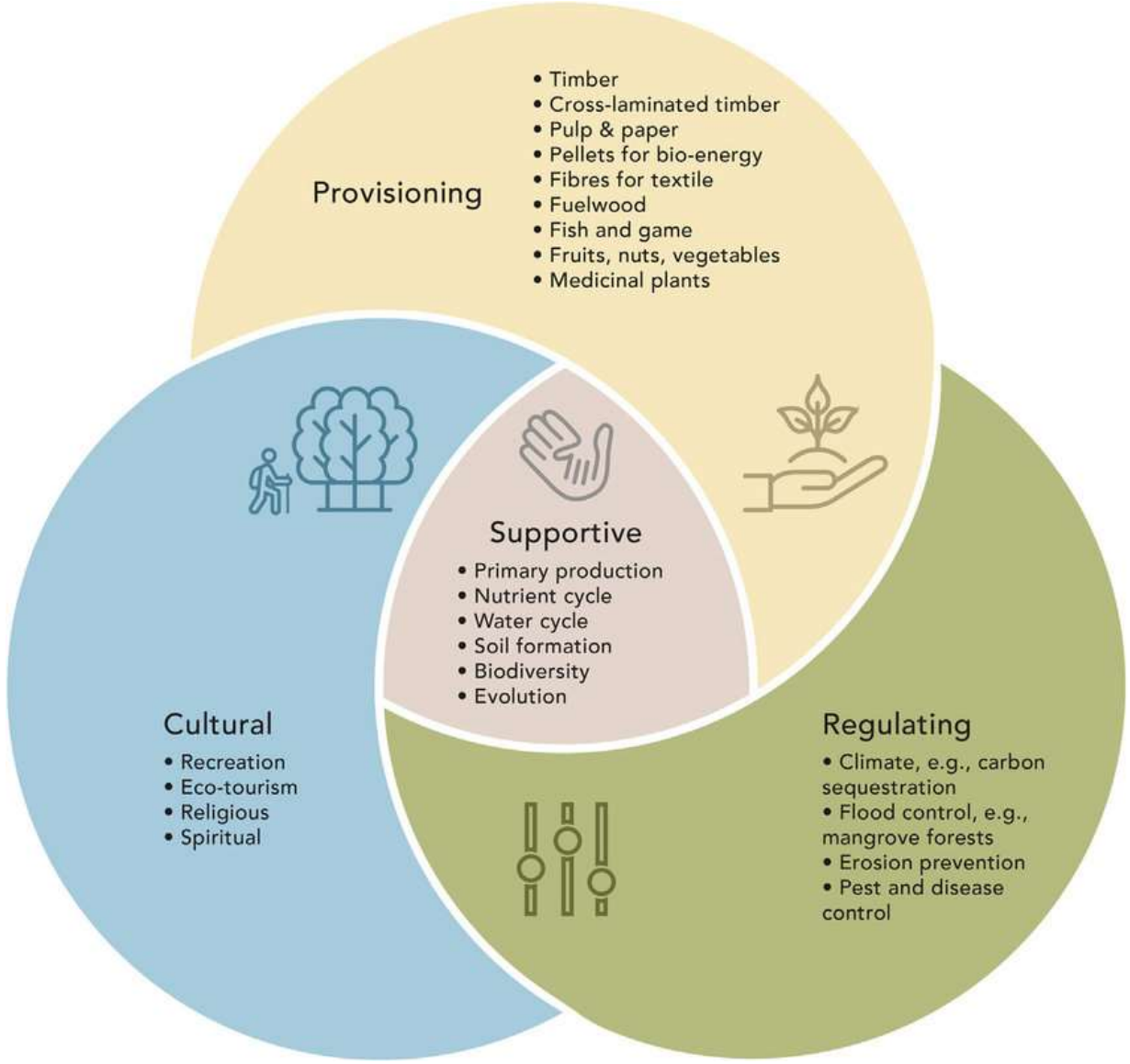
INDICATORS

Cation exchange capacity
Soil depth
Soil fauna biodiversity
Particle size composition
Coarse elements
Heavy metal pollution
Organic matter/organic C
Root limitation factor

What are ecosystem services?

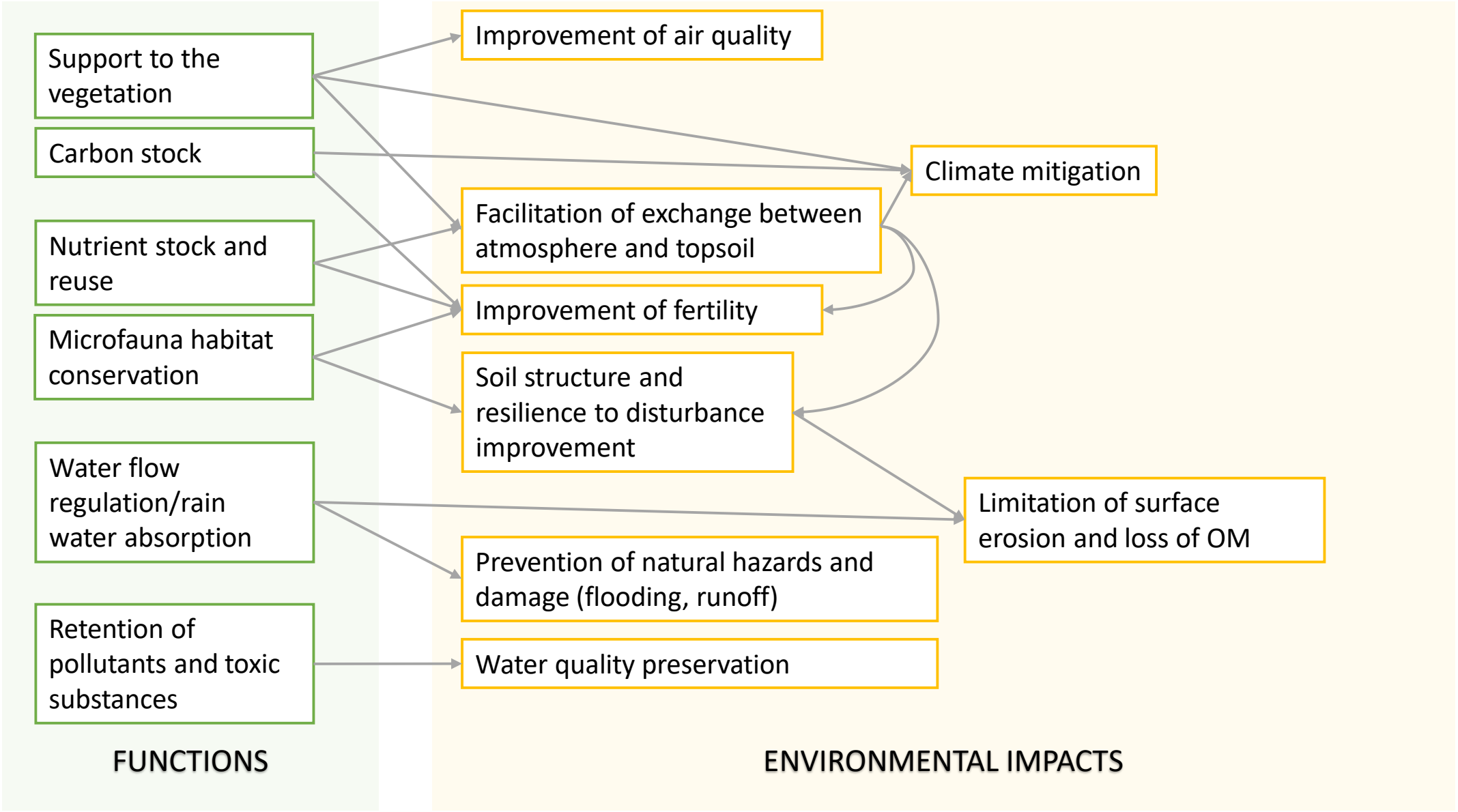
SEs are the benefits we get from natural ecosystems.

- Support: soil development, oxygen production, pollination
- Supply: food, clean water, fuel, raw materials
- Regulation: climate and hydrogeological risk mitigation, habitat conservation, erosion prevention
- Cultural/recreational value: landscape, spiritual value, recreational and sporting potential



Many of these are provided by soil

Soil ecosystem services



Soil ecosystem services: **sealing impact**

Compaction

Soil sealing (asphalting, tiling)

Soil system insulation

Reduction in the intake of:
- Organic substance
- Rain waters
- Nutrients
- Biotic organisms

Soil structure weakening

Heavy metal and other pollutant storage

Support to the vegetation

Carbon stock

Nutrient stock and reuse

Microfauna habitat conservation

Water flow regulation/rain water absorption

Retention of pollutants and toxic substances

FUNCTIONS

Improvement of air quality

Climate mitigation

Facilitation of exchange between atmosphere and topsoil

Improvement of fertility

Soil structure and resilience to disturbance improvement

Limitation of surface erosion and loss of SO

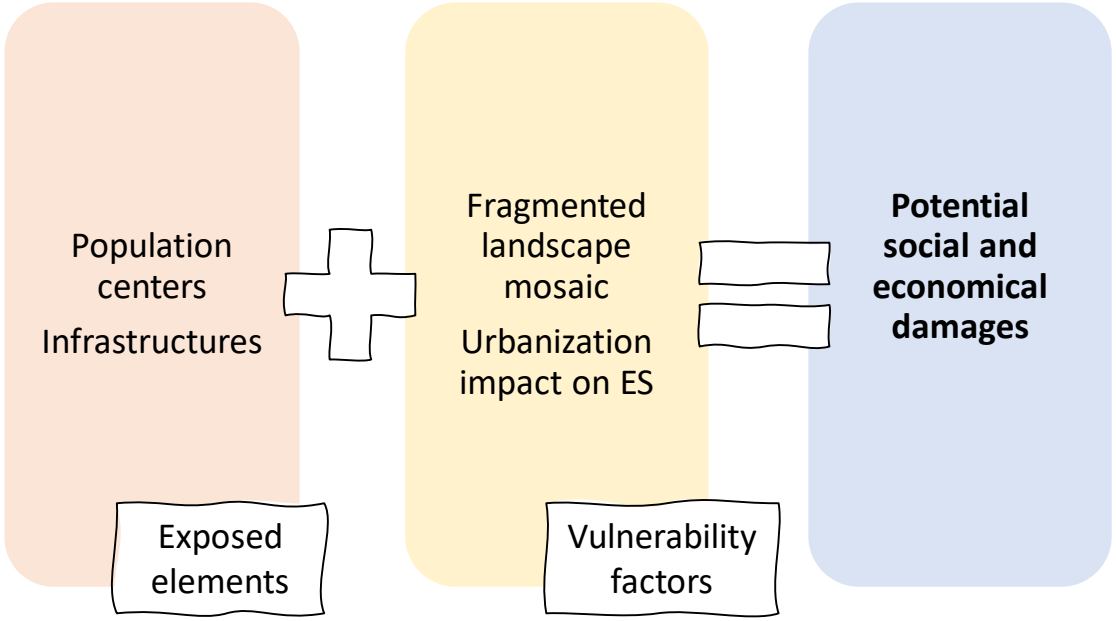
Prevention of natural hazards and damage (flooding, runoff)

Water quality preservation

ENVIRONMENTAL IMPACTS

Desealing: why and where

Vulnerability of urban centers:



Pilot Nature Based solutions

- Phytoremediation planting systems (soil and water filter)
- Urban afforestation (urban «heat island» mitigation, GHG removal)
- Hygrophilous buffer bands (reinforcement of river banks)
- Green roof (improved air quality, sound and heat insulation)

Desealing is not the final step of renaturalization: removal of waterproof surface has to be followed by restoration of the soil:

- soil input
- microorganisms inoculation
- chemical remediation
- drainage and permeability restoration