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Synergy of soil management with bioeconomy

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The EU Mission A Soil Deal for Europe

What this EU Mission deals with

The main goal of the Mission 'A Soil Deal for Europe' is to establish 100 living labs and lighthouses to lead the transition towards healthy soils by 2030.

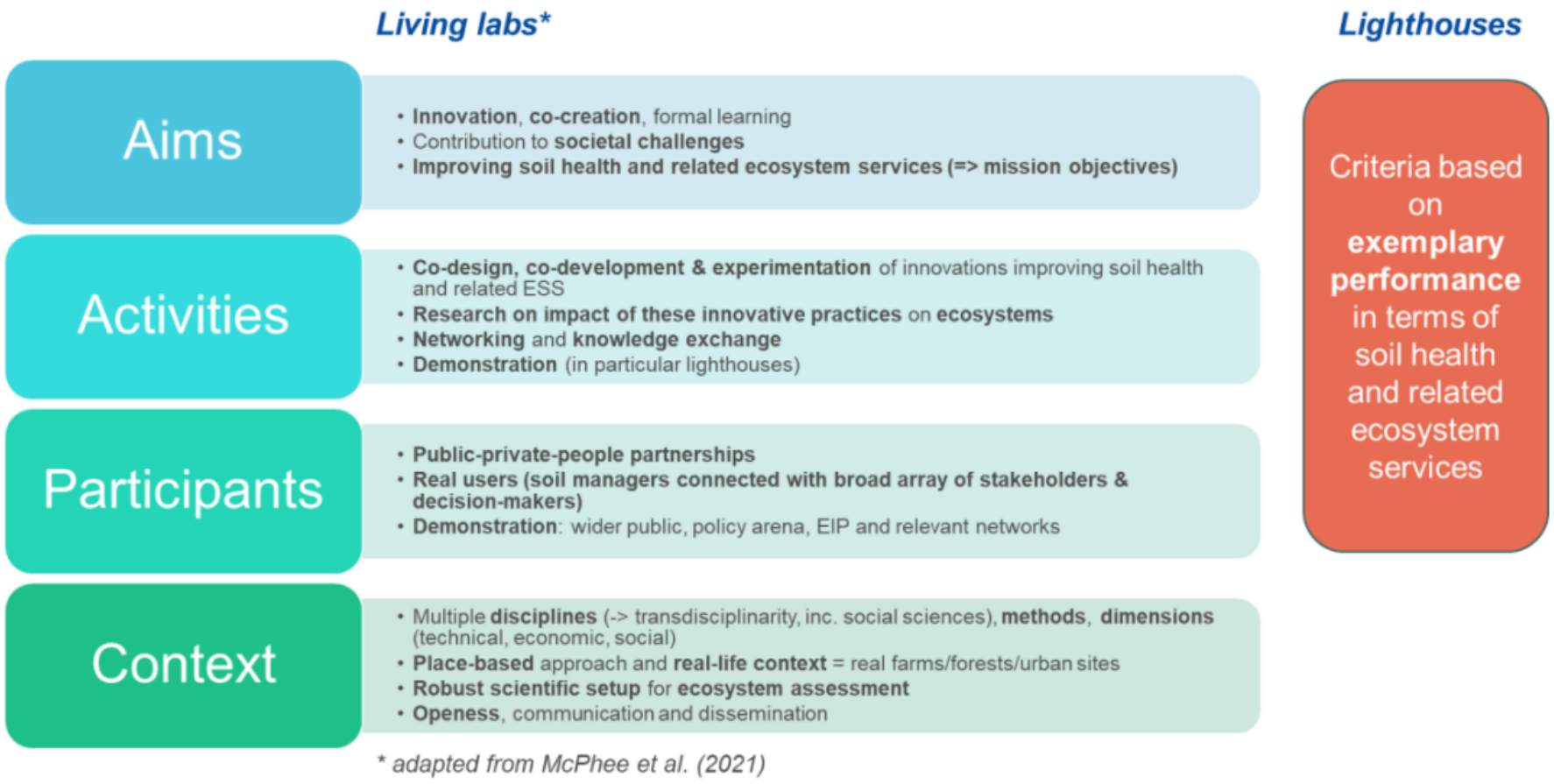
Life on Earth depends on healthy soils. Soil is the foundation of our food systems. However, it is estimated that between 60 and 70% of EU soils are unhealthy.

The Mission leads the transition towards healthy soils by:

- **funding** an ambitious **research** and **innovation programmes** with a strong social science component
- putting in place an effective network of **100 living labs** and **lighthouses** to co-create knowledge, test solutions and demonstrate their value in real-life conditions
- developing a harmonised framework for **soil monitoring** in Europe
- raising people's awareness on the vital importance of soils

The EU Mission A Soil Deal for Europe

Living labs and Lighthouses



The EU Mission A Soil Deal for Europe

The 8 objectives of the Soil Mission

1. Reduce desertification
2. Conserve soil organic carbon stocks
3. Stop soil sealing and increase re-use of urban soils
4. Reduce soil pollution and enhance restoration

5. Prevent erosion
6. Improve soil structure to enhance soil biodiversity
7. Reduce the EU global footprint on soils
8. Improve soil literacy in society

Soil – bioeconomy synergies

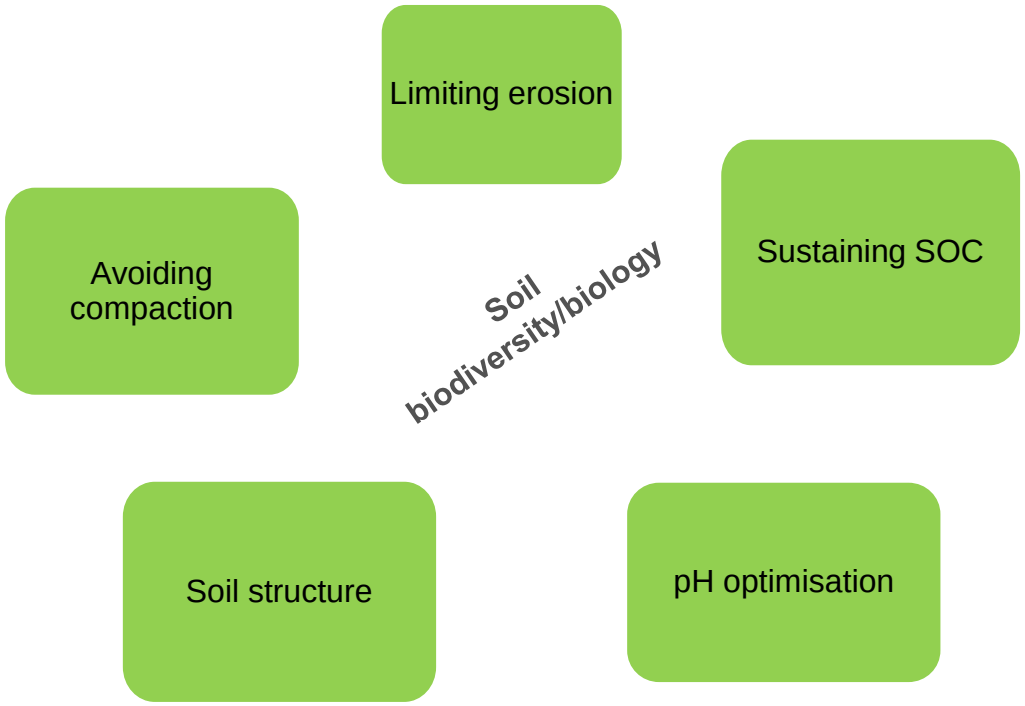
Circular bioeconomy

- Optimized resource management to close nutrient, energy and biomass circles
- Innovative technologies for processing and upgrading biological resources to produce the carbon (C)-based products and services demanded by society without fossil carbon
- Crop residues to produce soil amendments and through pyrolysis, gasification, torification, fermenatation and co-products (bio-oil, syngas, biogas, bioethanol)

Phosphorus recovery need

- About 85-90% of phosphate rock mined in the world is intended for food production (the rest is used for industrial applications such as the production of detergents).
- It is estimated that at the current rate of use, the phosphorus resources may be sufficient for 100 - 470 years (FAO, 2008).
- This means that the total global phosphorus resources are very limited. Estimates indicate that the increase in phosphorus demand will reach a global peak around 2030.
- Therefore, phosphorus has been included in the list of critical raw materials by the European Commission. At the same time, the degree of phosphorus recycling is still low.

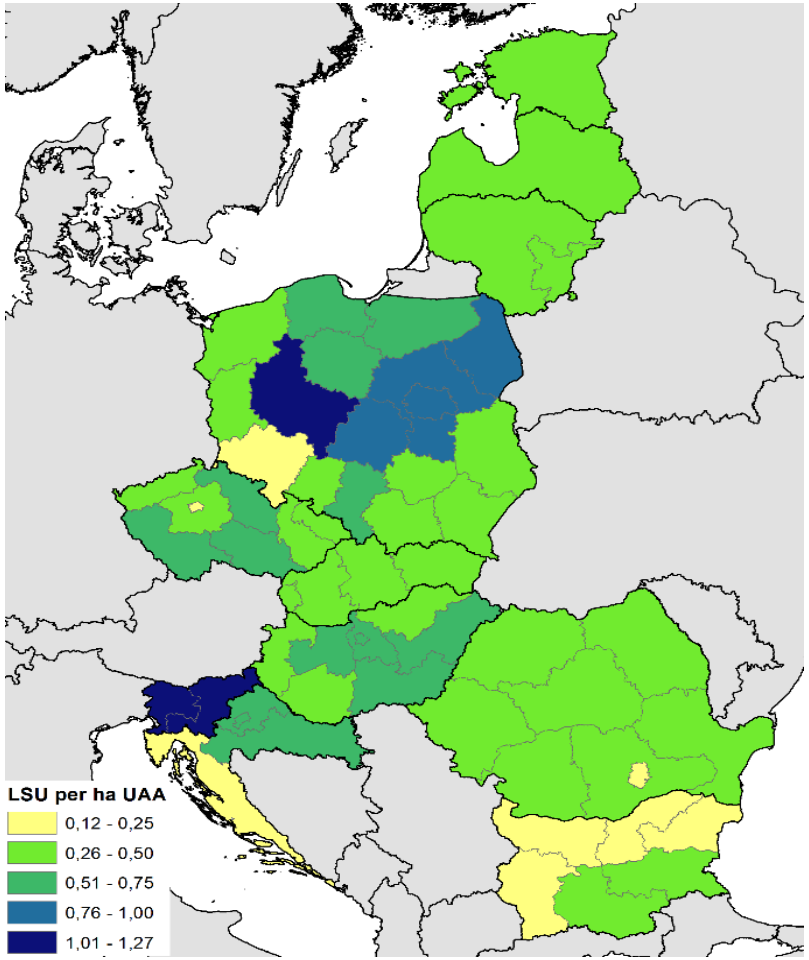
Soil a an organism



SOC in drought prevention

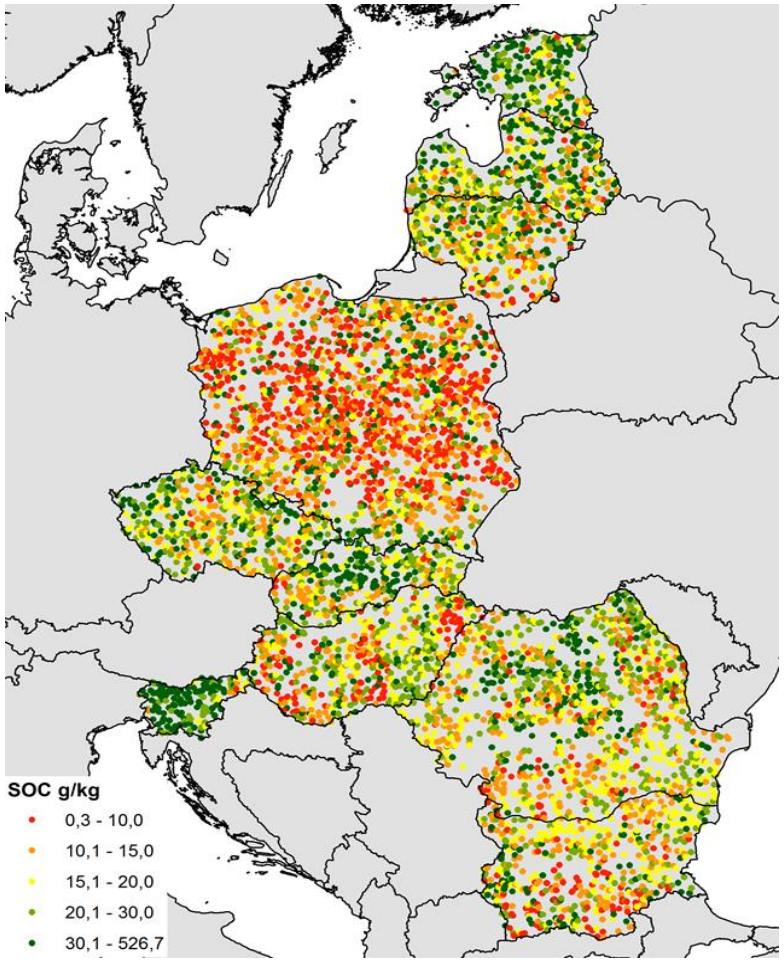
- ❑ Retention properties of the organic matter
- ❑ Positive effect on soil structure
- ❑ Greater resistance to compaction
- ❑ Positive effect on the activity of microorganisms that support plants during periods of drought (production of polysaccharides - soil structure, synthesis of deaminases, production of IAA and proline, improvement of water circulation by fungi

Manure availability



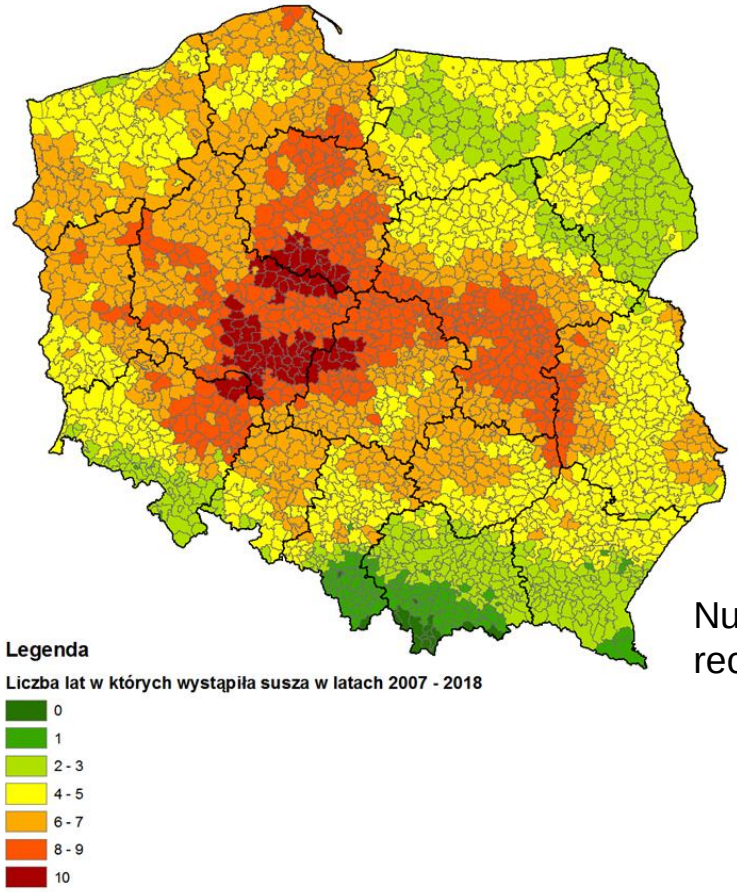
Regional diversity of livestock density across BioEAST countries (based on EUROSTAT)

Soil organic carbon



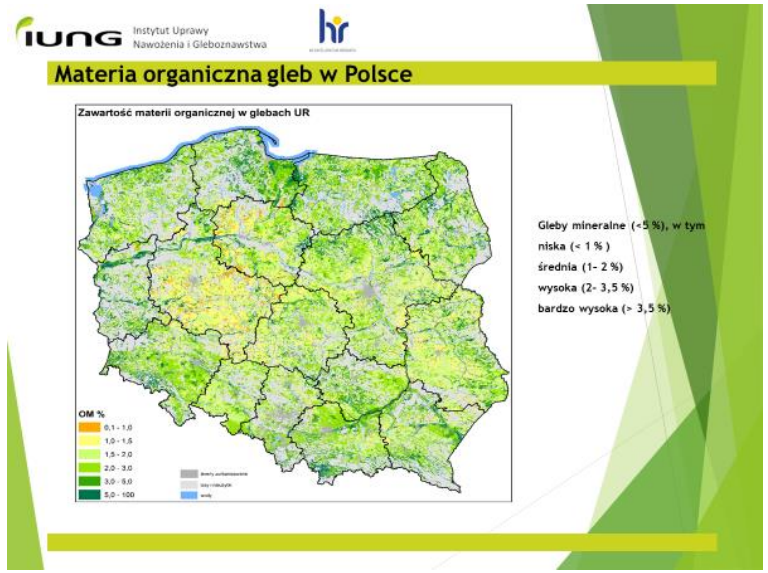
Soil organic carbon in soils of BioEAST coutries – based on LUCAS soil monitoring database

Drought challenge



Number of years with recorded drought

The share of farms affected by drought in the most unfavorable growing seasons is extremely large, and the share of municipalities experiencing drought reaches 90% in critical periods. This means that up to 9 million hectares may be affected by drought in some years



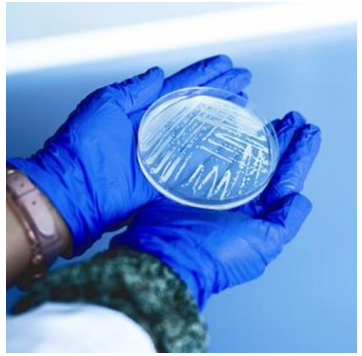
SOM content

The idea of enhanced biofertilisers

Stabilised organic waste, e.g compost

Preselected bacteria strains

Strain origin:
- ❑ Organic farming soils
- ❑ Reclaimed smelter waste deposit



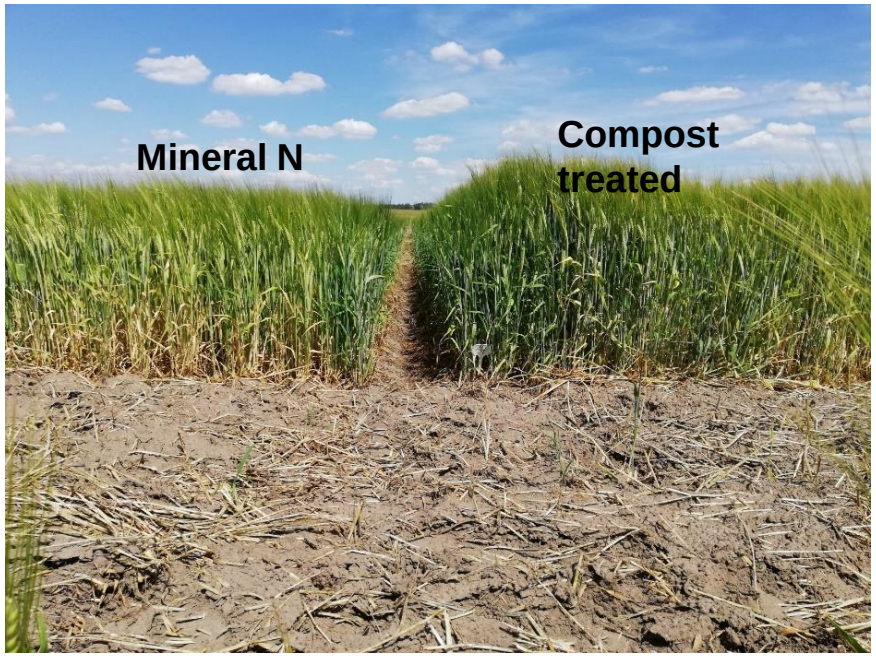
Humic acids, water retention
plant resistance promotion

Plant resistance, P solubilisation, contaminant decomposition

Intelligent bio-technologies based on NBS to combat drought

www.inno-mik.pl

Compost in agriculture and soil remediation



Interreg South Baltic project

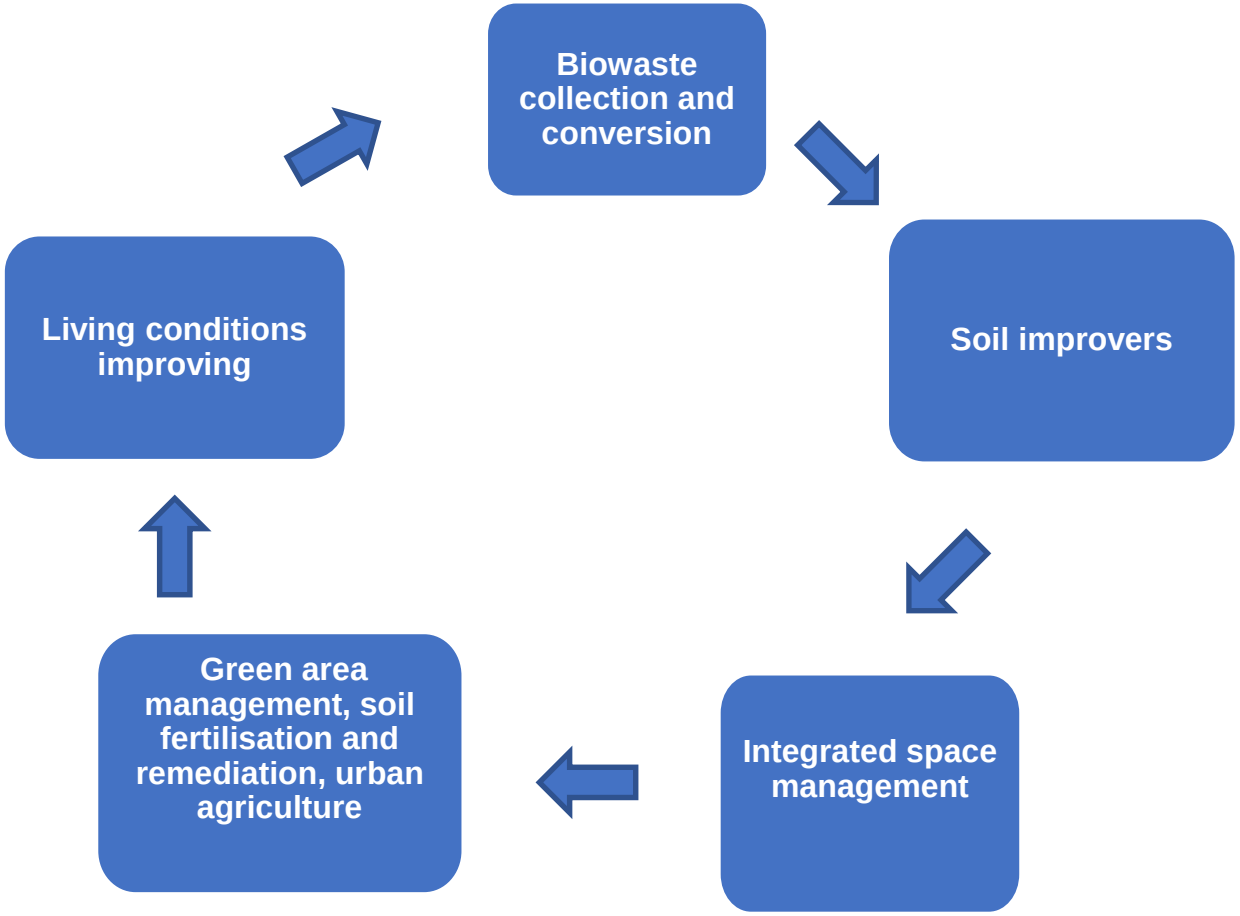
Smelter waste deposits, contaminated soils

Nutrients in biowaste

- Compost
- Digestate
- Sewage sludge
- Biochar
- RENURE – nutrients recovered from manure
- Struvite (magnesium ammonium phosphate) - inorganic phosphate mineral

Assuming the average sewage sludge production at the level of 700 thousand tons, at the national level they contain almost 18.5 thousand. tons of N and 13 thousand tons of P.
For example, this amount could replace mineral P fertilizers on an area of 618 thousand hectares of agricultural land (6.2% of the total arable land area)

Urban waste management for fertilization and reclamation



Horizon Europe – Soil Mission project

NBSoil - Nature Based Solutions for Soil Management

Duration 48 months: 1 Dec. 2022 – 30 Nov. 2026

Coordination: Institute of Soil Science and Plant Cultivation – State Research Institute

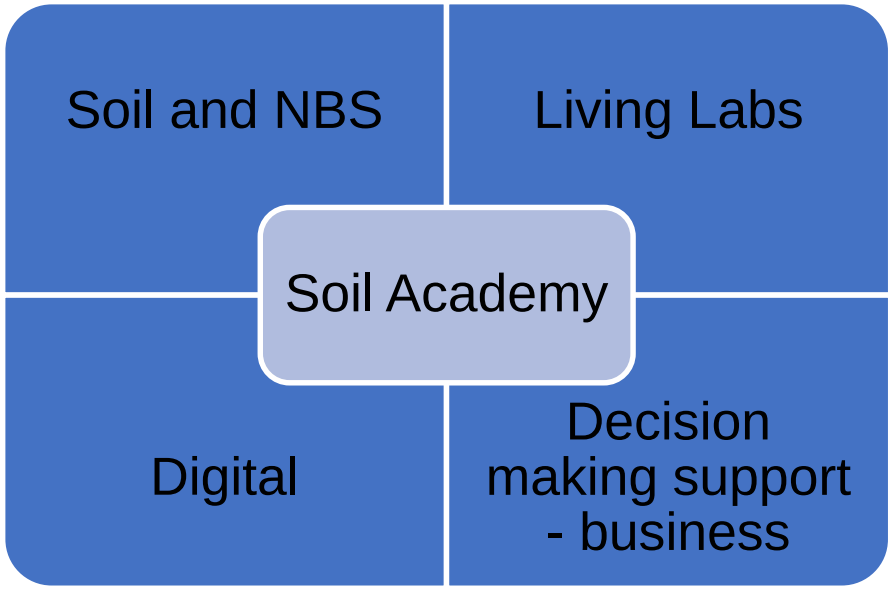
Coordinator - Grzegorz Siebielec gs@iung.pulawy.pl,

Project Manager – Javier Montellano javier.montellano.lopez@gmail.com

Partners: BOKU, BC3, AGRISAT, REVOLVE, CDR, CNA, ITAP, CAFS, ALCN, ILOT, UNITO, AERES, IUCN, FIBL, Soil Association

NBSOIL(Nature Based Solutions for Soil Management) is a four-year project which aims to co-create and test a learning pathway for existing and aspiring soil advisors

Soil Academy advanced modules – central point of the learning programme



Thank you for your attention!

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