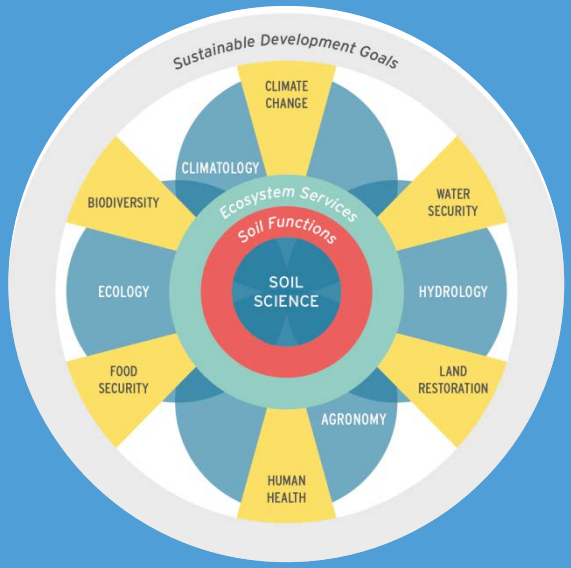
Land and soil in the Sustainable Development Goals

Saskia Keesstra

19 September 2019



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SUSTAINABLE DEVELOPMENT GOALS:

1 UNIVERSAL AGENDA, 17 GOALS

BUT:

FORUM paper: The significance of soils and soil science towards realization of the UN sustainable development goals (SDGs)
Keesstra, S.D., Bouma, J., Wallinga, J., Tittonell, P., Smith, P., Cerdà A., Montanarella, L., Quinton, J., Pachepsky, Y., van der Putten, W.H, Bardgett, R.D, Moolenaar, S., Mol, G., Fresco, L.O.

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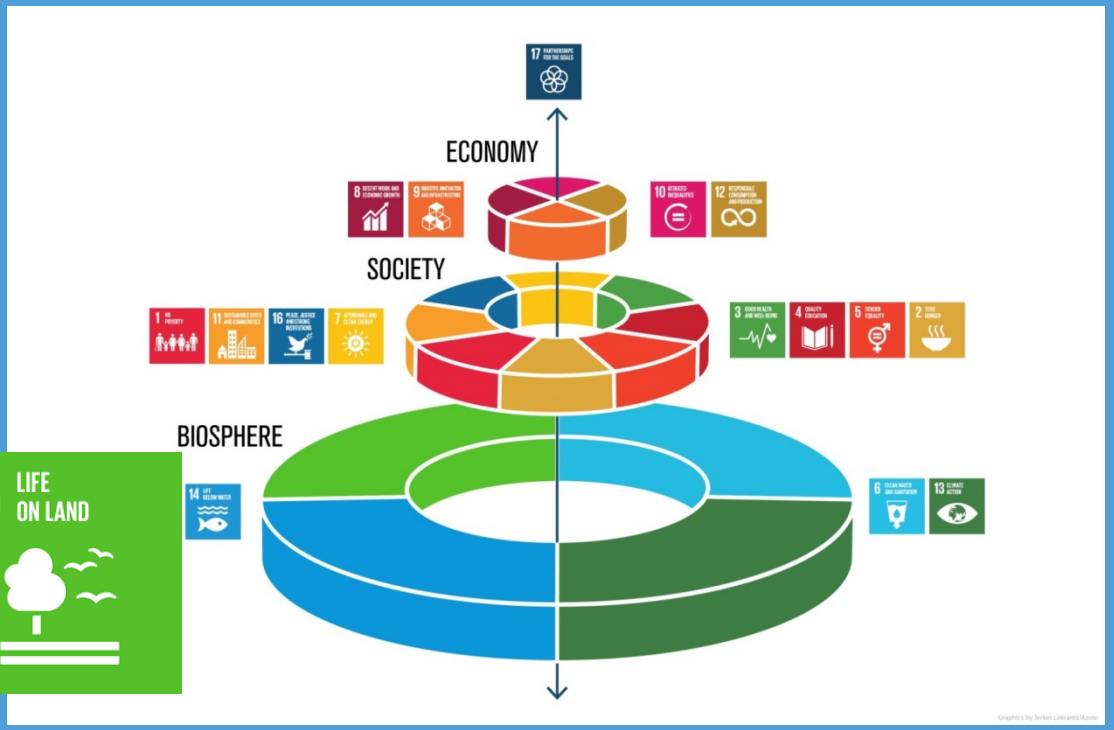
2030 is tomorrow!

Growing pressure on land and ecosystem services:

- Growing population and middle class
- Growing needs for natural resources
- Climate change



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2030 is tomorrow!

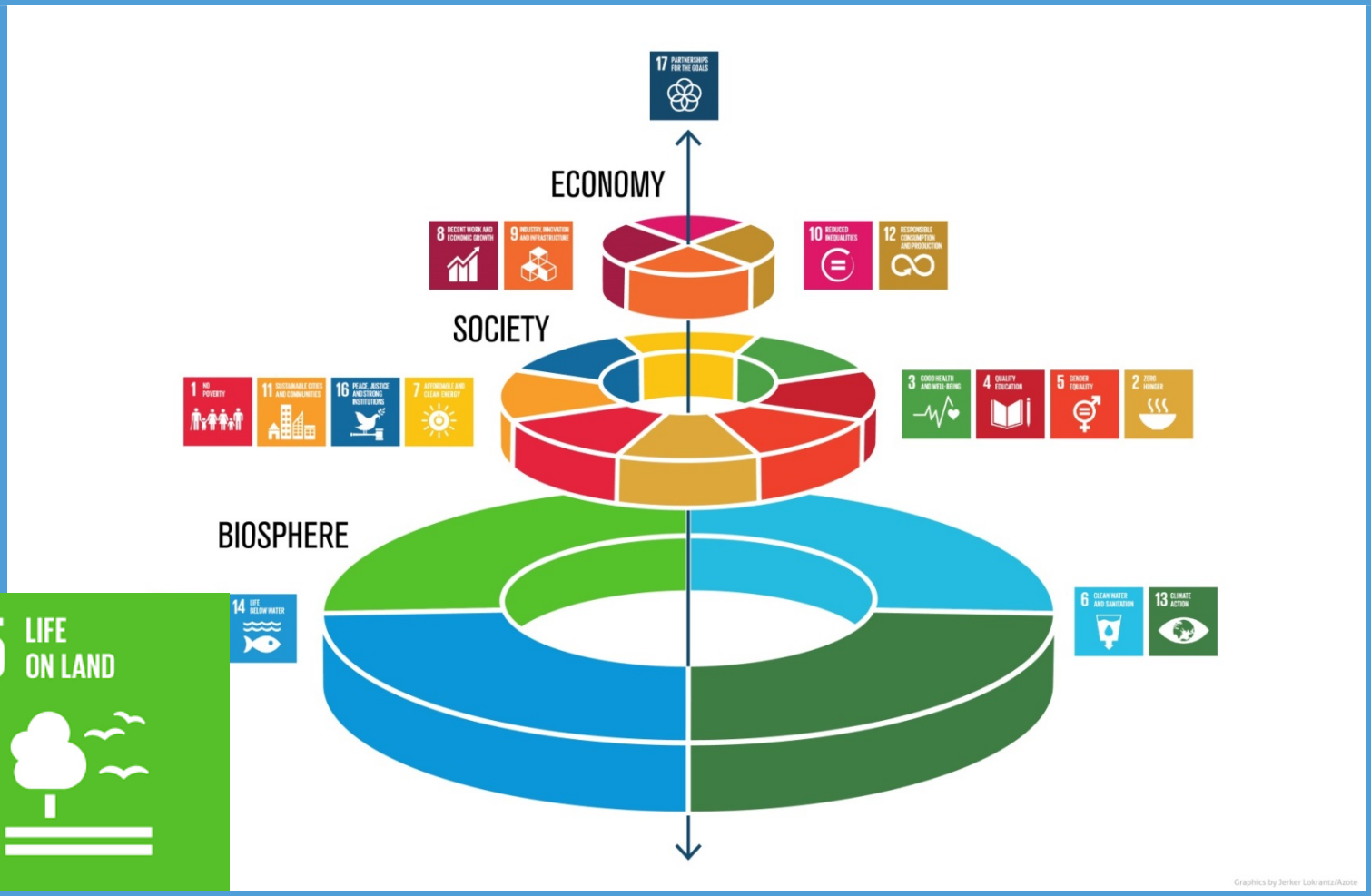
- Political agenda, policy processes and bio-physical processes not at the same pace
- Political agenda: SDGs achieved in 2030.
- BUT: after almost 5 years: limited implementation of SDGs at national, European and global level

What do we need to solve this problem

- Create ambition to protect and restore the eco- and geosystem services the environment provides
- Develop **economic** measuring and modelling tools
- Create economical sustainable solutions

  based in science: Sustainable robust economy

Systems approach: Soil-sediment-water system: basis for solutions for societal issues



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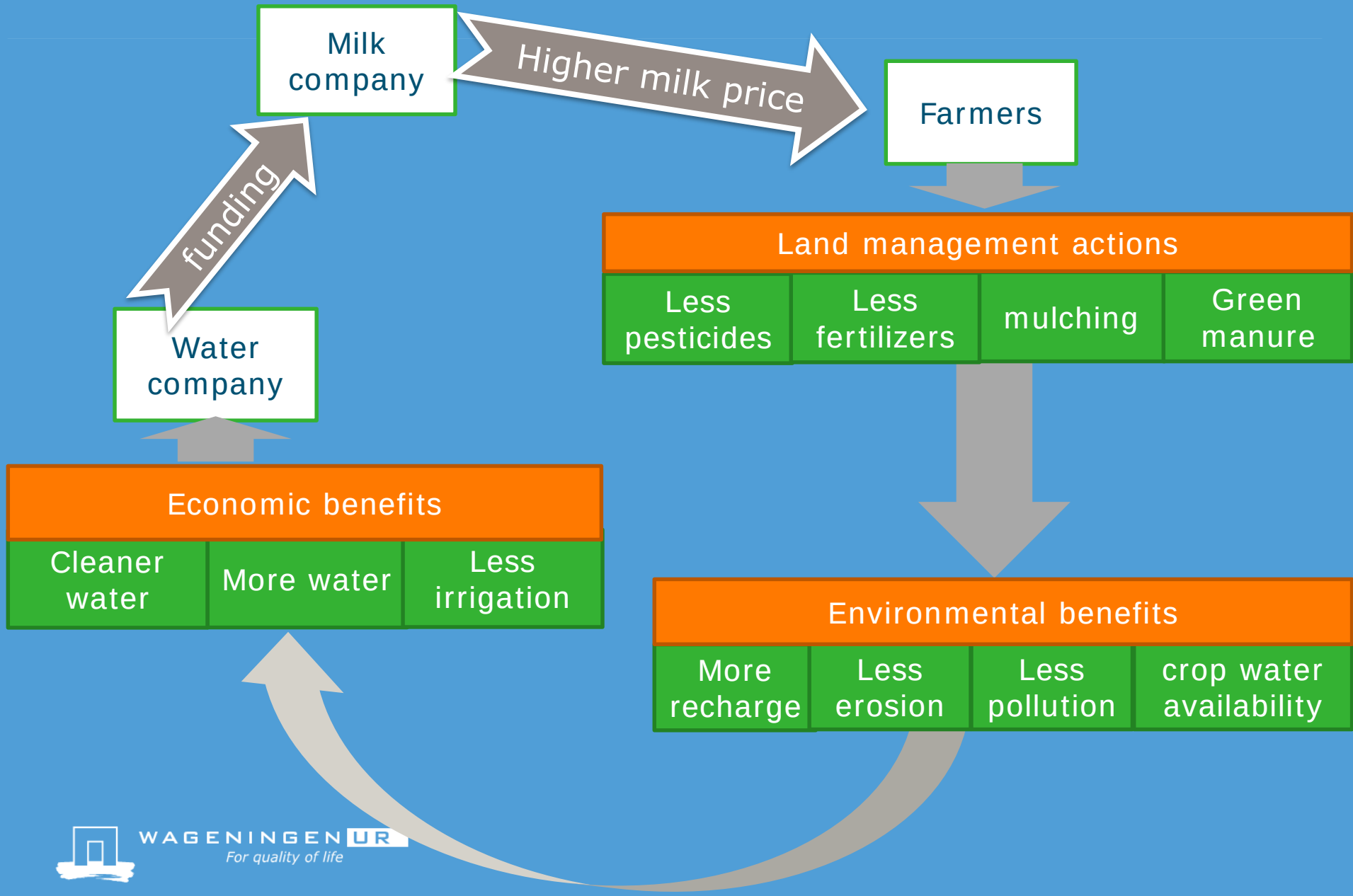
Example: new sustainable robust economy



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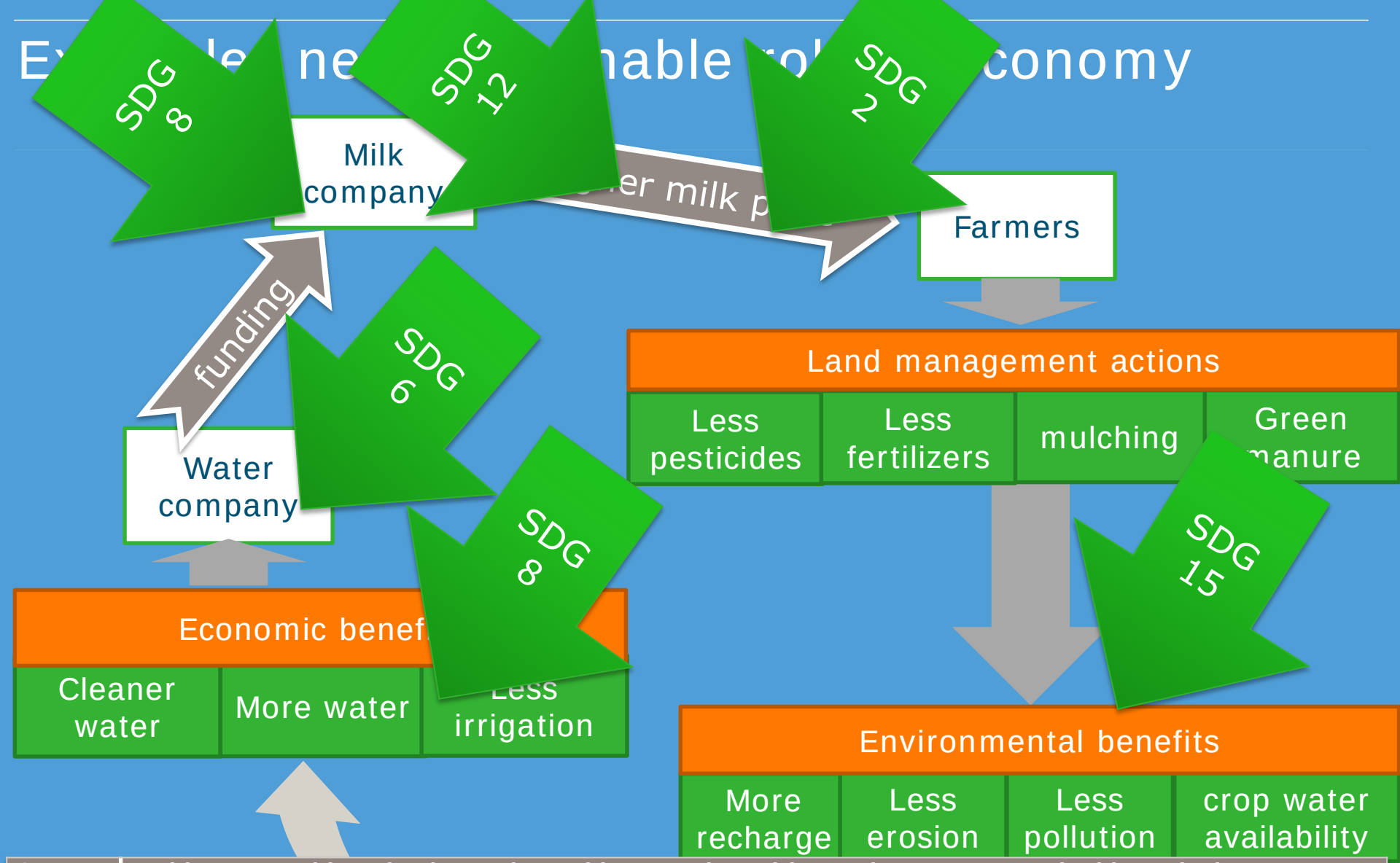
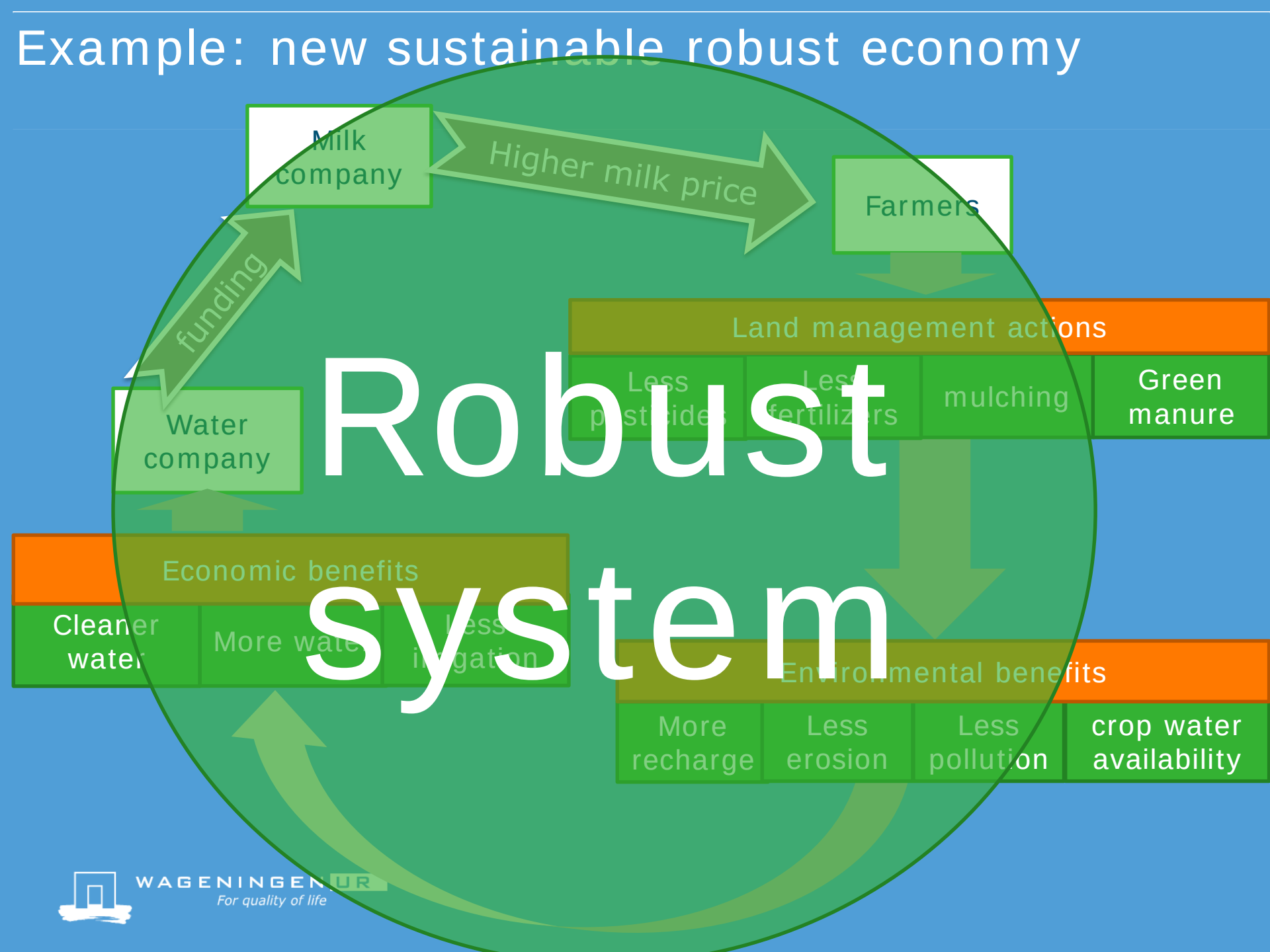
Ex[illegible] ne[illegible]nable [illegible]conomy



2	**End hunger, achieve food security and improved nutrition and promote sustainable agriculture**
6	Ensure availability and sustainable management of water and sanitation for all
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work
12	Ensure sustainable consumption and production patterns
13	Take urgent action to combat climate change and its impacts
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Example: new sustainable robust economy



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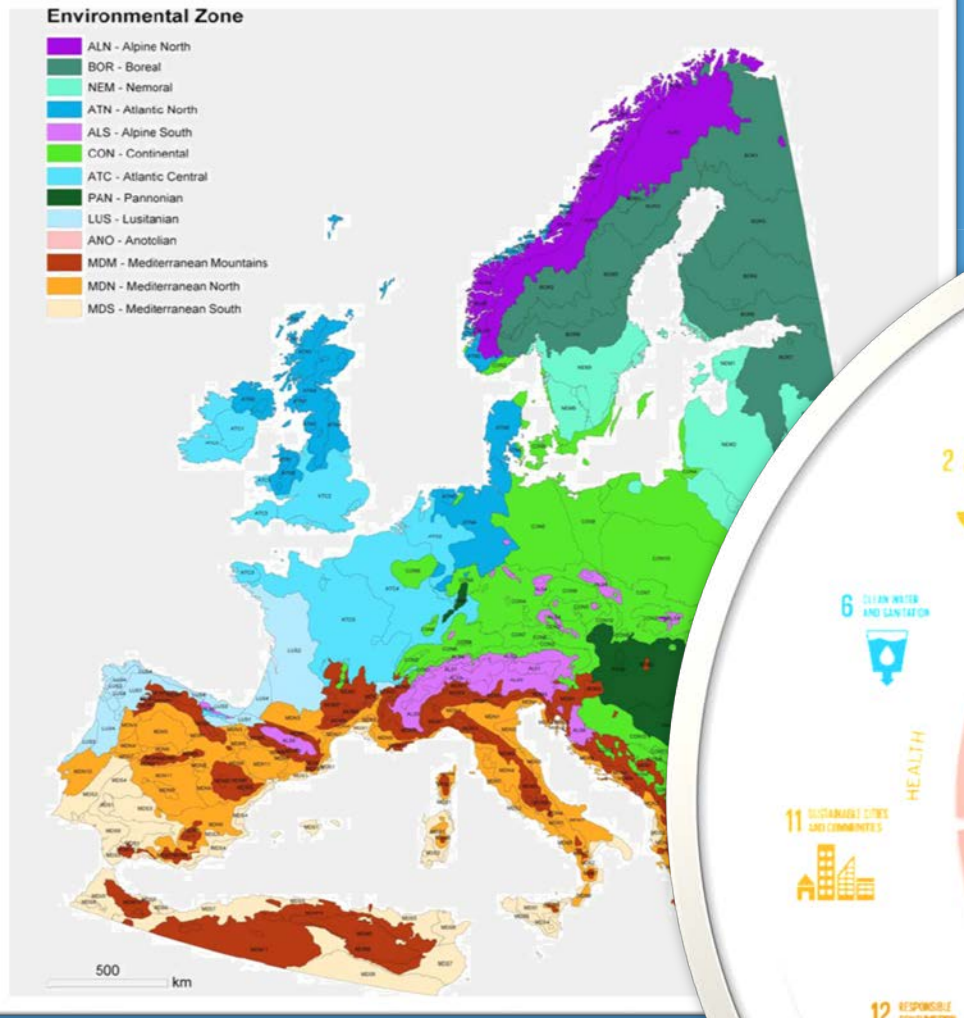

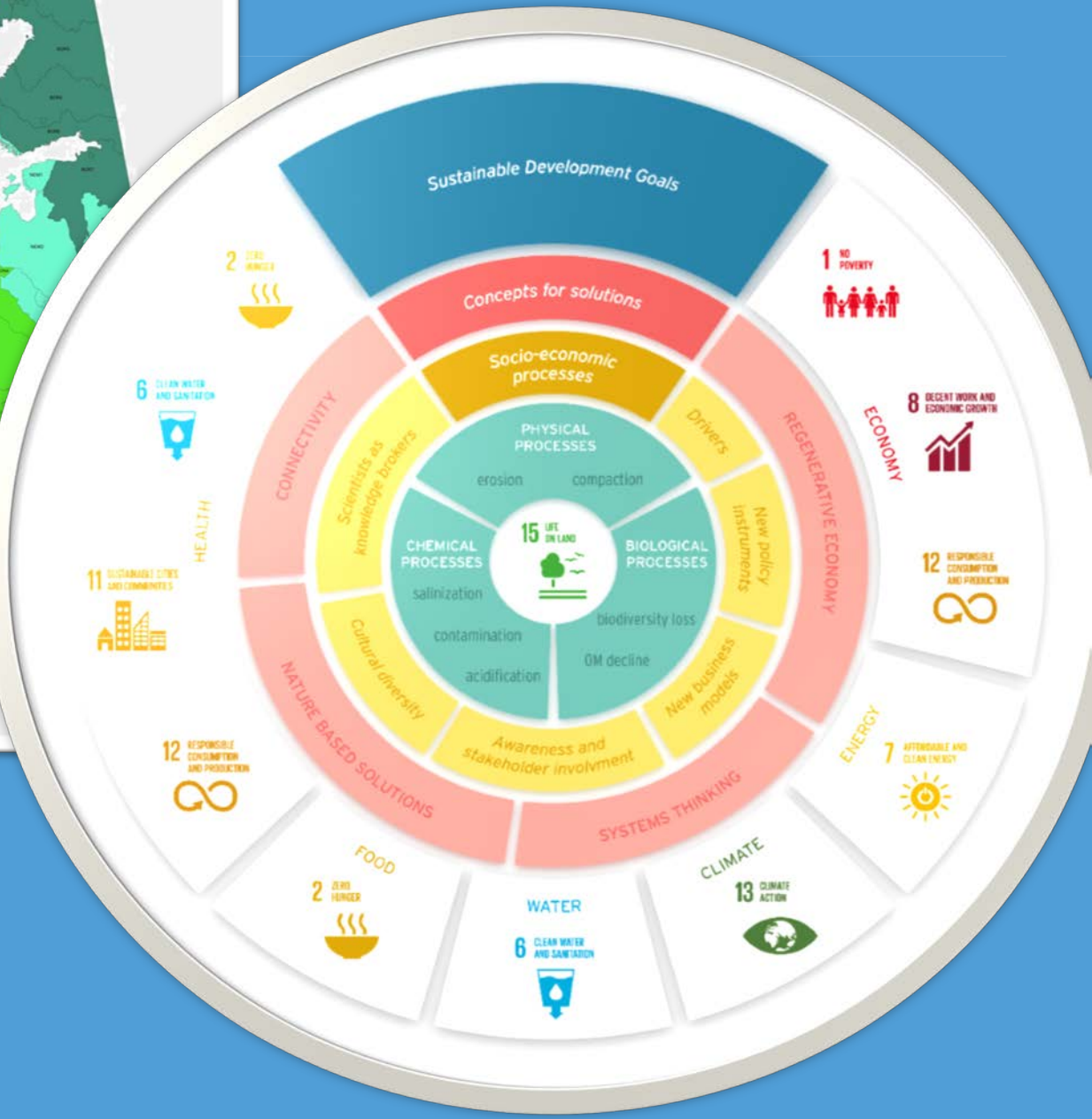

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European Joint Program SOIL: Towards climate-smart sustainable management of agricultural soils

Keesstra, S.D.[1,2], Visser, S.M.[3], NiChoncubhair O.[4], Mulder, V.L.[5], Constantini, E.[6], Priori, S.[6], Sousanna, J.F.[7], Kuikman, P.[1], Olesen, J.[8], Barron, J.[9], Kotzia, K.[10], Halberg., N[8], Borchard, N.[11], Zechmeister-Boltenstern, S. [12], Chenu, C[7].

A close up of a desert

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AIM

- **The main aim of the EJP SOIL is to construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management.** One important aspect of agricultural soil management to be addressed in the EJP SOIL is to strengthen the European research community on agricultural soil management, through a concerted alignment of research, training and capacity building; and co-construct with stakeholders a roadmap for agricultural soil research;

EJP SOIL consortium

24 countries, 26 partners

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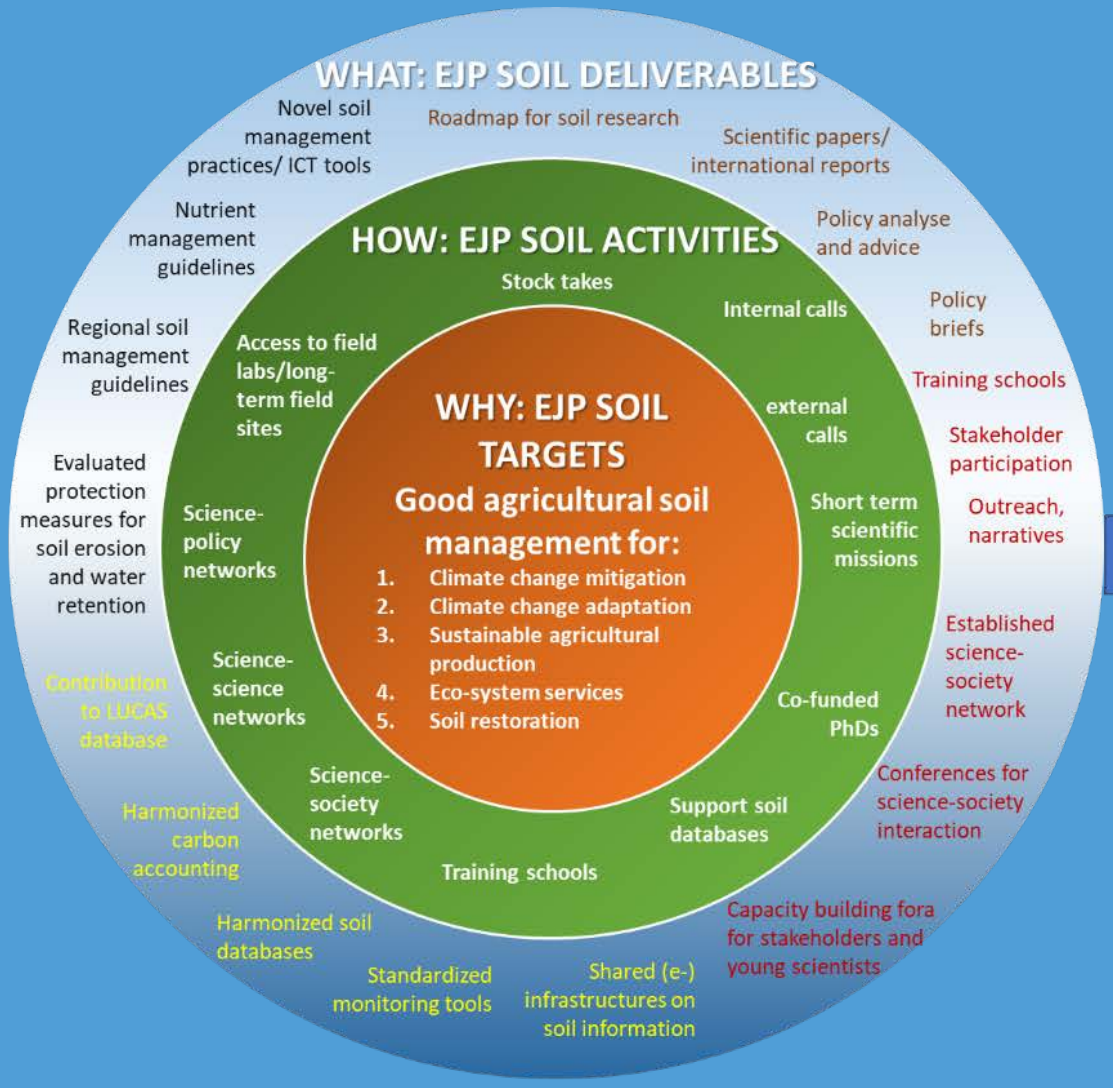

IMPACTS of EJP SOIL

1. Understand soil management impacts on:
   - climate adaption and mitigation (soil carbon sequestration)
   - Sustainable agricultural production
   - Land and soil degradation
2. Understand how carbon sequestration contributes to regional CC mitigation
3. Establish soil networks and build capacity
4. Harmonize soil information and support international reporting
5. Foster adoption of sustainable soil management
6. Develop region and context-specific fertilization practices

HELPS TO IMPLEMENT & REALIZE

- CAP
- CLIMATE TARGETS
- SDGs (2, 13, 15)

Support farmers in their role as stewards of land and soil resources

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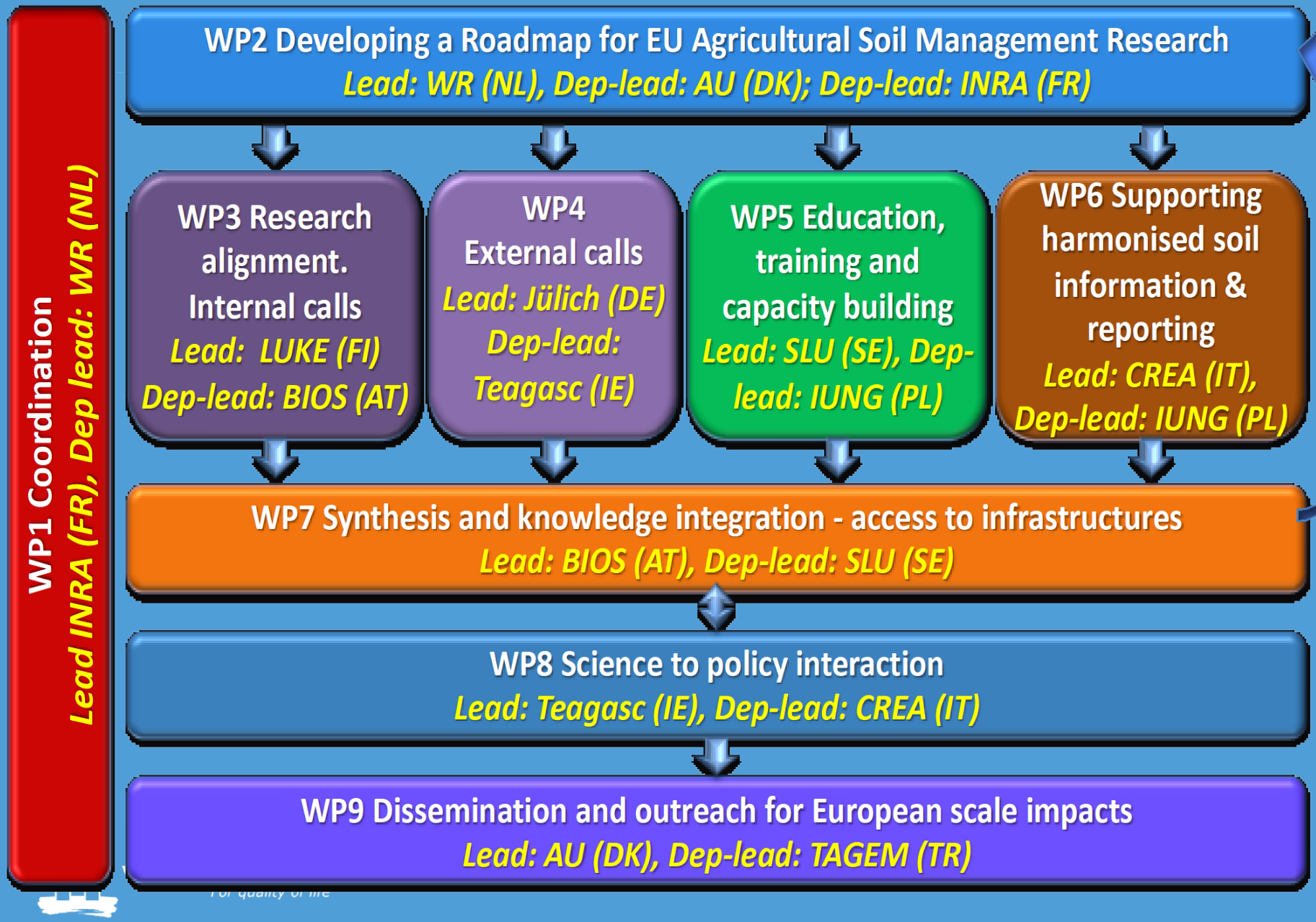
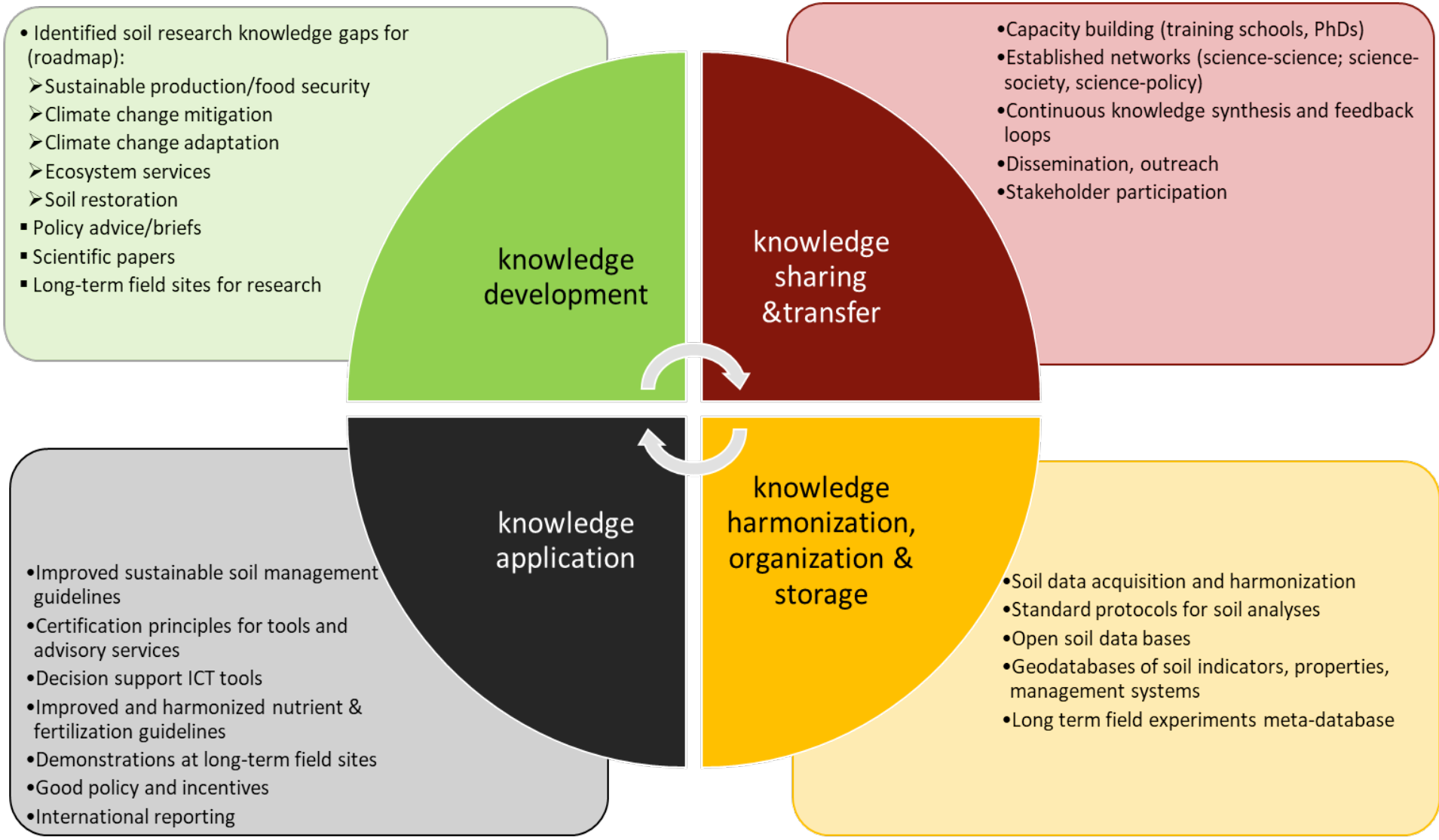

WP1 Coordination
Lead INRA (FR), Dep lead: WR (NL)
WP2 Developing a Roadmap for EU Agricultural Soil Management Research
Lead: WR (NL), Dep-lead: AU (DK); Dep-lead: INRA (FR)
WP3 Research alignment. Internal calls
Lead: LUKE (FI)
Dep-lead: BIOS (AT)
WP4 External calls
Lead: Jülich (DE)
Dep-lead: Teagasc (IE)
WP5 Education, training and capacity building
Lead: SLU (SE), Dep-lead: IUNG (PL)
WP6 Supporting harmonised soil information & reporting
Lead: CREA (IT), Dep-lead: IUNG (PL)
WP7 Synthesis and knowledge integration - access to infrastructures
Lead: BIOS (AT), Dep-lead: SLU (SE)
WP8 Science to policy interaction
Lead: Teagasc (IE), Dep-lead: CREA (IT)
WP9 Dissemination and outreach for European scale impacts
Lead: AU (DK), Dep-lead: TAGEM (TR)


• Identified soil research knowledge gaps for (roadmap):
➢Sustainable production/food security
➢Climate change mitigation
➢Climate change adaptation
➢Ecosystem services
➢Soil restoration
▪ Policy advice/briefs
▪ Scientific papers
▪ Long-term field sites for research
knowledge development
•Capacity building (training schools, PhDs)
•Established networks (science-science; science-society, science-policy)
•Continuous knowledge synthesis and feedback loops
•Dissemination, outreach
•Stakeholder participation
knowledge sharing &transfer
knowledge application
•Improved sustainable soil management guidelines
•Certification principles for tools and advisory services
•Decision support ICT tools
•Improved and harmonized nutrient & fertilization guidelines
•Demonstrations at long-term field sites
•Good policy and incentives
•International reporting
knowledge harmonization, organization & storage
•Soil data acquisition and harmonization
•Standard protocols for soil analyses
•Open soil data bases
•Geodatabases of soil indicators, properties, management systems
•Long term field experiments meta-database

Connect to society

- National Hubs
- Workshops in all MSs:
  - Aspirational targets
  - Knowledge availability and use
  - Barriers and opportunities
- Roadmap for soil research in Europe

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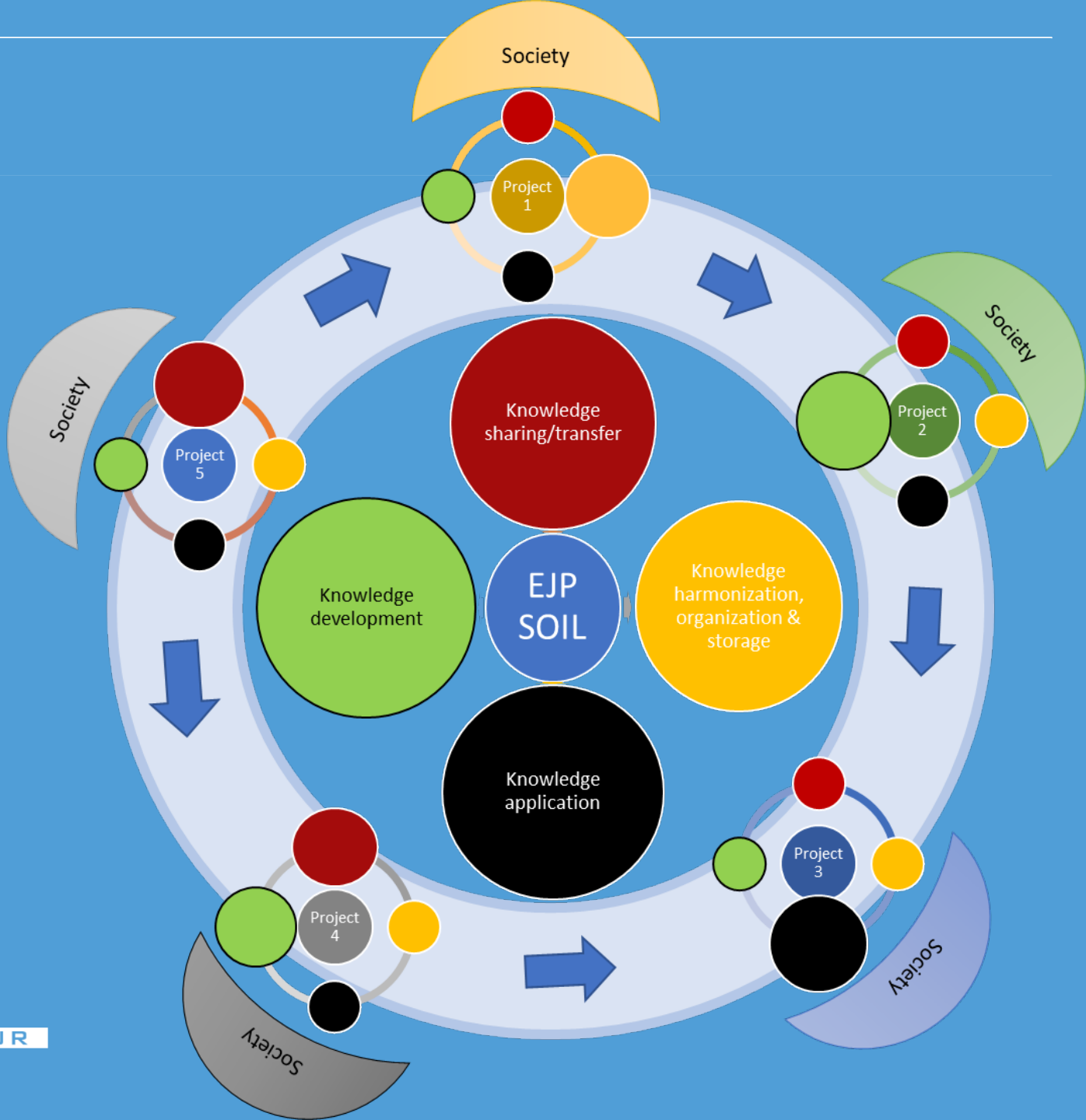
Each project is linked to one or more of the challenges of EJP SOIL
Challenge 1: Soil and climate mitigation (soil carbon sequestration)
Challenge 2: Soil and climate change adaption
Challenge 3: Sustainable agricultural production
Challenge 4: Environment, ecosystem services
Challenge 5: Land and soil restoration, soil fertility and soil erosion prevention



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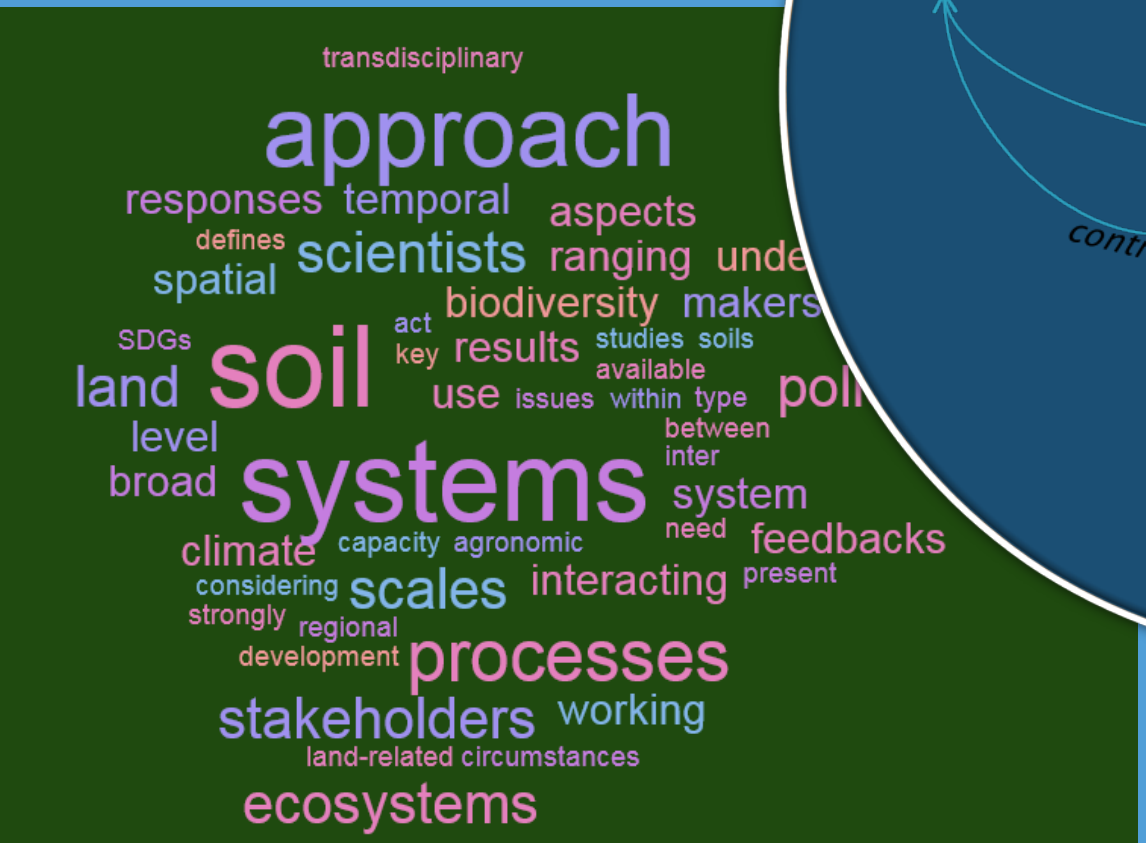
Take home message for soil scientists

- One discussion point:
- Soil organic matter as a key attribute of soils? Can this be our CO2??

Thanks for your attention

- Questions?



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