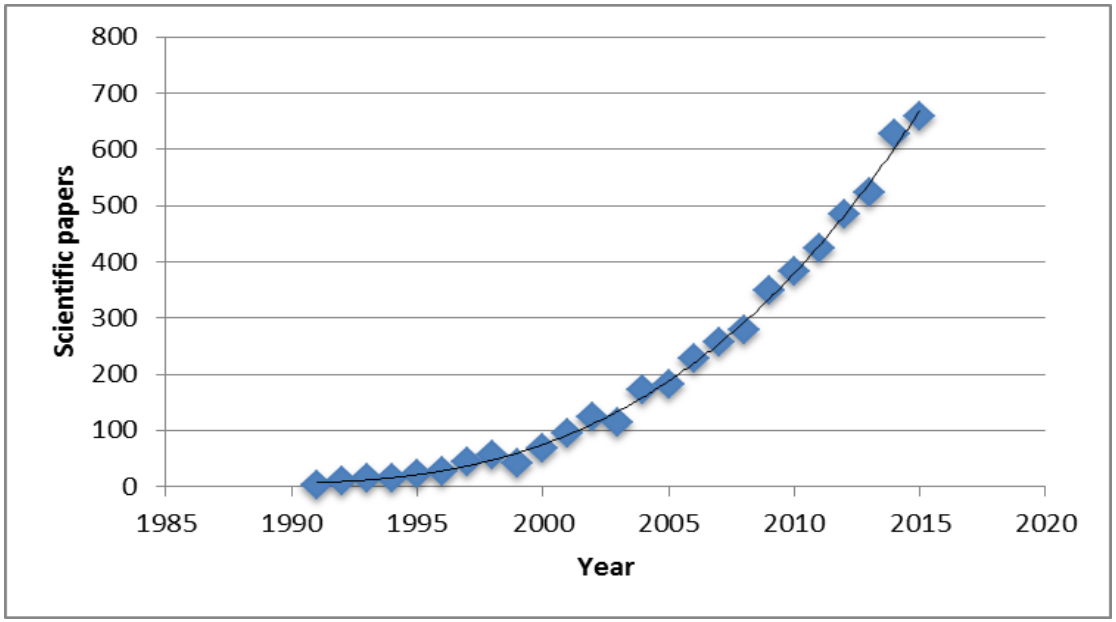
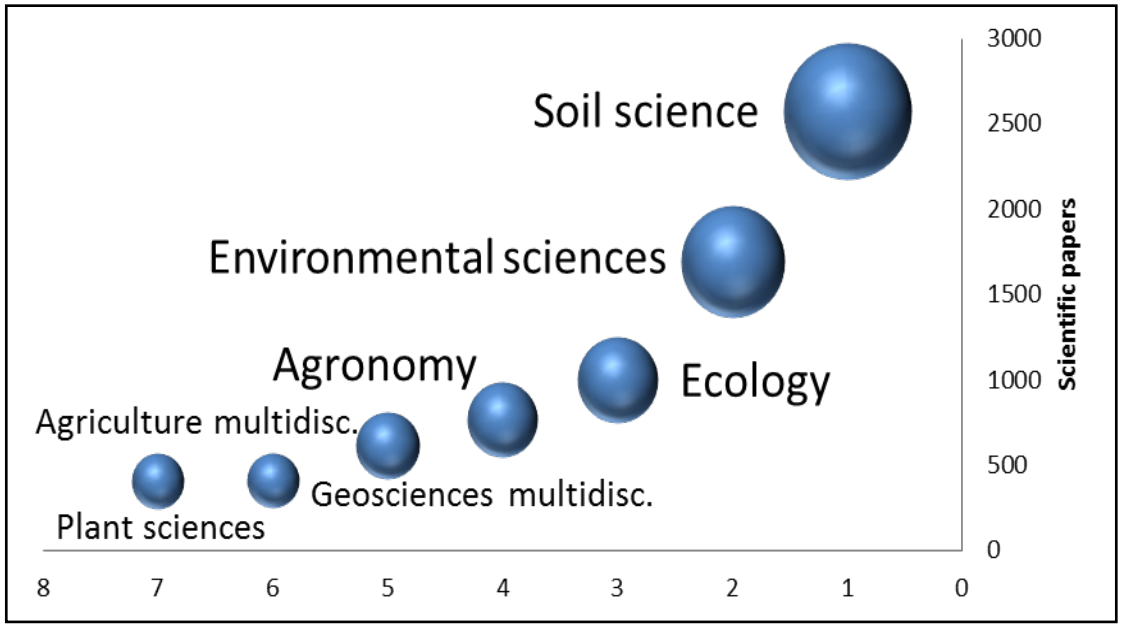
GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

Soil carbon sequestration flagship

Exponential growth in annual number of scientific papers on soil carbon sequestration in agriculture over 1991-2015 and distribution by scientific discipline





Agricultural practices for soil carbon sequestration

Conservation tillage

Integrated soil fertility management

Rangeland Management

Water management

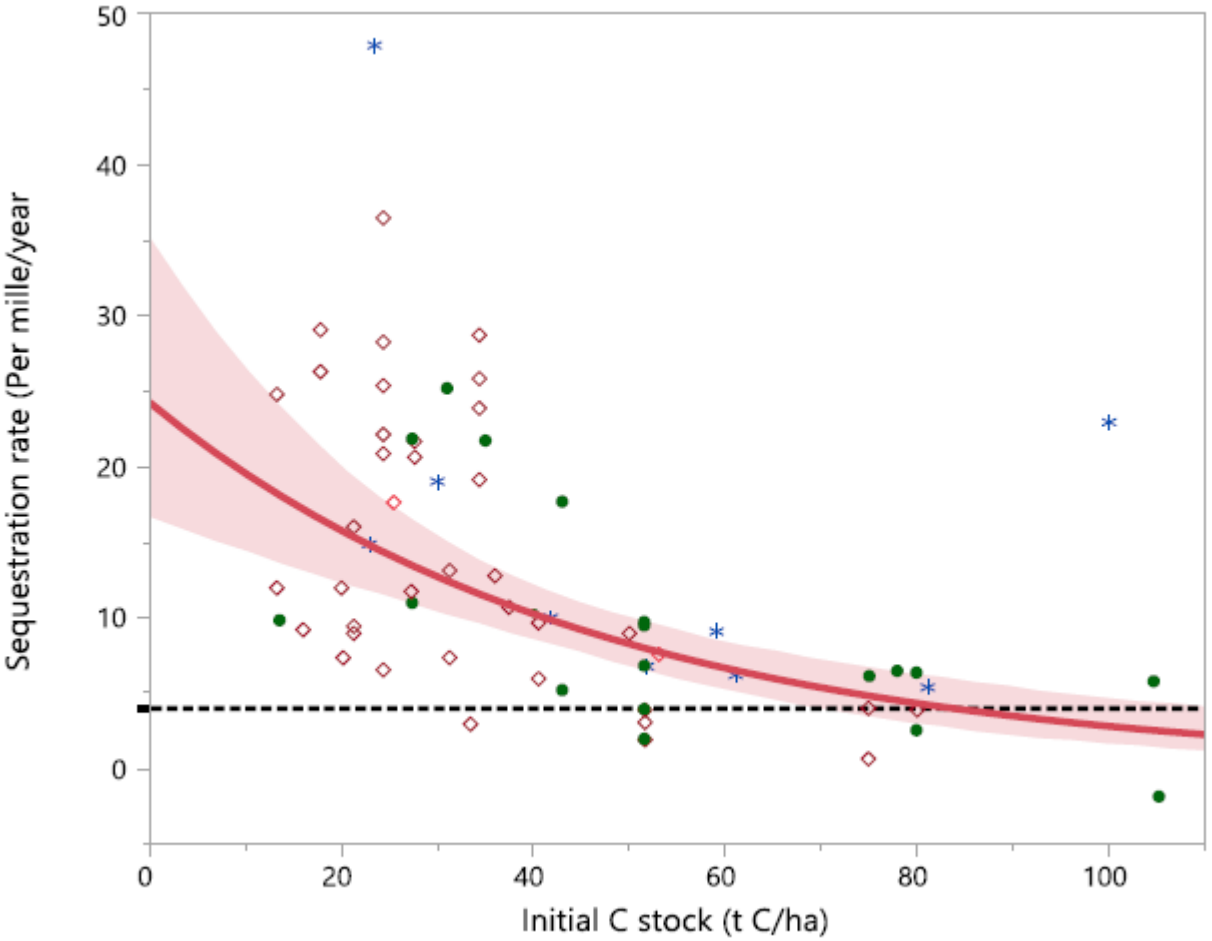
Agroecology

Agroforestry

Organic fertilizers

A 4 per 1000 SOC sequestration rate has often been observed or has been exceeded in long-term arable field trials

..but the rate declines with initial SOC stock



(Minasny et al., 2016, Geoderma)

Soil carbon sequestration flagship

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FOCUS: Agricultural practices that sequester carbon and restore soil health

ACTIVITIES / KEY COMPONENTS:

- Potential and dynamics of carbon sequestration in crop and pasture systems and interactions with N
- Practices for soil C sequestration and carbon calculators
- Co-benefits for yields, water balance, and non-CO_2 greenhouse gases,
- Monitoring, verifying and reporting soil organic carbon stocks,
- Improving national GHG inventories by integrating soil organic carbon stock changes.

Technical tools (e.g. maps) through web-based knowledge hub delivering value and implementation support and targeting national action plans

Components of the soil carbon sequestration flagship

Online collaborative knowledge hub

Developing solutions

Decision support toolbox

- Maps of SCS potential (e.g. to reach the 4 per 1000 aspirational target)
- Maps of crop and pasture practices suited to reach SCS targets
- Implications of SCS practices for
  - yields,
  - drought tolerance and climate change adaptation
  - N_2O and CH_4 emissions, energy use
- Costs and benefits of transitioning to SCS practices

Monitoring solutions

Enabling methods to certify SCS

- Tiered methodologies for monitoring, reporting and verifying (MRV) soil organic carbon (SOC) stocks in crop and pasture systems
- Handbooks and guidelines for project scale MRV adapted to regional contexts and agricultural systems
- Technologies for rapid SOC stock verification
- Modelling of SOC stock change in crop and pasture systems

Adopting solutions

Enabling environment

- Regional stakeholders workshops on SCS
- Criteria for sustainable SCS projects supporting livelihoods
- Assessment of barriers to the adoption of SCS practices
- Value chains, business models and policy options
- Research funding strategy and international research cooperation

Capacity building and training

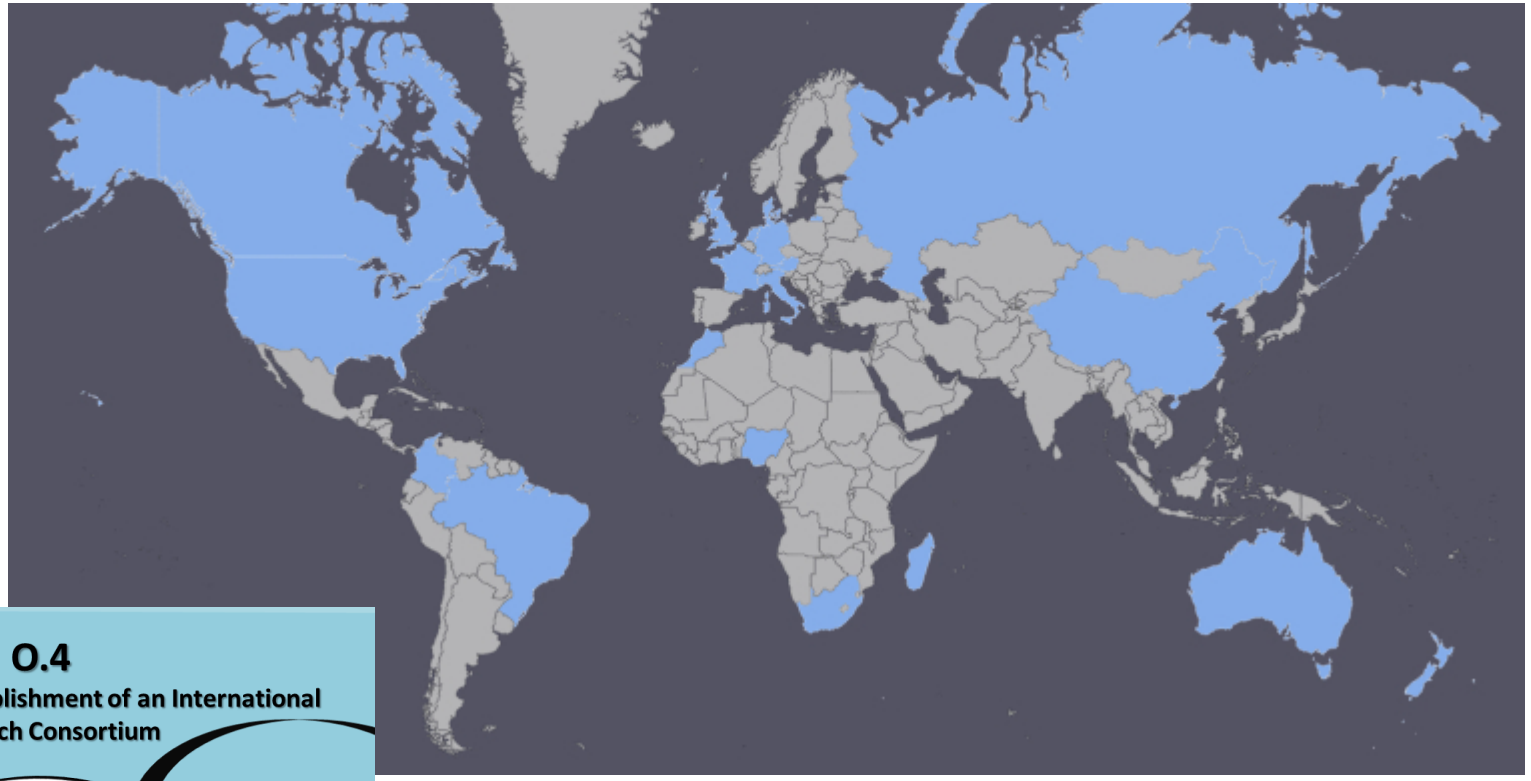
A multi-scale project: sharing data and methods at country and global scales

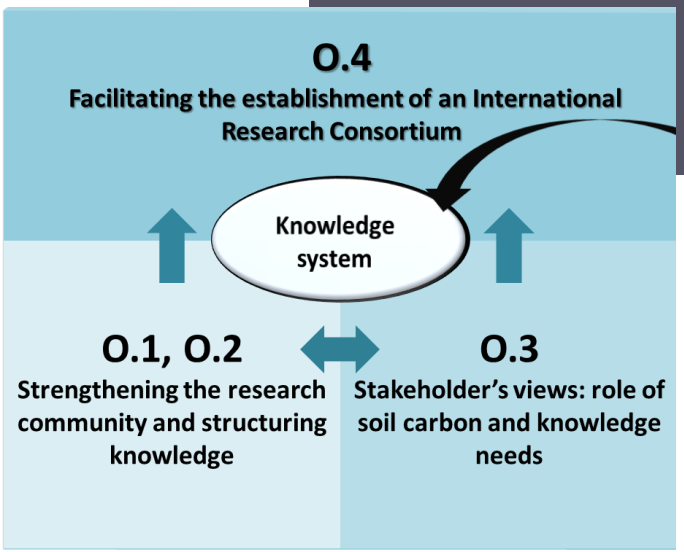
- This knowledge hub will facilitate the development of **national and regional SCS projects aiming at developing, monitoring and adopting soil carbon sequestration**.
- Each national/regional project will **contribute to the knowledge hub and will benefit from the shared data, methods and models**
- **Training and capacity building** on the use and development of the knowledge hub will be organized in contributing countries and regions
- **The SCS flagship will be inclusive** and offer low tier global maps concerning SCS options, as well as general guidelines for developing, monitoring and adopting SCS
- Nevertheless, **national/regional task forces** will be required to develop, monitor and adopt SCS through dedicated projects. These national/regional task forces will be supported by in-kind funding and by direct or donor support to activities developed within the country.

Horizon 2020 – SFS50 (2017)

European Commission

Coordination and Support Action will include 4 per 1000, GRA and FACCE JPI: **CIRCASA proposal**





Collaborative online platform

Collaborative research

- Develop protocols
- Share data and models
- Manage tasks
- Provide access to papers
- Review projects and papers

Matchmaking

- My research profile
- Identify partners , jobs
- Find or propose data, models, infrastructures (e.g. sites)M
- Map collaborative networks
- Search by research theme
- Search by geographical area
- Search by sequestration/ag. practice

Knowledge sharing

- Maps of practices, of potentials, co-benefits, etc..
- Links to multiple initiatives
- Events, webinars

Funding

- Share funding opportunities
- Connect with funders, agencies

Groups of users

Research groups
- Leaders
- Engineers
- Post-docs, docs, trainees
- IT staff

Research funding & programing
- Regional government, Ministries
- National funding agencies
- Foundations;, NGOSs

International

UN conventions
GRA, 4 per 1000, FACCE, CGIAR, GSP, EC…

Private sector
- Banks, insurances
- Private equity, business angels, etc.
- Private companies

Agriculture sector and rural development
- Farmers associations
- Cooperatives,
- Technical institutes
- Landowners

General public
- Students
- Consumers
- Citizens

Example of a potential regional project under the SCS Flagship

- **Title**: Planning for SCS development in grazing systems: an assessment of options
- **Task force**: Name x, Institution X, Name z, Institution Z, etc.
    - Develop SCS solutions by regionalizing maps showing a range of suitable options and their implications for SCS, for livestock systems productivity, for climate change adaptation and mitigation and for production costs.
    - Monitor SCS solutions by regionalizing monitoring, reporting and verification methodologies and by agreeing on the Tier needed (e.g. for carbon certification).
    - Adopt SCS solutions through a regional enabling environment, including dialog with stakeholders, assessment of barriers and criteria for sustainable and equitable SCS implementation, assessment of value chains and policy options, enhanced international research cooperation and alignment.
- **Key partners and existing resources/projects: e.g.** Integrative Research Group networks, LEAP partnership addressing soil carbon, FAO, World Bank, Global Environment Fund, Intergovernmental Technical Panel on Soils (ITPS), 4 per 1000 initiative, UNCCD action plan on land degradation neutrality.
- **Benefits and contribution to flagship:** Strongly supports policy needs via contribution to soil carbon sequestration options matching INDCs (UNFCCC, Paris agreement) and Land degradation neutrality (SDG 15.3 and UNCCD) targets; develops capability; etc.
- **Resourcing needs:** Dedicated person (coordinator) to lead. Resources (funded time) for each country contact point, one of whom will lead the project, to identify, obtain and submit data supporting the regionalized maps, the stakeholder dialog and the policy options. This will lead to co-authored papers.
- **Resourcing mechanisms: e.g.** post-doctoral award to support the coordinator. In-kind contributions by countries involved to support dedicated country contact points. Support by the CIRCASA team through the knowledge hub. In a second stage, funding by donors for SCS implementation.

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Thank you for your attention