FINAL CONFERENCE REPORT

Inspiration
Deliverable 1.3

Inspiration

Document information

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Disclaimer:

INSPIRATION FINAL CONFERENCE REPORT – WORLD SOIL DAY 2017

Land, Soils and Science

On 4 to 6 December 2017, the final conference of the H2020 co-funded coordination and support action INSPIRATION took place in Bruxelles Environnement – IBGE, Brussels. The event was organized under the motto "Land, Soils and Science" together with DG Environment to celebrate the 2017 World Soil Day. The focus was on discussing the potentials of science to support policy and practice and to introduce the strategic research agenda on soil and land management developed by INSPIRATION. Overall, the event was well-attended with over 200 participants from around 40 countries.

The feedback on the INSPIRATION project results was very positive - especially from DG Environment, DG Research and Innovation, the Joint Research Center and from various national representatives from across Europe. DG Environment made it clear that the European Commission continues to work on land and soil and is currently exploring how best to address the critical issue at EU level. However, it was stressed that a prove is required that there is a need for European action (e.g. due to transboundary impacts of soil degradation). DG R&I expressed to see soil research as an element in many of its supportive actions, which in parts address demands formulated in the INSPIRATION research agenda.

Current knowledge gaps in Europe and available options to close them have been key issues for discussion at World Soil Day 2017. Policy-makers, end-users of research and scientists from projects and networks, such as BonaRes, COPA-COGECA, EUKN, European Soil Partnership, ISOCARP, LANDMARK, SedNet, SNOWMAN, Soils4EU and SOPHIE, shared where they perceive the most crucial knowledge gaps and expressed their demands and expectations for future European and transnational science and research.

The INSPIRATION project presented its **Strategic Research Agenda**. A bottom-up process involving over 500 stakeholders from across Europe resulted in 39 research priorities grouped under five themes:

- Natural Capital and Ecosystem Services Supply,
- Demand for Natural Capital and Ecosystem Services,
- Land Use Management,
- Net Impact at different spatial and temporal scales,
- Integrated needs that cut across these themes.

Transnational co-funding is key to leveraging impact from research investments. Therefore, a special track brought together funders to discuss options for the implementation of transnational research. INSPIRATION National Contacts will further assist in identifying co-funding partners for 18 months beyond official termination of the project.

This reports combines the conference programme, the different contributions, impressions and an overview of the INSPIRATION strategic research agenda as well as a selection of briefing notes introducing research areas that lend themselves to co-funding. The complete agenda, background on its development and up-to-date contact information is at **www.inspiration-agenda.eu**.

CONTENT

World Soil Day

European Commission

WORLD SOIL DAY 2017 – Land, Soils and Science

IBGE Brussels, 4th - 6th December 2017

Let's talk about Land, Soils and Science

Land and soils require our attention! This celebration of World Soil Day is devoted to the topical research needs for soil and land use. The event will present and discuss state-of-the-art and pressing gaps in European research on land and soils from the perspectives of policy makers, funders, end-users of research and scientists.

Science creates and supports implementation of knowledge we need for sustainable land use and soil management

Learn about

- Research challenges for the future – what do policy-makers, end-users of research and scientists need and want
- Boundaries of research and knowledge
- Selected projects in Europe on sustainable soil and land management
- Meet with like-minded European stakeholders and research funders

Conference organisation

This event is organised by the European Commission funded Coordination and Support Action INSPIRATION www.inspiration-h2020.eu and the Soils4EU service contract to DG Environment.

Registration

You can register to take part in the entire event or parts of it. Capacities are limited. Further information is provided at www.worldsoilday2017.eu

Venues

IBGE: Bruxelles Environnement, Avenue du Port 86c/ 3000, 1000 Brussels, Belgium Information about venue and accessibility at http://bel.brussels/en
HTB: Herman Teirlinck Building, Avenue du Port 88.

Accomodation

Please make your own accommodation arrangements, e.g. at https://visit.brussels/de/article/green-key

Fees and early career support

Participation in the conference is free of charge. A limited budget is available on a first come first serve basis to reimburse travel costs for participating early career persons, in particular PhD students. To qualify, you must send a letter of motivation, CV and cost estimation to stephan.bartke@uba.de by latest 23 Nov. 2017.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Soils4EU is a DG-Environment Service contract for providing support in relation to the implementation of the EU Soil Thematic Strategy

Register at: www.WorldSoilDay2017.eu

European Commission

DEC. 4 th

Introduction | Implementing new research collaborations

10:00 Welcome / Registration | IBGE - Atrium

Registration and welcome coffee

11:15 Opening / Welcome | Auditorium


Stephan Bartke


Detlef Grimski


Josiane Masson

Welcome by conference chair and INSPIRATION coordinators Stephan Bartke and Detlef Grimski, German Environment Agency (UBA)

Welcome by European Commission
Josiane Masson, DG Environment

11:30 Soils4EU reports


Nina Hagemann


Suzanne van der Meulen

Transboundary effects of soil degradation – Challenges and ways ahead
Nina Hagemann, Helmholtz Centre for Environmental Research – UFZ

Soil related ecosystem services – status, trends and value
Suzanne van der Meulen, deltares

12:30 Sustainable spatial planning, land use and soil management - Closing knowledge gaps - implementing new research collaborations


Paul Nathanail

The INSPIRATION Strategic Research Agenda – Topics and match-making of funders
C. Paul Nathanail, University of Nottingham

Introduction to the afternoon sessions – Match–making and project workshops
Stephan Bartke, UBA

13:00 Lunch and networking | Atrium

Parallel sessions | IBGE at 13:50 and HTB at 14:00 (details on next pages)

Several sessions support policy and funding institutions interested in collaborative provisioning of research projects. Stakeholders from practice and science are invited to discuss in workshops research needs related to transboundary effects of soil degradation and ecosystem services.

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Register at:
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European Commission

DEC. 4 th

Funding research collaboration: Match-making and lessons learnt

13:50 Welcome to funders' sessions | IBGE - Auditorium


Isabelle Feix

Chair: Isabelle Feix, ADEME and Stephan Bartke, UBA

We will introduce funders and policy makers to the opportunities and challenges of transboundary research on soil and land in Europe.

The afternoon session first presents experiences and lessons learnt from SNOWMAN network. SNOWMAN is a transnational group of research funding organizations and administrations in the field of soil sustainable management in Europe. They aim to bridge the gap between knowledge demand and supply (Science-Policy-Practice Interface) through the development and sharing of relevant knowledge.

As part of the INSPIRATION match-making, opportunities for future transboundary collaborative funding actions regarding the INSPIRATION research agenda will be facilitated.

14:00 Introduction to transnational research collaboration: The Snowman experience


Esther Goidts


Yvonne Ohlsson

Chair: Esther Goidts, Soil Protection Direction, Public Administration of Wallonia
Yvonne Ohlsson, Swedish Geotechnical Institute

Presentation on the experiences gained in the SNOWMAN network on transboundary collaboration, e.g. recent calls, involved countries, main results. Also a introduction of a questionnaire sent to researchers, which gives introduction to the SNOWMAN parallel session.

14:30 Matchmaking Sessions INSPIRATION and reports from previous SNOWMAN projects

INSPIRATION match-making
Funders' Lounge

Based on identified research funding interests for topics of the INSPIRATION research agenda, a series of facilitated match-making events is planed. If you wish to join, indicate your funding interests at www.inspiration-agenda.eu

Transnational research collaboration: The SNOWMAN experience
Auditorium

Experiences related to transnational funding and collaboration, and some soil research project results SNOWMAN projects
- Marcel Marloie: Urban Soil project
- Dan Berggren-Kleja: IBRACS project
- Jenny Norrman: Balance4P project
- Valérie Guérin: IMaHg project
- Guénola Pérès: SUSTAIN project

Discussion follows on the added value of transnational research funding and collaboration, and recommendations for future initiatives.


Marcel Marloie


Dan Berggren -Kleja


Jenny Norrman


Valérie Guérin


Guénola Pérès

17:00 Joint Closing Session | Auditorium

Lessons on organization of collaborative funding, and invitation to match making with SNOWMAN for Dec 5th. Event closes ca. at 17:30.

European Commission

DEC. 4 th

Soils4EU workshops at Herman Teirlinck Building

14:00 Parallel sessions Soils4EU workshops

Transboundary effects of soil degradation in the EU

HTB: 01.05 – Isala Van Diest

Chair: Nina Hagemann, UFZ

Soil degradation occurs in different forms such as erosion, soil organic matter decline or sealing and compaction. The transboundary impacts can be economic, social and environmental, e.g. driving climate change, health problems and food shortage.
We bring together experts to exchange on the transboundary effects of soil degradation, to specify the challenges to overcome different types of degradation and to discuss the availability of data. This also includes recommendations for future research activities as well as policy implications.

Soil ecosystems and their services

HTB: 01.04 – Transitielab

Chair: Suzanne v. d. Meulen, deltares

Soil plays a key role in the provision of ecosystem services (ESS) and it does so in more ways than many people expect. Soils4EU in cooperation with the MAES Soil working group provide insight into status and trends of soil ESS potential, use and value. We support the inclusion of soil condition in assessments for e.g. agro-, forest, freshwater and urban ecosystems.
The aim of this session to present the state of the art with respect to the assessment of soil ecosystems and their services and to discuss the potential recommendations for soil managers, policy makers, researchers and funding bodies.

15:30 Coffee break

15:45 Combined session: Ways to progress and recommendations

HTB: 01.05 – Isala Van Diest

Chair: Linda Maring, deltares

Soils4EU provides insight in available information and data with respect to the transboundary effect of soil degradation and soil ecosystems and their services in Europe. Many gaps in information and data are identified as well.

Aim of the session

The workshop aims at bringing together experts on soil and/or ecosystem services assessment, to exchange on key challenges related to information and data availability and to discuss how to overcome these. This includes recommendations for future research and policy activities.

What you can expect

In this interactive workshop, we will first summarize the identified challenges related to information and data gaps, based on Soils4EU workshops. The main part of this workshop will be on the joint formulation of ways forward to overcome the gaps. This may be based on ongoing and planned actions or we may propose new initiatives. The session will result in recommendations for different target groups.

European Commission

DEC. 5 th

World-Soil-Day 2017
Land, Soils and Science

09:30 Welcome / Registration | IBGE - Atrium

Registration and welcome coffee

10:15 Welcome addresses to World Soil Day 2017 celebration and INSPIRATION Final Conference "Land, Soils and Science" | Auditorium

Why we need to talk about land and soil research today!
Lilian Busse, German Environment Agency - Head of Division Environmental Health and Protection of Ecosystems


Lilian Busse


Claudia Olazabal

Actions related to EU's soil policy
Claudia Olazabal, European Commission, DG Environment Head of Unit Land Use & Management

Land and soil knowledge for addressing societal challenges
Co Molenaar, Ministry of Infrastructure and Water Management, The Netherlands


Co Molenaar

11:00 Topical knowledge gaps and research needs of Europeans towards sustainability in spatial planning, land use and soil management: The INSPIRATION Strategic Research Agenda

Addressing societal challenges in a research agenda for soil management and land use
Annette Gatchett, U.S. EPA, Division Director


Annette Gatchett


Paul Nathanail

Outside the box thinking for an innovative research agenda
C. Paul Nathanail, University of Nottingham

11:45 Policy perspectives: The role of land and soil science to address societal challenges

Chair: Lilian Busse, German Environment Agency

High-level representatives discuss the role of soils on policy agendas. They illustrate examples, why soils matter from EU to local level. The debate will show why soil research is needed at different policy levels, and most importantly, what societal challenges must be addressed.


Lilian Busse

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Soils4EU is a DG-Environment Service contract for providing support in relation to the implementation of the EU Soil Thematic Strategy

Register at:
www.WorldSoilDay2017.eu

European Commission

DEC. 5 th

World-Soil-Day 2017
Land, Soils and Science

12:45 Lunch | Networking and poster session | Atrium

Next to a buffet lunch, INSPIRATION partners present identified research and knowledge needs for more sustainable soil and land management in Europe.

14:00 End-User perspectives: What Science do we need? | Auditorium

Chair: Margot de Cleen, Dutch Ministry of Infrastructure and Water Management; European Soil Expert Group

Representatives of different end-user groups debate on questions like: What do you need/want from policy and science? What are your knowledge gaps that need to be addressed? Do you want more applied or fundamental research? Is there too much or little policy on land and soils?

Margot de Cleen

15:30 Science Perspectives: What Land and Soil Science do we want?

Chair: Violete Geissen, WUR & European Soil Partnership

Representatives of different research groups will debate on: What type of science do we need (interdisciplinary, fundamental)? What are most critical areas of land and soil related science today? How to address data-information availability/issues (to be able to implement soil management (on local/national scale))? What potential has citizen science? How to improve the science policy interface?

Violette Geissen

16:30 Outlook: Lessons learned for land and soil research for Europeans

Actions related to EU's research policy
Birgit de Boissezon, European Commission, DG Research & Innovation
Head of Unit Sustainable Management of Natural Resources

Outlook to INSPIRATION implementation actions
Stephan Bartke, German Environment Agency

Birgit de Boissezon

Stephan Bartke

17:00 Poster session, reception and networking | Atrium

We invite all participants to a poster and networking session at the Atrium of IBGE Brussels. Event closes at 18:00.

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Register at:
www.WorldSoilDay2017.eu

European Commission

DEC. 6 th

State-of-the-art in EU research | INSPIRATION match-making

08:30 Registration | IBGE - Atrium

Registration

09:00 Keynote by Didier Vancutsem | Auditorium

Didier Vancutsem

Didier Vancutsem is an international expert with large experience in Urban and Regional Planning, Landscape Planning, Infrastructure, Environmental Management and Integrated Strategies. Based in Munich / Germany, he operates as Office Director at urban scape | Vancutsem Landscape Architects + Urban Planners and conducts also research activities in European and international projects. He is Associate Professor / Lecturer at the Université Libre de Bruxelles / Faculty of Architecture, University of Applied Sciences Munich-Weihenstephan, Université de Lille, Higher Institute of Town Planning Brussels and at the Technical University Perm / Faculty of Architecture. Since October 2013 he is Secretary General of the International Society of City and Regional Planners. He is also member of different professional societies, honorary appointments in Europe and worldwide, AESOP representative and IFLA Europe Delegate.

10:00 Parallel sessions

Match-making sessions support policy and funding institutions interested in co-funding research collaborations. Stakeholders from practice and science are invited to discuss in workshops the state-of-the art knowledge and research needs.

LANDMARK – Soil management, monitoring and understanding the supply and demand of soil functions at a European scale | IBGE - Auditorium

Chair: Rachel Creamer, WUR

Rachel Creamer

LANDMARK is a research project on the sustainable management of land and soil in Europe. The questions that LANDMARK aims to address are: "How can we make the most of our land? How can we ensure that our soils deliver on the many expectations we have of our land?". These expectations (or 'demands') include:

1. Primary productivity (agriculture and forestry)
2. Water purification and regulation
3. Carbon sequestration, cycling and regulation
4. Provision of functional and intrinsic biodiversity
5. Provision and cycling of nutrients.

The overall aim of LANDMARK is to comprehensively quantify the current and potential supply of soil functions across the EU, as determined by soil properties (soil diagnostic criteria), land use (arable, grassland, forestry) and soil management practices.

INSPIRATION acknowledges funding from Horizon2020 Frame-work Programme under grant agreement no 642372

Soils4EU is a DG-Environment Service contract for providing support in relation to the implementation of the EU Soil Thematic Strategy

Register at: www.WorldSoilDay2017.eu

DEC. 6 th

State-of-the-art in EU research | INSPIRATION match-making

Parallel sessions - continued

S.O.S. – Save Our Sediments
HTB: 01.04 – Transitielab

Chair: Jos Brils
deltares | SedNet

Globally river-sea-systems are short of sediment mostly due to damming. This causes dramatic impacts such as drowning deltas. Scientists and stakeholders should find solutions. The session aims to gain support and ingredients for drafting of a call text to promote as topic under EC FP9.

Precision governance for agricultural soils
HTB: 01.01 – Corneel Heymans

Chair: Bartosz Bartkowski, UFZ

There's a mismatch between spatial heterogeneity and multifunctionality of soils and current spatially inefficient soil governance. While technological solutions are there (e.g. precision farming), incentives to align their application with SDGs is missing. We discuss chances and limits to more site-specific soil governance.

INSPIRATION matchmaking
IBGE: Founders' Lounge

Open Space,
Room Sylva

Based Day 1 and 2 of the conference, we provide facilitated open space meetings to identify research funding interests for topics of the INSPIRATION Strategic Research Agenda. To join, please meet in room Sylva. Indicated funding interests at www.inspiration-agenda.eu

11:50 Closing ceremony and next steps | Auditorium

Closing Land, Soils & Science conference and INSPIRATION H2020 project Start into a new phase of collaboration, including remarks by
Annette Gatchett, U.S. EPA, Division Director
Maria Yeroyanni, European Commission, DG Research & Innovation

Annette Gatchett

Maria Yeroyanni

12:20 Lunch | Networking | Atrium

Atrium

13:00 SOPHIE - Integration, innovation and standardization of measuring Soil Hydro-Physics properties | HTB - 01.43 – Auditorium T. Thielemans

Chair: Gerben Bakker and Martine van der Ploeg, WUR
Facilitator: Saskia Visser, programme lead sustainable land use, WUR

Saskia Visser

Gerben Bakker

Martine van der Ploeg

The SOPHIE initiative's side event focuses at reliable SHP data and understanding as a means to reach commitment upon harmonisation, standardization and innovation of SHP properties, and to set up an international collaborating workforce. New, more advanced, faster, and cheaper measurement techniques must be developed and standardized, integrated and valorised to support EU-wide management of healthy soils.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Soils4EU is a DG-Environment Service contract for providing support in relation to the implementation of the EU Soil Thematic Strategy

Register at:
www.WorldSoilDay2017.eu

OPENING / WELCOME

Stephan Bartke & Detlef Grimski (German Environment Agency-UBA), Josiane Masson (European Commission DG Environment)

Opening / Welcome

Stephan Bartke & Detlef Grimski, German Environment Agency (UBA)
Josiane Masson, European Commission DG Environment

INSPIRATION's objectives

Call: Structuring research on soil, land-use and land management in Europe

- Establish & promote a Strategic Research Agenda (SRA) for Europe
- Consider current & future societal challenges
- Involve funders and create a network

Land use

Soil Management

Land use change

INSPIRATION's ambition

- *"Bottom-up" approach:*
  SRA based on real stakeholder demands
  - ✓ ***Refraining from Silo-Thinking***
  - ✓ ***Being relevant for practice***
  - ✓ ***Being feasible due to funders involvement***

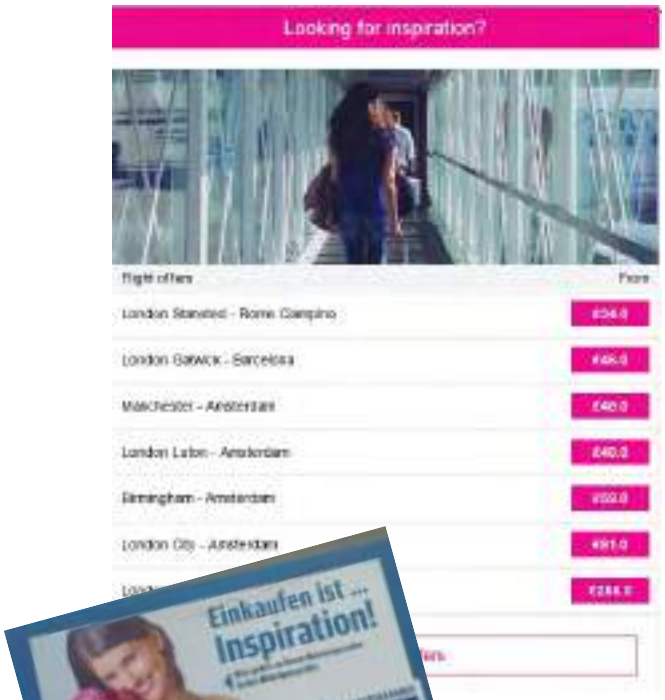
INSPIRATION's work

- Collecting reviewing and clustering stakeholder demands
- Drafting the INSPIRATION SRA
  www.inspiration-agenda.eu

From April 2015 to December 2017

WIFI: BEL EVENT → Bel171204

Acronym



INSPIRATION = INtegrated Spatial PlannIng, land use and soil management Research AcTION

FP7: BEL EVENT → Bel171204

Key organisers

European Commission environment

Soil4EU

Inspiration

LANDMARK

WAGENINGEN SOPHIE

BONARES

SedNet

Agenda at a glance

Agenda at a glance

4 DEC
- Transboundary impacts
- Soil ecosystem services
- Funding collaboration

5 DEC - World Soil Day
- Land, Soils and Science
- Stakeholders' perspectives

6 DEC
- Keynote: Challenges for our European territories
- Open space, workshops

Agenda at a glance – Day 1

4 DEC

- Soils4EU reports & workshops
- Funders match making
- Excursions

Soil4EU

Inspiration

Agenda at a glance – Day 2

5 DEC - World Soil Day

- Land, Soils and Science
- Round table: Stake-holders' perspectives
- Outlook

Inspiration

Agenda at a glance – Day 3

6 DEC

- Keynote
- Finders' Open Space
- LANDMARK, SOPHIE SedNet …
- Closing session

WELCOME BY EC DG ENVIRONMENT

Josiane Masson (European Commission DG Environment)

SOILS4EU: TRANSBOUNDARY EFFECTS OF SOIL DEGRADATION IN THE EU

Nina Hagemann (Helmholtz Centre for Environmental Research)

Co-Authors from Deltares, IUNG - Institute of Soil Science and Plant Cultivation, IAMZ - Mediterranean Agronomic Institute of Zaragoza, CSIC-EEAD Spanish National Research Council - Estación Experimental de Aula Dei EC DG Environment

Why Motivation and problem statement

Soil degradation occurs in different forms such as erosion, soil organic matter decline, salinization and contamination, sealing and compaction, and floods and landslides. The transboundary impacts of such soil degradation can be economic, social and environmental. For example, it can be a driver of climate change, health problems and food shortage. The provision of information, maps and figures, especially permanently available quality-proven data and technologies are crucial for scientists, land users, planners and decision makers to avoid and combat soil degradation and its transboundary effects and thereby overcome societal challenges together.

What Approach, results; keymessages

The participants of the workshop were separated into three working groups to discuss “Agricultural and forest soils”, “Urban and industrial soils” and “Climate change and carbon emissions”

Alltogether, the focus on transboundary impacts raised a lot of interest because soils are not static and the drivers of soil degradation are often global. The impact also is in many cases not local but trans-border. It is relevant for relevant for many stakeholder groups, e.g. for reaching the SDGs that require collaboration. Participants see an added value of the Soils4EU Report 1 because it provides valuable information and evidence that has so far not been collected.

Several challenges were identified in the group discussions, which are that people have different opinions about the relevant scale. Whereas one group is close to the soil and its interaction with other sources such as wind, water air, the other sees the greater picture and looks from a transboundary and inter-sectorial perspective. It is difficult to differentiate between local and transboundary effects.

We can hardly disentangle the different components that influence transboundary impact because of the many interlinkages. We should also differentiate between anthropogenic and natural drivers. The issue is too complex to approach it deeply in a single report.

We can quantify the amount of degradation but not the impact; this means we can say a lot about soil loss or contamination, but for example in a flood event we cannot precisely say much about the impact the soil loss has in this event (40%, 50%, …..), even though we know there is one.

Some approaches and methods could be useful for focusing the issue of transboundary impacts. E.g. umbrella framework, Nexus approach (water-soil-sediment). Regarding the context, Habitat, Flood and Water Directives should be taken into account as having transboundary implications.

Key Conclusions and take home message

The following actions need to be taken:

- Reward upstream actions such as flood control, nutrients, local climate effect (that is the goal)
- A National soil use inventory is need; at the moment Member States do not have a spatial planning and impact framework (so we do not know, what are the consequences of soil use?)
- There are internationally recognized concepts that can be used to frame the issue of transboundary impacts of soil degradation. Sustainable Development Goals (SDGs) ▸ reducing degradation will support reaching many of the SDGs. Land Degradation Neutrality as a driving force for soil protection
- Masterplan for cooperation between countries, e.g. on habitat protection

SOILS4EU:

Providing support in relation to the implementation of the EU Soil Thematic Strategy

Transboundary impacts of soil degradation

Deltares
IUNG - Institute of Soil Science and Plant Cultivation,
UFZ - Helmholtz Centre for Environmental Research
&
IAMZ - Mediterranean Agronomic Institute of Zaragoza,
CSIC-EEAD Spanish National Research Council - Estación Experimental de Aula Dei

Hagemann, N., Álvaro-Fuentes, J., Siebielec, G., Castañeda, C., Blauw, M., Dietze, V.

Service contract No. 07.0201/2016/742739/SER/ENV.D.I

Problem statement I

The **global** population could reach ca. 9 billion people in 2050 and at the same time European and global **soils degrade** further (Panagos et al., 2016; FAO, 2012).

- Mean **soil loss rate in Europe** is by far higher than the soil formation rate (Panagos et al., 2015).
- **Global production** of food has to **increase** by about **70 % to 100 %** in order to feed this predicted population (Godfray et al., 2010).
- Increasing pressure on already degraded soils.

Problem statement II

- Soil degradation as a consequence of sealing, land use intensification etc. = local or regional challenge.
- Impact often not limited to the area of degradation but much broader, examples:
  - Salination of soils in Spanish region = loss in agricultural production, increasing prices for vegetables and increasing pressure on soils elsewhere (even outside Europe).
  - Soil sealing within catchments increases flood risks = impact on downstream users (economic costs, health effects due to polluted water).

Transboundary impacts of soil degradation

Objectives:

- Identification and presentation of **facts and evidence** of transboundary impact of soil degradation (economic, ecological and social).
- Focus on societal challenges of transboundary impacts of soil degradation, drivers and impacts.

Scale: Impacts on EU level, incl. examples from EU Member States

Target group: Policy makers (agriculture, urban land and water management)

Report structure

1. Introduction
2. Societal challenges of transboundary impact
3. Drivers and transboundary impact of soil degradation
   - 3.1 Natural conditions (climate, topography, soil properties)
   - 3.2 Land use changes
   - 3.3 Land management (especially agricultural activities)
   - 3.4 Urbanization and development of infrastructures
   - 3.5 Consumption patterns and economic drivers
4. Identification of key challenges to address transboundary impacts
5. Recognition of transboundary impact in policies
6. Need for actions

Definitions

Soil degradation:

"Soil degradation is defined as a change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries. Degraded soils have a health status such, that they do not provide the normal goods and services of the particular soil in its ecosystem." (FAO, 2017)

Transboundary dimensions:

- Drivers (cause of degradation) are often distant and cross-borders (= transboundary).
- Soil degradation is often considered as local phenomenon but soil particles move (e.g. forced by either wind or water), e.g. when mixed with water, soil may become sediment.
- Degraded soils do not only affect people but can have broader economic (increasing imports), ecological (loss of biodiversity networks) or social (food security) impact

The (societal) challenges

- Climate change
- Food security and safety
- Land foot print
- Migration
- Water security
- Loss of biodiversity & ecosystem functions
- Human health

Source: Global Footprint Network

Societal challenges: Example I

Food security and safety I

- Approximately 95% of global food is produced in soil (FAO, 2015).
- Food demand is expected to increase up to 3 billion tonnes in 2050 (FAO, 2009).
- Approximately 50% of global land area is already devoted to agriculture (about 1/3 cropland and 2/3 grazing land).

Societal challenges: Example I

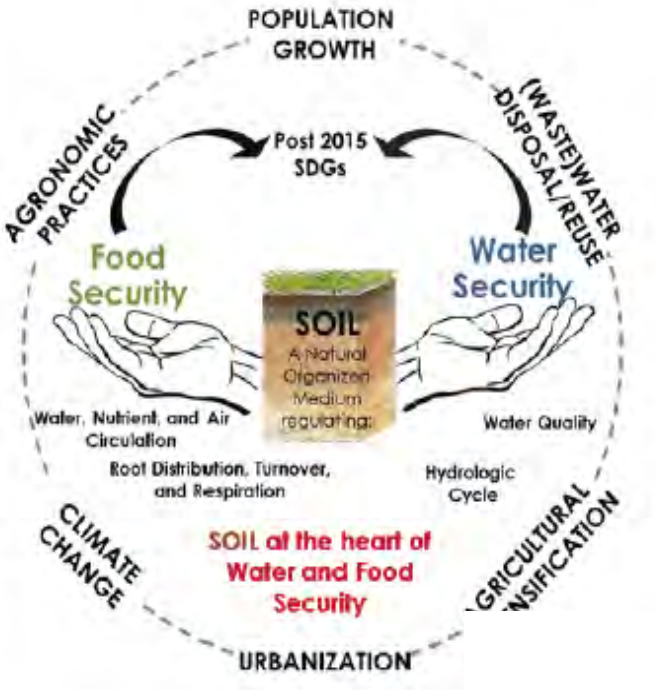
Food security and safety II

- Economic importance of agriculture and food commodities for EU: 350 billion Euro trade on the internal market (for the year 2016) and 129.1 billion Euro trade in exports to third countries (in 2015) (EC, 2017).
- During past 40 years about 30% of the world's cropland has become unproductive (much of this land has been abandoned) (Pimentel, 2006).

Societal challenges: Example II

Water security & quality

- Flooding and droughts
- Nutrient pollution
- Chemical contamination
- Securing water quality
- ……..



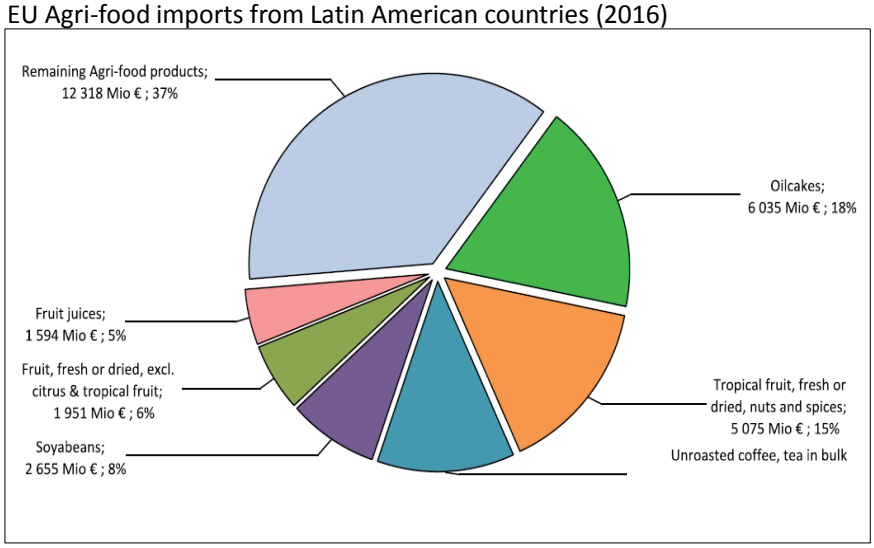
Source: Mohtar, 2015

Societal challenges: Example III

Migration

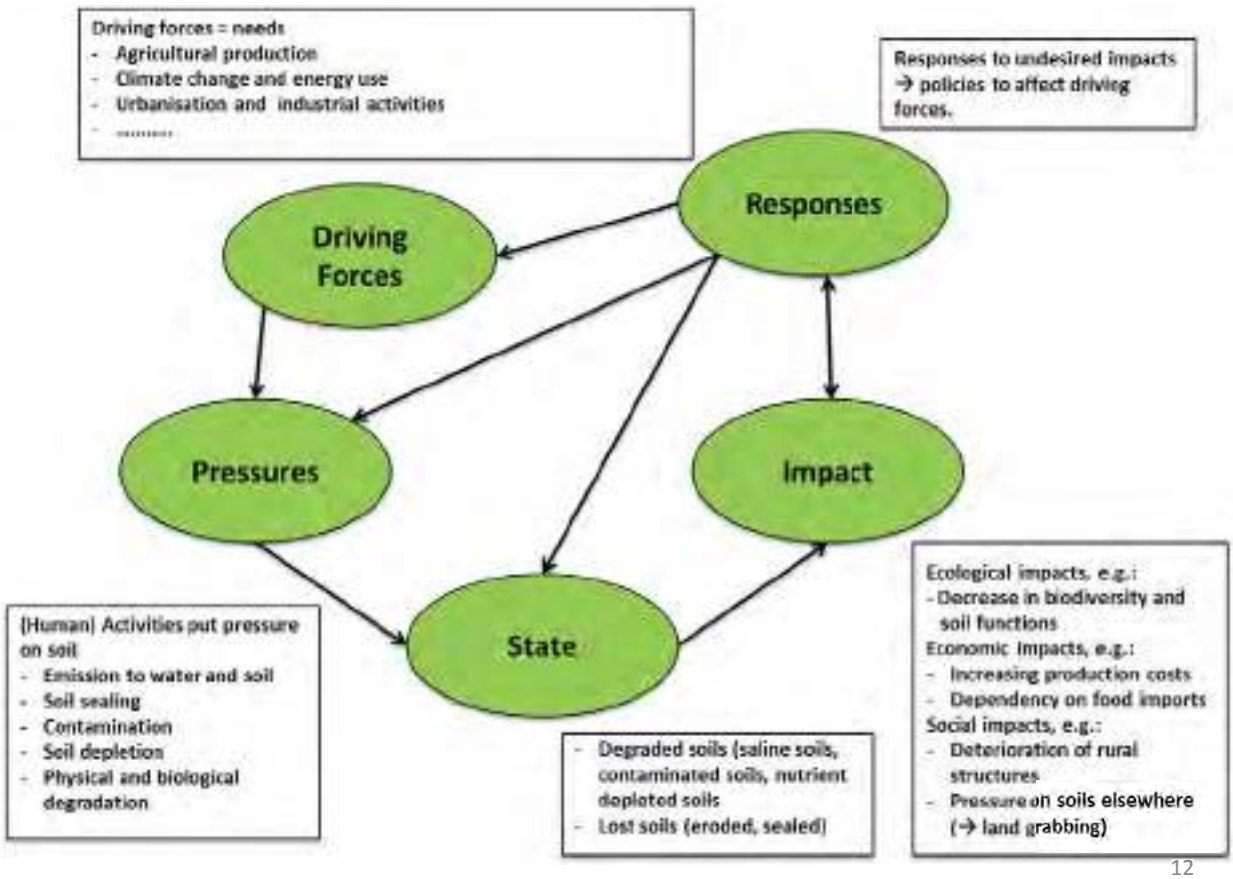
- Millions of people are migrating each year due to degraded land (UNCCD, 2017).
- Reasons are manifold:
  - Consumption patters require food imports → degradation in these countries.
  - Land grabbing (investors also from EU to produce, e.g. biofuels else-where)

EU Agri-food imports from Latin American countries (2016)



Source: EC, 2017

Drivers and impacts



Example I: Agricultural production

Driver background:
Global/European demand and economic pressure = intensification of agricultural production

Pressure (rather local):
Diffuse contamination, compaction, soil salination (irrigation), nutrient depletion, physical and biological degradation

State (rather local):
Degraded and lost soil

Impact (rather transboundary):
Reduction in food production can have several different impacts:
- Price increase for cereals (for Italy >70% over last 10 years) (FAO, 2013)
- Pressure on agricultural land elsewhere (e.g. land grabbing)

Example II: Urban development

Driver background:
Migration from rural to urban areas (more jobs in cities, better infrastructure)
E.g. in 2020 about 80% of the EU population will be living in urban areas (EC, 2013)

Pressure (rather local)**:**
Soil sealing (soil often irreversible lost), soil compaction, emission to air, water and soil

Degradation (rather local):
Degraded and lost soil

Impact (local as well as transboundary):
Loss of biodiversity, water stress, pressure on agricultural land (produce more on less land), floods

Source: EC (2012)

Policy framework

- Different regulations with indirect soil relevance (e.g. nitrate directive, emission regulation)
- EU legislation transboundary by definition, but cross-boarder in practice rarely addressed
- Water Framework Directive – A role model?
  - Member State need to cooperate on managing transboundary waters
  - Holistic approach of management
  - Cross-sectoral approach
  - Policy integration
  - Several challenges involved, e.g.
    - High transaction costs (e.g. exchange, negotiations and cooperation)
    - Data availability and comparability

Identified gaps

What we have:

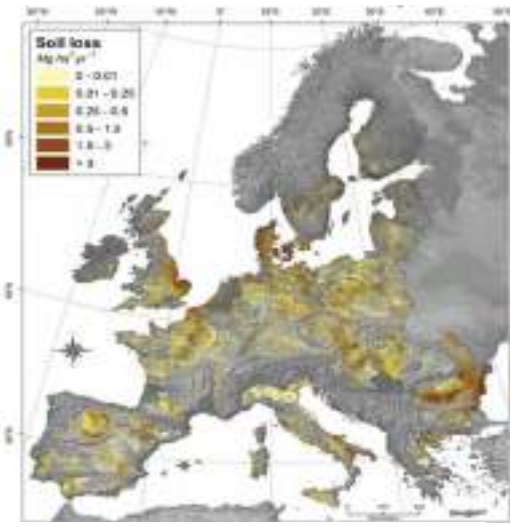
Information of the different forms of soil degradation in the EU and data on severity of degradation.

What we don´t have:

Due to the complexity of relationships it is very difficult to **measure** the proportion of **transboundary impacts and drivers.**

What is needed:

Provision of information (maps, figures, examples), especially permanently available quality-proven data.



Source: Borelli et al. (2017)

Aim of the afternoon workshop

- For the report we still need evidence/information on pressures which are most relevant from a transboundary perspective.
- Specific examples for and data on the transboundary impacts of degradation (e.g. urbanization → soil sealing → flooding → damage costs).

- Objectives:
  - Specify and quantify pressures and impacts (ecological, economic social) for specific drivers.
  - Exchange examples
  - Discuss the information and data needs to address transboundary impact of soil degradation.

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Institute of Soil Science and Plant Cultivation State Research Institute

HELMHOLTZ CENTRE FOR ENVIRONMENTAL RESEARCH – UFZ

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SOILS4EU:

Providing support in relation to the implementation of the EU Soil Thematic Strategy

Transboundary impacts of soil degradation

Deltares
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UFZ - Helmholtz Centre for Environmental Research
&
IAMZ - Mediterranean Agronomic Institute of Zaragoza,
CSIC-EEAD Spanish National Research Council - Estación Experimental de Aula Dei

Hagemann, N., Álvaro-Fuentes, J., Siebielec, G., Castañeda, C., Blauw, M., Dietze, V.

Service contract No. 07.0201/2016/742739/SER/ENV.D.I

Timeline

	Welcome
2:00-2:10pm	Welcome
2:10-2:20pm	Introduction and aim of the workshop
2:20-2:40pm	Discussion of draft report and key drivers
2:40-3:25pm	3 working groups to discuss pressures and impact of agricultural production, urbanisation and industrial activities, climate change and energy security
3:25-3:45pm	Feedback from groups and opportunity for others to add
3:45pm	Coffee break
4:15pm	Continue with 3rd workshop

Background information

What we have:

Information of the different forms of soil degradation in the EU and data on severity of degradation.

What we don´t have:

Due to the complexity of relationships it is very difficult to **measure** the proportion of **transboundary impacts and drivers.**

What is needed:

Provision of information (maps, figures, examples), especially permanently available quality-proven data.

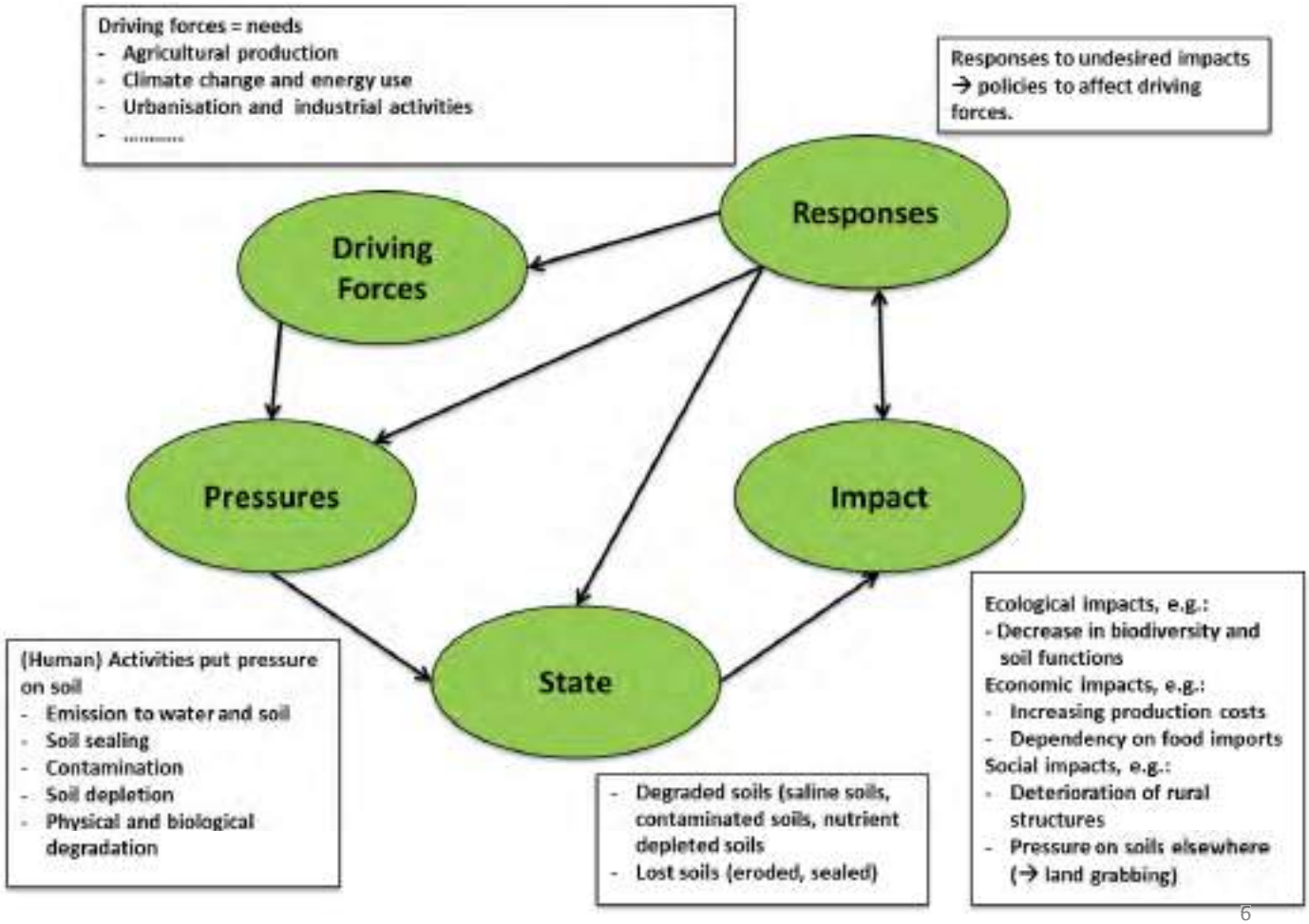
Aim of the workshop

- Specify and quantify pressures and impacts (ecological, economic and social) for specific drivers.
- Discuss examples
- Discuss the information and data needs to address transboundary impact of soil degradation.
- Format: Working groups

Questions on the report?

1. Introduction
2. Societal challenges of transboundary impact
3. Drivers and transboundary impact of soil degradation
   - 3.1 Natural conditions (climate, topography, soil properties)
   - 3.2 Land use changes
   - 3.3 Land management (including agricultural practices)
   - 3.4 Urbanization and development of infrastructures
   - 3.5 Consumption patterns and economic drivers
4. Identification of key challenges to address transboundary impacts
5. Recognition of transboundary impact in policies
6. Need for actions

5



6

Introduction to working groups I

- Three groups, each working on one specific driver
  - Agricultural production
  - Urbanisation and industrial activities
  - Climate change and energy security
- Guiding questions for each table
- Each table has a convenor (project team)
- After 25 minutes participants can move from one table to another

Introduction to working groups II

Afterwards:

- Reporting back the results of the discussion to the plenary of workshop 1 (outlining specific examples) – allowing other participants to add.
- Reporting back key messages in workshop 3 (3 minutes per working group).

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SOILS4EU: SOIL ECOSYSTEM SERVICES

Suzanne van der Meulen (Deltares); Linda Maring (Deltares)

Co-Authors from MAES Soil working group, IUNG - Institute of Soil Science and Plant Cultivation, UFZ - Helmholtz Centre for Environmental Research, IAMZ - Mediterranean Agronomic Institute of Zaragoza, CSIC-EEAD Spanish National Research Council - Estación Experimental de Aula Dei, EC DG Environment

Why Motivation and problem statement

The presented report provides the most comprehensive overview of soil ESS. All ESS included in this report meet the criteria of being goods or services that are provided by the ecosystem, used by humans, and contributing to human well-being. Besides, they are clearly depending on soil. A number of the soil ESS are often not overlooked in general ESS assessments or in soil ESS assessments

What Approach, results and key messages

Soil ecosystem services, as all ecosystem services, are fundamental for meeting societal needs such as food and energy provision and for overcoming societal challenges like climate change mitigation and adaptation. The MAES Soil Pilot is aimed to increase awareness of the importance of soil functions and related ecosystem services and to show their value. The pilot also aims to show the need for protection, management and restoration of soil ecosystems and the need to make a more sustainable and efficient use of it. In the context of the EU Biodiversity Strategy to 2020 the MAES Soil Pilot provides practical guidance and capacity building to the EU institutions and Member States on methods and tools for assessing soil ecosystem services. The pilot also supports other EU policy frameworks such as the Soil Thematic Strategy and the 7th Environmental Action Programme 2014-2020.

The process of mapping and assessing soil ecosystems and their services starts with assessing ecosystem status (also called 'condition'). Ecosystem status determines the capacity of an ecosystem to yield services, and soil pressures influence the ecosystem status. In the next step of the MAES process, ecosystem services supply are assessed and mapped. Methods and data availability vary between ecosystem services. Indicators for ecosystem services are collected in MAES pilots for six ecosystems: 1) Forest ecosystems, 2) Cropland and grassland ecosystems, 3) Freshwater services ecosystems, 4) Marine ecosystems, 5) Urban ecosystems and 6) Soil ecosystems. The presented report is developed in the context of the latter ecosystem.

Structural analysis by policy makers and soil managers on the impact of their decisions on soil ecosystem services will enable them to make well informed decisions. A good understanding of the role of soil ESS for human well-being will enable practitioners to develop soil management practices that have a positive impact on human well-being. When analysing the impact of soil management practices on ESS, it is recommended to consider the entire list of soil ESS to prevent that less obvious aspects are overlooked. Even when there is an indirect impact of changes in soil characteristics on ESS, the impact may be high. For example, temperature regulation by vegetation through transpiration may be severely impaired by a lack of available soil moisture.

There is no standard recipe for good soil management or land management. Since there are trade-offs between services, the optimal management depends on which ESS are demanded by society and on local soil characteristics that determine potential for ESS. Information on the status of potential provision and demand for ESS can be used to prioritize management actions. Some practices impact many ESS or specific bundles of ESS as is demonstrated in this report. Policy makers could stimulate management practices that enforce multiple ecosystem services or to mitigate adverse impacts on them. Still, priorities in soil management will always be determined by the demand for ESS and the value that decision makers or the people that they represent assign to certain services. Enhancing ESS to soil therefore starts with an integral assessment of current and future needs of humans, potential provision of ESS, and trade-offs between ESS. By comparing potential supply and use, it is possible to determine whether the use of soil is sustainable. Examples of this type of analysis from Flanders and the Netherlands are provided in this report. These examples demonstrate that many soil ESS are used unsustainably.

The availability of indicators for quantification and data on soil ESS varies between services.

SOILS4EU: SOIL ECOSYSTEM SERVICES

For provisioning services, production and abstraction are well documented. It requires further assessment to find out what causes the increase or decrease in and what role is played by soil (condition). For example, agricultural outputs in Europe increased between 2000 and 2010 while at the same time, potential supply of these goods seems to decline based on available arable land and soil fertility. This may indicate unsustainable use of the crop production service and studies in Flanders and The Netherlands support this impression. From the European studies that we considered, it is hard to determine if regulating services are improving or declining. One reason is that the role of soil is hidden in integrative indicators, soil being only part of the equation. Examples of integrative indicators are water retention capacity and relative water purification capacity of freshwater ecosystems. It would require more in-depth investigation to identify the role of soil in these indicators. However, the integrated indicators are valuable because they acknowledge the importance of an entire ecosystem, with all its components and processes, for provision of ESS. Extracting the role of soil may be useful for soil scientists and soil managers for the development of soil management practices that enable sustainable use of specific bundles of soil relates ESS.
Another difficulty with several regulating services is that their use is strongly spatially specific on sometimes fine spatial scale. For example, traffic noise reduction by bare soil and vegetation is provided at a level of spatial detail that is lost in assessments and maps at European scale.

The estimation of the economic value of soil ESS can inform decision-making on soils use and management. However, the economic valuation of soil ecosystem services is still a nascent area of research where research gaps abound. Conceptually, there is no unified framework and most common approaches lag behind the developments in general economic valuation research. There are generally very few studies available, most of which focus on a handful of soil ecosystem services and there are very few economic valuation studies of soil ESS conducted in Europe. Moreover, virtually all economic valuation studies of soil ecosystem services focus on agricultural contexts. This means a huge lack of insight in value of soil ESS in an urban context.

The available studies use very diverse, qualitatively divergent methods and approaches, which makes their results hardly comparable. Thus, economic valuation studies do not provide much information that can be informative for decision-making processes beyond the available biophysical data. This means there is significant potential for new research in this area. More focus on other contexts (e.g. urban soil ESS) and more research in Europe will improve the availability of information for decision makers in Europe.

Key Conclusion and take home message

A good understanding of the role of soil ESS for human well-being will enable practitioners to develop soil management practices that have a positive impact on human well-being.

There is no standard recipe for good soil management or land management. Since there are trade-offs between services, the optimal management depends on which ESS are demanded by society and on local soil characteristics that determine potential for ESS.

The availability of indicators for quantification and data on soil ESS varies between services. Extracting the role of soil may be useful for soil scientists and soil managers for the development of soil management practices that enable sustainable use of specific combinations of soil relates ESS and contributes to the awareness of the value of soil to a broader public.

The estimation of the economic value of soil ESS can inform decision-making on soils use and management. However, the economic valuation of soil ecosystem services is still a growing area of research with many research gaps and little common approaches.

More Further reading recommendations

Website: www.worldsoilday2017.eu/soils4eu.html
Twitter: @soils4eu

SOILS4EU:

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Soil ecosystem services

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CSIC-EEAD Spanish National Research Council - Estación Experimental de Aula Dei

MAES Soil working group

EC DG Environment

The contribution of soil ecosystems to well being

Picture: sustainablesites.org

Ecosystem Services

Goods and services provided by ecosystems that directly and indirectly contribute to human well-being

The Common International Classification of Ecosystem Services (CICES)

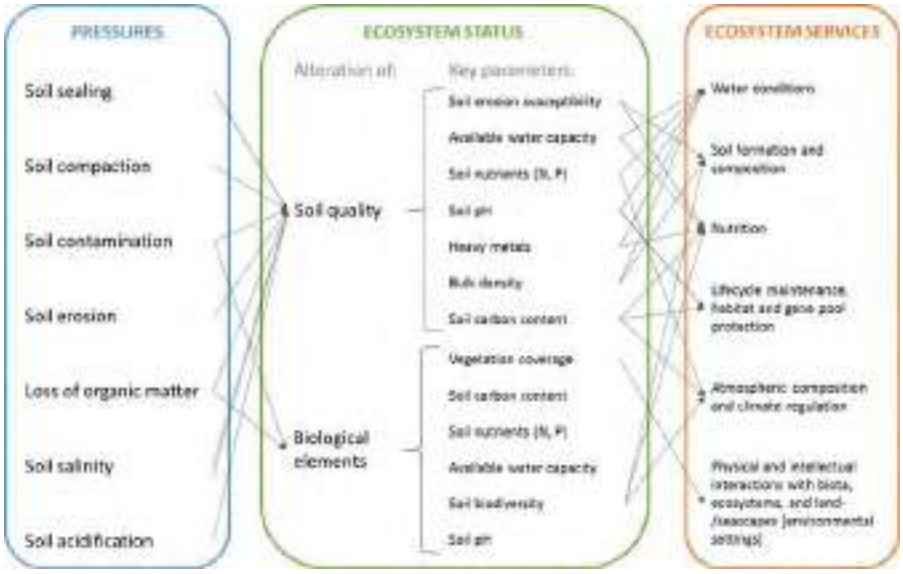
- Provisioning services
- Regulation & Maintenance services
- Cultural services

Soils4EU & MAES Soil Pilot

Increase awareness of the importance of soil functions,
related ecosystem services and
to show their value.

Show the need for protection, management and restoration
of soil ecosystems
and the need to make a more sustainable and efficient use of it.

Soil ecosystem services:
the goods and services provided by ecosystems that directly and indirectly contribute to human well-being,
which are depending on soil



Picture: JRC, 2017

Soil ecosystem services

Provisioning services	Biochemical and pharmaceuticals
	Food, wood and fibre
	Fresh water
	Carrying capacity for infrastructure, buildings and animals
Abiotic provisioning services	Raw materials
	Thermal energy
Regulation and maintenance services	
Cultural services	

Soil ecosystem services

Provisioning services	Biochemical and pharmaceuticals
	Food, wood and fibre
	Fresh water
	Carrying capacity for infrastructure, buildings and animals
Abiotic provisioning services	Raw materials
	Thermal energy
Regulation and maintenance services	Water purification and soil contamination reduction
	Water regulation
	Biological control of pests and diseases
	Carbon Sequestration
	Regulation of greenhouse gasses
	Regulation of local climate/temperature
	Noise abatement
	Air quality regulation
Cultural services	

Photo by Merijn de Jong

Soil ecosystem services

Provisioning services	Biochemical and pharmaceuticals
	Food, wood and fibre
	Fresh water
	Carrying capacity for infrastructure, buildings and animals
Abiotic provisioning services	Raw materials
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	Biological control of pests and diseases
	Carbon Sequestration
	Regulation of greenhouse gasses
	Regulation of local climate/temperature
	Noise abatement
	Air quality regulation
Cultural services	Recreation and tourism
	Knowledge/scientific research, Cultural heritage and education
	Spiritual and symbolic experience

Quantification of soil ecosystem services

USE  ECONOMIC VALUE 

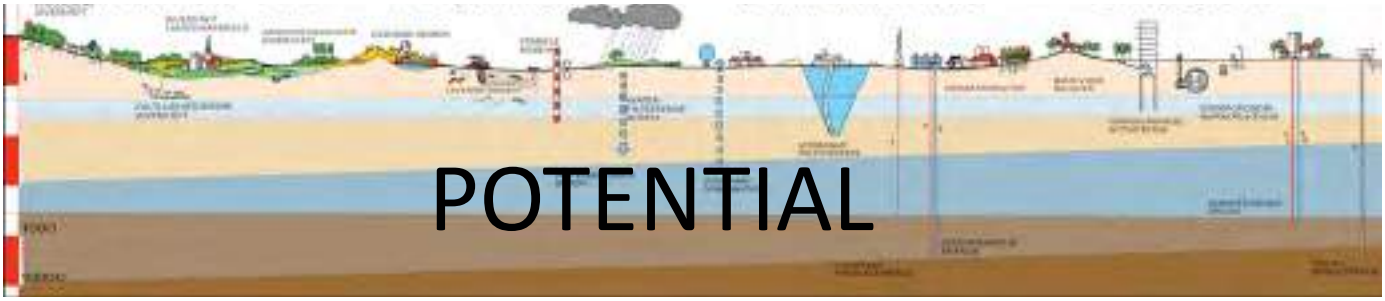
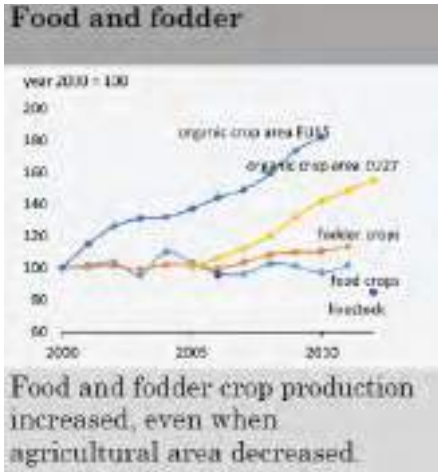


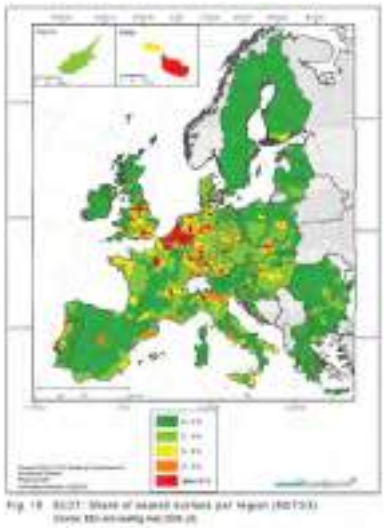
Figure subsurface: bodemvisie Groningen (Peter Dauvellier) en Ruimtexmilieu

Quantification of soil ecosystem services

some examples



Food, wood and fibre production



Regulation of local climate/temperature
Sealed surface

Knowledge/scientificresearch,Cultural heritage and education
Organics preservation capacity

Pictures: MAES et al., 2015; Prokop et al., 2011, Kibblewhite et al., 2015

Impact of land- and soil management practices on soil ecosystem services

Urban areas:

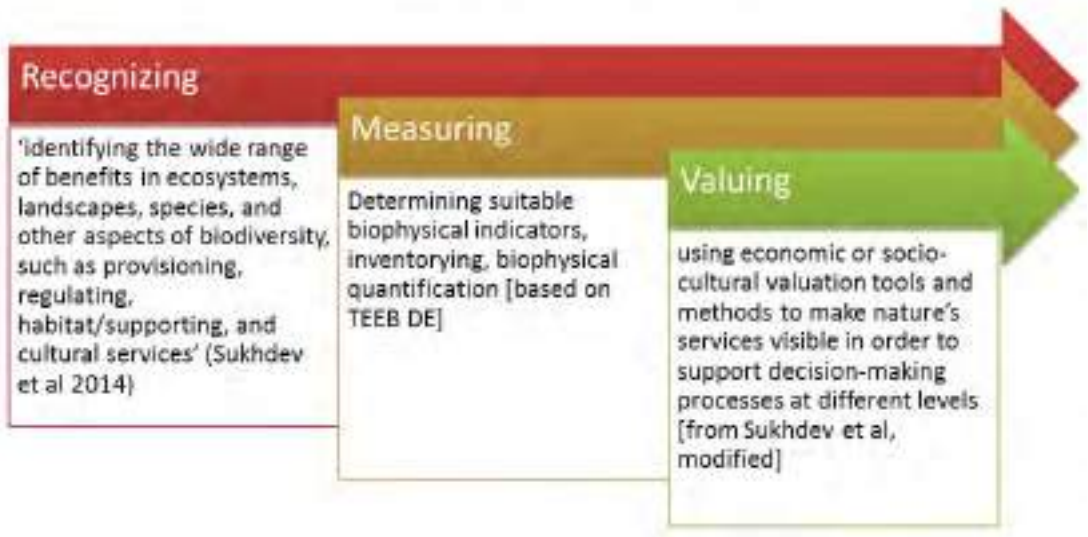
- Measures to reduce soil sealing by buildings and infrastructure
- Measures to reduce compaction
- Management of man induced soil subsidence
- Prevention and remediation of contamination and salinization
- Maintaining or increasing carbon storage in urban soils

Impact of land- and soil management practices on soil ecosystem services

Agricultural areas:

- Conservation agriculture:
  Tillage reduction, crop residue management, crop rotations
- Water management
  Land management oriented to increase soil water infiltration, Land management oriented to decrease soil water pollution
- Grazing management

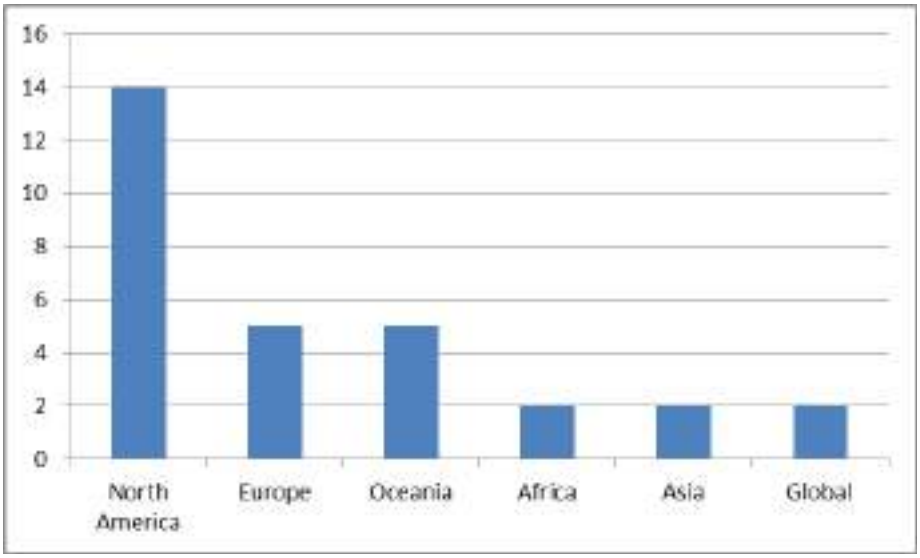
The value of benefits from soil ecosystem service



The valuation cascade from recognition and identification, through (biophysical) measurement to (economic) valuation (based on Sukhdev et al. 2014 and Natural Capital Germany – TEEB DE 2017).

Valuation studies soil ecosystem services

Geographic coverage of economic valuation studies



Distribution of economic valuation studies of soil ESS according to Jónsson and Davíðsdóttir (2016)

Conclusions

Which ecosystem services to include in a soil assessment?

- Overview of soil ESS
- Some less obvious, especially in urban context
- Cultural services: overlaps between services and the role of soil could be further elaborated

Conclusions

The impacts of land and soil management practices on ESS

- Optimal management depends on ESS demand and on local soil characteristics.
- Some practices impact many ESS or specific bundles of ESS.
- Information on the status of potential provision and demand for ESS can be used to prioritize management actions to enforce specific services.
- Stimulate management practices that enforce multiple ecosystem services or to mitigate adverse impacts.

Conclusions

The status of soil ESS: what we know about potential and use

- For provisioning services, production and abstraction is well documented.
- What causes the increase or decrease and what is the role played by soil (quality)?
- Indications for unsustainable use of agricultural production
- Regulating services: the role of soil is hidden in integrative indicators
- For some regulating services required level of spatial detail is a challenge

Conclusions

The economic impact of changes in ESS

- The estimation of the economic value of soil ESS can inform decision-making on soils
- Economic valuation of soil ecosystem services is still a nascent area of research where research gaps abound.
- Particularly, there are very few economic valuation studies of soil ESS conducted in Europe.
- Virtually all economic valuation studies of soil ecosystem services focus on agricultural contexts.
- The available studies use very diverse, qualitatively divergent methods and approaches, which makes their results hardly comparable.
- The field mainly provides insights into the economic value of soil ESS in orders of magnitude.

Recommendations and future outlook

14:00 Workshop 2 Recommendations
16:15 Combined workshop 1&2 Ways forward

SOILS4EU:

Providing support in relation to the implementation of the EU Soil Thematic Strategy

Soil ecosystem services

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MAES Soil working group

EC DG Environment

Workshop set up

time	topic	name
2:00-2:15	Welcome intro of people Aim of the workshop	Linda
2:15-2:40	Presentation key recommendations and motivations	Bartosz
2:40-2:50	Time for questions	all
2:50-3:30	4 working groups	Linda Bartosz Bavo Nele
3:30-3:45	Wrap up: key outcomes / ways forward	Group leaders

Land- and soil management practices

Recommendations for practical soil management and policy making:

- Integrally consider the *potential* provision of ESS, *demand* for these services and *trade-offs* between ESS to determine whether the use of soil is sustainable.
- Analysis of potential supply and demand of ESS should be spatially and temporally specific.
- Stimulate practices that enhance multiple ESS

Which ecosystem services to include in a soil assessment?

Provisioning services	Biochemical and pharmaceuticals
	Food, wood and fibre
	Fresh water
	Carrying capacity for infrastructure, buildings and animals
Abiotic provisioning services	Raw materials
	Thermal energy
Regulation and maintenance services	Water purification and soil contamination reduction
	Water regulation
	Biological control of pests and diseases
	Carbon Sequestration
	Regulation of greenhouse gasses
	Regulation of local climate/temperature
	Noise abatement
	Air quality regulation
Cultural services	Recreation and tourism
	Knowledge/scientific research, Cultural heritage and education
	Spiritual and symbolic experience

Which ecosystem services to include in a soil assessment?

Recommendations for practical soil management and policy making:

- Structural analysis on the impact of their decisions on ecosystem services for well informed decisions.
- Start with a broad analysis

Recommendations for future research:

- For consistent use of cultural soil ESS, it would be helpful to refine the definition and to further assess the role of soil.

Information quantity of potential and use of soil ecosystem services

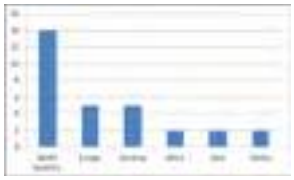
Recommendations for future research:

- Assess the relation between change in flows of provisioning services (harvest), the potential supply of provisioning services and the role of soil in potential supply.
- For regulation and maintenance services extract the role of soil
- Be aware of the required level of spatial detail
- When indicators for ESS potential are lacking, a combination of indirect indicators can provide insight in the potential. New maps in which these indicators are combined would be useful to be produced in the future.

Valuation studies soil ecosystem services

Recommendations for future research:

- Much effort in developing soil-specific approaches to economic valuation would be needed.
- More focus on non-agricultural contexts (e.g. urban soil ESS)
  and more research in Europe will improve the availability of information for decision makers in Europe.



TIME FOR QUESTIONS

Up to 2:50

DISCUSSION GROUPS

2:50-3:30

Group 1 which soil-related ESS - Bavo Peeters

Group 2 management of urban and agricultural soil systems to enhance ESS - Nele Bal

Group 3 Valuating ES - Bartosz Bartowski

Group 4 availability of information on ES capacity and use – Linda Maring

- Do you support recommendations?
- How to implement?
- Who can do what with it?
- Underpin your inputs with an example where possible

INSPIRATION STRATEGIC RESEARCH AGENDA: TOPICS & MATCH-MAKING OF FUNDERS

Paul Nathanail (University of Nottingham)
Co-Authors from INSPIRATION consortium

Why Motivation and problem statement

Growing a low carbon, resource efficient economy with a sustainable supply of raw materials requires research, innovation and dissemination of good practices across Europe and beyond. Cross-European networking is needed to facilitate dialogue among relevant funding bodies, research organisations and end user communities. Such dialogue can encourage R&I and improve coordination of EU and national funding activities while fostering synergies with international research and innovation programmes.

What Approach, results; keymessages

A transition in Soil Policy is needed, but such a transition needs new knowledge. INSPIRATION developed a bottom up approach to identifying the new knowledge needed. Workshops and interviews in over 17 countries across Europe reported over 2000 needs that were distilled into 22 research topics across four themes and an additional 17 integrating research needs, culminating in improving preparedness for changing climate conditions and amplified related hazards.

Such research and innovation requires funding beyond that available from national or even EU budgets – a variety of co-funding is essential. No one funding model will suit every organisation or activity. Models identified including International funding, Bilateral funding, EU initiatives (including frameworks, ERANets, COST, ERANets, JPI, Article 185), National Research foundations/ councils, Public/ Private co-financing (eg Innovate UK), Third sector and finally Crowd funding.

A series of online and face to face events has helped funders from across Europe meet and share their priorities and appetites for co-funding. This match making will continue beyond the end of the funding for the H2020 INSPIRATION project.

Key Conclusions; take home message

Funders are invited to review the research needs in the INSPIRATION SRA and identify those that meet their funding priorities and that lend themselves to collaborative funding. INSPIRATION National Contact Person are on hand to help identify other funding bodies with shared interests in co-funding specific activities.

More Further reading recommendations

Website: www.inspiration-h2020.eu and www.inspiration-agenda.eu
Twitter: @inspiration4eu

The INSPIRATION SRA – Topics and match-making

Paul Nathanail, University of Nottingham

INtegrated Spatial Planning, land use and soil management Research ActTION

Sustainable spatial planning, land use & soil management - Closing knowledge gaps by implementing new research collaborations

The INSPIRATION Strategic Research Agenda – Topics & match-making of funders

On behalf of INSPIRATION consortium
Professor Paul Nathanail, University of Nottingham, UK
Paul.nathanail@nottingham.ac.uk

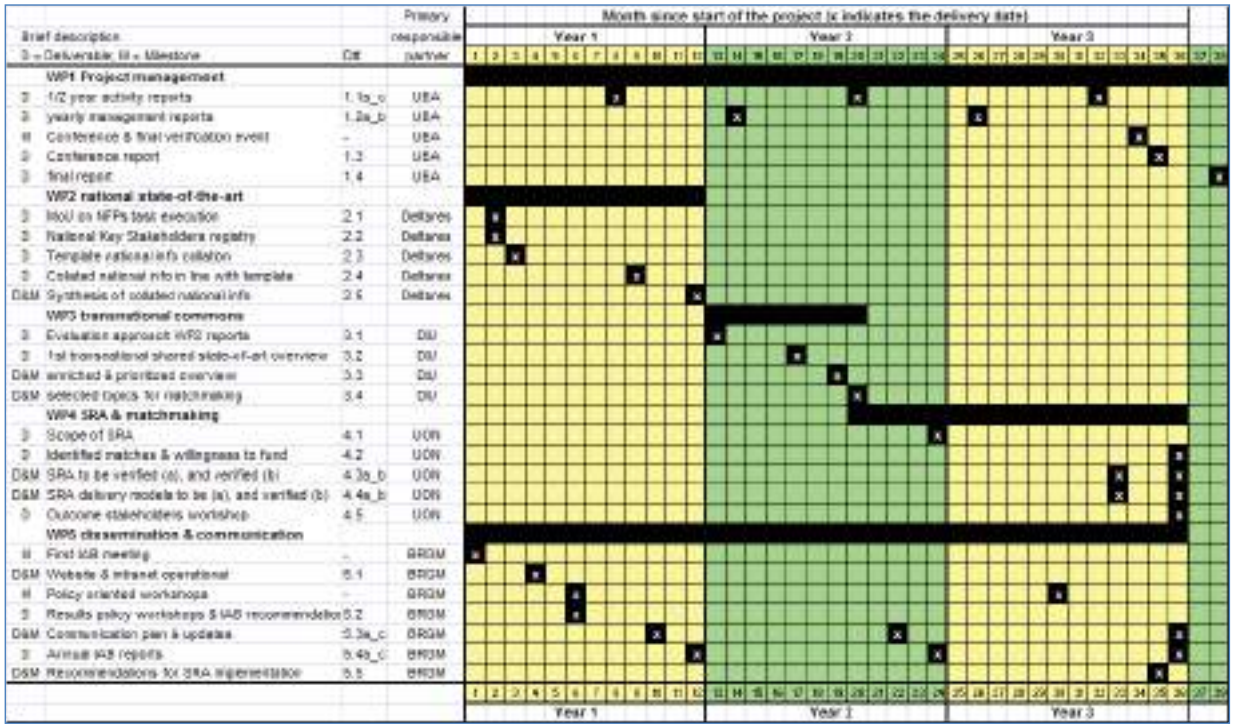
Spatial Planning, Land Use & Soil-Sediment-Water Management

Take home messages

- Bottom up identification of national research and innovation demands
- Synthesis of these demands into stakeholder focused Strategic Research Agenda
  - 4 themes (supply; demand; management; impact) and
  - 17 integrated research needs
- Use Strategic Research Agenda to help match making
- Conference and Soil Day Celebration 4 – 6 December 2017
- Match making and revision of the SRA
- Post funding INSPIRATION4EU network

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Schedule: 3 months to go!



www.inspiration-h2020.eu @inspiration4eu 4

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Societal Challenges #5: Growing a low carbon, resource efficient economy with sustainable raw material supply

Selected SC5 Topics

- 08-2014: Preparing & promoting innovation procurement for soil decontamination
- 09-2014: Consolidating the European Research Area on biodiversity and ecosystem services
- 10a-2014: Enhancing mapping ecosystems and their services
- **10b-2014: Structuring research on soil, land-use and land management in Europe**
- 11a-2014: Mining of small and complex deposits and alternative mining
- 11b-2014: Flexible processing technologies
- 13a-2014: Mineral deposits of public importance
- 13b-2014: Strategic international dialogues and cooperation on raw materials with technologically advanced countries
- 14-2014: Consolidating global knowledge on the green economy in support of sustainable development objectives in Europe and internationally

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Objectives of Call SC5-10b-2014

- Better **coordination** of often **fragmented research**
- Innovative ways to **mobilise** all relevant **actors, increase policy coherence**, resolve trade-offs, manage conflicting interests, increase participation of citizens in decision-making and improve public awareness and business uptake of research results.
- **Creation of European networks to facilitate dialogue among relevant scientific communities, funding bodies and user communities in Europe**
- Clustering, coordinating and creating synergies between international, European and nationally funded research and innovation actions,
- Developing **joint programmes and projects,**
- Creating links with related international programmes,
- Improve science-policy interface
- Aligning research with decision-making requirements.

SC5-10b-2014: Expected Products and Impacts

- **Network** of funding agencies and other key players in Europe
- Joint vision and a **Strategic Research Agenda (SRA)**
- Evidence-based policy and appropriate, cost-effective management, planning and adaptation decisions
- Enhanced **impact** of research and innovation activities through
  - better identification of R&I priorities,
  - improved coordination of EU and Member State/Associated Country research and innovation programmes and funded activities,
- **Synergies** with international research and innovation programmes.

INtegrated Spatial Planning, land use and soil management Research ActTION

"Research is not finished until it is written up"… & has made an impact

- Creation of knowledge
- Transfer of knowledge
- Uptake of knowledge
- Demonstration of applicability
- Codification & standardisation

MOST of our research & innovation needs involve two or more of each of these activities

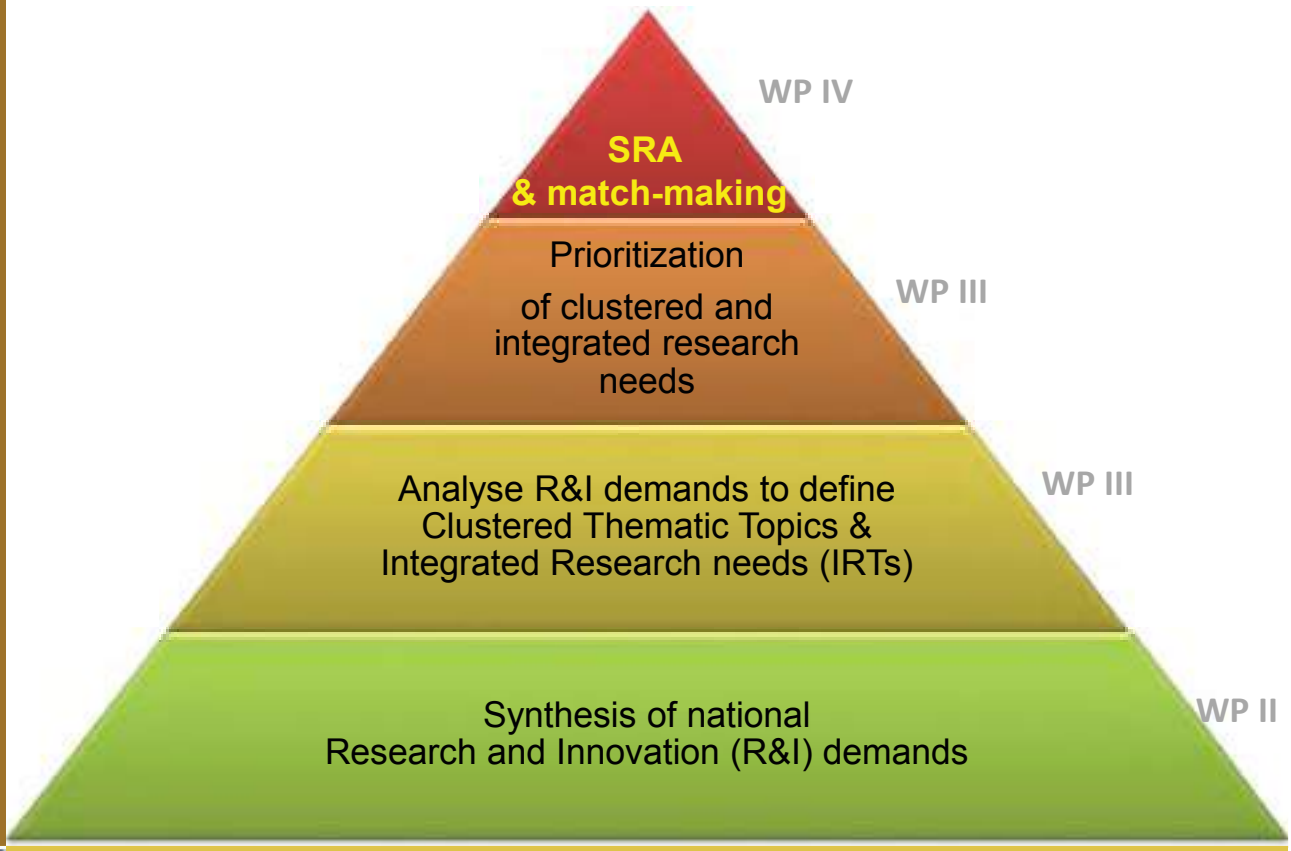
"Transition in Soil Policy needs new Knowledge" Margot de Cleen

- To manage something you must first understand it
- That which you cannot enforce, do not command
- Know your enemy - Know yourself (the enemy within)

So how did we identify the new knowledge we need?

INtegrated Spatial Plannlng, land use and soil management Research ActTION

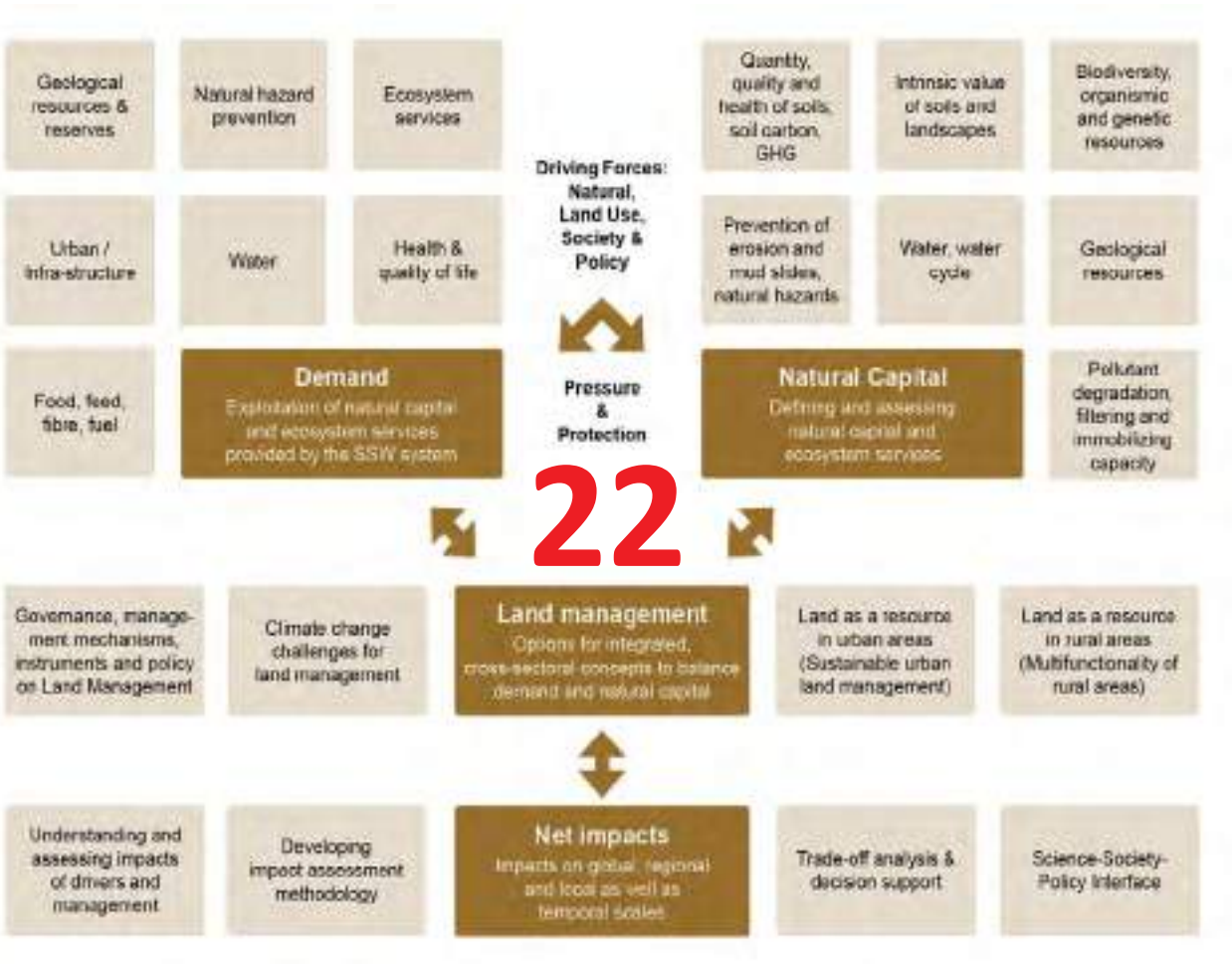
Bottom-up inspiration



National research priorities & capacity reviewed

Each Partner Country identified:

- Societal challenges and needs
- Research needs
- Connecting science, policy & practice
- National and trans national funding schemes
- **Key message**
  UK: Land use management is **complex**, **transcends disciplinary boundaries** and involves unavoidable inherent epistemic and aleatory **uncertainty**



Integrating Research Topics (IRTs)

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From information to implementation

IRT-1: Integrated Environmental Assessment and Soil Monitoring for Europe

IRT-2: Recognizing the value of ecosystem service in agricultural land use

IRT-3: From indicators to implementation: Integrated tools for a holistic impact and land use assessment

FFFF: demand, potentials and risks

IRT-4: Bio-Economy – unleashing the potentials while sustaining soils

IRT-5: Integrated scenarios for the Soil-Water-Food nexus under societal challenges

IRT-6: Assessing the efficiency of the Soil-Sediment-Water nexus of resources

IRT-7: Maintaining soil fertility by organic farming to attain food security

Challenge: Integrated urban management

IRT-8: Circular land management

IRT-9: Developing effective policies to combat urban sprawl

IRT-10: Facilitating the implementation of urban green infrastructure through stakeholder participation

IRT-11: Integrated management of soils in urban areas

IRT-12: Environmentally friendly and socially sensitive urban development

IRT-13: Urban Metabolism – Enhance resource efficiency through a closing of urban material loops

Disturbed landscapes

IRT-14: 'Emerging contaminants' in soil and groundwater

IRT-15: Sustainable management and valorization of degraded land

IRT-16: Innovative technologies and eco-engineering 4.0: Challenges for a sustainable use of rural and urban landscapes and the SSW system

Climate change challenges

IRT-17: Climate change challenges - improving preparedness, response for climate conditions and related hazards

17

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Overview of IRTs

From information to implementation

IRT-1: Integrated Environmental Assessment and Soil Monitoring for Europe

IRT-2: Recognizing the value of ecosystem services in agricultural land use

IRT-3: From indicators to implementation: Integrated tools for a holistic impact and land use assessment

FFFF: demand, potentials and risks

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Overview of IRTs

Challenge: Integrated urban management

IRT-8: Circular land management
IRT-9: Developing effective policies to combat urban sprawl
IRT-10: Facilitating the implementation of urban green infrastructure through stakeholder participation
IRT-11: Integrated management of soils in urban areas
IRT-12: Environmentally friendly and socially sensitive urban development
IRT-13: Urban Metabolism – Enhance resource efficiency through a closing of urban material loops

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Overview of IRTs

Disturbed landscapes

IRT-14: 'Emerging contaminants' in soil and groundwater
IRT-15: Sustainable management and valorization of degraded land
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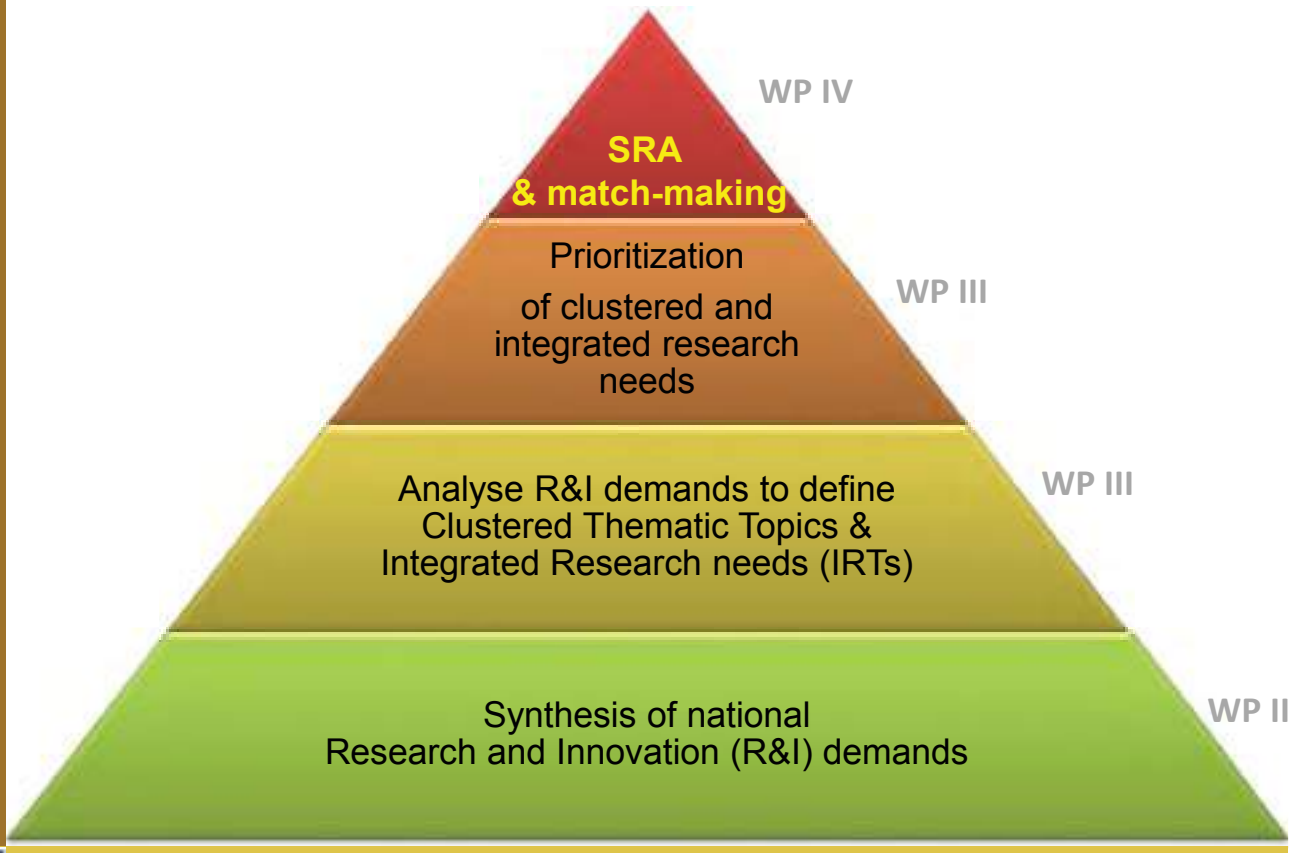
Climate change challenges

IRT-17: Climate change challenges - improving preparedness, response for climate conditions and related hazards

Making it happen



The 17 United Nations Sustainable Development Goals (SDGs)

UN Sustainable Development Goals (SDG): INSPIRATION

More on this tomorrow!

INtegrated Spatial Plannlng, land use and soil management Research ActTION

Funding models

- International funding
- Bilateral
- EU
  - Fwk
  - ERANets
  - COST
  - JPI
  - Article 185
- National Research foundations/ councils
- Public/ Private (e.g. Innovate UK)
- Third sector
- **Crowd funding**

Match making of funders

- Use the INSPI-SRIA as a high level catalyst to foster multi-lateral collaboration to fund research
- National meetings with funders to identify interest
- Introduce funders with common interests to each other
- Networking Conference: December 2017 (Brussels)
- INSPIRATION4EU network of national contact persons
- Online and face to face meetings in 2018+

Next steps by potential funders

looking for where to invest in third party research

- Review research needs
- Select those that meet YOUR institutional funding priorities
- Identify those suitable for collaborative funding
- Inform INSPIRATION National Contacts of interest in collaborative funding for specific needs
- Make contact with potential co-funders (after introduction by National Contacts)

This project received funding from the European Union under HORIZON 2020 under Grant Agreement No. 642372.

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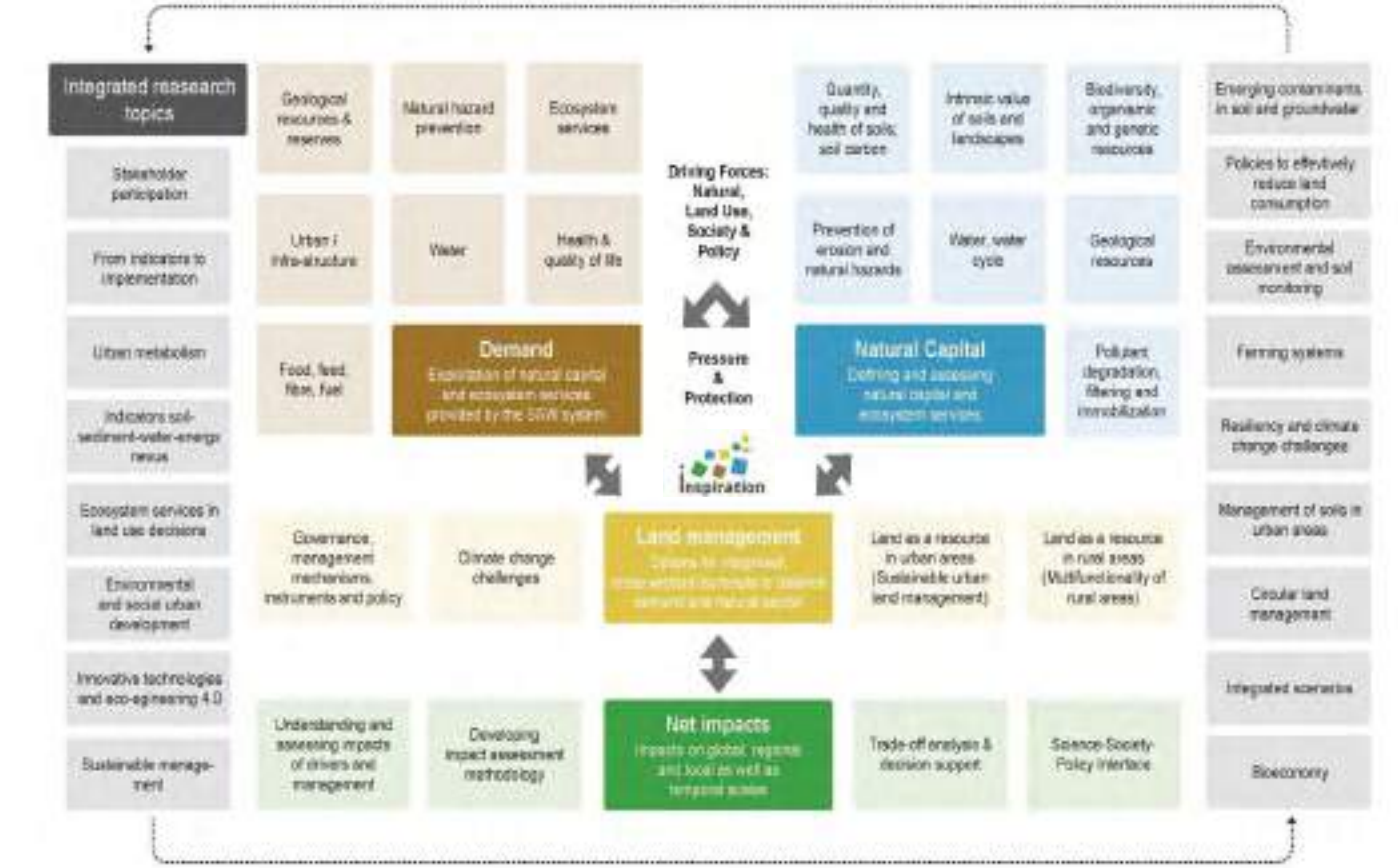
INSPIRATION Research Agenda



INTRODUCTION TO TRANSNATIONAL RESEARCH COL-LABORATION: THE SNOWMAN EXPERIENCE & REPORTS FROM PREVIOUS SNOWMAN PROJECTS

Isabelle Feix (Ademe); Esther Goidts (SPW); Yvonne Ohlsson (SGI)

Co-Authors from Bert van Goidsenhoven (OVAM); Frédérique Cadière (Ademe)

Why Motivation and problem statement

Presentation on the experiences gained in the SNOWMAN network on transboundary collaboration, e.g. recent calls, involved countries, main results. Experiences related to transnational funding and collaboration, through some soil research project testimony and results obtained from a questionnaire sent to researchers funded by SNOWMAN Discussion on the added value of transnational research funding and collaboration, and recommendations for future initiatives.

What Approach, results and key messages

SNOWMAN was firstly an eranet project under the 6th Framework Program. Since 2009, it is a self-funded network of research funding organisations and administrations on sustainable management of soil [and groundwater] in Europe. Its main intention is to minimize administrative constraints experienced in EU co-funding procedures and support joint funding interest and national flexibility. This network pay a special attention to the dissemination. They initiate a SNOWMAN landscape of funded projects on their thematic. They also published Policy Brief.

During the workshop they shared their call procedure, from the elaboration of the call to the call itself and the contracting phase.

They shared also the experience though the testimony of several project leader of SNOWMAN funded project and through the result of a questionnaire sent to all project leader funded by SNOWMAN
Main messages are the following:

- Medium size of the network appreciated
- Call flexibility (funders priority, national rules)
- Numerous network interactions (TC's)
- Mismatch between budget and proposals
- Strong secretariat is a key element
- Time for call preparation is significant

Key Conclusion and take home message

Willingness of the SNOWMAN network to initiate A European network for soil research funders : i.e. A group of European research funders and administrations that aims to bridge the gap between knowledge demand and supply in the field of sustainable soil management.

There are challenges to face:

- Soils are a stategic issue for humans and ecosystems, soil threats are still going on.
- There is no coordinated research at an European level, soil thematic research is split in different research programmes

INTRODUCTION TO TRANSNATIONAL RESEARCH COLLABORATION: THE SNOWMAN EXPERIENCE & REPORTS FROM PREVIOUS SNOWMAN PROJECTS

- Need for a strong soil research agenda coordinated at EU level and with a higher visibility

What to gain with such a network?

- New knowledge, methodology, decision support tools for a sustainable soil and land management
- Applied research, oriented on end-users' needs, including dissemination and science-policy interface
- Joint funding increase return on investment by sharing all results among all committed funders, with a flexible call procedure
- Complementarity of competences, diversity of approaches enables to answer more scientific questions and avoid redundant research project in several countries.

More Further reading

Slides of the presentation made

Proposal for a European network of funders to implement the INSPIRATION Strategic Research & Innovation Agenda for soil use, land management and spatial planning

Welcome to funders' sessions

Isabelle Feix, ADEME
Stephan Bartke, UBA

This session's organization

14:00 Introduction to transnational research collaboration: The Snowman experience | Auditorium

14:30 Parallel sessions

INSPIRATION match-making
Terra | Sylva | Aqua
14:30 - Funders meetings I
15:00 - Funders meetings II

Transnational collaboration
Auditorium
14:30 - Experiences & results from 5 projects

15:30 Joint break

16:00 - Funders meetings III
16:30 - Funders meetings IV

16:00 - Discussion & advise for future initiatives

17:00 Joint closing session

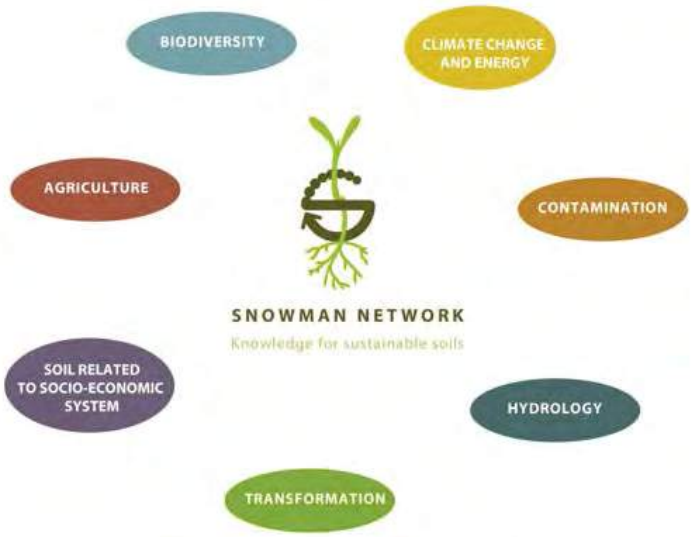
This session‘s organization

INSPIRATION match-making

- **Objective**:
  Enable funders to decide appetite for further match making and on next action after the event,
  + if possible: identify a lead contact person for specific actions
- Each registered funder receives an **individual agenda** based on interests in SRA topics in the web database
- Funder = providing financial resources,
  grant makers (public, private, trusts …) with collaboration intention

Transnational research collaboration

Esther Goidts, Soil Protection Direction, Public Administration of Wallonia
Yvonne Ohlsson, Swedish Geotechnical Institute



SNOWMAN NETWORK
Knowledge for sustainable soils

SNOWMAN NETWORK

Introduction to transnational research collaboration: the SNOWMAN experience…

… *And potential for future collaborations*

Esther Goidts, Public Administration of Wallonia (BE)
Yvonne Ohlsson, Swedish Geotechnical Institute

Outline

1. **Network first steps & evolution**
2. **Knowledge development & dissemination**
3. **Call procedure & experience**
4. **Feedback from researchers**
5. **New network potential**

1. Network first steps & evolution

- ERANET from 2003 to 2009 (6th Framework Program)
  - On management of contaminated sites
  - To establish a network of research funders to execute joint calls for research projects

=> pilot Call 1 in 2006 (FR, SE, BE, NL, UK, DE, AU, IT, CZ)

Topics : strategies and related tools for sustainable management of land contamination

=> Call 2 in 2009 (start of the call) (FR, SE, BE, NL, AU, RO)

- From 2009 : self-funded network of research funding organisations and administrations on sustainable management of soil [and groundwater] in Europe

Intention to minimize administrative constraints experienced in EU co-funding procedures and support joint funding interest and national flexibility

1. Network first steps & evolution

=> Call 2 finalised in 2009 (FR, SE, BE, NL, AU, RO) – 1,8M€

Topics : Areal management of contaminated soil and groundwater, integration of soil management into spatial planning, use of contaminated land for biofuel crop production

3 projects funded/12 submitted

=> Call 3 in 2010 (FR, SE, BE, NL) – 2 M€

Topics : Soil functions and ecosystem services, sustainable agriculture and forestry, contamination

6 projects funded/15 submitted

=> Call 4 in 2012 (FR, SE, BE, NL) – 1,8 M€

Topics : relationship between soil and social and economic sciences

3 projects funded/8 submitted

1. Network first steps & evolution

Scope – research themes

- **transformation processes on soil functions**
  physical, chemical and biological processes as a basis for ecosystem services
- **biodiversity**
  role of soil in maintaining diversity of species
- **hydrological system**
  interaction of soil and (ground)water
- **climate change and energy supply**
  role of and effects on soil, including carbon cycles
- **sustainable agricultural production**
  high yields while maintaining soil fertility
- **contamination**
  risk assessment of human health, ecology, risk reduction technologies
- **socio-economic factors**
  impact and influence of socio-economic factors on soil functions

1. Network first steps & evolution

Network partners from several countries and administrations:

- **France** - ADEME – Call 1, 2, 3 & 4
- **Sweden** - FORMAS – Call 2, 3 & 4
- **Austria** - KPC – Call 2
- **Belgium**, Flanders - LNE – Call 2 & 3
- **France**, MEDDE – Call 3 and 4
- **Belgium**, Flanders - OVAM - Call 1, 2, 3 & 4
- **The Netherlands**, SKB - Call 1, 2, 3 & 4
- **Sweden** - SEPA - Call 2 & 3
- **Belgium**, Wallonia - SPW-DGARNE – Call 3 & 4
- **Germany** - UBA – Call 1
- **Romania** - UEFISCSU – Call 2
- **UK** - UK EA – Call 1

2. Knowledge development and dissemination

Special attention to dissemination!

- Dissemination part mandatory within the project (website, conferences, publications, …)
- A Knowledge Dissemination Task Team within SNOWMAN network to support projects and enhance dissemination during and after project time

During project time :

- All-projects meetings! (Kick-off, mid-term, end)

=> Collaborations and exchanges promoted

2. Knowledge development and dissemination

Special attention to dissemination!

After project time :

Website,
Newsletter, …

SNOWMAN Landscape

Thematic Policy Briefs

http://snowmannetwork.com/

Follow-ups &
sharing of performed dissemination

3. Call procedure & experience

- **Network strategic objectives:**

1. **Implement Research agenda of the network through transnational regular calls**

1. **Update of the Research agenda based on needs identified (gaps/challenges)**

2. **Transnational dissemination of the knowledge acquired**

3. **Development of partnership with new funders**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Network hub**

3. Call procedure & experience

- **Call process**

<u>1. Research Agenda definition</u>

- Overall agenda
- Technical scope for a specific call
- Now INSPIRATION?

<u>2. Call:</u>

1. ***Preparation phase (funders)***
   - Voting matrix & budget (*Virtual Pot with Juste Retour model*)
   - Draft Letter of Commitment

   => Coordinated call principles and procedures to endorse

3. Call procedure & experience

- **Call process**

2. Execution phase

- Signature of Letter of Commitment
- **Call Steering Committee** nominated by funders
  Call Secretariat funded by funders participating in the call
- **Launch of the Call** (topics and constraints)

  Applicants'guide + application form (part A & B)

- **Checks: eligibility** (secretariat), **fundability** (funders), **fit to call** (CSC)
- **peer reviewing** (advisory board)**, evaluation report**
- **funding evaluation** (Call Steering Committee)

  short list : ***Offer funding / Reserve List / Reject***

3. Call procedure & experience

- **Call process**

3. Contracting phase

- **Confirmation Letter from funders and project Board setting**

3. Call procedure & experience

- **Call process**

  3. Contracting phase

  - **Consortium agreement between researchers**

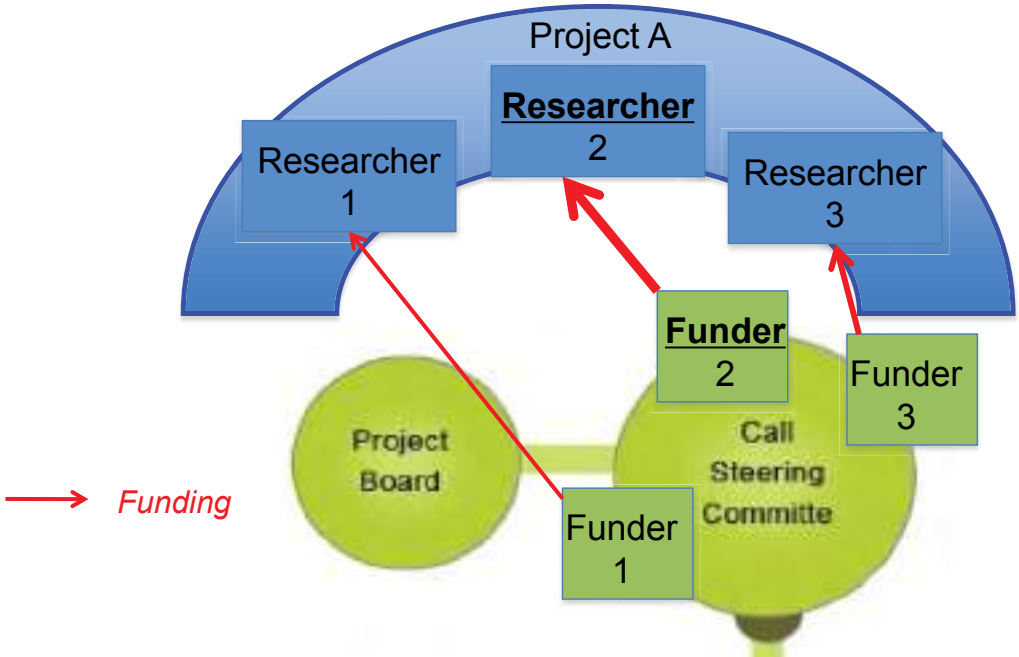
Consortium agreement binding researchers

3. Call procedure & experience

- **Call process**

  3. Contracting phase

  - **Funding : Virtual Pot with Juste Retour model**

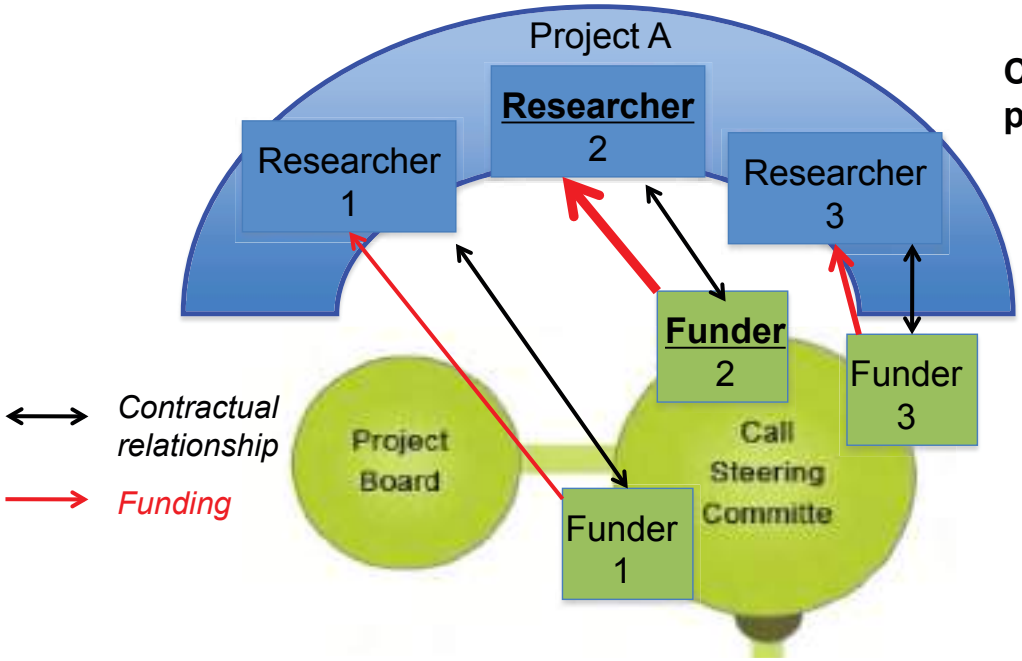


3. Call procedure & experience

- **Call process**

  3. Contracting phase

  - **Funding : Virtual Pot with Juste Retour**



Contract include 3 parts:

1) national rules

2) SNOWMAN specific terms & conditions

3) technical annex (project)

Project duration (2-3 yrs)

3. Call procedure & experience

- **Call experience**

  - **Call documents**
  - **Medium size of the network appreciated**
  - **Call flexibility (funders priority, national rules)**
  - **Numerous network interactions (TC's)**

  - **Mismatch between budget and proposals**
  - **Strong secretariat is a key element**
  - **Time for call preparation is significant**

2017 - No calls, but planning for the future!

What comes out of the INSPIRATION-project?

Is there a potential for a new funders platform?

Could the SNOWMAN experiences be used in such a platform?

What do the SNOWMAN project participants think?

4. Feedback from SNOWMAN researchers

Questionnaire sent previous to this conference

Objectives:

- *to explore what added value of transnational research funding and collaboration the researcher experienced, and*

- *to collect their recommendations for future initiatives*

4. Feedback from SNOWMAN researchers

- **Will be presented in the next session**

  Project leaders will give:

  - *Short summary of the project results*
  - *Examples of dissemination and communication*
  - *Provide their thoughts on:*
    1. *Added value of transnational research funding*
    2. *Critical challenges in planning / applying for or carrying out to SNOWMAN funded project?*

    And

  - *Provide their main recommendations for a future transnational research project calls for research:*

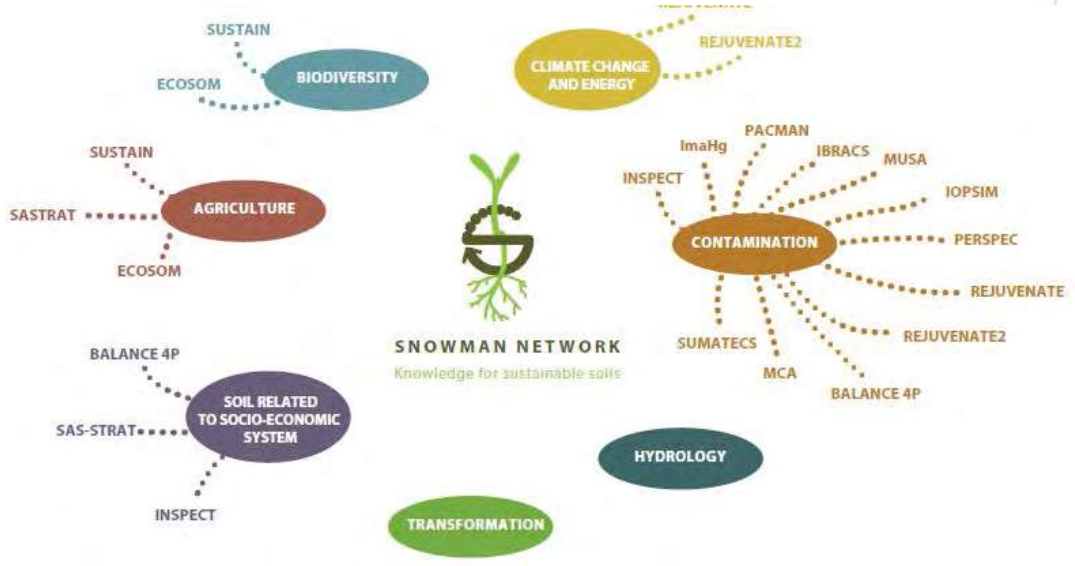
    1. *"elements to keep"*
    2. *"suggestions for improvements"*

Also a summary of the whole questionnaire later on today

5. New network potential

- **New opportunities for project funding:**
  - **INSPIRATION Strategic Research Agenda**

SNOWMAN landscape



=> Many common topics with INSPIRATION SRA

5. New network potential

- **New opportunities for project funding:**
  - **INSPIRATION Strategic Research Agenda**
  - **INSPIRATION Match-making of funders**
  - **SNOWMAN experience in call management**
  - **Cooperation with other soil networks**

=> New funding network?

2018 – Implementing the future

- Future calls?
- Partners?
- Research agenda
  - INSPIRATION?

Join us in discussions during sessions and match-making!

Or mail to info@snowmannetwork.com


Isabelle Feix


Esther Goidts


Yvonne Ohlsson


Bert van Goidsenhoven


Frédérique Cadière

BALANCE 4P

Jenny Norrman, Chalmers, CEE + Arch.

CHALMERS

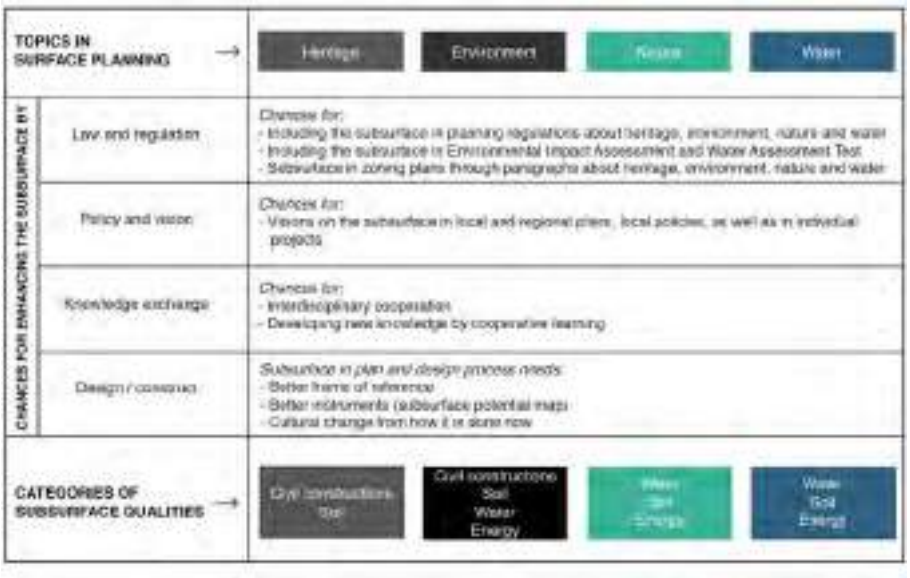
BALANCE 4P

Balancing decisions for urban brownfield regeneration – people, planet, profit and processes

Chalmers, CEE + Arch.: *J Norrman, Y Volchko, L Rosén, J-H Kain*
Deltares: *L Maring & S van der Meulen*
TU Delft, Dept of Urbanism: *F Hooimeijer*
VITO: *S Broekx, A Beames, K Touchant*
Enveco EEC: *M Ivarsson*
r3 Environmental: *P Bardos*

Subsurface in planning

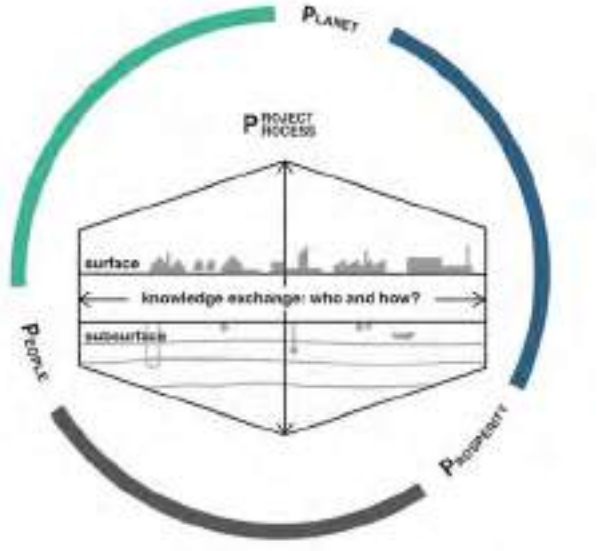
- Comparison of planning systems (NL, B, SE)
- Focus in project:
  - Knowledge exchange
  - Design/construct



Hooimeijer & Tummers, 2017. Integrating subsurface management in spatial planning in the Netherlands, Sweden and Flanders. *Urban Design and Planning Porceedings journal*, Paper 1600033, 12p.

Case studies + assessment and inventory of tools and instruments

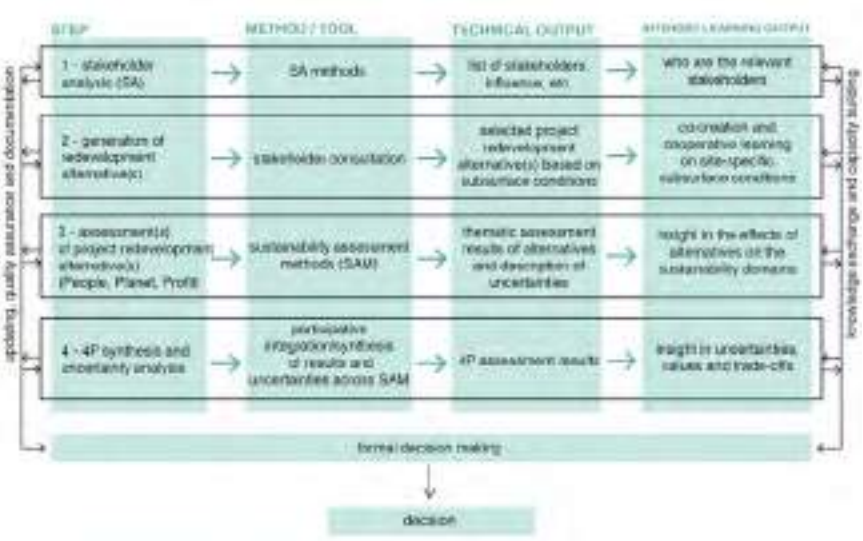
- Rotterdam
- Alvat
- Göteborg
- Instruments that asses 3P and enhance knowledge exchange between the surface and the subsurface sectors



Beames, A. et al., 2014. Sustainability appraisal tools for soil and groundwater remediation: How is the choice of remediation alternative influenced by different sets of sustainability indicators and tool structures? Science of the Total Environment, 470-471, pp. 954-966.

Suggested framework

- Working process including recommendations
- Combine methods from planning and decision support



Norrman, J. et al., 2016. Integration of the subsurface and the surface sectors for a more holistic approach for sustainable redevelopment of urban brownfields. Science of The Total Environment, 563-564, pp 879–889.

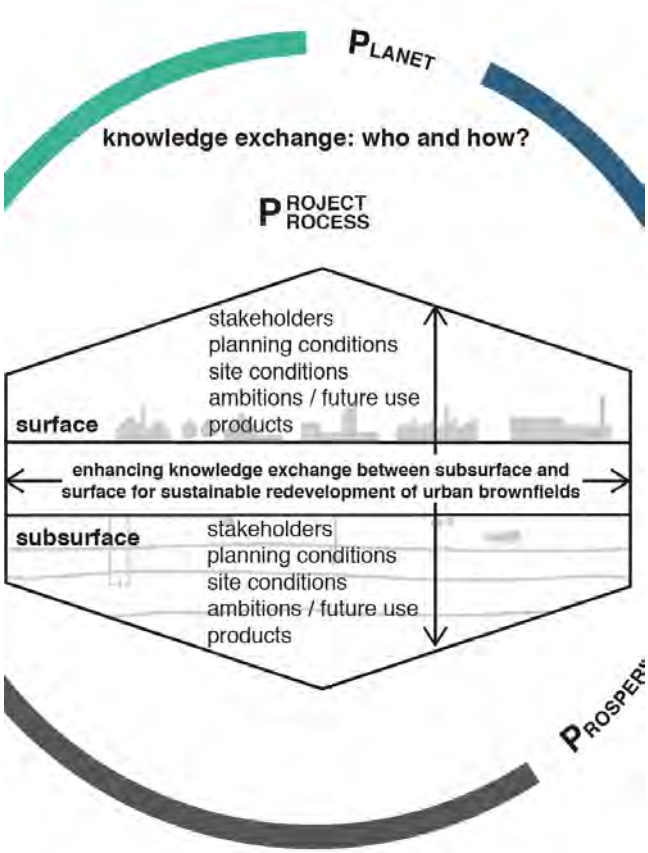
Dissemination activities

- Web: LinkedIn, web-page, SNOWMAN, summary
- Cases: workshops, exchange between cases and municipalities
- National branch conferences: 4
- Branch magazines: 2 planning, 1 remediation
- Students: workshops, study visit, internship, thesis work
- Reports: 3, all available on-line (+ report to funders)
- Int. conference/workshop presentations: 7
- Scientific papers: 3
- Proceedings (book): soil security
- SNOWMAN meetings & with other EU-projects

EXTERNAL COMMUNICATION			
Type of activity	**target group*)**	**Date**	**Weblink/documentatic**
Summary at the SNOWMAN website	1,3	June 2013	http://www.snowmanne ork.com/main.asp?id=2
Project website (at Chalmers website)	1,2,3,4	Nov 2013	http://www.chalmers.se n/projects/Pages/Balanc -4P.aspx
Posted project on the SNOWMAN landscape	1,3	Nov 2013	http://snowmanlandscap .com/projects/balance-4 balancing-decisions-for- urban-brownfield- regeneration-people- planet-profit-and- processes/
SNOWMAN knowledge dissemination meeting Paris, presentation (Jenny)	1	Nov 19-20, 2013	http://www.snowmanne ork.com/pagina1kolom. p?id=69
Project posted on LinkedIn, 14 members	2,4	Nov 2013	-
Publication of article in Dutch (spatial planning) magazine S+RO (Fransje, Linda)	2,3	Dec 2013	Hooimeijer, Fransje, Linda Maring (2013). Ontwerpen met de ondergrond. S+RO 2013/6, pp 52-56 http://repository.tudelft.r view/ir/uuid%3Ae6f9cbe -8cc5-4a2e-b706- d32224db2191/
Meeting with Andy Cundy from GREENLAND project (Linda, Fransje, Steven, Jenny)	3	Dec 2013	Dropbox
Abstract to AESOP Association of Schools of Planning (abstracts to Dec 31), Fransje sent abstract, dec 31 2013. *Not accepted.*	2,3	March 7-9	http://www.aesop-planning.eu/
Publication of review paper in STOTEN (Alistair, Steven, Kaat et al.)	3	Feb 2014	http://www.sciencedirec com/science/article/pii/S 048969713011881
Renare Marks vårmöte 2014, oral presentation (Jenny).	2 (Swedish branch) + 3	April 2 2014	http://www.renaremark. /filarkiv/konferens/2014/ armote2014/presentatio er/10_Balance_4P%20. nny%20Norrman%2014 402.pdf
Stakeholder workshop Rotterdam I (Linda, Fransje, Kaat, Jenny)	1,2	March 31	Dropbox
Student workshop in Göteborg, Fixfabriken (Jenny, Fransje, Linda, Jaan-Henrik)	1,2	April 24-25	Dropbox
Presentation on Balance 4P to municipality (Urban planning office) of Göteborg (Jenny, Fransje, Linda, Jaan-Henrik)	2	April 25	Dropbox
Presentation of Fixfabriken student workshop results to municipality and developer (Jenny, Fransje, Linda, Jaan-Henrik, Lars, Yevheniya)	1,2	April 25	Dropbox
Web-meeting with the HOMBRE project (Jenny, Linda)	1	April 25	-
Student workshop in Rotterdam (Fransje)	1,2	May 8-9	Dropbox

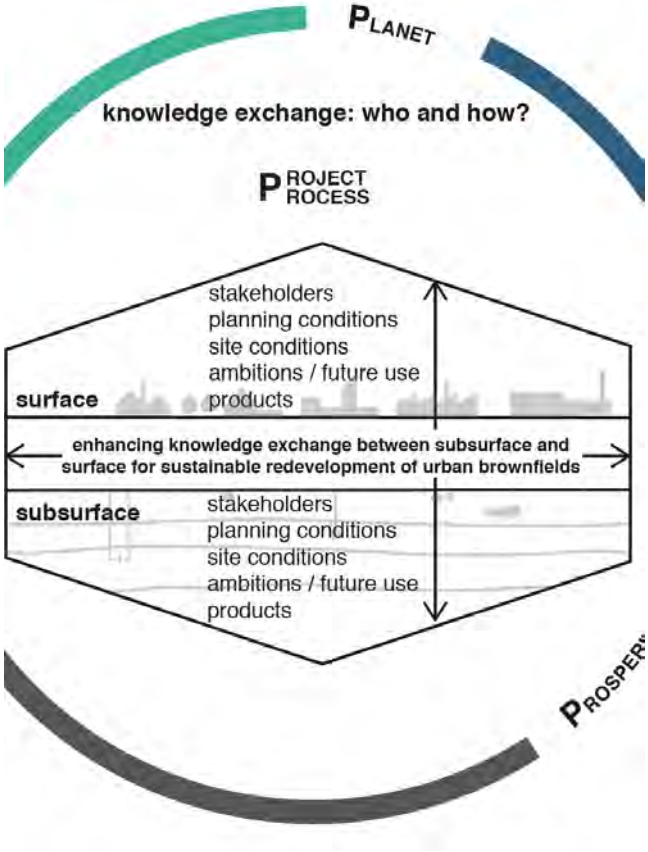
Lessons learned: added value

- Knowledge sharing across countries (and across disciplines)
- Increased dissemination possibilities
- Project size – manageable!
- Expanding researchers network, and in our case also to include a lot of other stakeholders
- FUN!



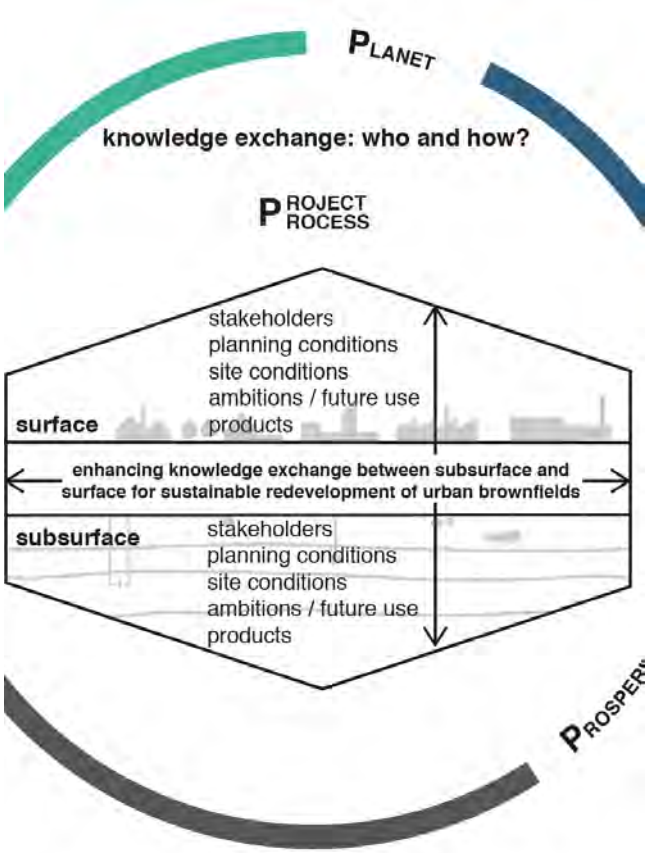
Lessons learned: critical challenge

- Funding for different time periods
- Different levels of funding and different demands on co-funding
- Balance application procedure and amount of funding
- Heavy on reporting administration (SNOWMAN + all 3 funders)
- Different praxis and regulations in the different countries
- Different disciplines (this was also the most rewarding challenge!!)
- Personnnel



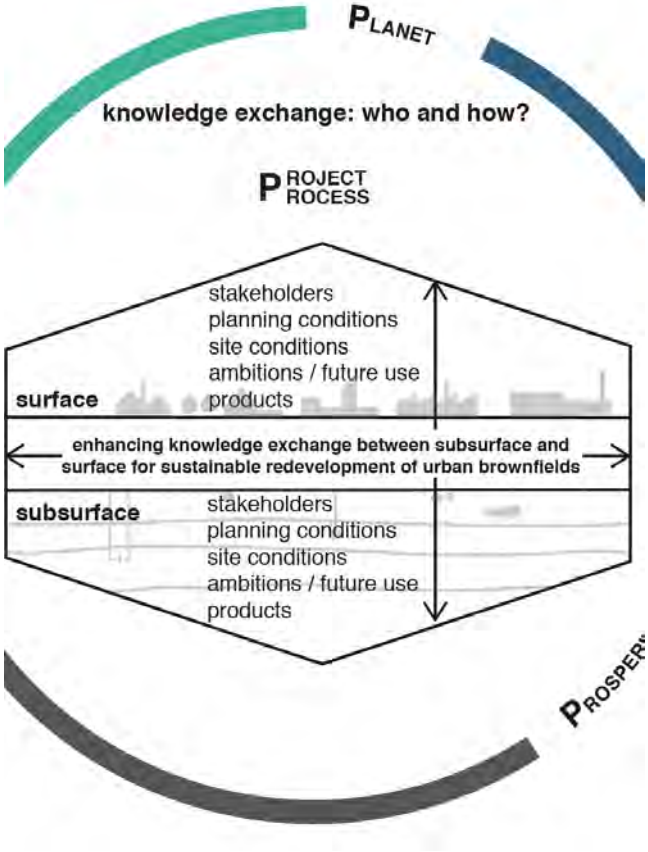
Main recommendations: elements to keep

- Possibility to get feedback and improve application (or possibly have a 2-stage application procedure)
- Knowledge dissemination meetings with all projects
- Easy administration of funding – directly from each national funder
- Supportive and flexible secretariat



Main recommendations: suggestions for improvement

- Coordinate reporting
- Avoid different funding periods within projects, avoid different levels of funding and different rules
- Knowledge dissemination meetings
  - Make sure technology works!
  - One part workshop or more informal meetings to increase knowledge sharing



CHALMERS

Urban Soils Project

Marcel Marloie, Latio.org

UMR 7206
CNRS – Muséum National d'Histoire Naturelle - Université Paris Diderot

SNOWMAN Network : Lessons from past for future collaborative funding

URBAN SOILS Project: How to better use soils to face the urban challenge?

LOUIZA BOUKHARAEVA: Project Coordinator
MARCEL MARLOIE : Project Manager

World Soil Day

WORLD SOIL DAY 2017 – Land, Soils and Science

RESULTS OF THE PROJECT

1.1. Allotment gardens sector of Russia and European countries - Quantitative analysis

Sub regions	Plots In thousand	City dwellers accessing to parcel (%)	Total areas (1000 ha)
Russia	16 900	31,7	1 562
Baltic Countries	78	4,3	3,4
Former socialist countries with allotments	1970	12,1	109
Former socialist countries without allotments	0	0	0
Germanic and Scandinavian countries	1 400	3,3	63
Western European countries	6312	1,0	17
Southern European countries	65	0,17	0,7
Total EU	4 145	2,7	192

RESULTS OF THE PROJECT

1.2. Allotment gardens sector of Russia and European countries – Qualitative analysis - Perceptions and practices - State of the art on recent research - Historical perspective - Characterization of the current period

SEVEN MODELS OF ALLOTMENTS		
	Allotments of vegetable gardens	Model 1: with open plots
		Model 2: with closed plots
	Allotments gardening with small houses → Family gardens → Leisure gardens → Ornamental gardens → Collective of dachas → Collectives of building lands	Model 3: medium multifunctionality = without the right to spend the night
		Model 4: extended multifunctionality = with the right to spend the night
		Model 5 : Shared gardens
	New collectives	Model 6: Specialized gardens (insertion, pedagogical, therapeutic)
		Model 7: New multifunctional collectives

RESULTS OF THE PROJECT

2. Results of recent research about Health and Gardening
Indicators for determinants of health: Stress levels - Physical activity – Violence - Socially profitable - Social contacts and cohesion - Fruit and vegetable consumption

3. Economic, social and environmental functions of Collective of allotments in the national accounts: in the case of transformation of agricultural land into collective gardens; land prices X 4; wealth produced X 16; equivalent jobs X 65.

4. Hypotheses to introduce a prospective research = change of scale in the creation of collective gardens in the coming decades. For instance 30% of citizens with access of a plot in a collective: more 2 millions hectares

5. Diagnosis of soil pollution problems with the provision of a guide helping garden organizations and public authorities to solve these problems

6. Children, soils and educational policies: Analysis of how urban children perceive soils, with pedagogical proposals for educational policies

DISSEMINATION

REALIZATIONS	TARGET AUDIENCE	DISSEMINATION TOOLS
1 Allotment gardens sector of Russia and EU	All audiences for paradigm shift	Deliverables on website Popular articles Books – Flyer Photographic exhibition
2 Health and Gardening	Scientific Community Public decision-makers General public	Seminar Deliverables on website Scientific articles - Flyer
3 Economic and social evaluation	Experts General public	Deliverables on website Popular articles Statistical Services Recommendations Flyer
4 Hypothesis for prospective research	All publics, scientists, actors, decision makers for paradigm shift	Deliverables on website Articles - Seminar Conferences - Flyer
5 Soil analysis and Road Map	Local communities Collective leaders	Deliverables on website Road Map with presentation articles - Flyer
6 Children and Soils	Ministries of Education Pedagogues	Booklet Recommendation for Ministries of Education Teaching materials - Flyer
Flyers are introduced in the Photographic exhibition		

SÉMINAIRES:

- **Gardening and Health, Oct. 2014 Utrecht**
- **Collectives of urban gardens in the ecological and solidarity transition Nov. 2017 PARIS**

PHOTOGRAPHIC EXHIBITION: "Working Soils in City: urban gardening at the service of sustainable cities"

BOOKS:

With 2 chapters from *Urban Soils*

Another one in preparation based on Urban Soils results

RESPONSES TO THE "SNOWMAN NETWORK: lessons from past for future collaborative funding"

1. ADDED VALUE OF TRANSNATIONAL RESEARCH FUNDING

1.1. Extension of partnerships, and network of contacts for investigations:
→ through SNOWMAN network, CNRS team identified the partnerships with:
→ RIVM, institution of which we have no equivalent in France
→ GxABT who declared itself available for that research
at the time of the project definition

1.2. Assistances for access to field research:
- RIVM organized several field visits for CNRS team investigations;
- GxABT organized several field visits for CNRS team investigations, and established contacts with a school in Liège for work with schoolchildren;
- CNRS team favored GxABT's contacts in France, Spain and the United Kingdom for soil analyzes

1.3. Confrontation with other ways of working: knowledge of other ways approaches problems, which allow the emergence of new manners to move forward differently

RESPONSES TO THE "SNOWMAN NETWORK: lessons from past for future collaborative funding"

2. CRITICAL CHALLENGES

The duration. It took us four years and a little more by having a salary over three years. Resolute by working longer.

Dissemination is a process that began during the project and then continues for several years. Everything cannot be done during the project.

Main recommendations for a future transnational research project call for research

Elements to keep

Combination of sciences of the nature and Human and Social Sciences.

Possibility of treating soils from the point of view of big societal challenges.

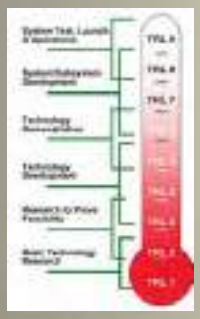
Allow the circulation of the proposals of the teams that can join the project

Main recommendations for a future transnational research project call for research

Suggestions for improvements

More flexibility for subcontracting

Candidates may be invited to situate their approach in relation to a diagram that could be inspired by the TRL (Technology Readiness Levels) scale



https://en.wikipedia.org/wiki/Technology_readiness_level

www.google.fr/search?q=manufacturing+readiness+level&rlz=1C1AVNG_enFR683FR687&tbm=isch&tbo=u&s

Outline of a questionnaire:

Work Packages	Addressed to which public : Scientific community - Public decision-makers - Companies - Civil society organizations?	Appropriate dissemination tools: Seminars - Internet - Articles - Books - Movies - Audiovisual Equipment - Exhibitions - Flyers - Notes ...
1		
2		

OTHER QUESTION: how is the target audience associated or consulted at some steps of the research process?

IBRACS

Dan Berggren Kleja, Swedish Geotechnical Institute

INSPIRATION – SNOWMAN session

4th December 2017 - Brussels

Enhanced knowledge in mercury fate and transport for Improved Management of Hg soil contamination

Partners

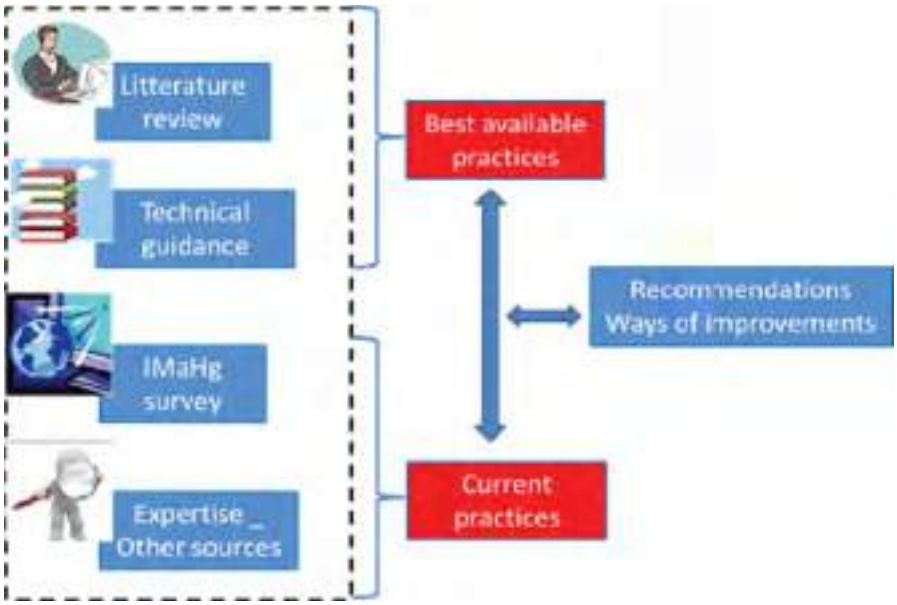
Funders

Start	End	Duration (months)	Total Funding (k€)	Dissemination cost (k€)
October 2011	February 2014	29	287	34,6

Aims of the project

- Improving the understanding of mercury speciation (chemical forms) and partition (physical forms) in the vadose zone, by
  - Compiling physical, chemical and thermodynamic constants of mercury forms
  - Checking mercury geochemical modelling capabilities
- Give recommendations for characterisation, assessment and remediation of mercury contamination in the vadose zone
- Identification of research needs

Mean-Methodology



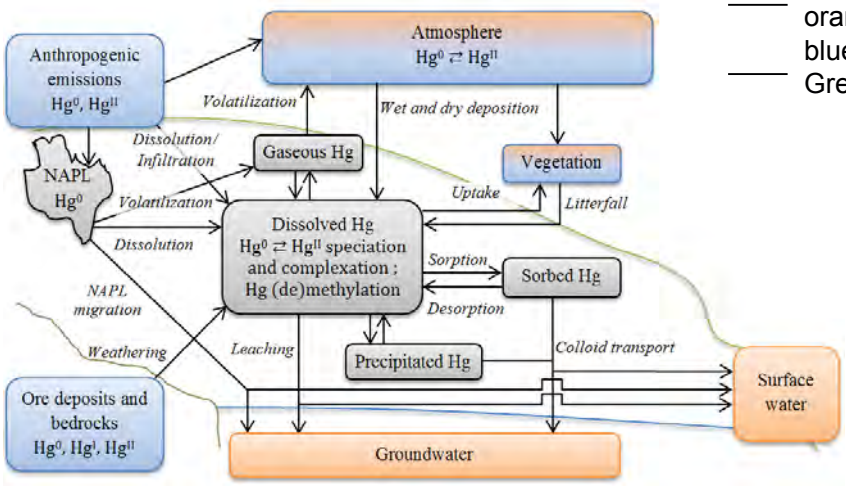
Means: litterature review ; european wide consultation ; partners experience

Mercury fate and transport

Objective: Knowledge about mercury fate and transport

Focus :

- Vadose zone and anthropogenic soil
- Aqueous species and solid species
- Phases transition: dissolution, sorption, volatilisation



orange : sink
blue : source
Grey phases in soils

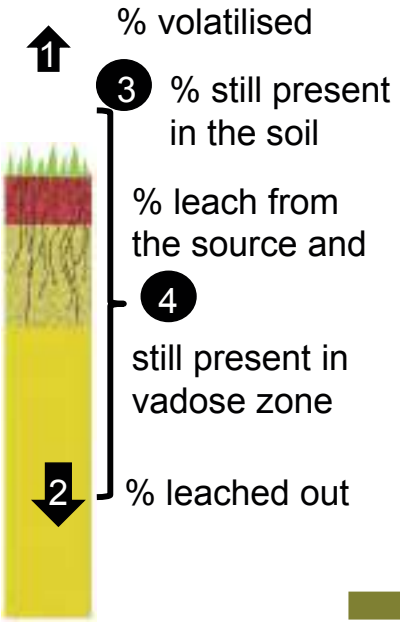
D2-1 Mercury fate and transport in soils

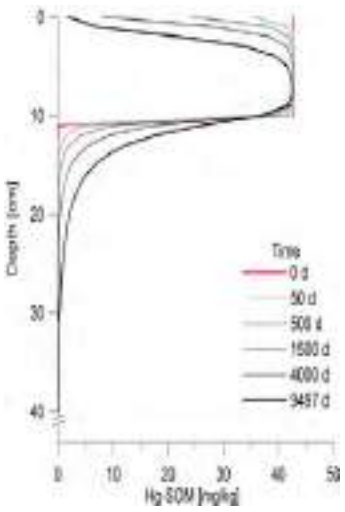
Modeling

Objective: Modelling of Hg mobility in vadose zone

Focus :

- Vadose zone and anthropogenic soil





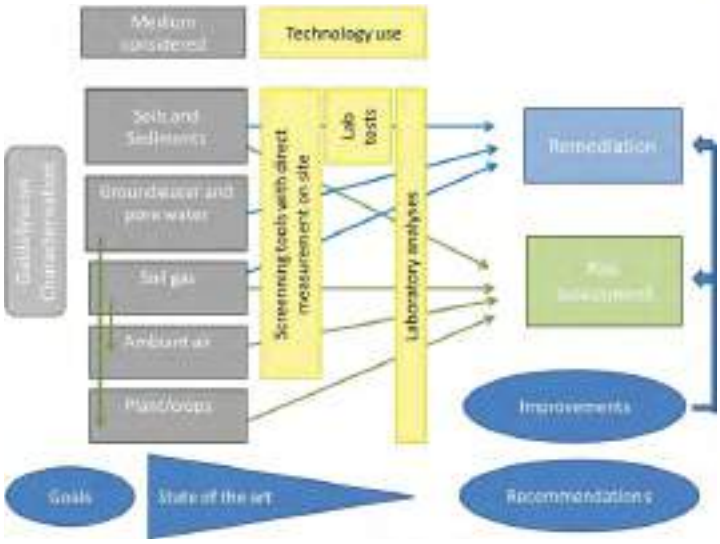
D2-2 Numerical tool for simulating mercury fate and transport in soils

Characterisation

Objective: Review of available mercury characterisation practices and ways of improvement

Focus:

- Evaluation of existing methods for all the forms of mercury, for all media



D 3.1 Best available practices in mercury characterisation and recommendations

Risk assessement

Objective: determine practices used for mercury risk assessment and propose improvement

Focus:

- on assessment models for soil, guideline values and the assumptions behind the values.
- on strategy that can be used to optimize RA, i.e. is support in focusing on aspects that makes a significant difference in RA.

	Hg in:	Common practice	Improvement options	Best Practice	Potential effect on risk estimate/guideline value when chosing Best Practice	Comment
Concentration in organs	Humans	Not commonly considered	Blood test, hair test Hg-species specific modeling.	-	-	Not commonly relevant in contaminated land investigations. Relevant only if assessing current exposure situation.
Intake and uptake	↑	100% Hg uptake/bioavailability is generally assumed	Determining the water-soluble and exchange-able Hg fraction. *In Vitro* bioavailability test. *In Vivo* bioavailability test.	*In-Vitro* bio availability tests	Intermerdiate/high	Literarture reports 2-38 % available fraction. Risk would be reduced by approx 2-50 times resulting in a guideline value at a maximum 50*GV(100%). At the moment no in vitro oral bioavailability test has been validated for Hg and no environmental agency has included it in its recommendations.
Concentration in soil	Vadose zone	Measurement of total Hg in soil or of inorganic and organic mercury	Measure Organic Hg, inorganic Hg	Measure Organic Hg & inorganic Hg-conc	Intermediate/High	Uptake of inorganic Hg less than of organic Hg

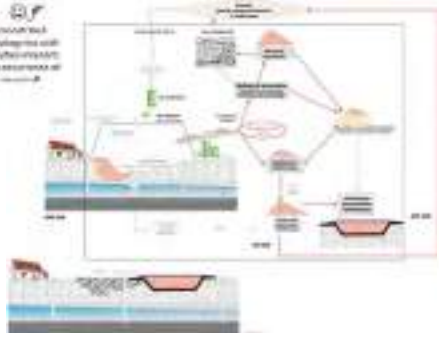
➡ D 3.2 Best available practices in mercury risk assessment and recommendations

Remediation

Objective: Current state of mercury remediation practices, recommendations and perspectives

Focus:

- Important parameters for remediation plan selection
- State of the Art of available remediation technologies for contaminated sub-surface making the distinction between proven and emerging technologies.



➡ D 4.1 Best available practices in mercury management and recommendations

Dissemination

- Project description was posted: on web site of all partners, eugris and snowman,
- Participation to the NICOLE Hg Working Group, and to NICOLE technical day on Hg 2012, Mercury Conference in Edinburgh 2013, ICCL meeting 2017
- Participation to congres: Aquaconsoil (2013), Goldschmidt (2013)
- Article: 1 scientific rewiew, technical article (UK)
- Result used for trainees in SE
- Final Workshop: On–line conference connecting national hotspots
- Deliverables will be sent to all IMaHg survey and final workshop participants (more than 100 people)
- Documents produced cited for guideline / Minamata convention

Snowman network : lessons from past for future collaborative funding

Added value of transnational research funding

- Adaptation of the problem to several countries issues
- Share of project's cost
- Possibility to work with high specialists (not always present in each country)
- Dissemination of the results to a wider audience due to redaction in English of the deliverables

Critical challenges in planning/applying a SNOWMAN project

- Not different from National project

Snowman network : lessons from past for future collaborative funding

Elements to keep

- An unique desk for launching
- Financial reporting and contractualisation in its own language
- Only one PO to follow the project

Suggestions for improvements

- Increase the number of Funders 5-6 max
- Reduced as much as possible the reporting part and also the useless intermediate reports
- Choose the right deliverables to be produced regarding the audience : to be defined at an early stage

Thank you for your attention

Are organic matter applications and reduced tillage relevant levers for sustainable farming ?

Results from ECOSOM project

(1/10/2011-31/12/2014)

S. Houot, L. Vieublé, F. Obriot, L. Lundin, A. Hartmann, J. Faber, A. Revallier

World Soil Day December 2017

Aims of ECOSOM:

Key role of soil organic matter and biodiversity in sustainable farming

x

?

?

Properties/Functions

- Organisms Activities
- Dynamic of elements (nutrients, contaminants)
- Porosity Soil structure
- GHG emission
- Carbon storage
- Water Dynamics

Services/ Dysservices

Provisioning

Regulation

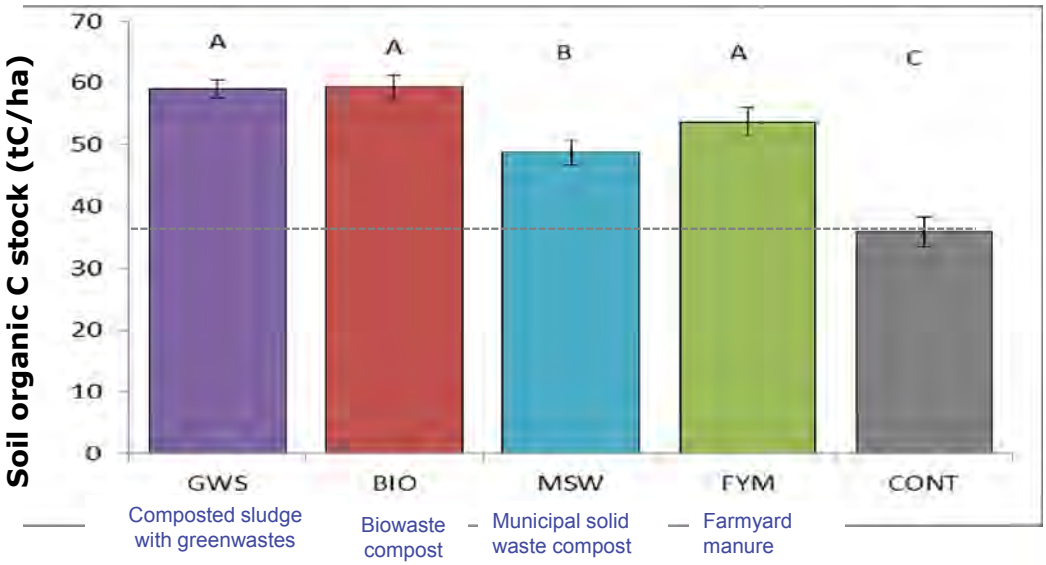
- Functional biodiversity
- Water regulation
- Climate Regulation
- Physical support
- Water quality
- Yield
- Fertiliser Substitution
- Erosion
- Contaminations – *Chemical - Biological (pathogenous)*

Trade-off

Guidance for farmers and stakeholders

Organic Waste Products and **C organic stocks** in soil

Soil organic C stocks after 15 years (7 composts and manure applications)



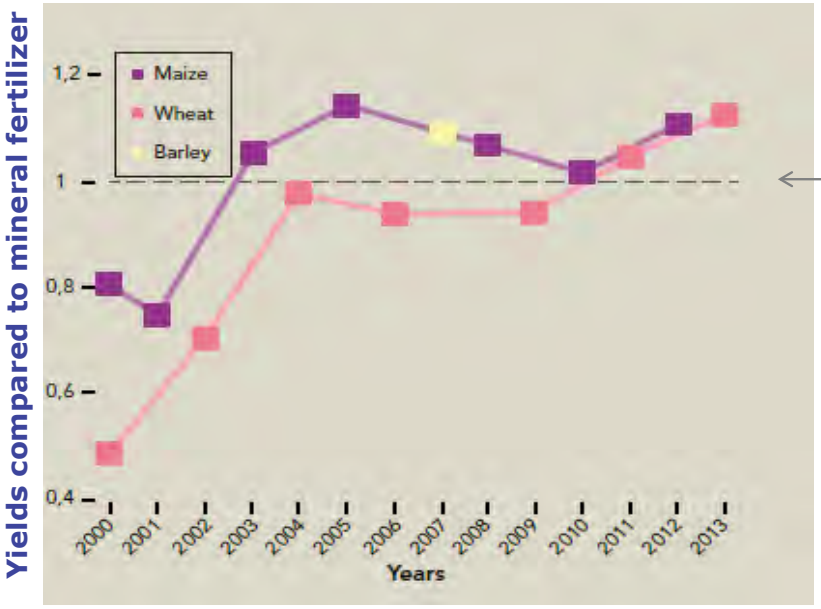
Qualiagro

4 tC/ha

➔ OWP : Increase of Soil organic carbon stock
➔ Increase of 3 to 4 % per year of Soil organic Carbon
➔ High increase is related to the stability of OWP

Organic Waste Products and **crop yield**

Relative yield in the amended treatments (composted sludge GWS) compared to mineral N treatment

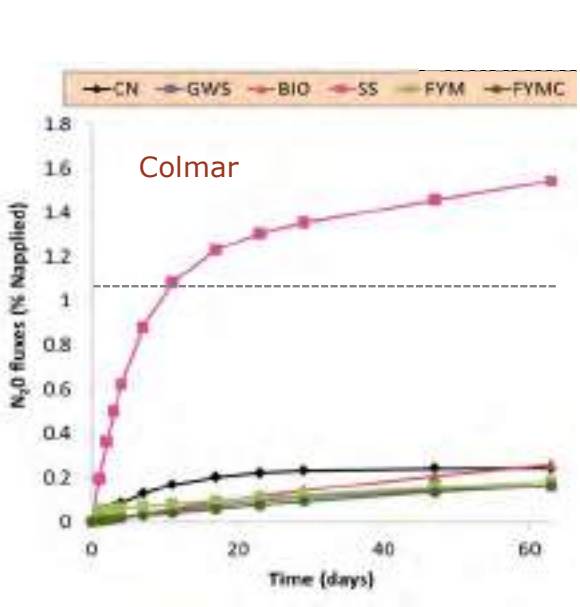


➔ Two phases :
- Progressively increase of yield ; reach the yield from mineral
- after 3-4 yrs : more stable

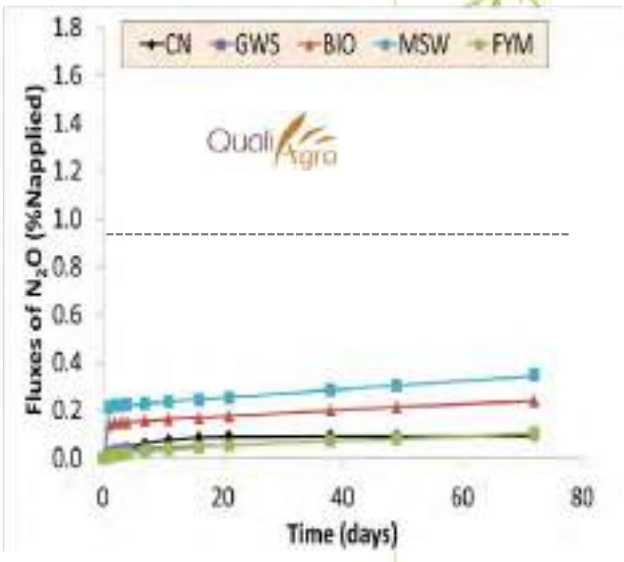
➔ Different response depending on the crop

Potential trade-off of Organic Waste Products: GHG emission

Dynamic of N20 flux (% N applied) just after OWP application

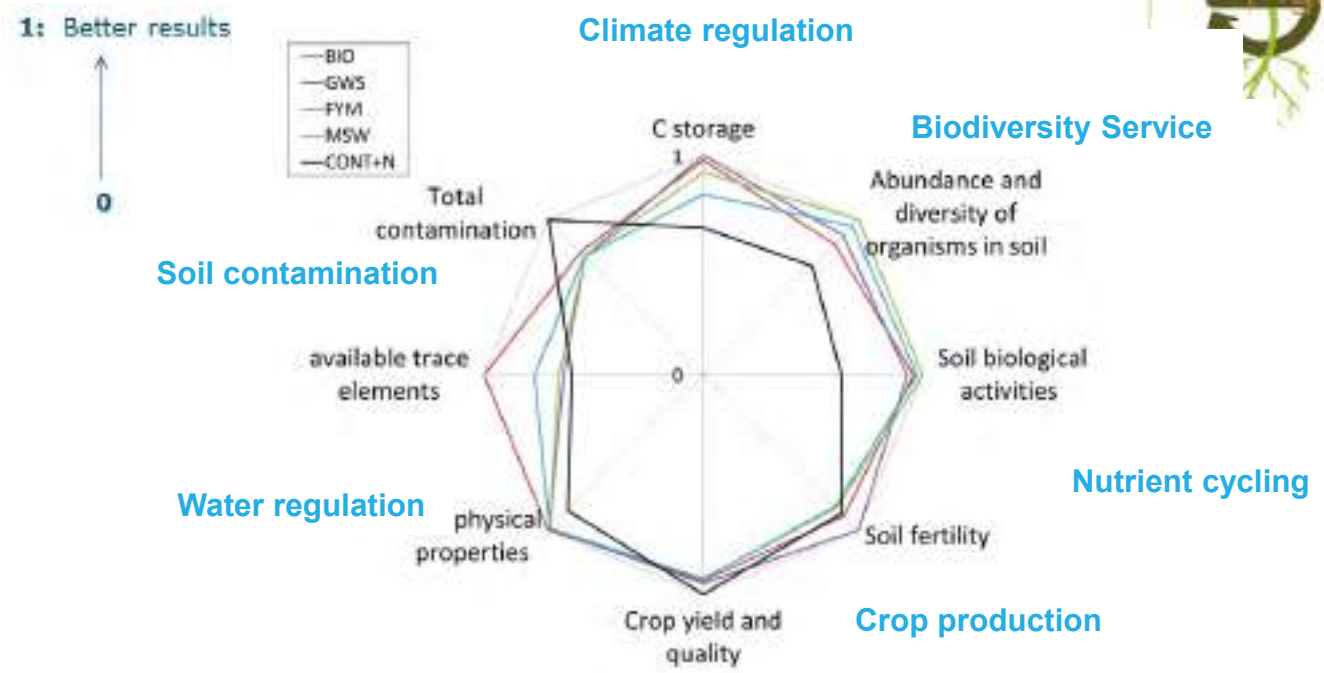


Emission factor IPCC: 1% N



➔ compared to mineral, no significant N2O production from WOP
➔ composts and farmyard manure, mineral N: low N2O fluxes (EF<0,3%)
➔ sludge: High N2O (EF> 1,5%)

Soil quality index for Organic Waste Products application - Agregated approach



→ All OWP improved QI compared to mineral N, except "total contamination"
→ The **BIOwaste** compost presented the best scores
→ Need to be tested in other situations

Dissemination

Field actions

Brochures

English and French versions

Join meeting

Advices

Films are available on websites :

https://ecobiosoil.univ-rennes1.fr/snowman-sustain/news.php

Feedback from a SNOWMAN funded project

Added value

Enable to compare different approachs between countries for a same scientific question (soil organic matter for ECOSOM project)

Vary environmental and regulatory context and stakeholders

Exchanges between ECOSOM and SUSTAIN:

- Complementary approachs
- Join meetings with the two projects were interesting (human and scientific)
- Enable to get larger results to discuss and present together (final join meeting and brochures)

Feedback from a SNOWMAN funded project

Critical challenges

Not enough exchanges between partners

Lake of interactions with stakeholders from other countries. Difficulty to disseminate to ALL stakeholders (differents in the different country) in an adapted and specific way to each of them.

Lake of information on « less formal » dissemination in other countries

Feedback from a SNOWMAN funded project

Elements to keep

Budget and strong encouragement for dissemination!

Relative simplicity of functionning

Lauching new projects and presenting the previous funded ones at the same meetings => give a nice up-to-date map of the research on soil topics closed to us

Good involvement of funders at milestones meetings

Feedback from a SNOWMAN funded project

Suggestions for improvements

More exchanges with ALL stakeholders (more dedicated budget for this?)

IBRACS

Dan Berggren Kleja, Swedish Geotechnical Institute

SNOWMAN NETWORK
Knowledge for sustainable soils

IBRACS

Integrating Bioavailability in Risk Assessment of Contaminated Soils: opportunities and feasibilities

***Period**: Oct 2011-Sep 2014; **Total founding**: € 654 236*
***National founders**: Formas & SGI (Sweden), ADEME & INRA (France), OVAM (Flanders), DGARNE (Wallonia)*

Dan Berggren Kleja (coordinator), Swedish Geotechnical Institute (SGI)

Jurate Kumpiene, Luleå University of Technology (LTU)

Gerard Cornelissen, Stockholm University (SU) / (NGI on subcontract)

Erik Smolders, Katholieke Universiteit Leuven (KUL)

Philippe Sonnet, Université Catholique de Louvain (UCL)

Thibault Sterkeman, Institut National de la Recherche Agronomique (INRA), Université de Lorraine

Aims IBRACS

- **The overall aim of IBRACS** was to provide policymakers, authorities and service providers with **guidelines on how chemical bioavailability tests** can be used in site specific risk assessments.

Why account for bioavailability?

- To **improve accuracy** in risk assessments giving more reliable decisions on how much soil that needs to be remediated.
- To open up for management options based on **immobilization** of contaminants (reducing bioavailability).
- More **cost effective** site management.

Major deliverables

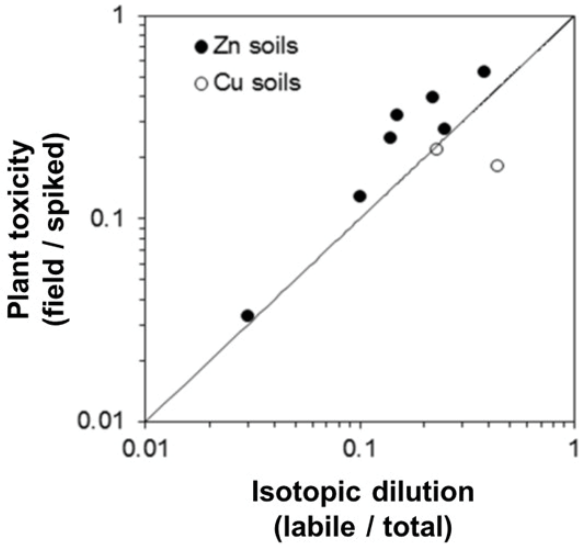
A complete framework for ecological risk asssment of PAHs based on porewater concentrations

- Porewater concentrations are determined using a passive sampler method (polyoxyethylene membrane, POM)[a,b]
- Scaling of toxic response is made using ecotoxicity data compiled by RIVM[c]
- An Excel-based tool developed by the IBRACS team is freely available at http://projects.swedgeo.se/ibracs/

a) Hawthorne et al. 2011, Anal. Chem. 83, 6754-6761
b) Arp et al. 2014, Environ. Sci. Technol. 48, 11187−11195
c) Verbruggen 2012. RIVM Report 607711007/2012

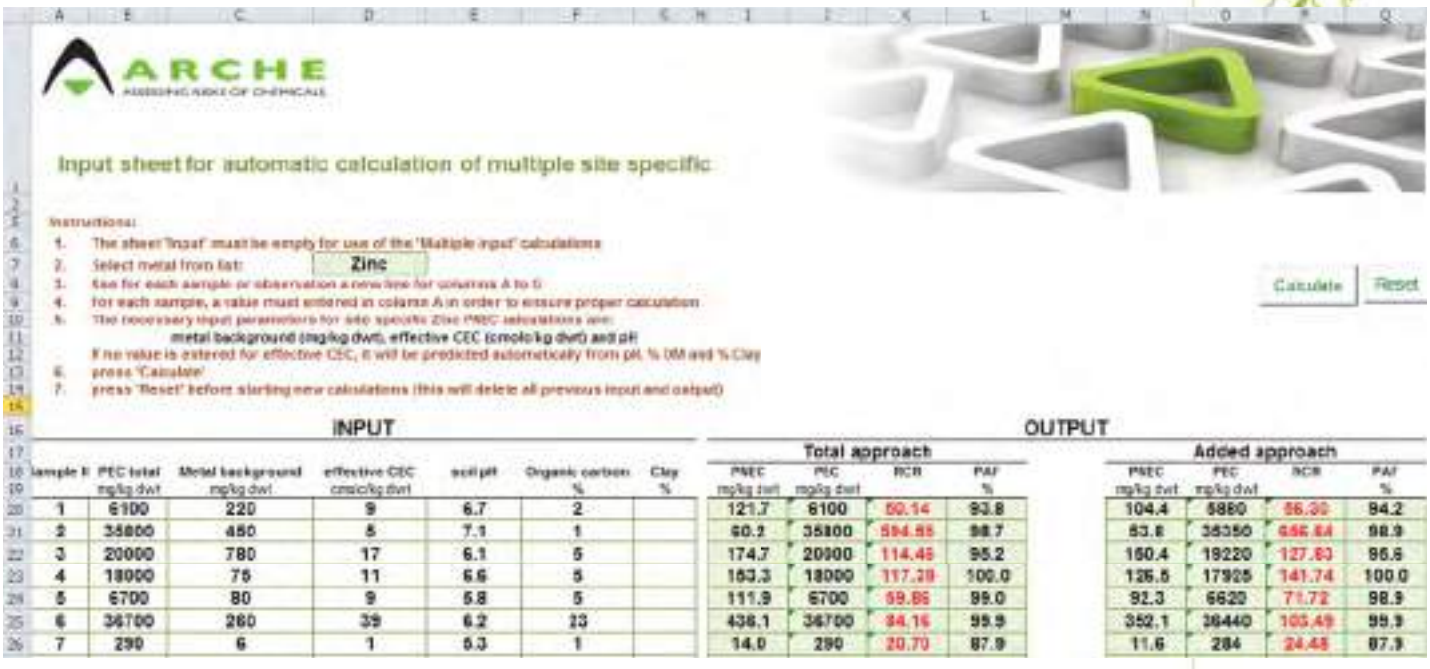
A development of the ecological risk assessment tool for metals – the SOIL PNEC calculator

- The SOIL PNEC calculator accounts for bioavailability by 1) soil property correction functions, and by 2) metal specific leaching-ageing factors
- We showed that site-specific leaching-ageing factors can be determined using an isotopic dilution method[a]



a) Hamels et al. 2014. Environ. Toxicol. Chem. 33, 2479-2487.

The SOIL PNEC calculator can be downloaded free of charge



http://www.arche-consulting.be/metal-csa-toolbox/soil-pnec-calculator/

Dissemination and communication

Published papers (≥6)

- Arp, H. P. H., S. Lundstedt, S. Josefsson, G. Cornelissen, A. Enell, A.-S. Allard and D. B. Kleja. 2014. "Native Oxy-PAHs, N-PACs, and PAHs in Historically Contaminated Soils from Sweden, Belgium, and France: Their Soil-Porewater Partitioning Behavior, Bioaccumulation in Enchytraeus crypticus, and Bioavailability." Environmental Science & Technology 48, 11187−11195.
- Hamels F., J. Malevé, P. Sonnet, D. Berggren Kleja and E. Smolders 2014. “Phytotoxicity of trace metals in spiked and field-contaminated soils: linking soil-extractable metals with toxicity.” Environmental Toxicology and Chemistry 33, 2479-2487.
- Dupuy, J., S. Ouvrard, P. Leglize and T. Sterckeman. 2015. Morphological and physiological responses of maize (*Zea mays*) exposed to sand contaminated with phenanthrene. Chemosphere 124, 110-115.
- Josefsson, S., H. P. H. Arp, D. Berggren Kleja, A. Enell and S. Lundstedt. 2015. "Determination of POM-water partition coefficients for oxy-PAHs and PAHs." Chemosphere 119, 1268–1274.
- Enell, A., Lundstedt, S., Arp, H.P.H., Josefsson, S., Cornelissen, G., Wik, O. & Kleja, D.B. 2016. Combining Leaching and Passive Sampling To Measure the Mobility and Distribution between Porewater, DOC, and Colloids of Native Oxy-PAHs, N-PACs, and PAHs in Historically Contaminated Soil. Environmental Science & Technology 50, 11797−11805.
- Dupuy, J., Leglize, P., Vincent, Q., Zelko, I., Ouvrard, S. and Sterckeman, T. 2016. Effect and localization of phenanthrene in maize roots. Chemosphere 149, 130-136.

Seminars, workshops and conferences

- Co-organizer of national workshop on ecological risk assessment in Visby, Sweden, October 2014 (two IBRACS presentations)
- National meetings and seminars with stakeholders
- ≥6 oral presentations and ≥6 poster presentations at international conferences (AquaConSoil, SETAC, ICOPTE, NORDROCS, etc.)
- A Swedish guidance document on IBRACS methods will be published in early 2018

the Snowman network: lessons from past for future collaborative funding

Added value of transnational research funding

- Provide knowledge and idea transfer between countries. Very stimulating!
- Facilitate harmonization of concepts and perceptions (e.g. guidelines).
- Expand networks for researchers, research funders and policy makers.
- In IBRACS all partners had other parallel research projects which interplayed with the project. This resulted in a lot a added values to the project. A high output of a fairly small budget.

Main recommendations for a future transnational research project call

Keep:

- Number of research groups/countries involved in the SNOWMAN projects were quite optimal (6 groups).
- National funding system worked fine, resulted in less work for project coordinator.
- Kick-off, mid-term and final meetings in Paris during the project period. Appropriate timing and enabled exchange between SNOWMAN projects.

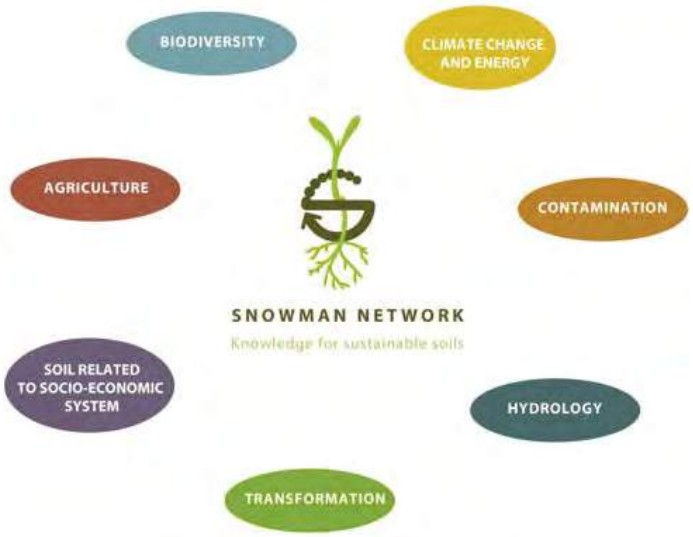
Improve:

- Longer project period (4 years), and larger budgets.

Thank you for your attention

Feedback from researchers on SNOWMAN experiences and expectations for future

Yvonne Ohlsson, Swedish Geotechnical Institute
Frèdèrique Cadiére, ADEME



SNOWMAN NETWORK

Knowledge for sustainable soils

SNOWMAN NETWORK

Feedback from researchers on experiences from SNOWMAN and expectations on future funding

11 respondents/7 projects
Answers in free text

Yvonne Ohlsson, Swedish Geotechnical Institute
Frèdèrique Cadiére, ADEME

Added value of transnational research?

Adds to societal relevance and impact, e.g.:

- Knowledge, information and idea transfer between countries.
- Possibility to identify wich aspects are more general and which aspects are country-specific

Networking

- Provides opportunities also for future research collaborations
- Meeting new people and cultures makes work more attractive. ☺

”Stronger effort towards an EU-wide approach of soil conservation and more harmonsied views on protecting soil as a natural resource.”

Added value of transnational research?

Better, and more, science for the investment, e.g.:

- Complementarity competences and means **enables answering more scientific questions**.
- **Diversity of approaches** and of experimental contexts **reinforce the validation of hypotheses and models**.
- International projects promote **multidisciplinary** research with **exchanges of know-how between countries.**

Gathering more funding sources provides larger platforms & allow for focused and substantial research

Experienced added value of research within SNOWMAN

Also:

- knowledge exchange **between projects** (joint meetings)
- Strong **linked to a practical application**,
- Ensures that the proposed research is focused on **transnational issues**.
- **Extended partnerships/collaborations** facilitated access to e.g. test sites, focus groups (e.g. school children, farmers, industry) etc.
- **results became available more easily** to interest groups in more countries (language issues).

When parallell research projects interplayed with the joint project, a high output for a fairly small budget was gained

Call process (including funding rules)

”Appreciated the rather uncomplicated process”

- Rather straightforward, no transfers needed between countries but funding came directly to each partner. It worked fine with the national funding system.
- Number of research groups/countries involved in projects optimal. Not to big projects, overall not too many participants.
- Project management and coordination not too time consuming.
- Satisfying.
- …

Call process - improvements

- Funding of partners could be quite different – could it be designed to be more equal?
- Longer financing times, four or five years (to include also dissemination). And know in advance the possibilities of time extension.
- More flexibility in able to adapt subcontractors tasks to actual conditions later on in the project
- The contract format (consortium agreement) needs to be improved

Engagement of the funders

The presence of the funders at all milestone meetings and their interactions during on-going work is something to keep.

Funders engagement – some suggested improvements

- Different funders required quite different types of reporting, this could be better aligned.
- Keep the decentralized financial management, which allows the coordinator not to be overloaded with administration
- Maybe the funders could be more active at a national level, if possible?

Dissemination

- The several SNOWMAN **dissemination meetings** appreciated.
  - An **opportunity to expand ones network** and to **get influences and information from other research topics related to soil.**
  - **High expectations** on dissemination from SNOWMAN**,** but **also support** by e.g. providing the **joint meetings opportunities**.

- A **dissemination strategy** a prerequisite to get funding. Workshops, popular science reports, and guideline documents recommended (to keep)
- The strong **recommendations given for the dissemination phase was very helpfull** to keep the target of a large and specific communication of results to stakeholders.

”Certainly **keep everything**!”

Dissemination – suggestions

- Support ”larger” dissemination occasions (meetings, congresses...) & organize international meetings associated with recognized congresses (such as aquaconsoil) , e.g. special sessions.

- Maybe a specific group to address and support implementation issues in the organization.
  - Help the project holders to refine their strategy and identify target groups.
  - Support to disseminate results to the institutions of the European Union
  - Help in logistics for dissemination events

- Balance between time devoted for research and time devoted for outreach and dissemination activities.

Critical challenges?

”Language, Culture etc always a challege but mainly it is positive.”

- To **find a common language** and to (in more depth) understand the **different perspectives** amongst eachother. To know all members well enough (specific skill, way to work...)
- A challenge to fully integrate the research work.
  - Critical not to make the project too big. 5-6 partners optimal.
  - A good communication strategy within the project.

- Limitations in funding & project time
  - best to have ”PhD type funding”
  - Sometime funding for experimental equipment a challenge (for analysis)
  - Took longer than 3 y

How we dealt with challenges

- open attitude and tried to be open with our different perspectives from the start.
- **Listed project risks** early on, **made a plan for how to try to manage those**.
- **Physical meetings important.** Frequent Skype and telephone meetings also needed.
- Meetings **also provide an opportunity to talk about potential future research collaborations**.
- A good project structure and **communication strategy**.
- Resolute by working free of charge.

How to get the best value out of time and money invested?

- Minimum administration
  - align reporting requirements between funders
  - two-step application system,
- **Keep or increase budget for & focus on dissemination**:
  - Well organised dissemination meetings, discussions in groups not only presentations, Make sure the technique works!
- Ensure that **PhD funding is possible**
- Focused projects with limited scopes

Even smaller sums provided from each country can result in great achievements altogether. The investments probably result in more research than just the funded ones, i.e. follow-up applications and Projects.

Additional comments

- There is a **pronounced continued need for European funding** on sustainable soil and land management. Even if soil research to some extent is included in other challenges, it also needs to be addressed "by itself"

- SNOWMAN has been a rather small funder, still with a lot of research results for the invested money.

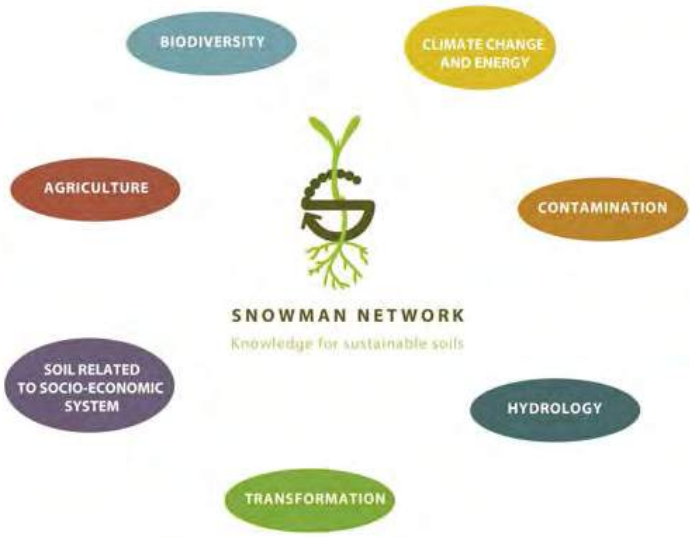
- Such network is very welcomed!
- Please, go for another SNOWMAN (or similar) call!

Lessons on organization of collaborative funding

Joint Closing Session

Lessons on organisation of collaborative funding

Isabelle Feix, ADEME



SNOWMAN NETWORK
Knowledge for sustainable soils

SNOWMAN NETWORK

Lessons on organisation of collaborative funding, and invitation to match-making with SNOWMAN for tomorrow

Isabelle FEIX, ADEME (FR), chair of SNOWMAN network

Outline

1. **Feedback from researchers**
2. **New network potential**
3. **Topics to investigate**
4. **Letter of interest & further match-making invitation**

1. Feedback from researchers

- Results of the discussion just before

    1. *Added value of transnational research funding*

    2. *Critical challenges in planning / applying for or carrying out to SNOWMAN funded project?*

    3. *Main recommendations for a future transnational research project calls for research:*

        ** to keep*

        ** suggestions*

2. New network potential

(see briefing note)

A European network for soil research funders

Forming a sustainable platform of European research funders and administrations that aims to bridge the gap between knowledge demand and supply in the field of sustainable soil management

Why?

There are challenges to face:

- Soils are a stategic issue for humans and ecosystems, soil threats are still going on.
- There is no coordinated research at an European level, soil thematic research is split in different research programmes
- Need for a strong soil research agenda coordinated at EU level and with a higher visibility

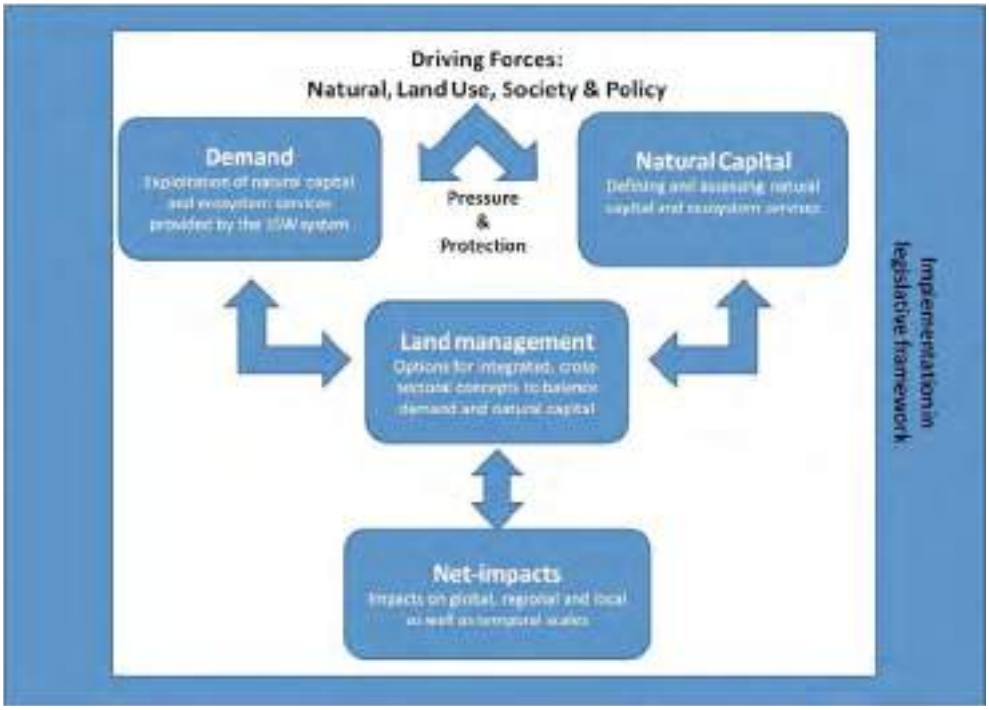
2. New network potential

What to gain?

- New knowledge, methodology, decision support tools for a sustainable soil and land management
- Applied research, oriented on end-users‘ needs, including dissemination and science-policy interface
- Joint funding increase return on investment by sharing all results among all committed funders, with a flexible call procedure
- Complementarity of competences, diversity of approaches enables to answer more scientific questions and avoid redundant research project in several countries.

3. Topics to investigate

- Topics interesting SNOWMAN so far



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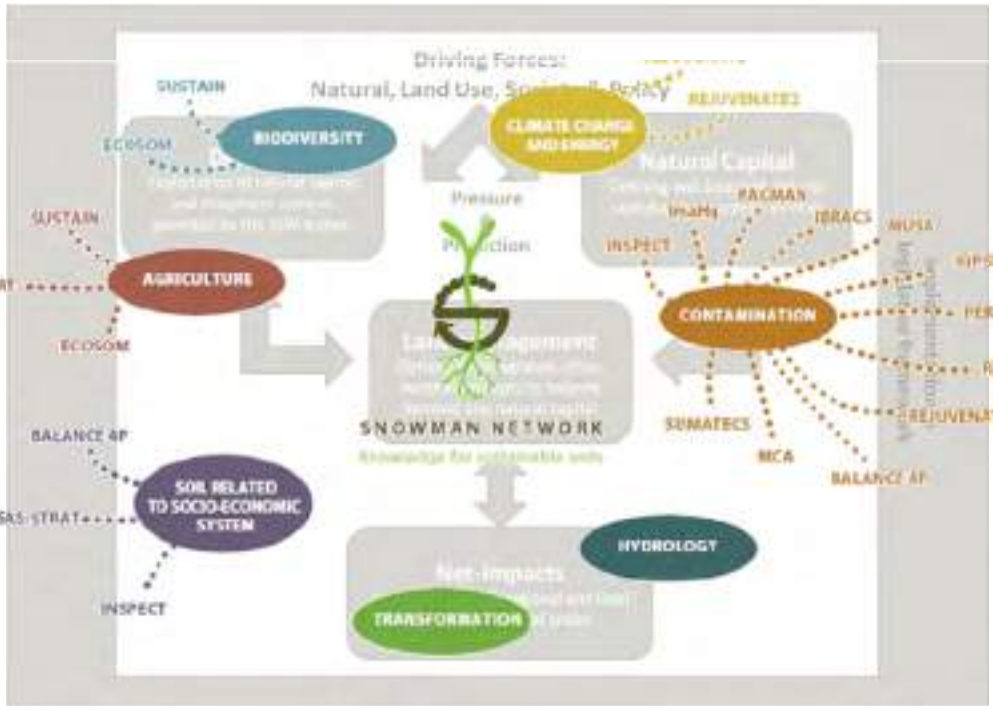
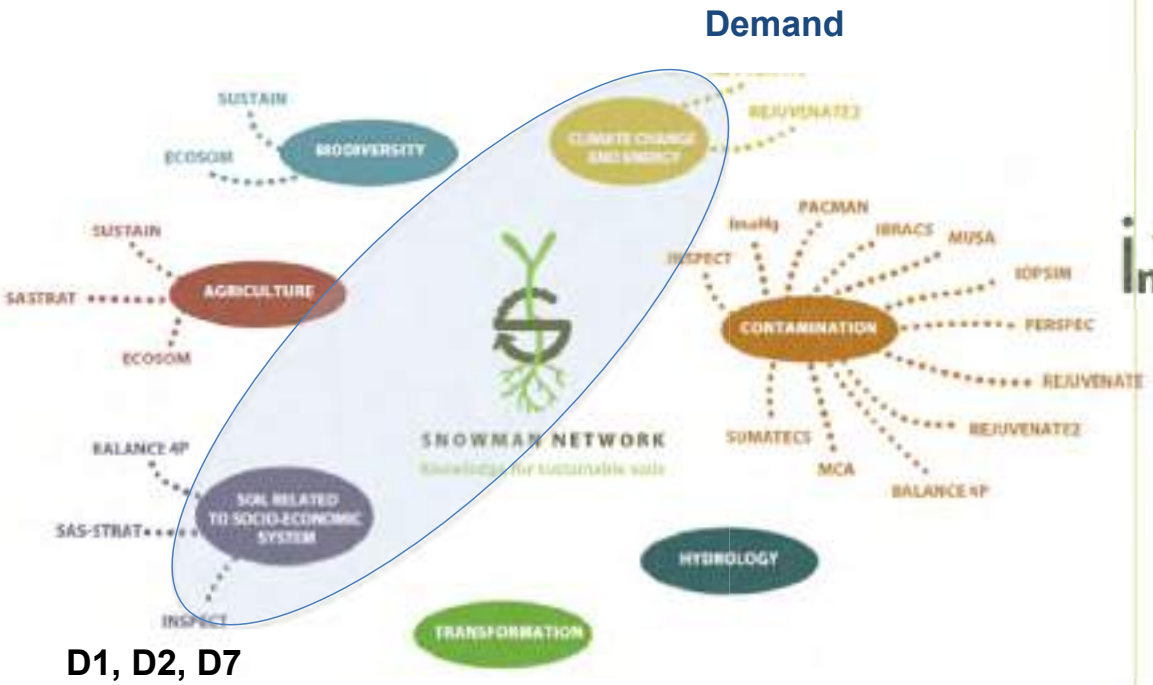


IRT1 to 4, IRT8 to 9, IRT11, IRT14 to 17

3. Topics to investigate

- Topics interesting SNOWMAN so far

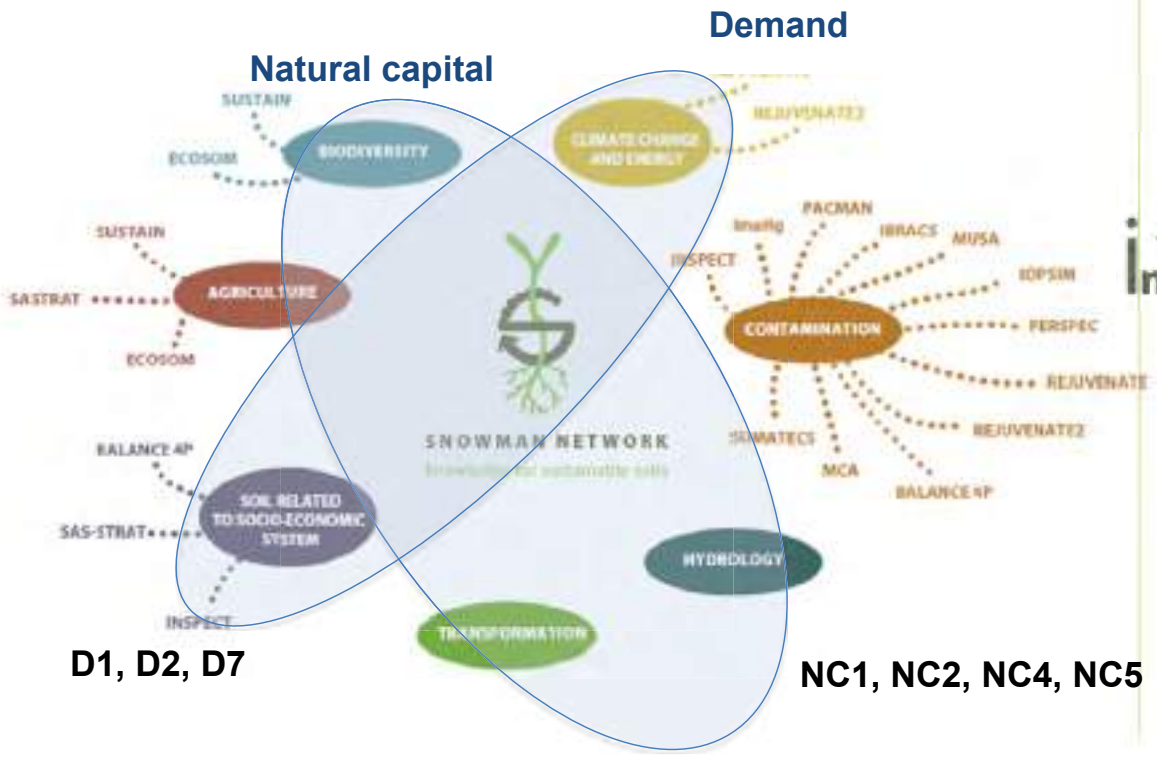


D1, D2, D7

IRT1 to 4, IRT8 to 9, IRT11, IRT14 to 17

3. Topics to investigate

- Topics interesting SNOWMAN so far



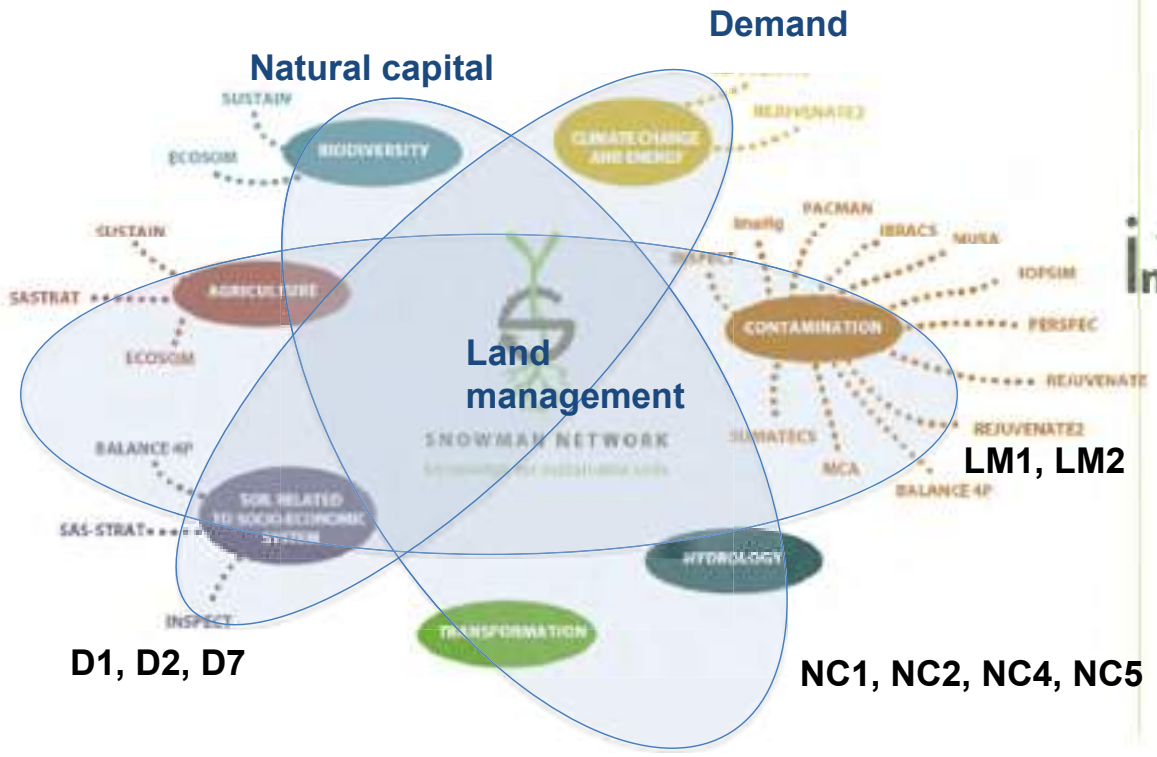
D1, D2, D7

NC1, NC2, NC4, NC5

IRT1 to 4, IRT8 to 9, IRT11, IRT14 to 17

3. Topics to investigate

- Topics interesting SNOWMAN so far



D1, D2, D7

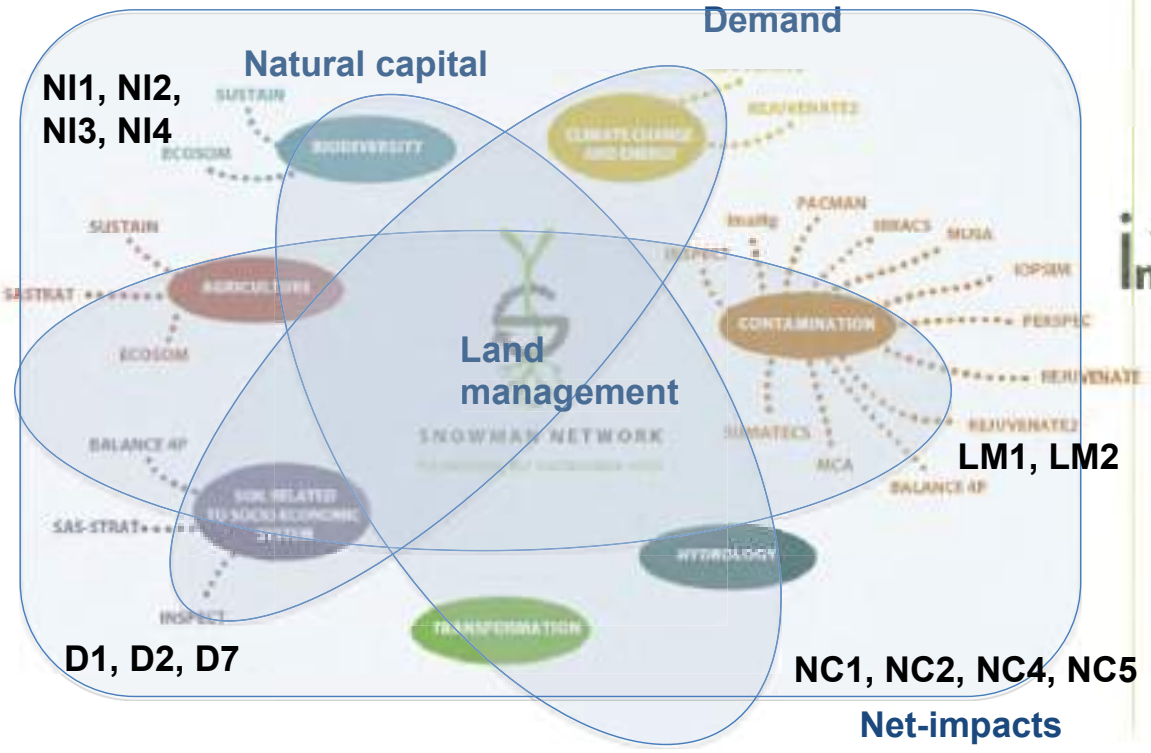
NC1, NC2, NC4, NC5

LM1, LM2

IRT1 to 4, IRT8 to 9, IRT11, IRT14 to 17

3. Topics to investigate

- Topics interesting SNOWMAN so far



IRT1 to 4, IRT8 to 9, IRT11, IRT14 to 17

4. Letter of interest & further match-making invitation

- Letter of interest to join a EU network of soil and land research funders based on INSPIRATION SRA

  Send it back to your INSPIRATION NCP or to info@snowmannetwork.com

Join us in discussions tomorrow at 8:30 at th entry of the auditorium for match-making!

Continue the dialogue

Stephan Bartke, UBA

Continue the dialogue

INSPIRATION-SNOWMAN	8:30 – 9:30: Room Terra	Determine next steps		
Funders' Lounge	Meet INSPIRATION contacts	Info about the SRA	Register your funding interests	Announce and join discussions
Continued dialogue	Breaks	Poster sessions	Networking	Reception
Open Space				

Continue the dialogue

Open Space

- Recommended method when situation is complex, high degree of diversity, for speedy decisions, no preassigned outcomes
- Self-organizing individual and collective activity
- **We set frame → You set the time and place to discuss your topic**
- Use flexibility and take responsibility for what you care about
- **Open Space = Marketplace of ideas**, inquiry, reflection and learning
- Builds commitment and shared leadership – Participants accept responsibility for what does or doesn't happen
- Action plans and next steps emerge from discussions as appropriate

Open Space: 1 law and 4 principles

The **Law of Two Feet**: Take responsibility for what you care about! Use your own two feet to move to whatever place you can best contribute and/or learn.

Whoever comes is the right people	Whatever happens is the only thing that could've	When it starts is the right time	When it's over, it's over
• Whoever is attracted to the same conversation are the people who can contribute most to that conversation—because they care.	• Expectations are critical. Focus on the present time and place and not get bogged down in what could've or should've happened.	• The creative spirit has its own time, and our task is to make our best contribution and enter the flow of creativity when it starts.	• Creativity has its own rhythm. So do groups. When you think it is over, ask: Is it over? If it's not, make plans for continuing for conversation.

Open Space: Your choices!

	Terra = Lounge	Silva I	Silva II	Silva III	Aqua	Poster
10:15		Topic A *Contact* Bartke, UBA G Finka, SK Governmen				Topic D *Contact*
10:45			Topic B *Contact* Bartke, UBA Germany		Topic C *Contact* Finka, SK Governmen	
11:15						

See you tomorrow for World Soil Day

08:30: SNOWMAN – INSPIRATION Match-Making Room Terra
10:00: Opening session Auditorium

This project received funding from the European Union under HORIZON 2020 under Grant Agreement No. 642372.

WHY WE NEED TO TALK ABOUT LAND AND SOIL RESEARCH TODAY!

Lilian Busse (German Environment Agency)

“Why we need to talk about land and soil research today!”

– – – Notes – – –

Lilian Busse,
Head of Division
Environmental Health and Protection of Ecosystems

at

World Soil Day 2017 celebration and
Final Conference “Land, Soils and Science”
of EU project INSPIRATION
(INtegrated Spatial PlannIng, land use and soil management Research AcTION)

05th December 2017
IBGE - Bruxelles Environnement
Avenue du Port 86c/ 3000, 1000 Brussels, Belgium

– These notes may not reflect the actually spoken words. –

- Welcome
    - World Soil Day (= 5 December), celebrated by the international Union of Soil Science since 2002, UN-Day since 2015
    - “Land, Soils and Science” = Conference title → We need to talk about soils today, of course! – Need to think how to manage soils and use land more sustainably. Idea of science & research is to create knowledge → so let’s talk about today about the links of land, soils and science
- European Commission annually celebrates World Soil Day with a conference in Brussels – bringing together stakeholders from across Europe
    - Today, ›› 200 participants, 40 countries
- This year: This event organized by EC Horizon 2020 funded coordination and support action INSPIRATION
    - INSPIRATION! – “nice acronym” – perfectly fits into the nature of our Agency.
- German Environment Agency
    - Notably about protecting the environment, incl. soils, and providing the public and ministries with knowledge / understanding of potentially harmful consequences of (in-)actions
    - UBA = Germany’s central scientific environment authority. Overarching mission: Early detection of environmental risks and threats in order to assess them and find viable solutions.
    - Impossible without inspirations, e.g. for scoping underlying research that is conducted in our own labs or outsourced to scientific institutions.
    - Independent in identifying and assessing environmental issues and deriving conclusions and recommendations. → Addressing societal challenges as related to the environment.
    - Yet, UBA belongs to Germany’s Federal Ministry of the Environment, Nature Conservation, Building and Nuclear Safety. The Ministry is expecting our scientific advice, our policy advice and our support.
    - In a certain way, we are located right at the interface of science, public and policy.

    - Like everywhere, also the German Ministry highly appreciates recommendations that are on one hand scientifically verified and environmentally effective.
        - solutions are more appreciated if they are politically compliant and easily agreeable upon the private and public stakeholders.
        - inspirations how to design and communicate our activities among the relevant stakeholders to get them on board.
- Like in any other agencies, our resources are finite. We have to prioritize our activities and select topics.
- Thus, I was delighted to learn about the INSPIRATION project.
    - INSPIRATION – = acronym of this project – stands for "Integrated spatial planning, land use and soil management research Action".
    - 23 partners from 17 countries since March 2015 strive for structuring and prioritizing research for soil and land in Europe
- A difficult task given the disparity within the topic itself:
    - Spatial planning and land use on one hand and soil protection issues on the other hand!
    - We know that both fields haven't really been working in harmony in the past.
    - Spatial planning and land use authorities are often still working in the conventional planning tradition of economic growth – based on an apparently unlimited availability of land for urban expansion.
    - The fact that land use always has an effect on the quality of the underlying soil is widely underestimated or simply unknown.
        - Germany: day by day some 70 ha valuable – mostly agricultural – greenfield land converted into land for traffic, settlement.
        - Across European Union almost 100,000 ha of agriculture or natural land disappears every year (= the size of Berlin)

- What do we know about the consequences:
    - Urban sprawl, land and soil sealing, more traffic, land segregation, diffuse and local contamination, and the loss of natural land are obvious consequences.
    - However, effects are even more manifold: Soil is the largest pool of organic carbon which is essential for mitigating and adapting to climate change. Soils are also fundamental for the storage and distribution of water.
- Therefore, we also lose important ecosystem services of the soil – also transboundary by impacts to groundwater, rivers, lakes, and oceans – if we continue business as usual – as the workshops of DG Environment addressed already yesterday.

- Dear colleagues, soil and land are finite and shrinking resources. They are subject to competing pressures – not only in Europe but worldwide.
    - Across the globe, an increasing demand for land. Urbanization, intensification of global farming and the installation of new infrastructures are globally progressing.
    - At the same time, social conflicts related to land use are also increasing. Arable land is worldwide in great demand. Mainly due to soil erosion the amount of usable land is decreasing by 10 million hectare per year worldwide. About 33 per cent of our global soil resources are under degradation and human pressures on soils are reaching critical limits, reducing and sometimes eliminating essential soil functions.
- A significant challenge: Although awareness for the consequences increases, in several areas we are lacking in-depth knowledge and scientific evidence or clear/convincing advice on how to act.
    - The knowledge about the processes of how land management pressures the soil system and how this in return impacts the state of soil functions which humans recognize as ecosystem services is incomplete
    - We know little about the complexities of soil processes
    - We have no agreed indicators for soil degradation of soil health
    - We don’t have silver bullet to trade off competing demands for land …
- Research and science is expected to deliver enlightenment

- Dear colleagues, the INSPIRATION project – which is celebrating its official final event today – had the ambition to support structuring and prioritising research on soil, land-use and land management in Europe.
    - An ambitious goal!
    - Creation of synergies and networks among the different – sometimes opposing – groups who are working and researching in this complex and fragmented field of soil and land issues.
    - I really appreciate that the European Commission had taken initiative on such an important task and am more than happy that the German Environment Agency has had the opportunity to coordinate this activity.
- During this final conference, you learn about the results.
    - At registration you received a folder
        - Agenda for talks and workshops that present the Strategic Research Agenda and state-of-the-art research in Europe
        - Background on the INSPIRATION research agenda and its impressive bottom-up approach – having engaged ›500 European stakeholders
        - Information on contact points in 17 countries and the coordination level.
        - Website inspiration-agenda.eu → database of the complete Strategic Research Agenda and background info
        - Also: Website → expressions of co-funding interests → establishing network of funders
- It is important: This final conference is a kick-off into a phase of new collaboration.
    - Funders from across Europe come together – we saw an intense workshop yesterday evening and already this morning – to exchange on research needs and identify collaboration opportunities.
    - Discussions continue today more informal and tomorrow again in a dedicated match-making session
    - Your folder includes briefing notes on example areas that deserve further collaboration.
- I wish you all an inspiring conference.
- Thanks for attention

ACTIONS RELATED TO EU'S SOIL POLICY

Claudia Olazabal (European Commission, DG Environment)

Actions related to EU's soil policy

Claudia Olazabal, European Commission, DG Environment
Head of Unit Land Use & Management

SOER 2015

- *The **ability of soil to deliver ecosystem services** — in terms of food production, as biodiversity pools and as a regulator of gasses, water and nutrients — is **under increasing pressure.***
- *Observed rates of **soil sealing, erosion, contamination and decline in organic matter all reduce soil capability**. Organic carbon stocks in agricultural soil may have been overestimated by 25%.*
- *A **coherent soil policy at EU level** would provide the framework to coordinate efforts to survey soil status adequately.*

Soil Thematic Strategy

- Thematic Strategy for Soil Protection adopted in September 2006, incl. proposal for a Soil Framework Directive, COM(2006)232
- Overall objective: protection of **soil functions** and **sustainable use** of soil, based on:
  - Prevention of soil degradation
  - Restoration of degraded soils
- **Four pillars** of which three non-binding
- To be implemented by MS
- 2012 Report from the Commission on the implementation of the STS COM(2012)46

Achievements under the Thematic strategy research and monitoring

- *EU-funded research projects*
  - **FP6, FP7, Horizon 2020**
- *LIFE/LIFE+: 147 projects on Soil Protection*

http://ec.europa.eu/environment/soil/pdf/LIFE%20and%20Soil%20protection.pdf

- *Monitoring – soil data collection*
  - **A lot of soil data at national level**
  - **JRC European Soil Data Centre**
  - **LUCAS database**
    - >20,000 soil samples collected in 2009-2012 and analysed (physico-chemicals properties, Heavy Metals)
    - New campaign in 2015
  - **Land cover/land use monitoring: LUCAS, Corine, Copernicus at EU level**

-> However lack of systematic soil monitoring system accross EU and lack of harmonisation

Soil threats considered

Sealing

Erosion

Organic matter decline

Compaction

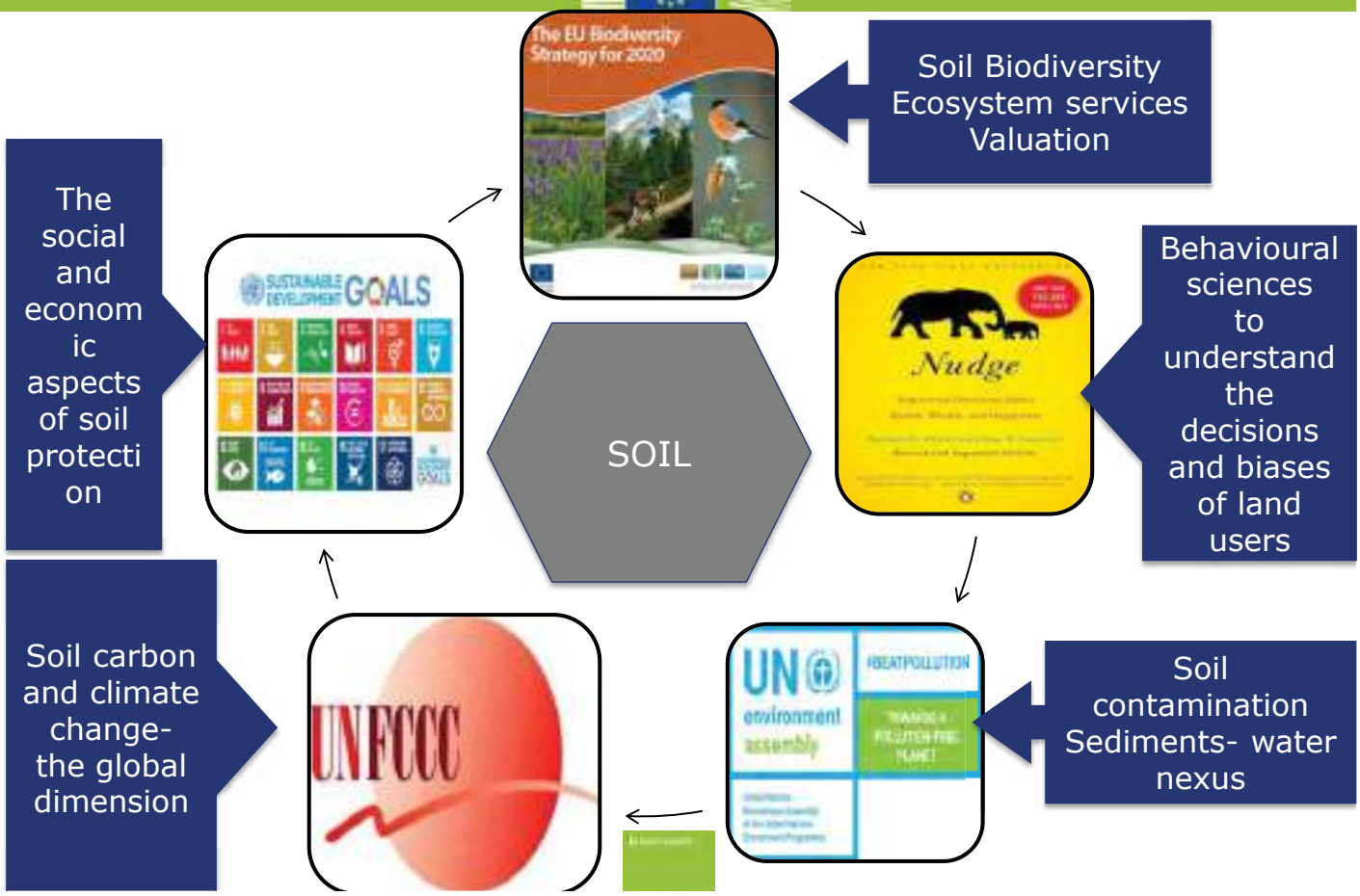
Salinisation+Acidification

Landslides

Contamination

Research gaps for policy making

We need the evidence to shift the political mind- from perceiving soil as static, inert, productive machine to a living complex ecosystem that delivers many functions



The challenge of multidisciplinary research

European Commission

From highly specialised soil science

To multistakeholder and multidisplinary sustanaible soil management and land use

SFD and lessons learned

- *SFD proposal withdrawn by the Commission in May 2014 after 8 years of negotiations and blocking minority of 5 MS in the Council (OJ C 153, 21.5.2014, p.3)*
  - **The Commission remains fully committed to the objective of soil protection and would examine how to best achieve this. Any further initiative in this respect would however have to be considered by the next college. (OJ C 163, 28.5.2014, p.15)**
- *Key issues*
  - **Subsidiarity principle**
  - **Soil not recognized as Common good – Private ownership**
  - **Contamination –– issue of orphan sites and costs**
  - **Laand users' concerns –**

7th Environment Action Programme

Objective

- By 2020: "**land is managed sustainably** in the Union, **soil is adequately protected** and the **remediation of contaminated sites is well underway**;"
- This requires, in particular: "increasing efforts to **reduce soil erosion** and **increase soil organic matter**, to **remediate contaminated sites** and to enhance the **integration of land use aspects** into coordinated decision-making involving all relevant levels of government, supported by the **adoption of targets on soil and on land as a resource**, and land planning objectives;"

Commitments

- **"**The Union and its Member States should also reflect as soon as possible on **how soil quality issues could be addressed using a targeted and proportionate risk-based approach within a binding legal framework**. **Targets** should also be set for **sustainable land use and soil**."

Recent activities at EU level

- *Awareness raising and knowledge base*
- *Launch of an EU Expert Group on Soil Protection*
  - **Experts nominated by EU Member States**
  - **Reflexion on how to address 7th EAP commitments on soil**
- *Inventory of soil protection measures in all EU MS*

http://ec.europa.eu/environment/soil/pdf/Soil_inventory_report.pdf

  - **National legislations and non-binding measures + implementation EU policies**
  - **State of play, implementation, gap analysis**

- *Mapping and Assessment of Soil-related Ecosystem Services (MAES) Soil pilot*

Thank you for your attention!

http://ec.europa.eu/environment/soil/index_en.htm

SUSTAINABLE DEVELOPMENT GOALS: REALIZING TRANSITIONS BY SUSTAINABLE LAND RESTORATION, LAND USE AND MANAGEMENT

Co Molenaar and Margot de Cleen (Ministry of Infrastructure and Water management)

Why Motivation and problem statement

Changing political and policy context: SDG have to be implemented by 2030. Paradigm shift (= transition) are needed! We have to act and find new/other ways to achieve those goals. Land use, restauration and management are the key instrument.

What Approach, results and key messages

Changing political and policy context. Herefore a paradigm shift is needed.

- From protection of soil quality towards restoration, sustainable use and management, to achieve societal challenges (climate, energy, food…)
- From central to local governance
- From soil as a hindrance to soil as an opportunity
- From chemical quality to ecosystem services of the soil and subsurface

Key Conclusion and take home message

1. Transitions (food, energy, economy) are needed to realize the SDGs.
2. Land en soil services are the key awareness raising, closing of cycles (food print), restoration and sustainable land use and management are needed
3. Increasing pressure on land and soil services: multifunctional use of land
4. Achieving public goals with private means (land stewardship and trade-offs): society is at stake! Who gets the benefits/ the costs?
5. Transition guidance is needed, not legislation per se.
6. Instruments for different levels (local, regional, national..)
7. Monitoring essential, all stakeholders' responsibility, transparency
8. New knowledge is needed

More Further reading

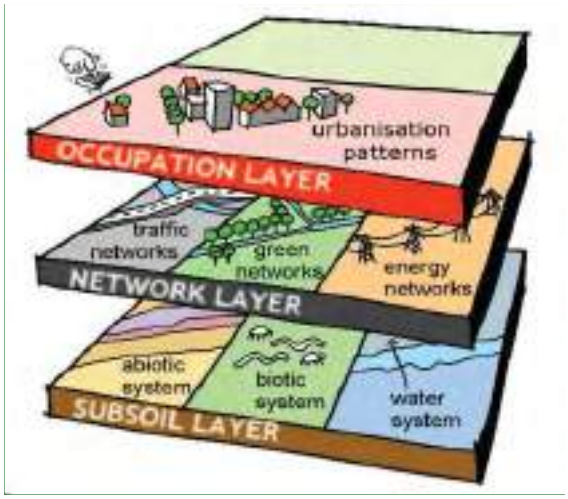
See added papers:

WIKI NL Soil policy in the Netherlands; The dynamics of joint policy making

Back ground paper World Soil Day 2016 Towards Societal Benefits by Soil Services

Land and soil knowledge for addressing societal challenges

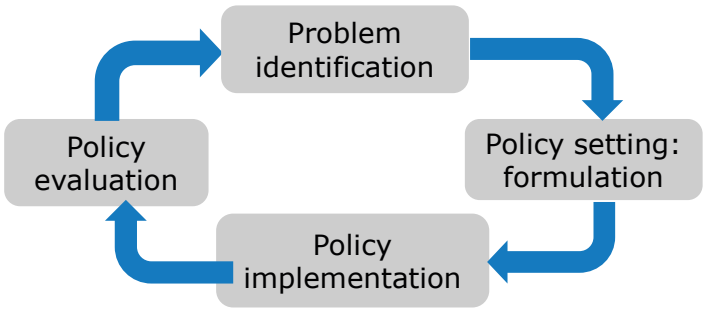
Co Molenaar
Ministry of Infrastructure and Water Management, The Netherlands



Rijkswaterstaat
Ministry of Infrastructure and the Environment

Sustainable Development Goals: realizing transitions by sustainable land restoration, land use and management

Winsemius policy cycle



The necessity of knowledge development and stakeholder involvement

Co Molenaar
Margot de Cleen

Take home messages

1. Transitions (food, energy, economy) are needed to realize the SDGs.
2. Land en soil services are the key → awareness raising, closing of cycles (food print), restoration and sustainable land use and management are needed
3. Increasing pressure on land and soil services: multifunctional use of land
4. Achieving public goals with private means (land stewardship and trade offs): society is at stake! Who gets the benefits/the costs?
5. Transition guidance is needed, not legislation per se.
6. Instruments for different levels (local, regional, national..)
7. Monitoring essential, all stakeholders' responsibility, transparency
8. New knowledge is needed

Changing political and policy context

Urgency societal challenges: 2030 is tomorrow!

Global trends: growing population, growing middle class, growing demand for resources, climate change

→ Growing pressure on land and soil services

Transition characteristics: paradigm shift

Old world view	New world view
Exploitation model	Cooperation model
Economical return	Societal return
Linear processes	Circular processes
Value extraction	Value creation
Independency	Togetherness

Transition characteristics: change in structure

Old structure	New structure
Vertical	Horizontal
Hierarchic	Networks
Top down	Bottom up
Central	Decentral
Silos	Communities

Paradigm shift in soil policy

From

soil as a slave

towards

soil as Mother Earth

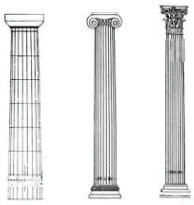
towards

soil as a partner

- From protection of soil quality towards restoration, sustainable use and management, to achieve societal challenges (climate, energy, food…)
- From central to local governance
- From soil as a hindrance to soil as an opportunity
- From chemical quality to ecosystem services of the soil and subsurface

Current situation

- Availability of land and soil is **under pressure**
- **Unawareness** that **soil services** are essential to tackle societal challenges
  - Damage
  - loss of benefits
- **Land management policy** lacks: sectorial and protective
- Stakeholders are insufficiently involved: **public private cooperation** needed





The necessity of up scaling

- Up scaling to **area approach**:
  - Broader area, more potential solutions
  - Connecting to societal challenges and interests, new investors (stakeholders)
  - Problem solving, business case
- Up scaling to **services of the SSW**
  - Soil quality improves by soil value creation
- **Integral** approach
  - Area development and social quality improvement

Balance in use, protection and improvement of soil and groundwater quality: **Land management is the instrument**

Policy? Land management and spatial planning

Transition in policy:

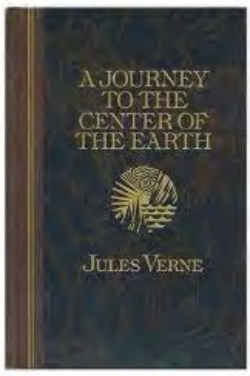
- From subsurface care to deep and broad use of ecosystem services
- From general regulations and prohibitions to tailor made solutions on regional and local level: spatial planning
- From taking the lead to involving the energetic society

Land management is the instrument to connect sustainable use of natural resources to societal challenges

Change towards:

- **Less legislation**
- **More self regulation and initiatives from society**
- **Facilitation of innovations**

Transition towards environmental planning



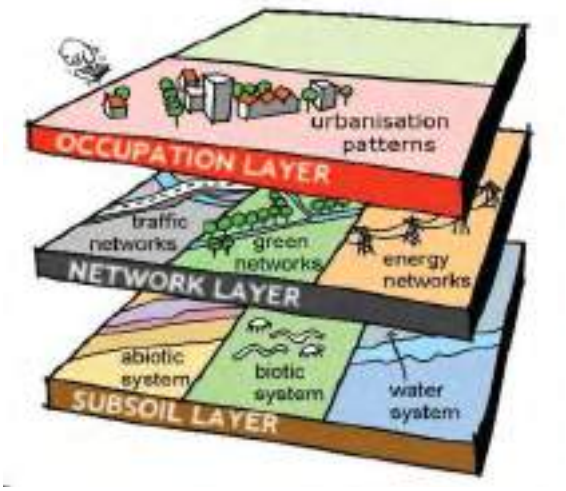
- From 2 to 3 and 4D spatial planning
- System approach (soil sediment water system)
- Spatial and inter governmental coordination
- Development and sharing of information, knowledge and expertise
- Shared assessment framework connecting national, regional and local interests and decisions

→ National 4D Spatial plan
Regional and local 4D spatial specifications

- In accordance with the new integral Environment and Planning Act (2021)

Dutch approach for a spatial plan for soil and subsurface

- On request of energetic society
- Inventory of national policy and interests
- Together with local authorities and stakeholders
- Sustainable and efficient use
- Long term: 100 years
- Energy, (drinking) water, agriculture, efficient use ecosystem services



Aim is sustainable and efficient use of the subsurface

Recommendations for transition

- Strategy and Vision
  - Long term public and private perspectives; different scales spatial scales; towards 4/5 D land management
- Awareness and Capacity building
  - Value creation by connecting societal challenges to the SSW
- Organizing cooperation
  - Stakeholder participation
- Creating networks of practice
  - Connect with existing networks
- Facilitating with instruments, information and knowledge
- Monitoring
  - Efficacy of land management instruments


Thank you for your attention
More information:
Co Molenaar@rws.nl
Margot.de.cleen@rws.nl
March 26, 2018

ADRESSING SOCIETAL CHALLENGES IN RESEARCH AGENDA ON SOIL & LAND

Annette Gatchett (U.S. EPA)

Addressing societal challenges in a research agenda on soil & land

Annette Gatchett, U.S. EPA, Division Director

INSPIRATION impressions

Talking Points

- Thank you to: Conf. Organizers for the invitation to speak
- We heard earlier about the Why we need to talk about Soil and Land and the why we need a strategic plan for research. Now we will talk about how we take the next step in determining the what are the important research areas and how did we come up with the highest priorities.
- I will talk specifically about the how we gathered the information on the research areas of interest.
- Paul will then finish with the final product or Strategic Research Agenda.

Talking Points

- The INSPIRATION project addresses societal needs for a research agenda. Identifying research priorities within a country let alone across countries presents a challenge. There are many similarities but also differences. INSPIRATION was designed to answer the question: How do we identify relevant research needs across 18 (with more than 20 participating) countries? more than 20 countries involved

- While the Project focused on 18 Countries across Europe….. Sustainable Soil and Land use is a Global issue!!!! Many are struggling with how best to address this issue.

Talking Points

- INSPIRATION used a unique way of determining research priorities or way to gather knowledge. It Used Stakeholders to set the priorities rather than:

    1. scientific based literature reviews from an Agencies perspective with a set of scientific disciplines. This may introduce bias.
    2. Or rather than letting political priority or regulatory processes influence the priorities (like the US). EXAMPLE: the US would gather information from our program offices (regulatory) and the Regions that work with the States to implement. Public comment is a part of this process but near the end of the process.

- In these 2 approaches priorities are introduced and then commented on by the general public. Public is asked to verify, comment or suggest additions but the Agenda is set!

Talking Points

- INSPIRATION used a novel Bottom up approach to gather the information. This included the identification of Stakeholders in all sectors at the beginning of the development of the Research Agenda framework and then a constant interaction and communication throughout the process. Truly a Bottom up Approach! This included a layered approach of small groups with Key Stakeholders and then larger attended workshops in each country. More than 500 involved overall.
- This process is interactive.
- Co-development

Talking Points

- ADVANTAGES
  - Buy in and trust results because they are relevant and because there is ownership. Constant interaction with Stakeholders.
  - Integration of different disciplines and expertise. Workshops were used for discussion and debate. This allowed for interaction among individuals who wouldn't normally meet and interact. In addition, the workshops were conducted in 2 languages: native and English
  - Clear structured stakeholder engagement and networking.

- Potential weaknesses
  - By using 1st key stakeholder (smaller group) in each country one could introduce bias by their particular expertise or experiences. However, A counter balance was the checkpoint conferences as a ground truthing or check point.
  - Also, working across 18 countries, with varying disciplines and languages you run the risk of losing clarity. Workshops were conducted in the native language and English to help counter balance this weakness.
  - The bottom up approach attracted stakeholders differently. Funders while a very important group were not as active participants as the project would have liked.

Talking Points

- As you can see the project was a very Challenging endeavor. At first it may even seem impossible. However great strides have been made and I would say a big success in identifying needed research to balance our demand and supply of land resources so that we can protect and provide proper management.

- The final step to ensure this plan moves to implementation is to focus on common areas of interest and the uptake from outside stakeholders. The matchmaking between funders and the researchers is key. This conference is an opportunity to move this forward. I would hope the participants take advantage of this opportunity.

- THANK YOU!!!!

OUTSIDE THE BOX THINKING FOR AN INNOVATIVE RESEARCH AGENDA

Paul Nathanail (University of Nottingham)

Co-Authors from INSPIRATION consortium

Why Motivation and problem statement

Soil is a finite threatened resource. Land is limited and once built on is hard to return to soft uses. Spatial planning has a key role to play in how our soils are protected and our land is managed.

European citizens are increasingly realising that they both need and want: Net land degradation neutrality; Zero waste; Circular land economy; Protected soils, waters & sediments; Biodiversity and Clean air.

A bottom up approach has led to the development of a strategic research agenda to improve the way we plan, manage and use our land and the soil-sediment-water system.

What Approach, results and key messages

Business as usual will at best slow down the rate of land consumption and soil loss. Delaying the inevitable is not compatible with the principle of sustainable development nor would it contribute to achieving the United Nations sustainable development goals (SDG). The SDG consider ab initio how to mobilize of financial resources, how to build capacity, ways of transferring environmentally sound technologies and ultimately tackling the societal implications of climate change.

Research and innovation needs have been identified in the way we understand the supply of natural resources and ecosystem services; how we call on, or demand from, them; how we manage land use and how we measure and evaluate the impact of such use. In addition to these thematic research and innovation needs, cross cutting activities were also identified.

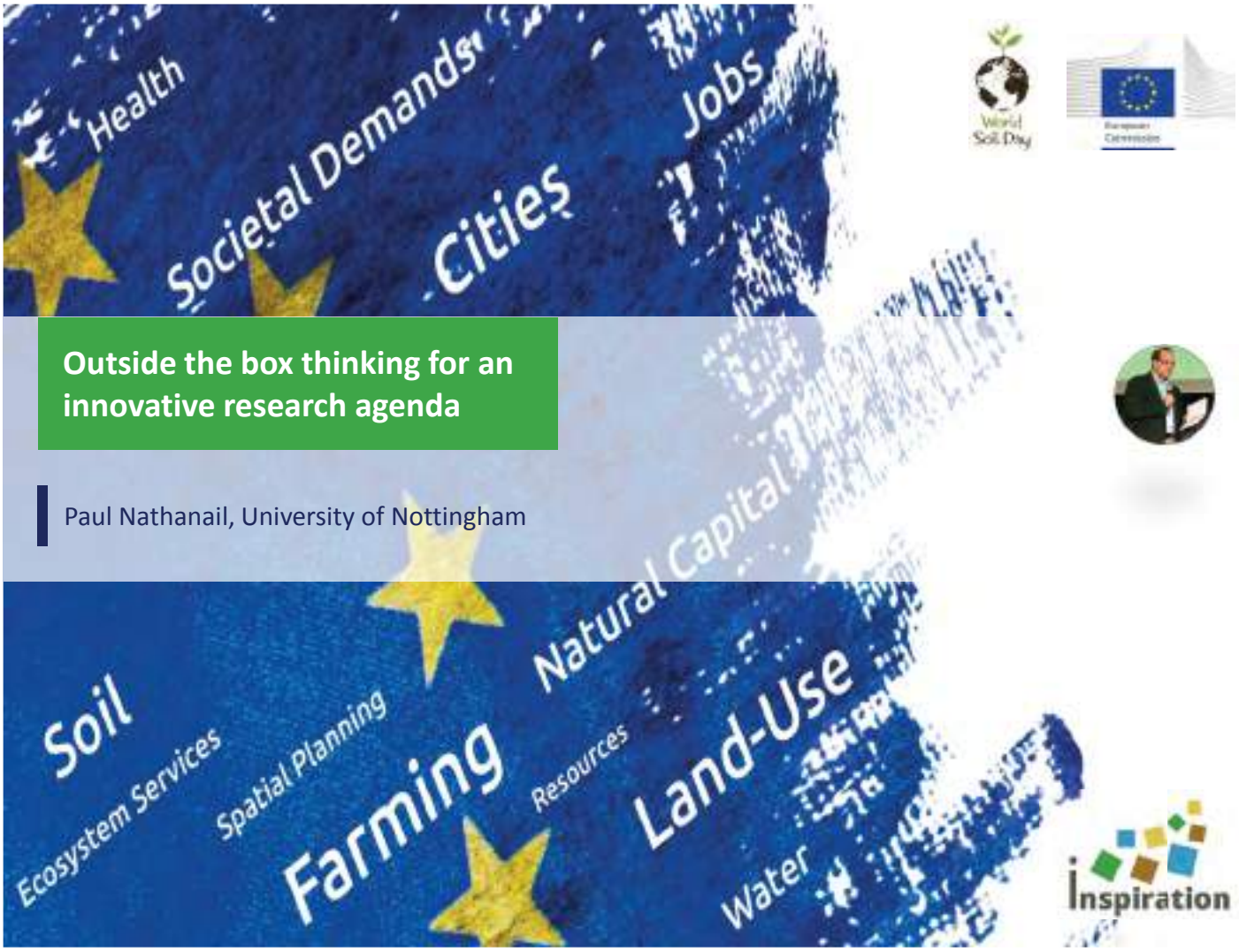
Such activities need to result in a step change in policy and practice and to do so relatively quickly.

Key Conclusion and take home message

Co-funding is essential if the identified research and innovation is to take place and do so at a pace that will allow it to have the impact it needs within the next 10-15 years. INSPIRATION partners remain committed to helping Europe's funders, end users and researchers deliver on the bottom-up inspired strategic research agenda.

More Further reading

http://www.inspiration-h2020.eu/



Outside the box thinking for an innovative research agenda

Paul Nathanail, University of Nottingham

INtegrated Spatial Planning, land use and soil management Research ActTION

Topical knowledge gaps and research needs of Europeans towards sustainability in spatial planning, land use and soil management: The INSPIRATION Strategic Research Agenda

Outside the box thinking for an innovative research agenda

On behalf of INSPIRATION consortium
Professor Paul Nathanail, University of Nottingham, UK
Paul.nathanail@nottingham.ac.uk

World soil day ~~is coming~~… is here!

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This Land Is Your Land

Woody Guthrie

As I went walking I saw a sign there
And on the sign it said "No Trespassing."
But on the other side it didn't say nothing,
That side d me.

In the shadow of the steeple I saw my people,
By the relief office I seen my people;
As they stood there hungry, I stood there asking
Is this land made for you and me?

Nobody living can ever stop me,
As I go walking that freedom highway;
Nobody living can ever make me turn back
This land was made for you and me.

The box…

- *What* is the box?
- *Where* is it?
- *Who* is in it?
- *When* was it finished?
- *Why* was it made?
- *How* can we work outside it?

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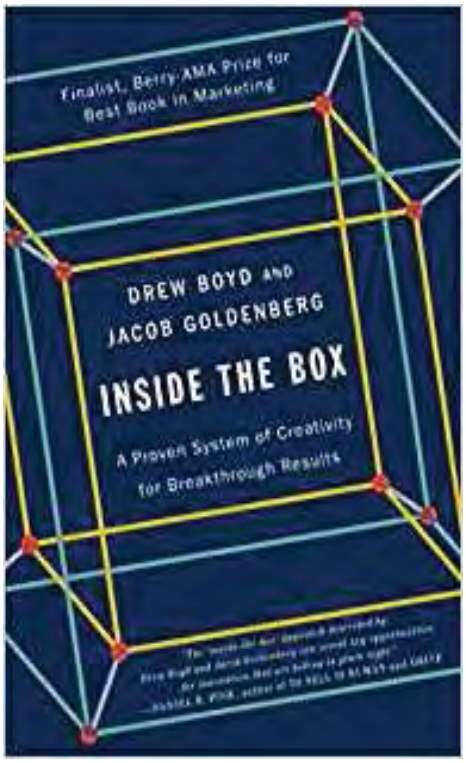
The box…

- *What* is the box? Silos
- *Where* is it? Take a look around you
- *Who* is in it? We are, by default
- *When* was it finished? Boiling a frog
- *Why* was it made? Mind limits
- *How* can we work outside it? Mind blowing

Thinking inside the box



new ideas vs problem solving

Systematic Inventive Thinking
Five Thinking Tools

- Subtraction
- Multiplication
- Division
- Task Unification
- Attribute Dependency

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What do we want?

- Net neutrality
- Zero waste
- Circular land economy
- Protected soils, waters & sediments
- Biodiversity
- Clean air

What do Europeans, really, really want?

Spice Girls, London 2012

- Peace & security (Bosnia)
- Wholesome Food & water (Slovenia)
- Health (EHIC cards)
- Education (Marie Curie; Erasmus; Tempus)
- Pleasant environment (my university's campus)
- Fast wifi and cheap mobile access (no roaming charges)
- A better future for their children (or nephews nieces…)
- Hope! (Pandora's **box**!)

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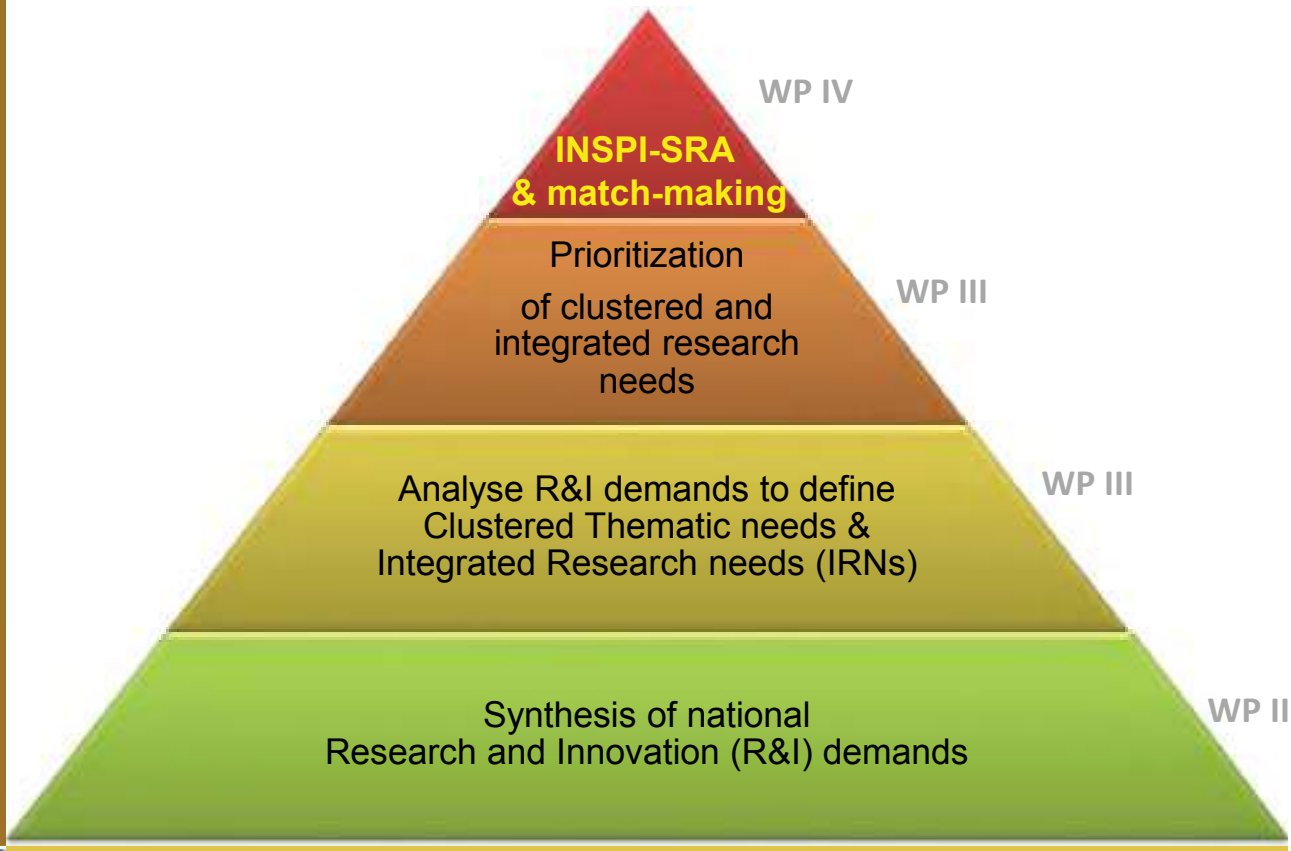
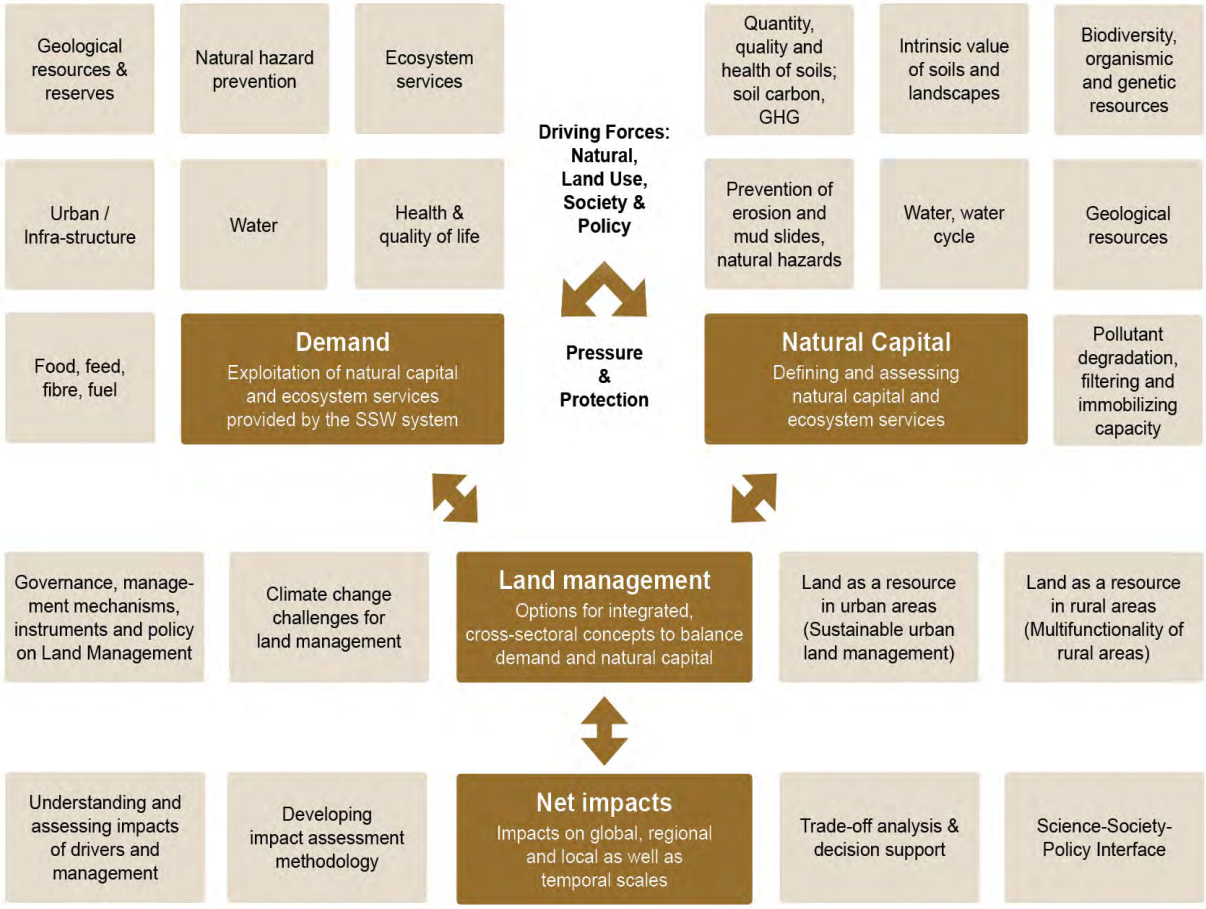
Bottom-up inspiration





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Integrating research Needs (IRNs)

From information to implementation

IRN-1: Integrated Environmental Assessment and Soil Monitoring for Europe

IRN-2: Recognizing the value of ecosystem service in agricultural land use

IRN-3: From indicators to implementation: Integrated tools for a holistic impact and land use assessment

FFFF: demand, potentials and risks

IRN-4: Bio-Economy – unleashing the potentials while sustaining soils

IRN-5: Integrated scenarios for the Soil-Water-Food nexus under societal challenges

IRN-6: Assessing the efficiency of the Soil-Sediment-Water nexus of resources

IRN-7: Maintaining soil fertility by organic farming to [illegible] in food [illegible]

Challenge: Integrated urban management

IRN-8: Circular land management

IRN-9: Developing effective policies to combat urban s[illegible]awl

IRN-10: Facilitating the implementation of urban g[illegible]struct[illegible]e through stakeholder participation

IRN-11: Integrated management of soils in urban areas

IRN-12: Environmentally friendly and socially sensitive urban development

IRN-13: Urban Metabolism – Enhance resource efficiency through a closing of urban material loops

Disturbed landscapes

IRN-14: 'Emerging contaminants' in soil and groundwater

IRN-15: Sustainable management and valorization of degraded land

IRN-16: Innovative technologies and eco-engineering 4.0: Challenges for a sustainable use of rural and urban landscapes and the SSW system

Climate change challenges

IRN-17: Climate change challenges - improving preparedness, response for climate conditions and related hazards

17

The 17 United Nations Sustainable Development Goals (SDGs)

The World's To-Do List by 2030

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MDG vs SDG

millennium vs sustainable

- Broader
- Deeper
- Global
- Implementation considered up front
  - mobilization of financial resources
  - capacity–building
  - transfer of environmentally sound technologies
  - Tacking climate change is key

The Global goals…

1. need ~~you~~ us
2. will change how we do business
3. are one for all and all for one
4. will address climate change
5. will eradicate extreme poverty by 2030
6. will leave no one behind
7. are hands-on: planned, costed, buy-in
8. are “Global”
9. are the people’s goals
10. are the world’s ultimate to-do list for the next 15 years

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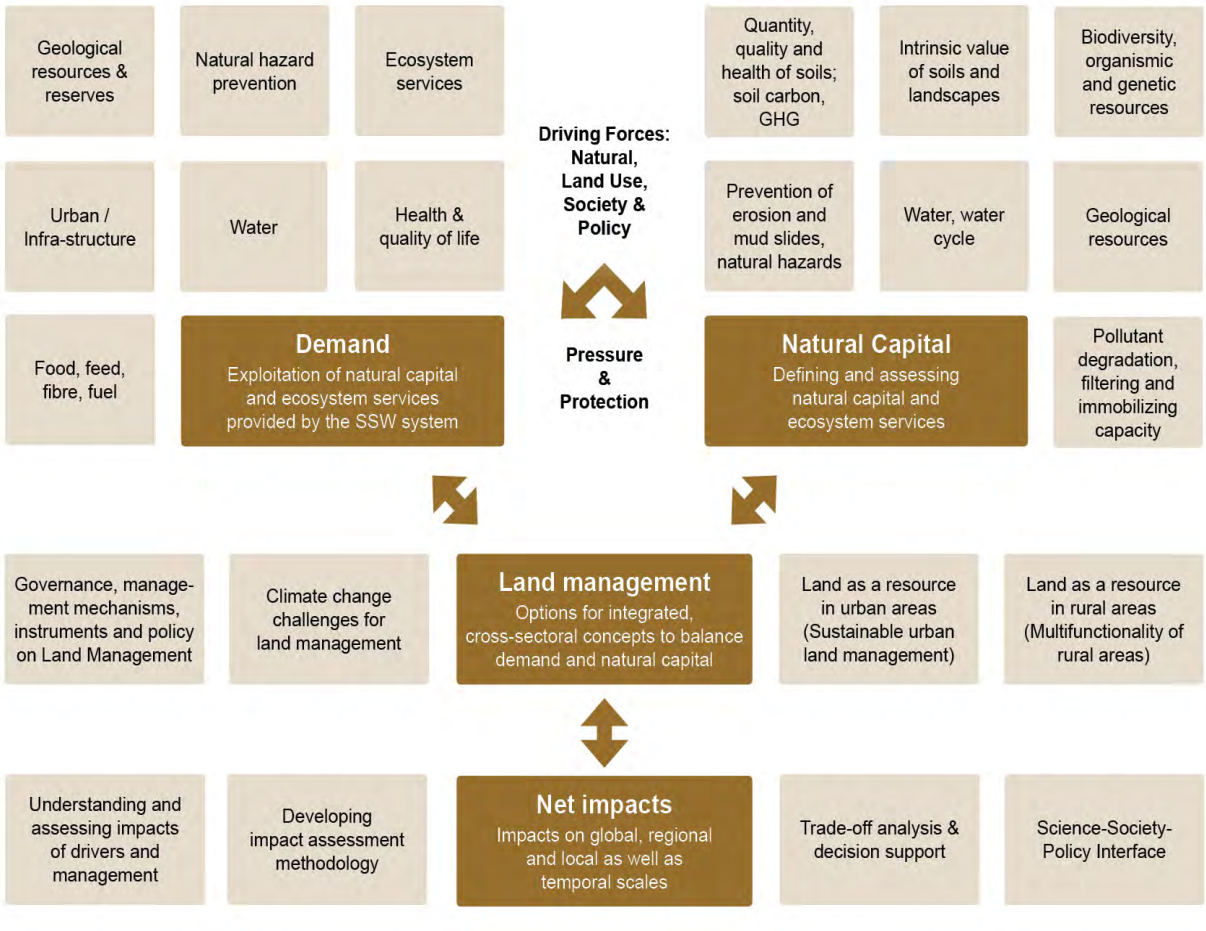
UN Sustainable Development Goals (SDG): INSPIRATION

More on this tomorrow!

Sustainable Development Goal	No poverty	Zero hunger	Good health	Quality Education	Gender equality	Clean water & sanitation	Affordable and clean energy	Decent work and economic growth	Industry, innovation and infrastructure	Reduced inequalities	Sustainable cities and communities	Responsible consumption	Climate action	Life below water	Life on land	Peace and justice	Partnership for the goals
SDG	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Soil	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	✓✓	✓	✓✓	✗	✓✓	✗	✗
Sedi-ment	✗	✗	✗	✗	✗	✓	✗	✗	✓	✗	✓	✓	✓✓	✓✓	✓	✗	✗
Water	✓	✓	✓	✓	✓	✓✓	✓	✓	✓	✓	✓	✓	✓✓	✓✓	✓	✗	✗
SSW System						✓			✓		✓	✓	✓✓		✓		

INtegra soil ma

INtegrated Spatial Planning, land use and soil management Research ActTION



INtegrated Spatial Plannlng, land use and soil management Research ActTION

Geological resources & reserves

Natural hazard prevention

Ecosystem services

Urban / Infra-structure

Water

Health & quality of life

Food, feed, fibre, fuel

Demand

Exploitation of natural capital and ecosystem services provided by the SSW system

D… orces: …al, …se, …y & …y

Pressure & Protection

Quantity, quality and health of soils; soil carbon, GHG

Intrinsic value of soils and landscapes

Biodiversity, organismic and genetic resources

Prevention of erosion and mud slides, natural hazards

Water, water cycle

Geological resources

Natural Capital

Defining and assessing natural capital and ecosystem services

Pollutant degradation, filtering and immobilizing capacity

provided by the SSW system

Governance, management mechanisms, instruments and policy on Land Management

Climate change challenges for land management

Land manageme

Options for integrated cross-sectoral concepts to b demand and natural cap

Understanding and assessing impacts of drivers and management

Developing impact assessment methodology

Net impacts

Impacts on global, regio and local as well as temporal scales

ecosystem services

immobilizing capacity

nd management

Options for integrated, ectoral concepts to bal mand and natural capita

Land as a resource in urban areas (Sustainable urban land management)

Land as a resource in rural areas (Multifunctionality of rural areas)

Net impacts

pacts on global, regiona and local as well as temporal scales

Trade-off analysis & decision support

Science-Society-Policy Interface

Integrating research Needs (IRNs)

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IRN-17: Climate change challenges - improving preparedness, response for climate conditions and related hazards

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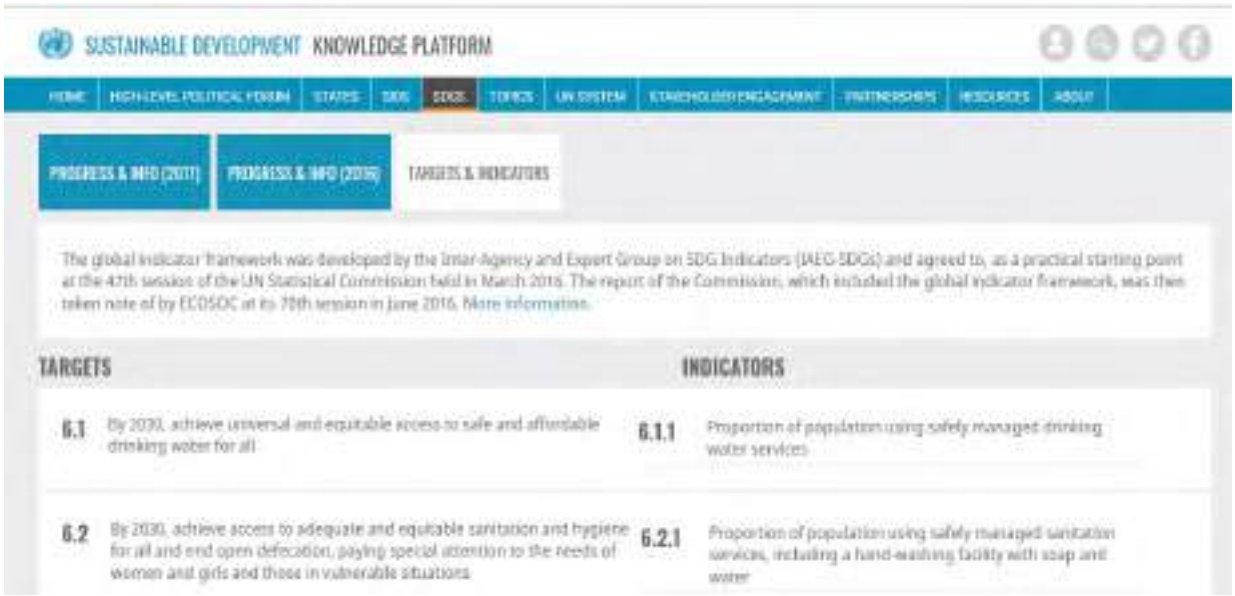
INtegrated Spatial Plannlng, land use and soil management Research ActTION

If you don't know where you are going, how will you know you have got there?



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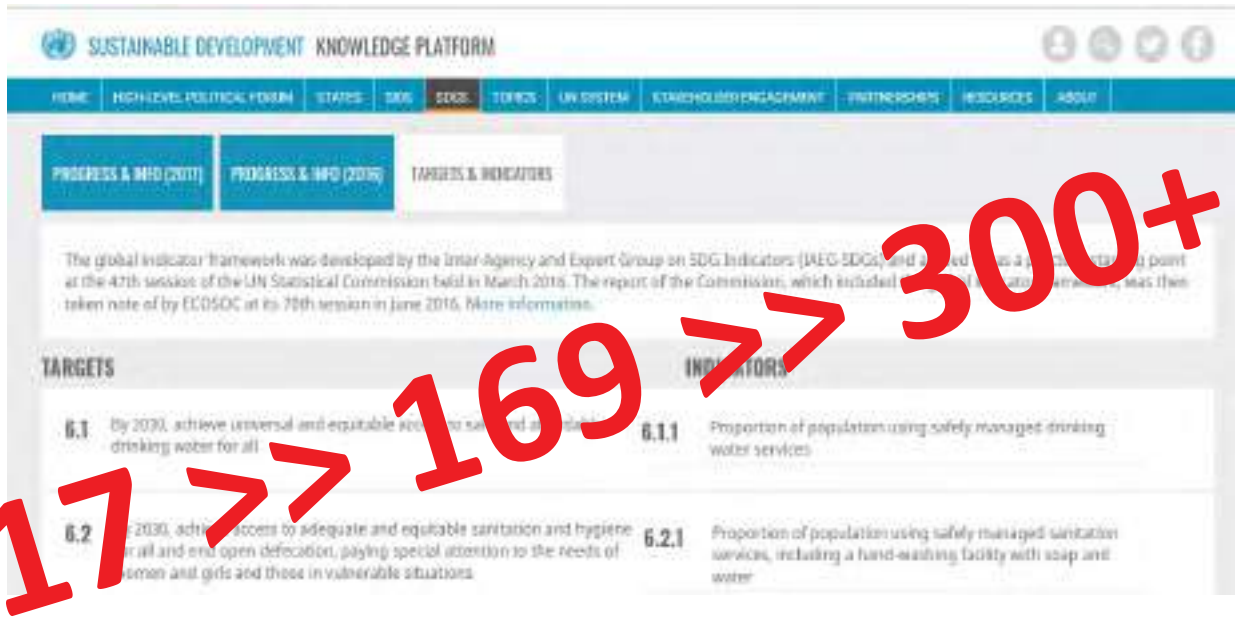


Funding models

- International funding
- Bilateral
- EU
  - Fwk
  - ERANets
  - COST
  - JPI
  - Article 185
- National Research foundations/ councils
- Public/ Private (eg Innovate UK)
- Third sector
- Crowd funding

Woodie Guthrie was wrong

INtegrated Spatial Plannlng, land use and soil management Research ActTION

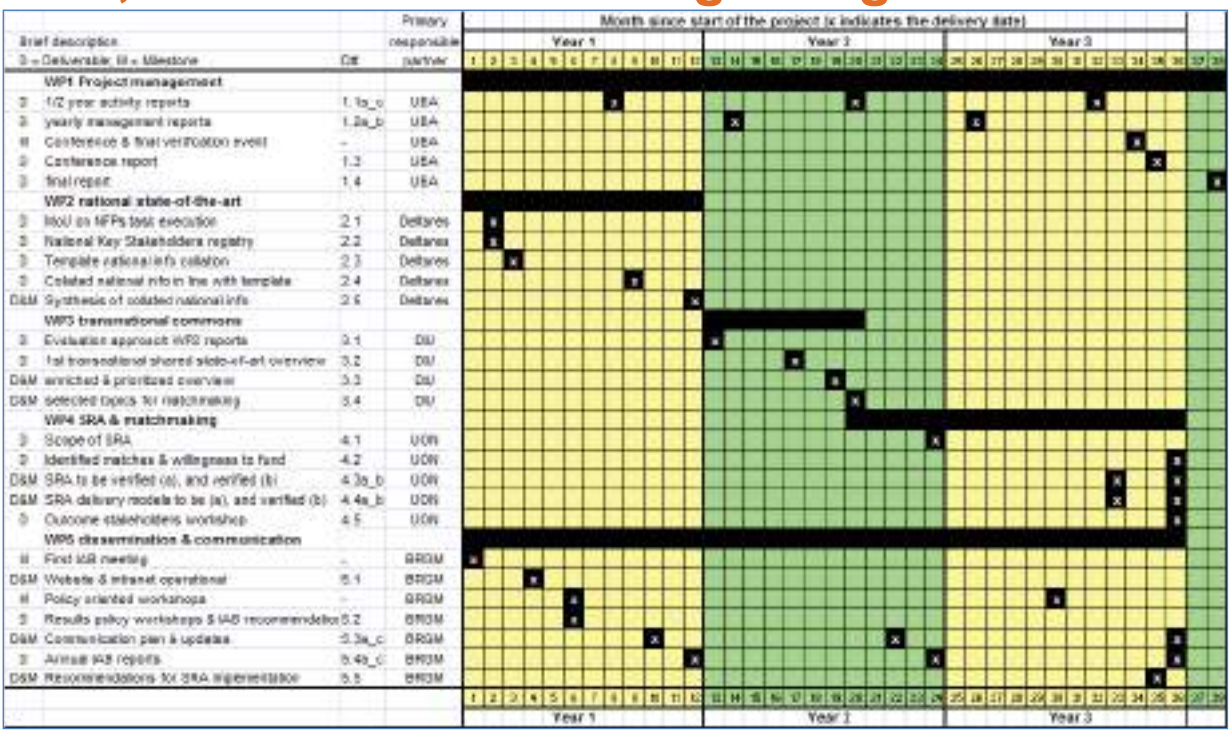
Brand new state!
Brand new state, gonna treat you great!
Gonna give you barley, carrots and pertaters
Pasture fer the cattle
Spinach and termayters!
Flowers on the prairie where the June bugs zoom
Plen'y of air and plen'y of room
Plen'y of room to swing a rope!
Plen'y of heart and plen'y of hope

Oklahoma, where the wind comes sweepin' down the plain
And the wavin' wheat can sure smell sweet
When the wind comes right behind the rain
Oklahoma

Ev'ry night my honey lamb and I
Sit alone and talk and watch a hawk
Makin' lazy circles in the sky
We know we belong to the land
And the land we belong to is grand!
And when we say
Yeeow! Ayipioeeay!
We're only sayin'
You're doin' fine
Oklahoma!
Oklahoma O.K

Schedule: 3 months to go!

Not the end, or even the beginning of the end, but the end of the beginning



D = Deliverable; M = Milestone		Primary responsible partner
WP1 Project management		
D	1/2 year activity reports	UBA
D	yearly management reports	UBA
M	Conference & final verification event	UBA
D	Conference report	UBA
D	final report	UBA
WP2 national state-of-the-art		
D	MoU on NFPs task execution	Deltares
D	National Key Stakeholders registry	Deltares
D	Template national info collation	Deltares
D	Collated national info in line with template	Deltares
D&M	Synthesis of collated national info	Deltares
WP3 transnational commons		
D	Evaluation approach WP2 reports	DIU
D	1st transnational shared state-of-art overview	DIU
D&M	enriched & prioritized overview	DIU
D&M	selected topics for matchmaking	DIU
WP4 SRA & matchmaking		
D	Scope of SRA	UON
D	Identified matches & willingness to fund	UON
D&M	SRA to be verified (a), and verified (b)	UON
D&M	SRA delivery models to be (a), and verified (b)	UON
D	Outcome stakeholders workshop	UON
WP5 dissemination & communication		
M	First IAB meeting	BRGM
D&M	Website & intranet operational	BRGM
M	Policy oriented workshops	BRGM
D	Results policy workshops & IAB recommendations	BRGM
D&M	Communication plan & updates	BRGM
D	Annual IAB reports	BRGM
D&M	Recommendations for SRA implementation	BRGM

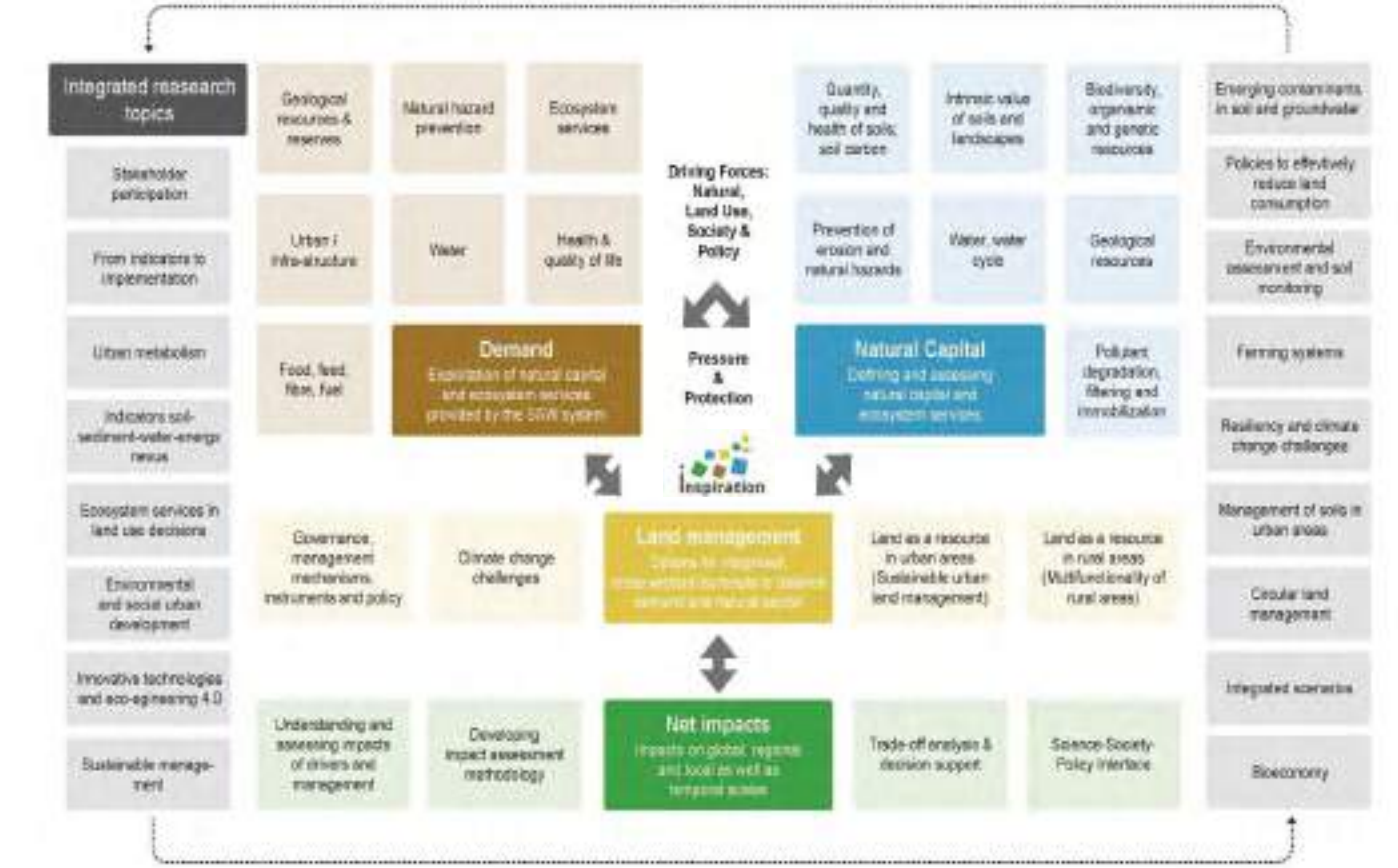
Continue to dialogue, come to the UK… poster

Which INSPIRATION SRA topics contribute to what the UN SDGs require

This project received funding from the European Union under HORIZON 2020 under Grant Agreement No. 642372.

This presentation reflects only the authors' views and that the European Union is not liable for any use that may be made of the information contained therein.

INSPIRATION Research Agenda



ROUNDTABLE

Lilian Busse (German Environment Agency), Margot de Cleen (Dutch Ministry of Infrastructure and Water Management), Violette Geissen (WUR)

Policy perspectives: The role of soil science to address societal challenges

Moderation:
Lilian Busse, German Environment Agency

Policy perspectives: The role of soil science to address societal challenges

Maros Finka
Office of the Government of the Slovak Republic

Nicola Dall'Olio
Head of cabinet of the Emilia Romagna regional Minister for Agriculture Hunting and Fishing

Rolf Bräuer
German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Josiane Masson
European Commission DG Environment

Ivana Vujic
European Knowledge Network

End-user perspectives: What science do we need?

Moderation: Margot de Cleen, Dutch Ministry of Infrastructure and Water Management; European Soil Expert Group

End-user perspectives: What science do we need?

Paola Toniolo
Solvay
GBU Peroxides EMEA

Liisa Pietola
Copa-Cogeca Working Party on Environment soil scientist and MTK

Nikola Petković
Advisor for Regional Development City of Zagreb

Michaël Wilde
Eosta,
Save our Soils

Paul van Riet
DOW,
Chairman industry group NICOLE

Science perspectives: What science do we want?

Moderation:
Violette Geissen, WUR & European Soil Partnership

Science perspectives: What science do we want?

Linda Maring
Deltares
Coordinator Soils4EU

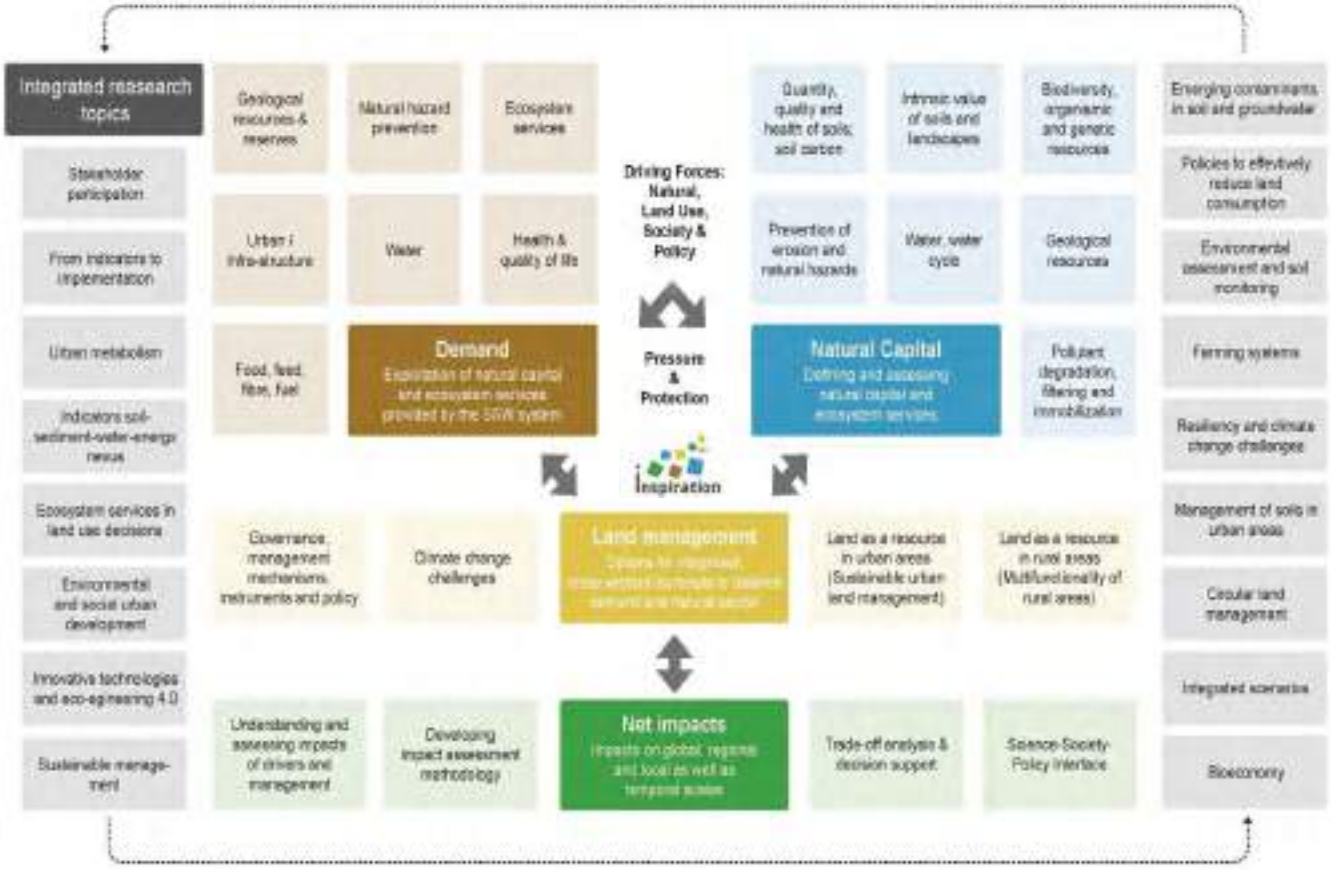
Ana Iglesias
Universidad Politécnica de Madrid

Arwyn Jones
European Commission Joint Research Centre

Kris von Iooy
Forschungszentrum Jülich Institute of Bio- and Geosciences

Jan Staes
University of Antwerp , Antwerpen Department of Biology

INSPIRATION Research Agenda



ACTIONS RELATED TO EU'S RESEARCH POLICY

Birgit de Boissezon (European Commission, DG Research & Innovation

Actions related to EU's research policy

Birgit de Boissezon, European Commission, DG Research & Innovation
Head of Unit Sustainable Management of Natural Resources

European Commission

EU PROJECT "INSPIRATION" FINAL CONFERENCE

WORLD SOIL DAY 2017 – LAND, SOILS AND SCIENCE

Outlook: Lessons learned for land and soil research for Europeans

Brussels, 5 December 2017

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DG Research & Innovation
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International policy context

European Commission

Research and Innovation

Urban Agendafor the EU

European Commission

Research and Innovation

The EU Urban Agenda Partnership on sustainable land use and NBS

- ✓ *Kicked off in July 2017 - with the support of the EC*
- ✓ *Coordinated by the **Ministry of Poland** and the **City of Bologna***
- ✓ ***Key actors:** EUROCITIES, URBACT, **EUKN,** EIB*
- ✓ ***Countries**: Cyprus, Lithuania, Luxembourg, Portugal, Slovenia*
- ✓ ***Cities**: Águeda (PT), Antwerp (BE), Cork (IR), Métropole Européenne de Lille (FR), Stavanger (NO), Verband Region Stuttgart (DE), **Zagreb** (HR)*

The EU Urban Agenda Partnership on sustainable land use and NBS

- ✓ *Towards **Compact and Liveable cities**, **through efficient use of land and of infrastructure**.*
- ✓ *Need of **Better knowledge**, **Better Regulation, Better Funding** – incl. tools and instruments*
- ✓ *2 workstreams: "Liveable Compactness" and "Nature based solutions"*
- ✓ *Milestones:*

  Draft Action Plan (consultation): July 2018

  Final Action Plan: the end of 2018

Horizon 2020 Projects

INSPIRATION
INTEGRATED SPATIAL PLANNING, LAND USE AND SOIL MANAGEMENT RESEARCH ACTION

BRODISE
BROWNFIELD DECONTAMINATION IN SOUTHERN EUROPE

Multi-stakeholder Large-Scale demonstration projects on Nature-based Solutions for Climate and Water resilience and for Urban regeneration

FP7 Projects

EcoFINDERS

SCALES
Securing the Conservation of biodiversity across Administrative Levels and spatial, temporal, and Ecological Scales

VISIONS OF LAND USE TRANSITIONS IN EUROPE
VOLANTE

SOILTREC

BiodivERsA_- Soil in 27% of funded projects

1. Biodiversity: linking scientific advancements to policy and practice	➔ 4 projects / 12
2. Biodiversity and ecosystem services, and their valuation	➔ 1 project / 7
3. Biodiversity dynamics: developing scenarios, identifying tipping points, and improving resilience	➔ 3 projects / 9
4. Invasive species and biological invasions	➔ 1 project / 9
5. Promoting synergies and reducing trade-offs between food supply, biodiversity and ecosystem services	➔ 4 projects / 10
6. Understanding and managing soil and sediments biodiversity dynamics to improve ecosystem functioning and delivery of services	➔ 9 projects / 26
7. Understanding and managing biodiversity dynamics in land-, river- and sea-scape (habitats connectivity, green and blue infrastructure, naturing cities)	

➔ Already 22 pan-European projects funded

BiodivERsA 2015-2016 COFUND call

✓ Theme on soil & sediment biodiversity:
9 projects funded for a total of **13.5 million** euro by 15 organisations from 13 countries (1 on sediment only)

Exemples of projects

BIOINVENT - Generic bio-inventory of functional soil microbial diversity in permanent grassland ecosystems across management and climate gradients. Participating countries: DE, CH, PT, SE.

CLIMARCTIC - Climate change impacts on Arctic soil and lake microbiomes. Participating countries: BE, NO, CH, ES, DE.

DIGGING_DEEPER - Agro-ecosystem diversification: digging deeper. Participating countries: CH, DE, FR, ES, SE.

Highlights of expected outcomes

Significance of soil microbial diversity and its functional potential for grassland ecosystem productivity; evaluation of bio-fertilizer product

Effects of climate change on soil and sediment diversity and functioning, and role as feedback mechanisms in the global change system

Framework to identify the impact of agricultural practices on the yield, biodiversity and sustainability of agroecosystems

For more information on this call and projects: www.biodiversa.org/922

PRIMA

PRIMA, the Partnership for Research and Innovation in the Mediterranean Area, will address

- *more climate-resilient, cost-effective and sustainable integrated water management and agro-food systems*
- *joint innovative solutions to pool know-how and resources*
- *water scarcity, food security, health, well-being, migration*

Article 185 TFEU, 2018-2028

Participants: 11 EU Member States: 3 Associated Third Countries, 5 non-Associated Third Countries

Budget: €494 M (€274 M national contributions, €220 M EU contribution, Additional in-kind contributions: €121,5 M)

Strategic Research and Innovation Agenda

Goal:

- *Long-term collaboration between Euro-Mediterranean countries, on an equal footing*
- *Alignment of national programmes*
- *Synergies with European Research Area for the Neighbourhood and other research initiatives*

Cross-Cutting Themes

Soil Sustainability, Food Security, Digital Revolution, Socio-Economic Research and Stakeholders Involvement, Capacity Building

SRIA – 3 Thematic Areas

PRIMA Annual Work Plan

- ***3 sections:***
  - **Section 1 calls** – actions and activities organised, managed and funded by the EU/PRIMA-IS (in line with H2020)
  - **Section 2 calls** – organised by PRIMA-IS and funded by national contributions of PRIMA participating states
  - **Section 3 calls** – organised, managed and funded by the PS
- *Indicative budget for AWP 2018:*
  - **€20 million by EU**
  - **at least €40 million by PS**

European Commission

OUTLOOK

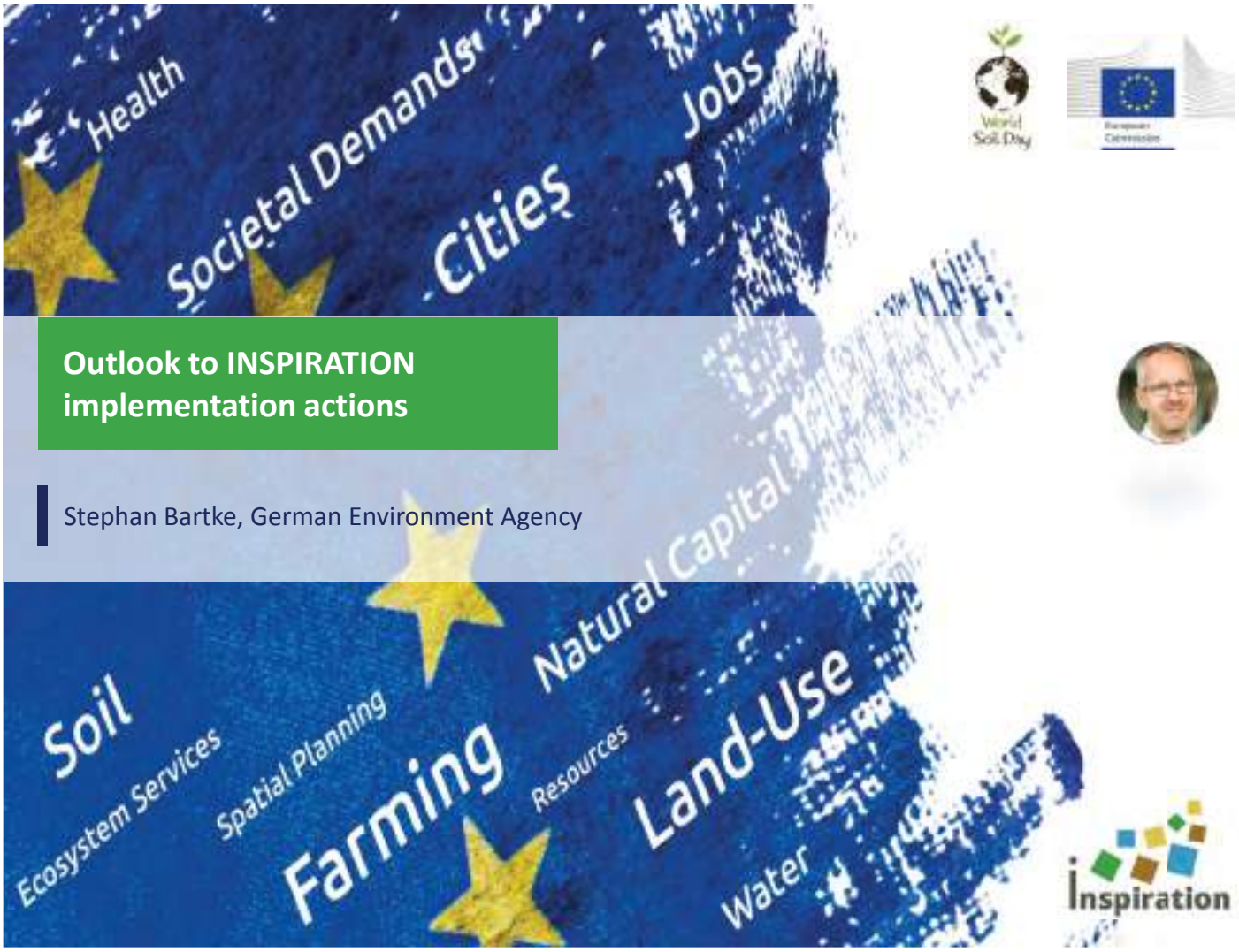
- *INSPIRATION SRA to be consolidated*
- *Opportunities for match-making of funders through National Contact Partners, INSPIRATION4EU*
- *Horizon 2020 calls 2018-20*
- *PRIMA call for proposals 2018 and beyond*
- *Preparation of FP9 and other EU programmes beyond 2020*

An open invitation to work with you to work with nature!

Find out more:
www.ec.europa/research/horizon2020

OUTLOOK TO INSPIRATION IMPLEMENTATION ACTIONS

Stephan Bartke (German Environment Agency)



Outlook to INSPIRATION implementation actions

Stephan Bartke, German Environment Agency

Towards Inspiration4EU

Outline of a network implementing
INSPIRATION for Europe beyond 2018

The Starting Point: H2020 CSA INSPIRATION

- **Coordination & Support Action** from March 2015 till February 2018
- A **Strategic Research Agenda (SRA)** on Soil, Land Use, Land Management in the light of current and future societal challenges
- **Match-making** for delivering the SRA

22 project partners from 17 countries

The next stage? → Inspiration4EU

- **I**mplementing strategic research on **i**ntergrated **s**patial **p**lanni**n**g, land use and soil management **r**esearch **a**ctio**n**s **for Eu**rope – Inspiration4EU
- Network of **voluntary partners** committing **contributions until August 2019**
- **Aims:**
  - Facilitation and support for **implementing INSPIRATION SRA**
  - Establishing the basis for a solid **long-term collaboration** network
  - Extent to **more partner countries**

Inspiration4EU
Services for our stakeholders

- Inspiration4EU provides in each country a
  - **Personal contact for information** about INSPIRATION SRA and on how to get involved towards implementation of parts of the SRA
  - **Contact to** other national and European **funders** is facilitated
- Inspiration4EU supports
  - **promotes national interests** in transnational and EU discussions
  - informs national networks about **transnational and EU** relevant actions

Inspiration4EU
National Contacts

The National Contacts of the Inspiration4EU network

- will be **the national "faces" of the Inspiration4EU network**.
- **enable implementation** of the INSPIRATION SRA
- act on a **voluntary basis** for (up to) 18 months* until August 2019 following the termination of the H2020 CSA INSPIRATION
- **offer specific services** to the network and their national stakeholders, in particular funders, interested in the INSPIRATION SRA.

All INSPIRATION countries remain represented in INSPIRATION4EU

* Inspiration4EU screens options for a (co-)funding of its networking activities to support the National Contacts.

Inspiration4EU
Basic NCP services

- Being available by email / phone to link national stakeholders, in particular funders, with the Inspiration4EU network.
- Putting expressions of interests of funders into an Inspiration4EU Database (provided by UBA).
- Checking the Database for updates from other countries and updating national stakeholders about relevant information. (Automatic info on updates will be provided on NCP's request).
- Identifying potential matches and agreeing with respective other NCPs on next steps (e.g. liaison of interested funders).
- Monitoring initiated coalitions/cooperation's

Inspiration4EU
Potential additional NC tasks

The following is not assumed to be a standard activities of a NC, but are option to do more:

- Actively acquiring additional funders and document their interests to implement parts of the SRA
- Organizing workshops / meetings to link national stakeholders, in particular funders, with the network
- Supporting Inspiration4EU network to shape a follow-up network, e.g. contributing to a joint call or by looking for (national/EU) funders to co-fund networking activities

Inspiration4EU
Structure and needed resources

We need

- Commitments of NCs to perform the requested basic tasks (about 1h/week) voluntarily until Aug. 2019 – all confirmed
- Inspiration4EU database – initiated and provided by UBA
- After 15 months (May 2019) a Go or No Go Decision whether (and how) or not to continue with the voluntary network after Aug 2019

And if possible

- Funding for meetings, etc.
- Establishing network funding for follow-up phase, e.g. a CSA, ERAnet, JPI, EJP, ESP, Snowman-reloaded network

Inspiration4EU
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This project received funding from the European Union under HORIZON 2020 under Grant Agreement No. 642372.

LAND AND SOILS - CHALLENGES FOR OUR EUROPEAN TERRITORIES

Didier Vancutsem (Secretary General of the International Society of City and Regional Planners)

LAND AND SOIL – challenges for our European territories

INSPIRATION Final Conference
December 6, 2017

Didier Vancutsem
ISOCARP Secretary General
Assoc. Prof. ULB Faculty Architecture Brussels

Contents

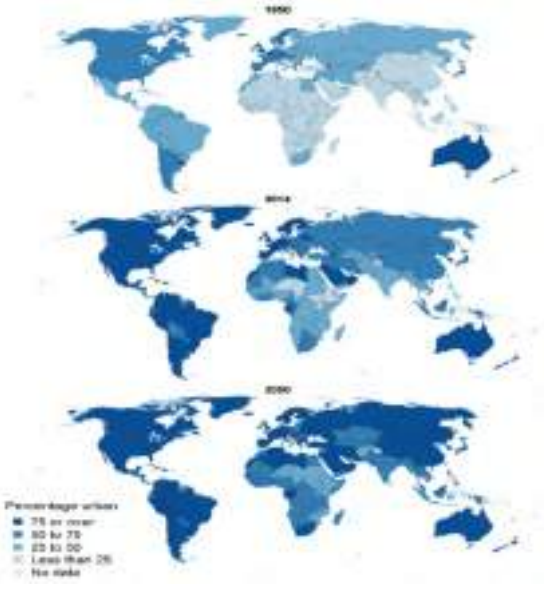
- Global Context
- Conflicts and challenges: the International Framework
- 3 biggest Challenges
- The future of cities – how?
- Research topics

Humanity's challenges

Source: www.anthropocene.info

Humanity's challenges

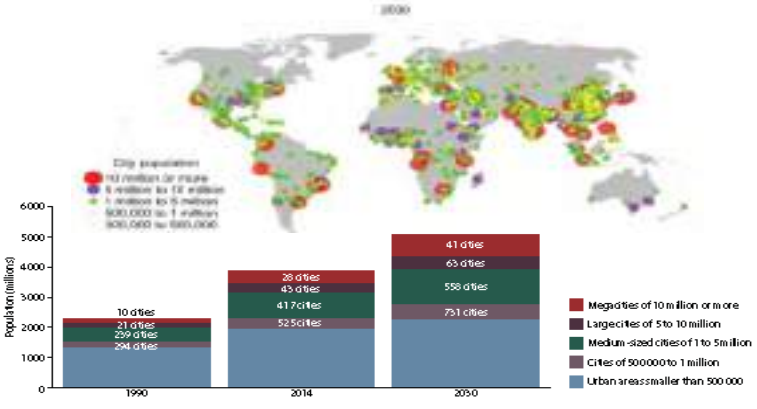
1950: 30% - 2050: 66% urban population



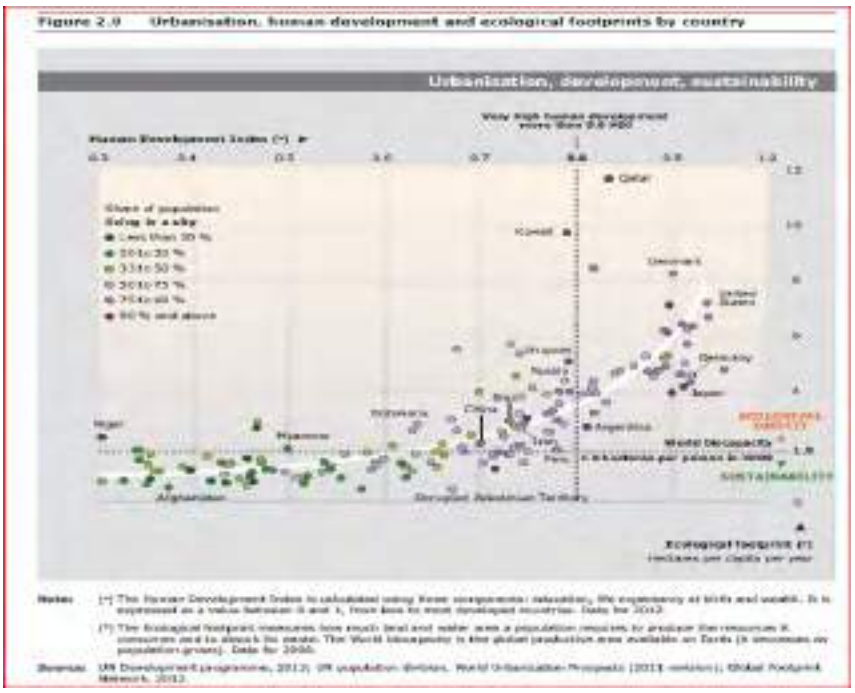
Source: UNDESA 2014 - http://esa.un.org/

Population

- projected to increase to 9.7 billion people in 2050
- 90% increase in Asia and Africa
- most urbanized region North America (82%)
    - Latin America (80%)
    - Europe (73%)
    - Asia (48%)
    - Africa at 40%



Humanity's challenges



Humanity's challenges

Table S.1 Indicator scoreboard by 7th EAP thematic priority objectives

Indicator	EU indicator past trend (a)	Outlook for meeting the selected objective by 2020
Priority objective 1: 'To protect, conserve and enhance the Union's natural capital'		
(!) Exposure of terrestrial ecosystems to eutrophication due to air pollution (*)	▲	●
Gross nutrient balance in agricultural land: nitrogen	▲	●
(!) Land take (*)	▲	●
(!) Forest: growing stock, increment and fellings	▲	●
Status of marine fish stocks	▲	●
Abundance and distribution of selected species (common birds (*) and grassland butterflies)	▲	●
(!) Species of European interest	▲	●
(!) Habitats of European interest	▲	●
(!) Status of surface waters	N.A.	●
Priority objective 2: 'To turn the Union into a resource-efficient, green, and competitive low-carbon economy'		
Resource productivity	▲	●
Waste generation in Europe (excluding major mineral wastes) — absolute and per capita	▲	●
Recycling of municipal waste (*)	▲	●
Use of freshwater resources	▲	●
Total greenhouse gas emission trends and projections	▲	●
Share of renewable energy in gross final energy consumption	▲	●
Progress on energy efficiency in Europe	▲	●
Energy consumption by households	▲	●
Greenhouse gas emissions from transport	▲	●
Animal product consumption (animal protein)	▲	●
Share of environmental and labour taxes in total tax revenues	▲	●
Employment and value added in the environmental goods and services sector	▲	●
Environmental protection expenditure in Europe	▲	●
Priority objective 3: 'To safeguard the Union's citizens from environment-related pressures and risks to health and well-being'		

Source: EEA Environmental Indicator Report 2017

How can we deal with these conflicts and challenges in the future?

What are our engagements towards more sustainable and integrated soil and land use for the next generations?

SDG's

New Urban Agenda

Our shared vision

11. We share a vision of cities for all, referring to the equal use and enjoyment of cities and human settlements, seeking to promote inclusivity and ensure that all inhabitants, of present and future generations, without discrimination of any kind, are able to inhabit and produce just, safe, healthy, accessible, affordable, resilient and sustainable cities and human settlements to foster prosperity and quality of life for all. We note the efforts of some national and local governments to enshrine this vision, referred to as "right to the city", in their legislation, political declarations and charters.

12. We aim to achieve cities and human settlements where all persons are able to enjoy equal rights and opportunities, as well as their fundamental freedoms, guided by the purposes and principles of the Charter of the United Nations, including full respect for international law. In this regard, the New Urban Agenda is grounded in the Universal Declaration of Human Rights[11], international human rights treaties, the Millennium Declaration[12] and the 2005 World Summit Outcome[13]. It is informed by other instruments such as the Declaration on the Right to Development[14].

13. We envisage cities and human settlements that:

(a) Fulfil their social function, including the social and ecological function of land, with a view to progressively achieving the full realization of the right to adequate housing as a component of the right to an adequate standard of living, without discrimination, universal access to safe and affordable drinking water and sanitation, as well as equal access for all to public goods and quality services in areas such as food security and nutrition, health, education, infrastructure, mobility and transportation, energy, air quality and livelihoods;

(b) Are participatory, promote civic engagement, engender a sense of belonging and ownership among all their inhabitants, prioritize safe, inclusive, accessible, green and quality public spaces that are friendly for families, enhance social and intergenerational interactions, cultural expressions and political participation, as appropriate, and foster social cohesion, inclusion and safety in peaceful and pluralistic societies, where the needs of all inhabitants are met, recognizing the specific needs of those in vulnerable situations;

(c) Achieve gender equality and empower all women and girls by ensuring women's full and effective participation and equal rights in all fields and in leadership at all levels of decision-making, by ensuring decent work and equal pay for equal work, or work of equal value, for all women and by preventing and eliminating all forms of discrimination, violence and harassment against women and girls in private and public spaces;

[11] Resolution 217 A (III).
[12] Resolution 55/2.
[13] Resolution 60/1.
[14] Resolution 41/128, annex.

New Urban Agenda

96. We will encourage the implementation of sustainable urban and territorial planning, including city-region and metropolitan plans, to encourage synergies and interactions among urban areas of all sizes and their peri-urban and rural surroundings, including those that are cross-border, and we will support the development of sustainable regional infrastructure projects that stimulate sustainable economic productivity, promoting equitable growth of regions across the urban-rural continuum. In this regard, we will promote urban-rural partnerships and inter-municipal cooperation mechanisms based on functional territories and urban areas as effective instruments for performing municipal and metropolitan administrative tasks, delivering public services and promoting both local and regional development.

97. We will promote planned urban extensions and infill, prioritizing renewal, regeneration and retrofitting of urban areas, as appropriate, including the upgrading of slums and informal settlements, providing high-quality buildings and public spaces, promoting integrated and participatory approaches involving all relevant stakeholders and inhabitants and avoiding spatial and socioeconomic segregation and gentrification, while preserving cultural heritage and preventing and containing urban sprawl.

98. We will promote integrated urban and territorial planning, including planned urban extensions based on the principles of equitable, efficient and sustainable use of land and natural resources, compactness, polycentrism, appropriate density and connectivity, and multiple use of space, as well as mixed social and economic uses in built-up areas, in order to prevent urban sprawl, reduce mobility challenges and needs and service delivery costs per capita and harness density and economies of scale and agglomeration, as appropriate.

99. We will support the implementation of urban planning strategies, as appropriate, that facilitate a social mix through the provision of affordable housing options with access to quality basic services and public spaces for all, enhancing safety and security and favouring social and intergenerational interaction and the appreciation of diversity. We will take steps to include appropriate training and support for service delivery professionals and communities in areas affected by urban violence.

New Urban Agenda

Reflections on the New Urban Agenda

- Centrality of housing, planning, land, public space, local governance, formality and informality, safety and security, gender mainstreaming
- Participation and consultation finds a place but no clear commitments towards institutionalization of multi-stakeholder partnerships
- 70+ references to planning (full section), 35 references to local governments, 10 references to private sector

Looking through the Planning lens

Multiple references to planning throughout the text

Commitments (Para 16):

- "reinvigorating long-term and integrated urban and territorial planning and design"
- **Social inclusion (Para 25-42)**
- Urban prosperity (Para 43-62)
- Sustainability and resilience (Para 63-80)
- **Effective implementation (Para 93-125)**
- Means of implementation (Para 126-160)

EU Urban Agenda

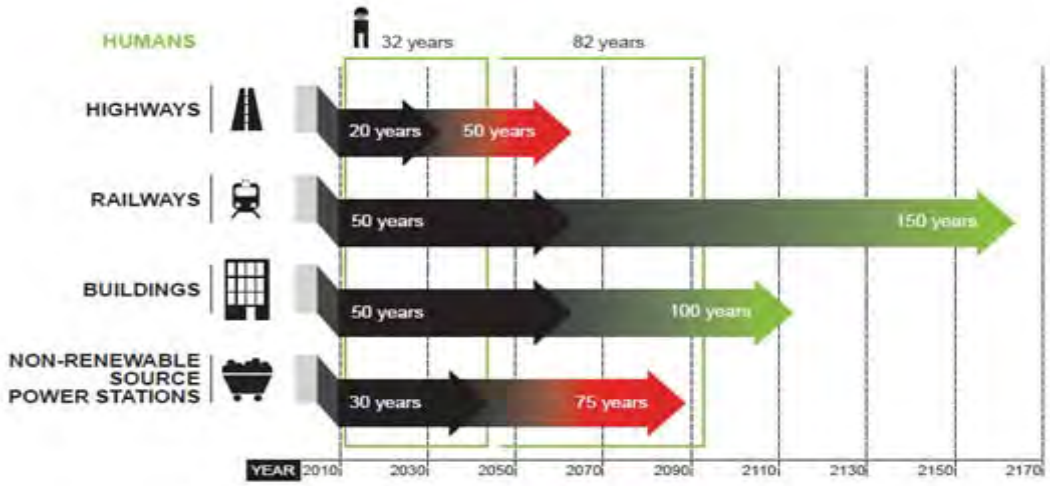
3 Challenges

- **Urban sprawl – together with uncontrolled land consumption**

Urban Sprawl

Urban Sprawl

Urban Lock-In effect – the challenge: Lifespan of people, assets and infrastructure

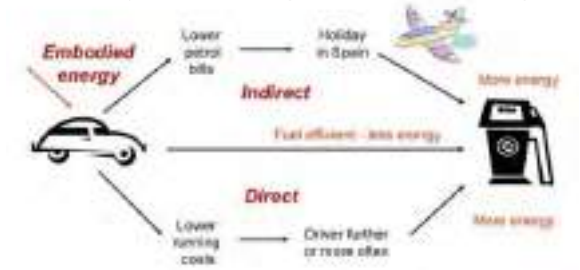


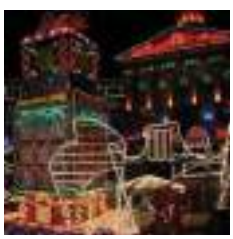
Source: Are we building competitive and liveable cities? Guidelines for developing eco-efficient and socially inclusive infrastructure – UN Habitat (page 19)
http://www.unescap.org/esd/environment/infra/documents/Guidelines.pdf

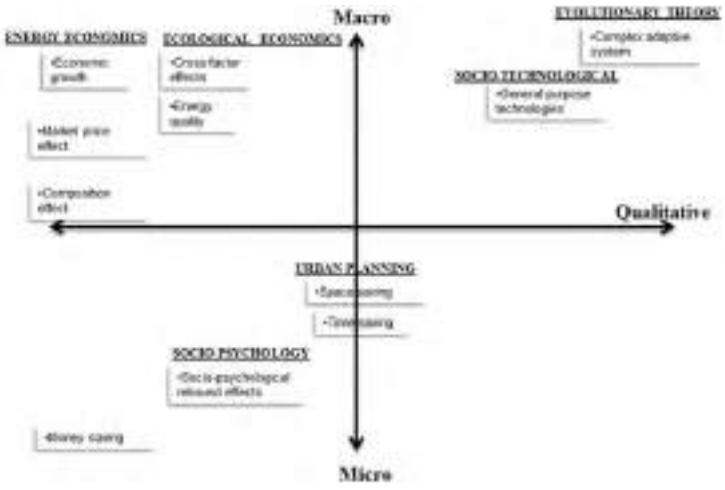
Urban Sprawl

Urban Rebound –

The difference between the original engineering estimate and the real energy savings after implementing new technologies







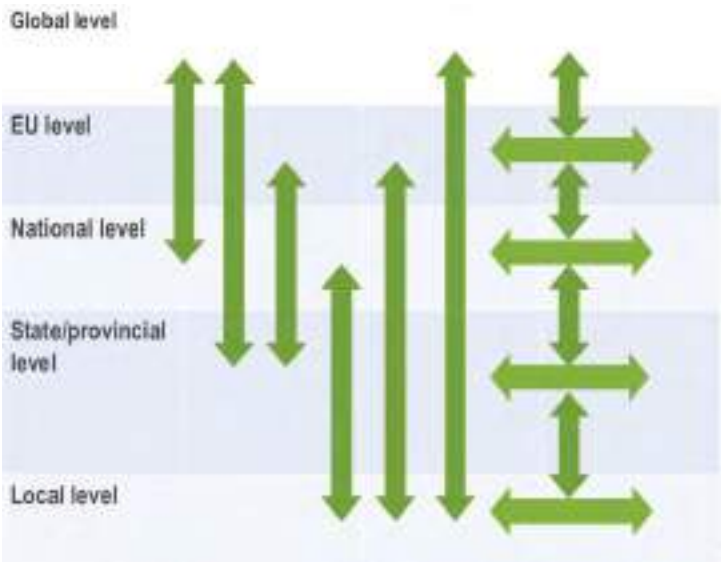
Source: Can rebound effects explain why sustainable mobility has not been achieved? Hans Jakob Walnum, 2014

3 Challenges

- **Urban sprawl – together with uncontrolled land consumption**
- **Competing jurisdictions within the same metropolitan area**

Urban Governance

Good Governance: multi-level / causal loop



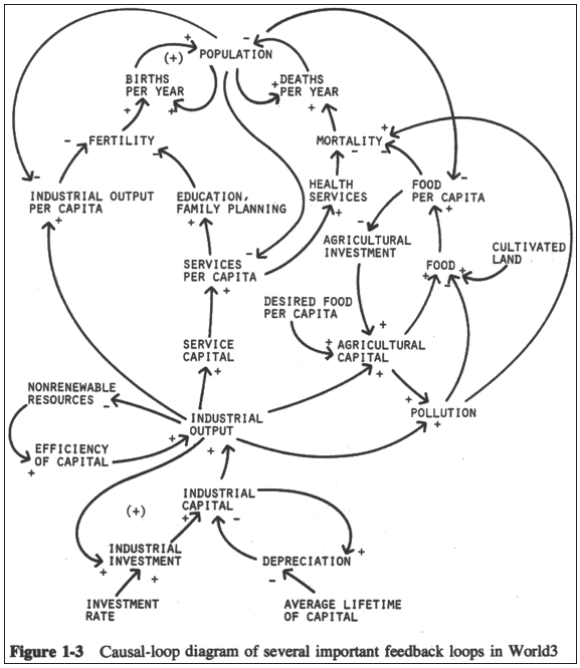
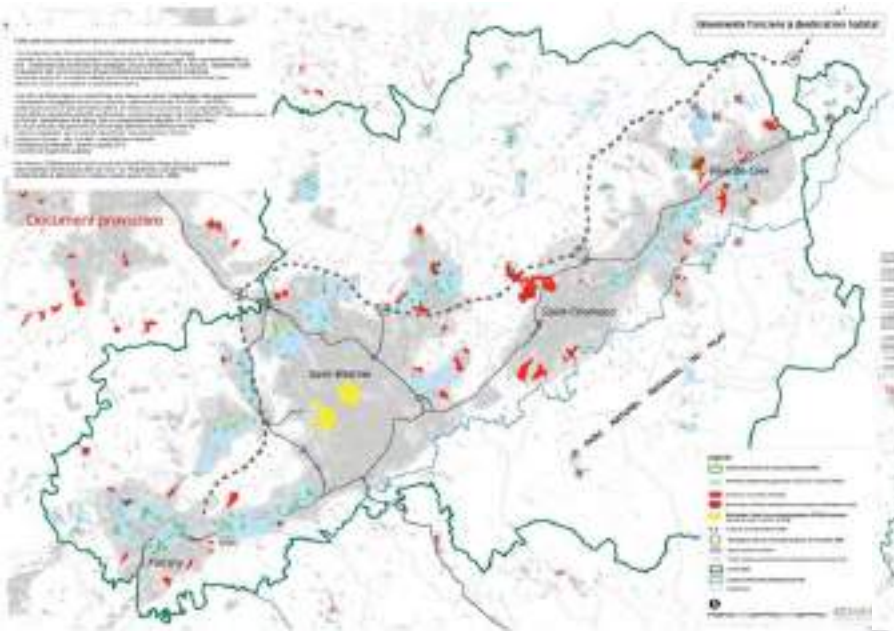


Figure 1-3 Causal-loop diagram of several important feedback loops in World3

Source: Limits to Growth

Urban Governance

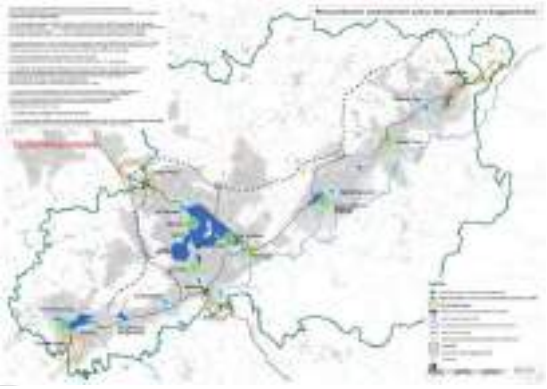
Land use Management: LUMASEC project URBACT (Saint-Etienne)



Development of a Land Use Strategy as a Governance tool

Operational Tool to limit urban sprawl and promote urban renewal, preserve natural spaces and promote social housing
Strategic tool to establish a governance capacity without new institution

Actions to promote a smart green and incentive city:
Public Land Banks in peripheries (organizing urban development, prevent uncontrolled development) and existing urban areas (urban renewal, public investment with incentive role)
Identify strategic places for social housing development, transport, etc
Development of mixed-uses programs, organization of land exchanges with investors, etc.



3 Challenges

- **Urban sprawl – together with uncontrolled land consumption**
- **Competing jurisdictions within the same metropolitan area**
- **Rising awareness on land and soil role in the future of our humanity and cities - combined with education and capacity-building**

Awareness rising – capacity-building

Education at all levels: think tanks, workshops, training, YPPs, School Tool Kit

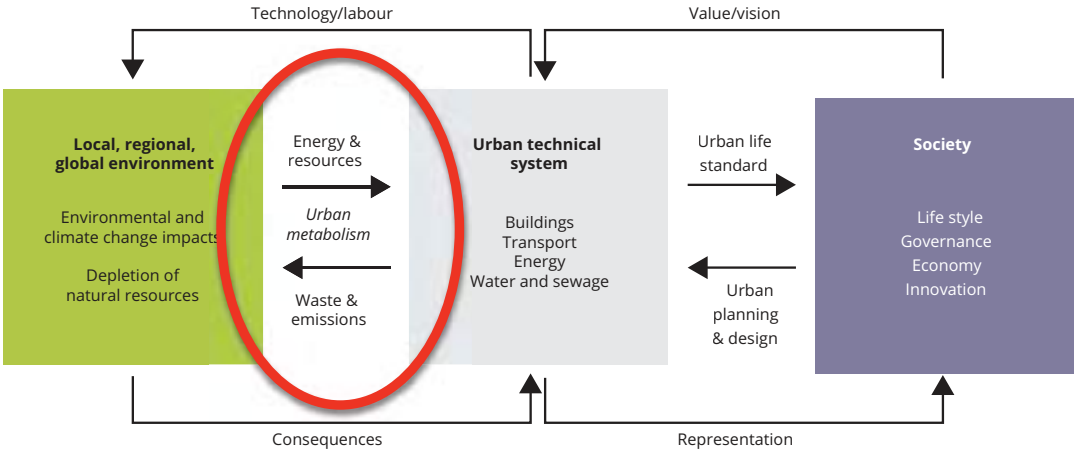
Learning Kit Karlsruhe

How should the cities of the future be thought of?

And what will be the future of land and soil?

Urban System

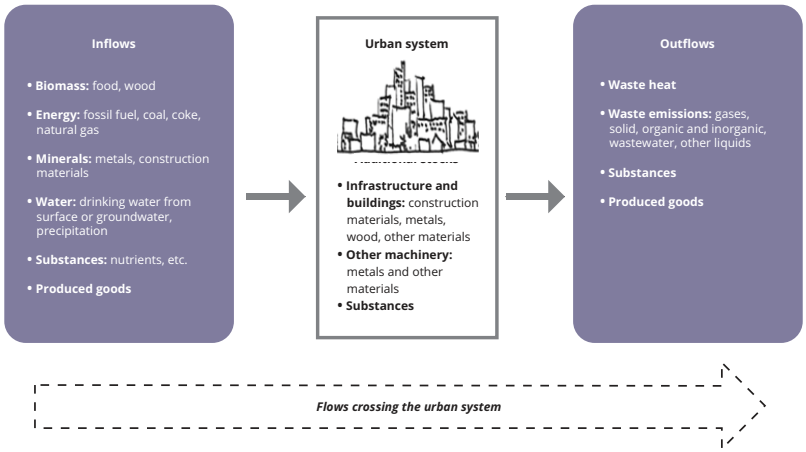
- Our urban system: getting increasingly complex
- Past years: research and practices on understanding system
- Assure long-term viability of our system: social, economic, quality of life, urban conditions
- Implement SDGs
- Implement NUA
- Urban Innovation



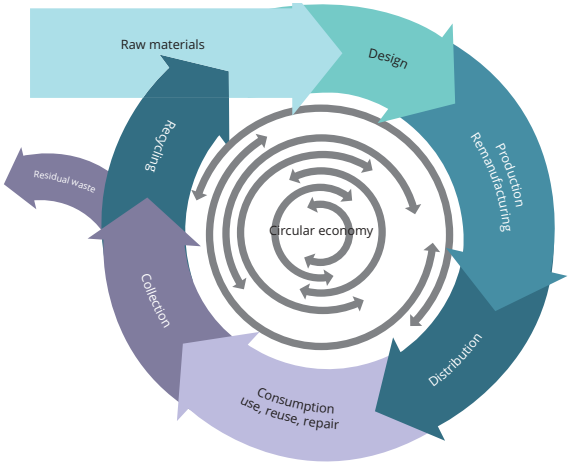
Source: EEA 2016

Urban System

Urban Metabolism – from linear to circular



Source: Adapted from Kennedy and Hoornweg, 2012 — modified by the EEA.



Source: Adapted from EC, 2014c.

Food for Thoughts

Soil and land research needed - related to urban and territorial planning:

- Food security
- Nature-based solutions and green infrastructure
- Water – Groundwater protection
- Awareness rising and participation
- Education and capacity building
- Interdisciplinary cooperation
- Cooperation on level of Territorial Impact Assessment and EIA
- Urban ecosystem services
- Climate change adaptation and CO2 soil storage
- Agro-food value chain
- Urban-rural linkages
- Land Value and Land Pricing

Towards the productive city 4.0

PRECISION IN SOIL GOVERNANCE

Bartosz Bartkowski (UFZ – Helmholtz Centre for Environmental Research)

Why Motivation and problem statement

There seems to exist a significant mismatch between the heterogeneity and multifunctionality of soils and the heterogeneity of farmers on the one hand, and a lack of context- and site-specificity of existing governance instruments relevant to agricultural soils.

What Approach, results and key messages

The aim of the workshop was mainly exploratory: to discuss some general ideas regarding the above stated mismatch. The discussions crystallised in the following key points:

- Property rights of land/soils are central for any kind of soil governance;
- The level of governance is the main source of the spatial mismatch/lack of site specificity;
- Spatially explicit valuation of soil ecosystem services can inform Payment of Ecosystem Services and similar compensation mechanisms;
- Current consumption patterns are a problem (meat consumption, non-regional food…), so consumers should be included in the analysis of soil governance;
- CAP seems the most important policy instrument in agricultural soil context, but it is deficient and involves issues of political power (imbalances).

Regarding specific policy instruments/governance solutions, zoning (depending on some soil properties) and a reform of the CAP were discussed; also, the importance of farmers' education and positive incentives was stressed.

Key Conclusion and take home message

The mismatch between heterogeneity/multifunctionality of soils and existing governance instruments is not only linked to knowledge gaps, technological challenges and the general lack of attention to soils in agricultural policy. While these issues are important, political power and consumption patterns also play a significant role.

Precision in Governance of Agricultural Soils

Workshop @INSPIRATION Conference,
6 December 2017, Brussels

Bartosz Bartkowski, UFZ – Helmholtz Centre for Environmental Research, Leipzig

Outline and goals of workshop

1. Some context: setting the stage
2. What does precision in soil governance mean to you? / Introduction round
3. Precision in soil governance: some thoughts and ideas
4. Open questions → Discussion

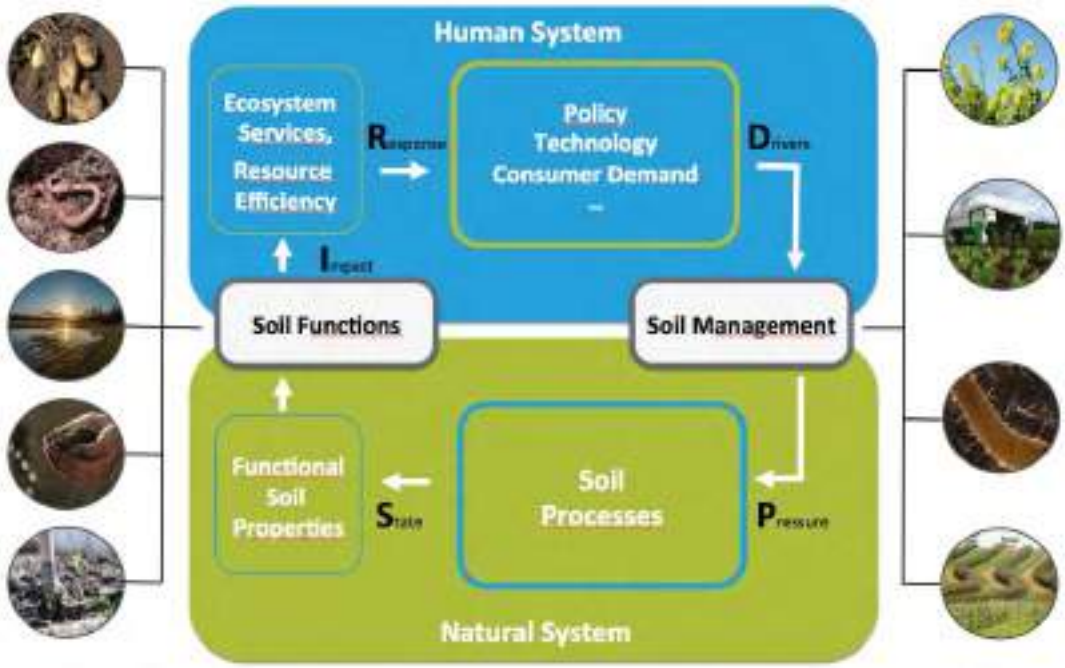
Goal of workshop: discuss some ideas regarding precision of soil governance

→ development of criteria for design of site-specific policy instruments & identification of frictions in current institutional setting

Setting the stage

- BonaRes – Soil as a Sustainable Resource for the Bioeconomy:
  - Research programme with BonaRes Centre + 10 further projects
  - Focus on the sustainable management of agricultural soils
- Governance research in BonaRes Centre:
  - Focus on policy instruments
  - Deficit analysis of existing and development of new instruments and governance approaches
  - Currently: site-specific policy instruments

Governance within the BonaRes research framework



BONARES
Centre for Soil Research

Precision in agricultural soil governance – some thoughts and ideas

BONARES

What does “precision in soil governance” mean?

- Precision or site-specificity
- 2 components: spatial heterogeneity of soils & heterogeneity of farmers
- Heterogeneity of farmers:
  - Property rights
  - Culture
  - Symbolic capital
  - Attitudes
  - Habits
  - …

What does “precision in soil governance” mean?

- Spatial heterogeneity of soils:
  - Heterogeneity vs multifunctionality
  - 2 issues: efficient/precise management of a given field and its soil + spatial configuration of uses
- Technological advances theoretically allowing for higher precision → induce precision farming in line with societal goals/multifunctionality of soils
- Problem: current governance regimes not focusing on soils + too general

Open questions

- Does the definition make sense?
- Is the hypothesised problem relevant? → How to measure lack of precision/site-specificity?
- What are frictions/barriers/obstacles? (Technology? Economic pressures? Data availability? Acceptance? Existing policy instruments?)

Breaking new ground for sustainable management of soil functions along the frontiers of soil ecosystem research

Federal Ministry of Education and Research

S.O.S - SAVE OUR SEDIMENTS

Jos Brils (deltares)

What Approach, results and key messages

Globally river-sea-systems are short of sediment mostly due to damming. This causes dramatic impacts such as drowning deltas. Scientists and stakeholders should find solutions. The session aims to gain support and ingredients for drafting of a call text to promote as topic under EC FP9.

‘S.O.S – Save Our Sediments’

SedNet session
at the final conference of INSPIRATION
6 December 2017, Brussels

Session chair and report:
Jos Brils
Deltares & INSPIRATION core group & SedNet Steer Group
email: jos.brils@deltares.nl

1. Introduction

The European Commission’s co-funded Horizon 2020 Coordination and Support Action INSPIRATION[1] had its final conference in Brussels at 4-6 December 2017[2]. At this event, INSPIRATION’s main product, i.e. the European strategic research agenda (SRA) for “Integrated Spatial Planning, Land Use and Soil Management” was made public. The SRA was developed through a bottom-up process that engaged more than 500 experts (science, management, policy making, industry, NGOs) from 20 European countries. The SRA is accessible on-line[3]. Although the key-focus is on soil and land-use/management, the SRA also covers some sediment management related research needs.

2. The session

SedNet contributed to the final conference with the session “S.O.S – Save Our Sediments” that was announced in the following way in the conference program:

Globally river-sea-systems are short of sediment mostly due to damming. This causes dramatic impacts such as drowning deltas. Scientists and stakeholders should team-up urgently in research and innovation to inform solutions for sediment quantity management. The session aimed to gain support and ingredients for drafting of a call text to promote as topic under EC FP9.

The session was held at 6 December from 10.00 – 12.00 hour. There were 12 participants with a variety of backgrounds: science, policy making as well as NGO. The session kicked-off with the introduction presentation ‘S.O.S – Save Our sediments’ given by Jos Brils. An INSPIRATION briefing note with the same title is now available and attached as Annex to this document and is also available on-line[4].

Ample of room was given during the presentation for questions and discussion. At the end of the presentation it was questioned to the group who was in favour to see the ‘S.O.S.’ topic included as a call under EC FP9. Eleven out of twelve participants were in favour and one participant abstained from voting due to a lack of expertise to be able to answer the question. The session concluded with a working session where the participants were invited to suggest components to be included in such a possible FP9 call topic. The outcome is presented in the next section.

[1] See: www.inspiration-h2020.eu
[2] See: http://www.worldsoilday2017.eu/
[3] See: www.inspiration-agenda.eu
[4] See: http://www.inspiration-h2020.eu/sites/default/files/upload/documents/inspiration-briefingnote-sos.pdf

3. Suggested components for an EC FP9 'S.O.S.' call text

Scope of the possible S.O.S project:

- Holistic, entire river-sea system oriented with also a focus on social and economic aspects
- Development and use of a holistic sediment management concept (see Elbe for example)
- Very practical, applied research and sharing of experiences and best practices
- Pilots to test, demonstrate, inspire/learn:
    - Integrated management, integrating: remediation, flood risk mitigation, enabling recreation possibilities, cost-benefit analysis, job creation and practical use and application, capitalization of solutions
    - The role of sediment management in climate change mitigation
    - Nature based solutions
    - Reuse possibilities
- As input for learning experiences, a comparison across countries or territories is suggested of sediment & dredged material management strategies, assessment criteria and (re)-use options
- Sediment ecosystem services
- Respecting natural processes and functions, but keeping in mind 'trade-offs', e.g. navigation versus road-transport or hydropower versus nuclear plants
- Overcoming the Waste Directive bottleneck that regards even non-contaminated dredged material as a waste (it is NOT, see below under Impact) which hinders re-use, e.g. on land
- Stakeholder engagement work: engage them in the early steps of the project and as end-users to become owner of the developed management solutions. However, realize that power between them is different and that they may have conflicting interests. Who 'benefits' and who faces 'costs' of a proposed solution and how to balance this and come to actionable solutions? Maybe application of the DELPHI method[5] could help here
- Engage networks such as European Land and Soil Alliance, Climate Alliance, NGO's etc. as supporters (ask for their letter of support) and observers of the progress in the project
- Awareness raising: EU and national and regional governments should fund NGOs that work with local authorities, especially with majors of cities and villages to make them aware about soil and sediment management

Content of the possible S.O.S project:

- Data: this is the basis. So collecting of field data should be part of the call
- Sediment quantity / sediment continuum:
    - Get the bad spots out to restore continuum
    - Benchmarked tools that can be used across the system to describe the sediment situation and suggest suitable action that would help with any 'negative' impacts identified
    - Suitable models for sediment evolution after dredging
- Sediment quality / contaminated sediment:
    - Integrated, *in situ* and *ex-situ* risk assessment, integrating: human, ecological/biological and chemical/physical parameters
    - Tackle hot-spots of contaminated sediment
    - Reuse possibilities
    - Good quality of sediments as it is also secures, enables sustainable (re)use
- Soil-Sediment-Water (SSW) nexus related:

[5] See e.g.: https://en.wikipedia.org/wiki/Delphi_method

    - Impact of contaminated sediment on meeting WFD objectives: good (ground)water status. This is a key-driver for action as we know that water quality is always regarded as very important
    - (Re-)use of sediment as fertilizer on the near agricultural lands (deposited after flooding, or re-use after dredging)
    - Soil sealing
    - Urban sprawl
    - Role that sediment plays in land-use management, e.g. as mitigation to the soils that we lose (e.g. do to soil erosion) or soil subsidence

Impact of the possible S.O.S project (i.e. key-deliverables):

- Identified best practices and cost-effective solutions
- Demonstrated examples of restored sediment continua
- An entire river-sea system oriented (systems thinking), Soil-Sediment-Water management integrated and holistic (environmental, social and economic aspects) management approach
- Enhanced sediment ecosystem services provision
- Contribution to job creation: green economy, green jobs
- Delivery of climate change mitigation options
- Raised awareness and nudging towards changed
    - Mind-sets: sediment is NO waste but a natural resource having economic, social and environmental value
    - Behaviour: e.g. re-use of dredged material which is also an environmental sound solution.

4. What next

The session resulted in the above additional suggestions for sediment related topics for INSPIRATION's SRA. These suggestions are also passed to, and further elaborated in the SedNet working group (WG) on "Sediment Quantity Management of entire River-Sea Systems". This WG was initiated at the last SedNet conference, 14-17 June 2017 in Genoa. The initial WG objectives (open for further adaptation) are in brief:

- To increase the general awareness for sediment quantity management;
- To promote the sharing of experiences and best management practice in this field;
- To develop a related strategic research and innovation agenda (SRIA), not only focusing on research, but also on sound solutions (measures), their effectiveness and feasibility;
- To promote the developed SRIA to potential funders.

WG membership is free of charge and open to any professional willing to engage and (pro-) actively contribute to achieving the WG objectives. Today's members of the WG come from Europe and beyond and bring in the perspectives from a.o. science, policy making, management, navigation, NGO as well as industry. The next WG workshop is held 7 and 8 March 2018 at the Deltares main office in Delft. In this workshop we aim to refine the WG starting document as well as to jointly produce the first drafts for some other possible WG products, such as a flyer/brochure for the WG, a (scientific) review paper and the first version of the SRIA.

If you are interested to engage in this WG, then please contact: Jos Brils: jos.brils@deltares.nl.

5. Annex – INSPIRATION briefing note 'S.O.S. – Save Our Sediments'

S.O.S. – SAVE OUR SEDIMENTS

Sediment shortage in river-sea-systems causes dramatic impacts, such as drowning deltas, worldwide. EU research can inform solutions.

Why we need to act

Human interferences, such as damming, have disturbed the sediment continuum in river-sea systems, worldwide. These interferences result either in a surplus or a lack of sediment. A surplus causes the siltation of reservoirs with negative effects on hydropower production and water storage; causes siltation of waterways with negative effects on navigation; and causes hyper-turbidity in estuaries resulting in the decline of ecosystem health. A lack of sediment causes coastal erosion and retreating or drowning deltas; causes erosion of river beds and degradation of channel morphology with impacts on river habitat and floodplain groundwater; and causes a lack of suited spawning material.

What we will gain

If scientists and stakeholders are given the opportunity, e.g. under EU Framework Programme 9, to team-up in research and innovation (R&I), this R&I can inform solutions that we urgently need to mitigate the societal, economic as well as ecological impacts resulting from either a surplus or from a lack of sediments in river-sea systems.

Key research areas

Sustainable and resilient solutions to disturbed sediment continua should be sought at the entire river-sea system scale. Presently, there are on-going R&I activities which only partially target "end-of-pipe" management solutions. Up to now, hardly any concerted R&I action is taken on the entire river-sea systems scale. R&I is needed which:

- Adresses entire river-sea systems, so crossing geographical as well as political borders;
- Carefully balances social, economic and environmental values;
- Involves stakeholders;
- Embraces the entire soil-sediment-water system (integrated solutions);
- Respects natural processes and functions;
- Not results in unwanted impacts elsewhere in the river-sea system (up- or downstream), not now, nor in the future;
- Recommends early solutions to decision makers where they can be implemented.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu to identify joint funding options. For further information, in favour to see this topic in FP9 and/or want to suggest ingredients for the topic, then please contact Jos Brils (jos.brils@deltares.nl).

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

LANDMARK SESSION: SOIL MANAGEMENT, MONITORING AND UNDERSTANDING THE SUPPLY AND DEMAND OF SOIL FUNCTIONS AT A EUROPEAN SCALE

Rachel Creamer (WUR)

What Approach, results and key messages

LANDMARK invited stakeholders to discuss with project partners the state-of-the art knowledge and EU research needs in the contest of the **LANDMARK** past 30 months activities.

Session outline:

Chair: Prof Rachel Creamer (**Wageningen University & Research**)

- Introducing LANDMARK H2020 by the project coordinator Prof Rachel Creamer (**Wageningen University & Research**)
- Stakeholder engagement: harvesting existing knowledge on soil quality and soil functions (**WP1**) by Dr **Francesca Bampa** (**Wageningen University & Research**)
- Monitoring soil quality and functions (**Pillar2**) by Dr **Jeroen van Leeuwen** (**Wageningen University & Research**)
- EU policy tools for optimizing soil functions and Functional Land Management (**Pillar3** & **WP4**) by Dr **Jan Staes** (**Antwerp University**)
- LANDMARK Strategic Research Agenda (**WP1**) by Prof Rachel Creamer (**Wageningen University & Research**)
- Discussion and conclusions

More Further reading

Web: http://landmark2020.eu/

Twitter: https://twitter.com/landmark2020

Facebook: https://www.facebook.com/LandmarkH2020/

LinkedIn: https://ie.linkedin.com/in/landmark2020

Vimeo: https://vimeo.com/landmark2020

Email: info.landmark@wur.nl

SOIL MANAGEMENT, MONITORING AND UNDERSTANDING THE SUPPLY AND DEMAND OF SOIL FUNCTIONS AT A EUROPEAN SCALE

06th December 2017

WORLD SOIL DAY 2017 – Land, Soils and Science,

IBGE, BRUXELLES

LANDMARK

LAND MANAGEMENT: ASSESSMENT, RESEARCH, KNOWLEDGE BASE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 635201.

AGENDA

LANDMARK session chaired by Prof Rachel Creamer (WUR)

10.00 -10.20	**INTRODUCTION** *by LANDMARK coordinator Prof Rachel Creamer (WUR)*
10.20 – 10.40	**Stakeholder engagement: Harvesting existing knowledge on soil quality and soil functions** *by Dr Francesca Bampa (WUR)*
10.40 – 11.00	**Designing, testing and evaluating a monitoring schema for soil function**s *by Pillar2 postdoc Dr Jeroen van Leeuwen (WUR)*
11.00 – 11.20	**Functional Land Management at European level: demands on soil functions and scenario analyses** *by Pillar3 Dirk Vrebos & Jan Staes (University of Antwerp)*
11.20 – 12.00	**DISCUSSION**

Regional

European

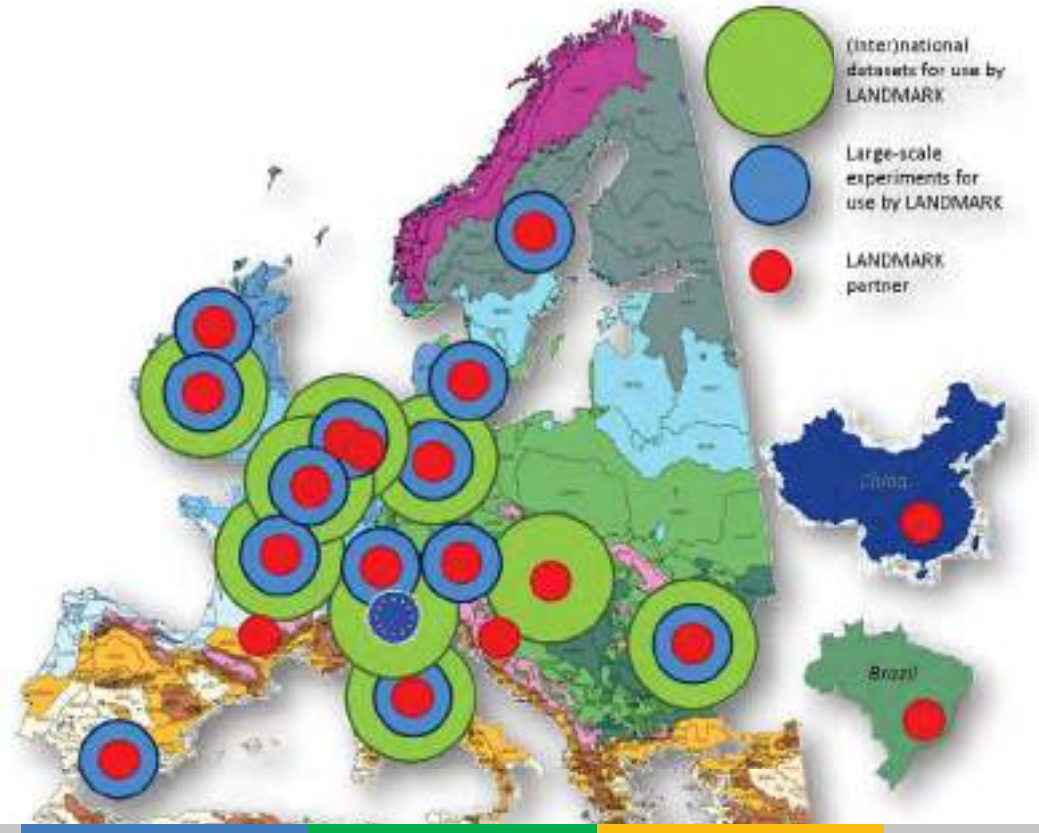
TOUR DE TABLE

WAGENINGEN UNIVERSITY & RESEARCH

INTRODUCTION LANDMARK

PROJECT COORDINATOR: PROF. RACHEL CREAMER

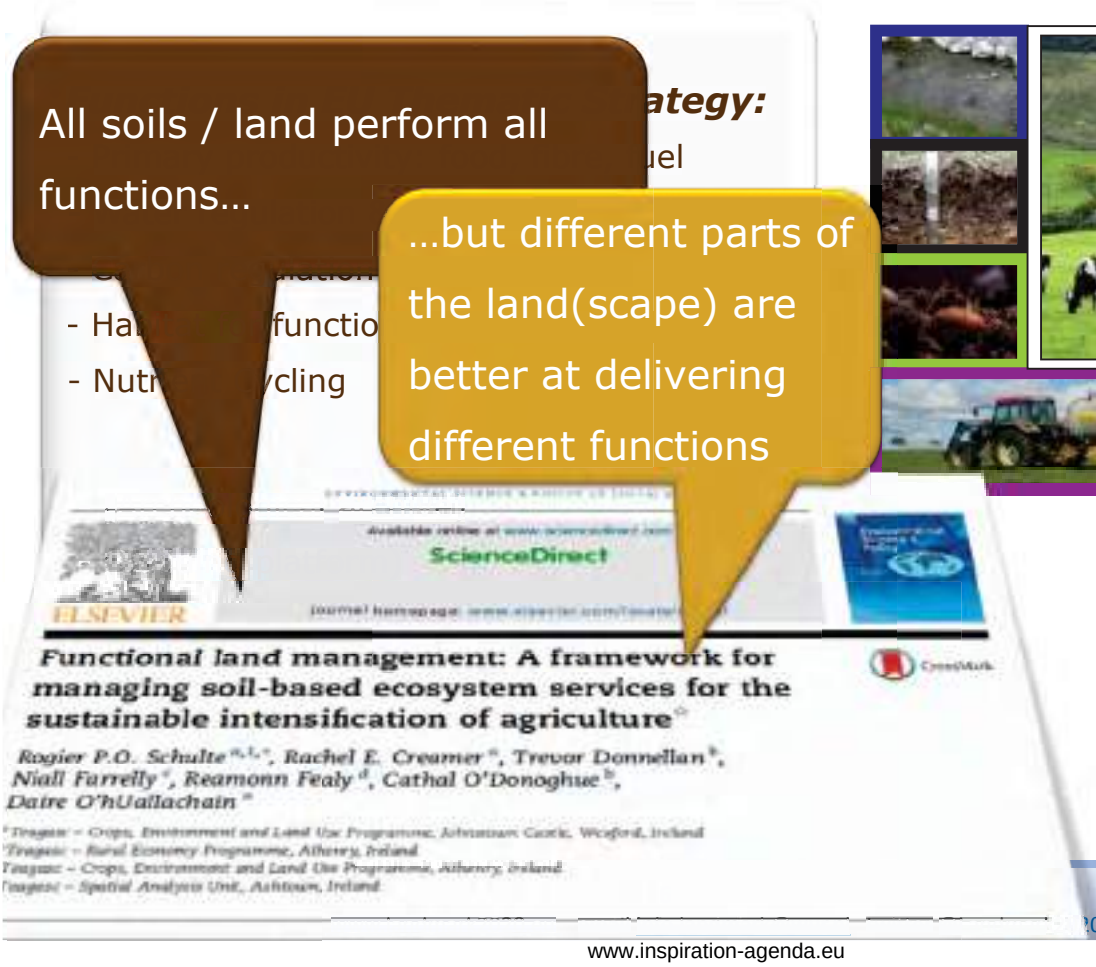
LANDMARK CONSORTIUM (635201)



WHAT CAN OUR LAND SUPPLY?

All soils / land perform all functions…

…but different parts of the land(scape) are better at delivering different functions



MAIN PILLAR (WP5) OUTCOMES

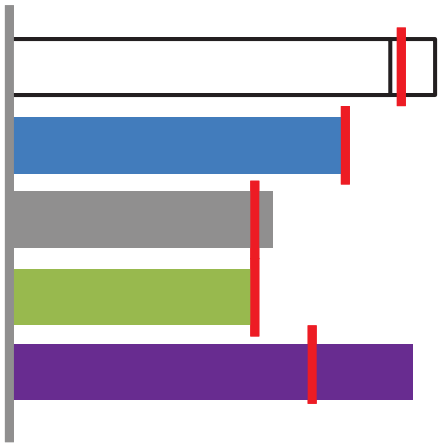
Pillar 1: Farm scale: Develop an agricultural Decision Support Tool (DST) for soil management

Pillar 2: Country scale: Design a monitoring scheme for Soil Functions that is applicable at regional scale, for a range of soil types, land uses and pedo-climatic zones;

Pillar 3: EU scale: Develop a policy framework for 'Functional Land Management' at European scale that aims to optimise the sustainable use of Europe's soil resource

PILLAR 1: FARM SCALE

THE SOIL NAVIGATOR: INTERFACE



Recommendations:

- ☑ Buffer strips
- ☑ Nutrient management plan
- ☑ Minimum tillage
- ☑ Lime application

More info: http://landmark2020.eu/pillars/soil-navigator-pillar1/

PILLAR 2: REGIONAL SCALE- MONITORING

More info
http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

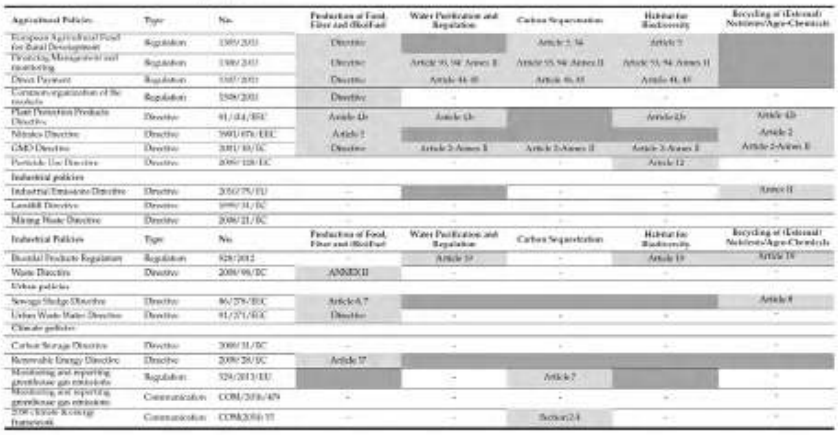
PILLAR 3: EU POLICY OPTIONS

More info:
http://landmark2020.eu/pillars/eu-policy-tools-optimising-soil-functions-pillar3/


sustainability

Article

The Impact of Policy Instruments on Soil Multifunctionality in the European Union



35 different overarching-legislative-financial/research policy areas recognised as important for their potential impact on soil functions in agricultural areas:

- 22 Directives and 8 Regulations
- 4 Communications and 1 Decision

http://landmark2020.eu/publication-tree/publication-tree-n-4-the-impact-of-policy-instruments-on-soil-multifunctionality-in-the-european-union/

WAGENINGEN
UNIVERSITY & RESEARCH
FRANCESCA BAMPA

STAKEHOLDER ENGAGEMENT: HARVESTING EXISTING KNOWLEDGE, REQUIREMENTS AND PRIORITIZATION OF SOIL QUALITY AND SOIL FUNCTIONS

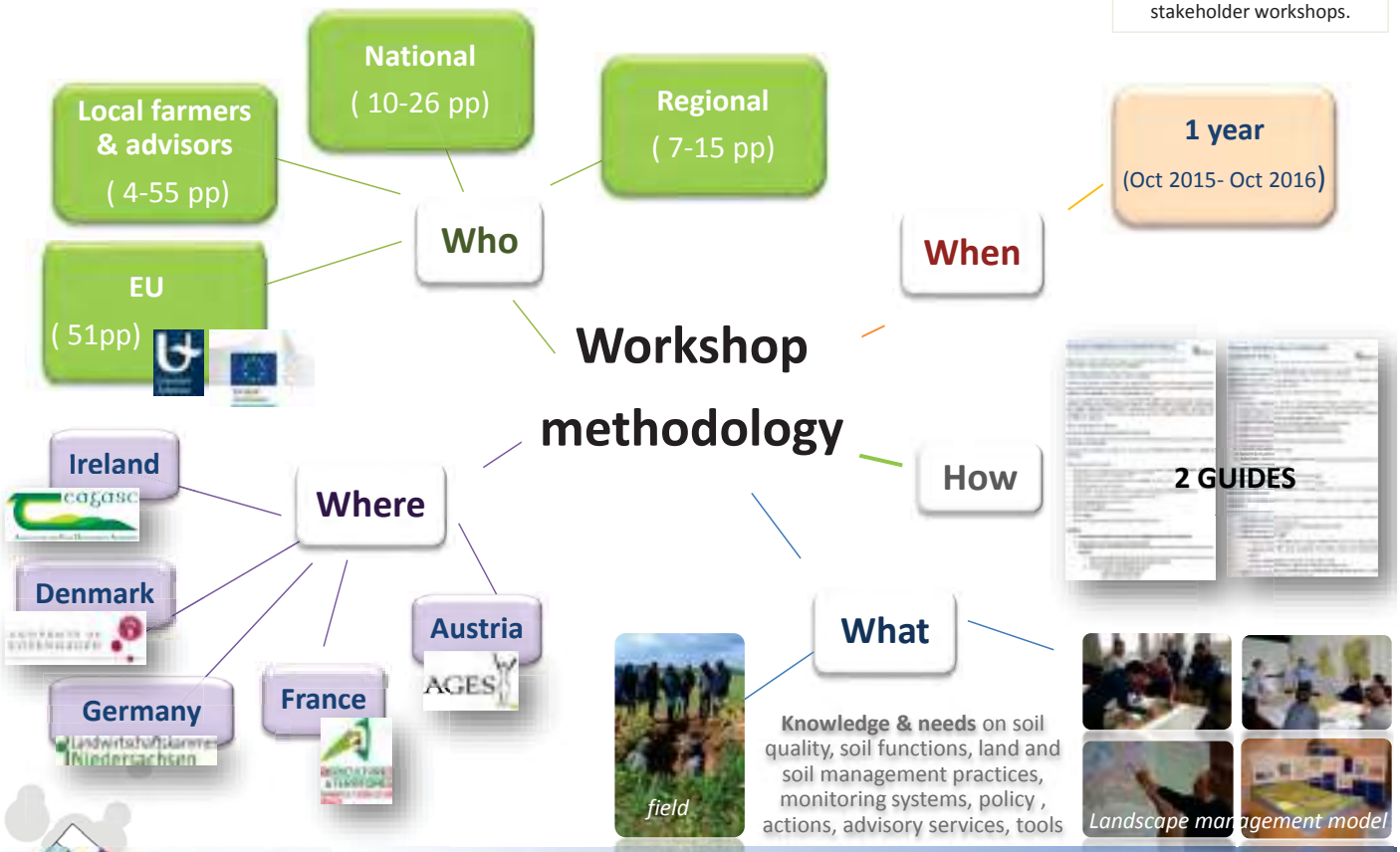
WHICH IS THE KNOWLEDGE OF #SOIL ACROSS DIFFERENT STAKEHOLDERS?

- # SOIL
  - # SOIL QUALITY and FUNCTIONS
    - # Land and soil management practices
      - # Actions, policies, tools, ideas, needs, requirements & concerns

STAKEHOLDER CONSULTATION

STAKEHOLDER CONSULTATION

CHALLENGE no existing method available, so we had to develop our own methodology for the stakeholder workshops.



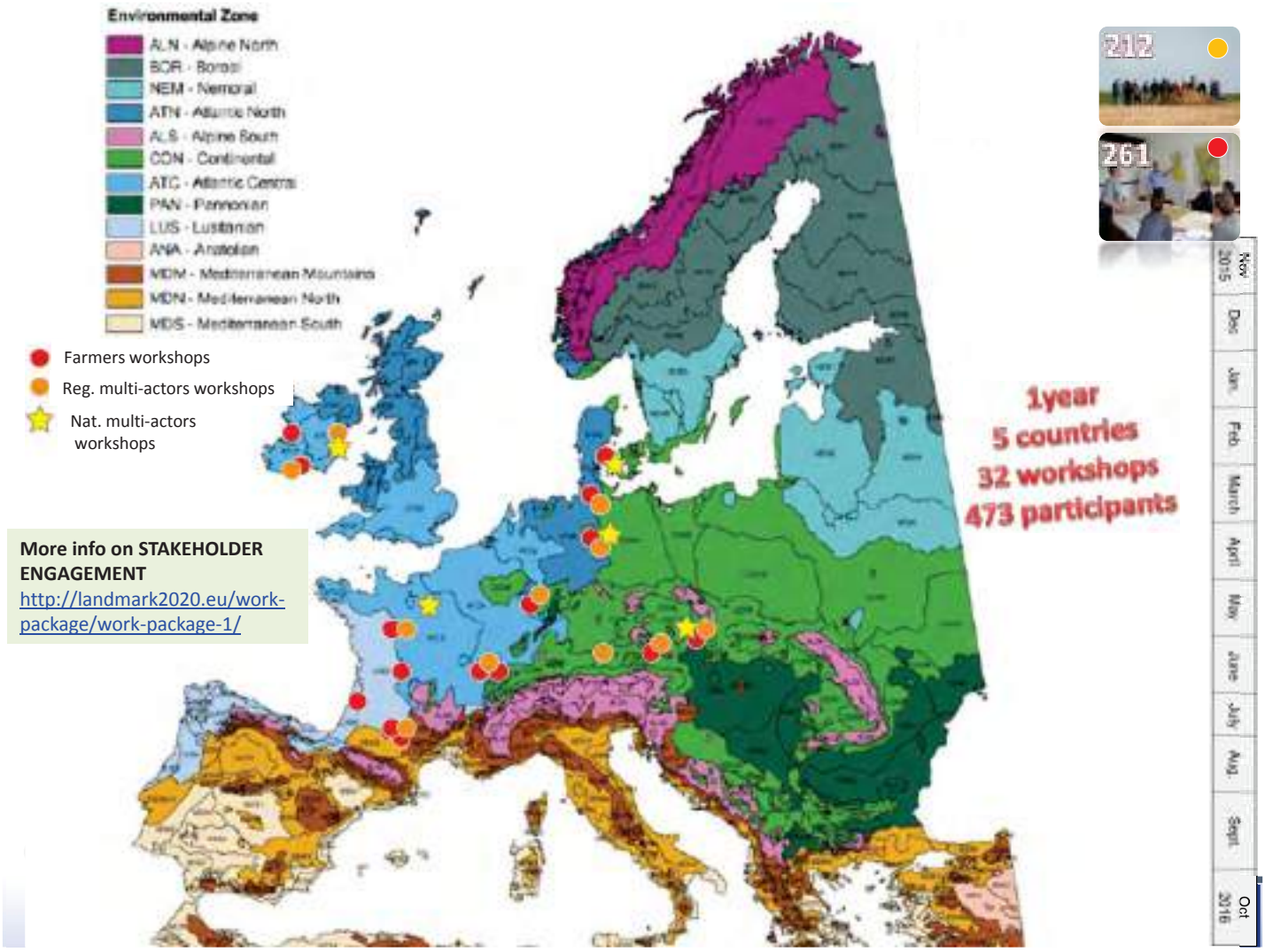
.. BUT BEFORE WE LEARNT FROM YOU

INSPIRATION attended:

- ✓ Farmers Maves, France
- ✓ Regional Multistakeholders AGES, Austria
- ✓ National multistakeholders workshop APCA Paris
- ✓ EU multistakeholder workshop, Bruxelles, Belgium

21st April 2016 – Chambre d' Agriculture Region Centre, Orleans, France

Introduction | Knowledge | Regional | European | Discussion



More info on STAKEHOLDER ENGAGEMENT
http://landmark2020.eu/work-package/work-package-1/

WAGENINGEN
UNIVERSITY & RESEARCH

JEROEN VAN LEEUWEN

DESIGNING, TESTING AND EVALUATING A MONITORING SCHEMA FOR SOIL FUNCTIONS

MONITORING SOIL FUNCTIONS

- Evaluation:
  - Why is monitoring important?
  - What is needed?
  - What is currently monitored?

- Looking forward:
  - Designing and testing a monitoring schema

IOP Publishing Environ. Res. Lett. 12 (2017) 124007 https://doi.org/10.1088/1748-9326/aa8dc5

Environmental Research Letters

LETTER

OPEN ACCESS

Gap assessment in current soil monitoring networks across Europe for measuring soil functions

J P van Leeuwen[1], N P A Saby[2], A Jones[3], G Louwagie[4], E Micheli[5], M Rutgers[6], R P O Schulte[7], H Spiegel[8], G Toth[9] and R E Creamer[10,11]

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8 Department for Soil Health and Plant Nutrition, Austrian Agency for Health and Food Safety-AGES, Spargelfeldstraße 191, A-1220 Wien, Austria
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11 Author to whom any correspondence should be addressed.

E-mail: rachel.creamer@wur.nl

Keywords: soil functions, soil monitoring networks, soil attributes, Europe

Supplementary material for this article is available online

More info http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

WHY MONITORING?

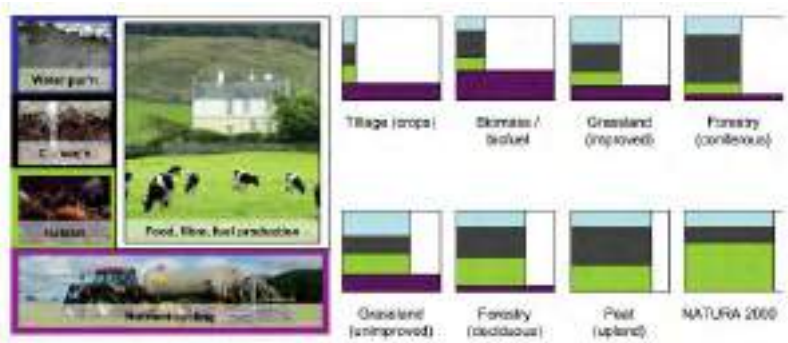


Fig. 1 – Freestyle illustration of typical suites of soil functions under contrasting land use types.

To understand the potential of our soils to deliver soil functions and enable the formation of evidence-based policies to incentivize sustainable soil management, changes in provisioning of soil functions need to be monitored

Schulte et al 2014 ESP 38:45-58

WHAT TO MEASURE?

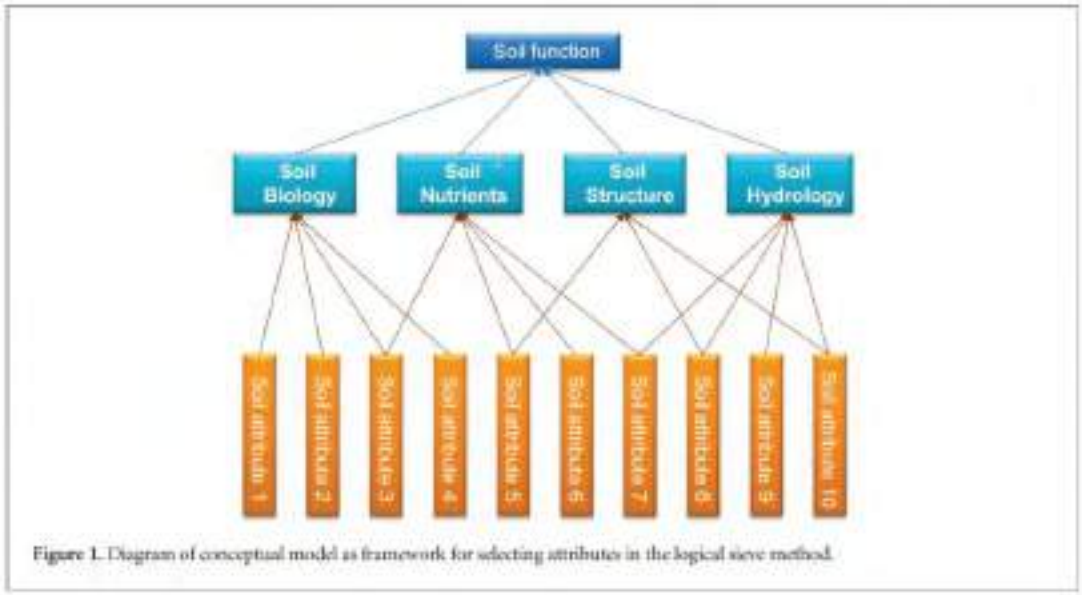


Figure 1. Diagram of conceptual model as framework for selecting attributes in the logical sieve method.

Van Leeuwen, *et al.* (2017), **Gap assessment in current soil monitoring networks across Europe for measuring soil functions**. Environmental Research Letters, 1748-9326.

More info http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

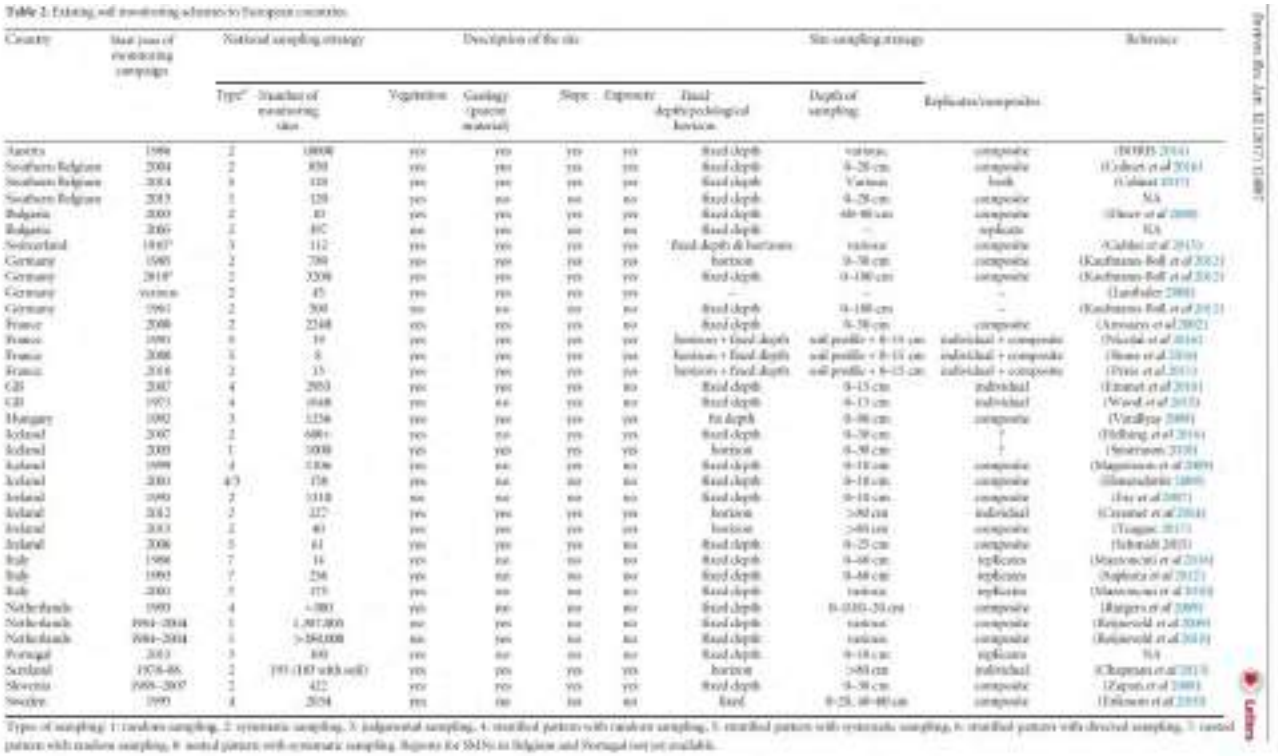
WHAT TO MEASURE?

Table 1. Top 30 of soil attributes resulting from the logical sieve. Presented are the scores from the logical sieve per soil function, and the final scores on which the attributes were ranked. In bold the three highest scores per soil function.

Attribute/SF	Primary productivity	Water regulation	C sequestration	Biodiversity	Nutrient cycling	Final score
Organic C/N/P/K	**2.89**	**3.47**	**2.88**	3.24	**3.42**	64.2
pH	2.38	2.57	2.66	3.14	**3.31**	33.7
Bulk density	**2.62**	3.20	2.69	2.70	2.63	31.9
C:N ratio	2.25	2.36	2.63	2.58	**3.13**	22.5
C mineralisation rate	2.12	2.36	3.01	2.62	2.80	22.1
Texture	2.55	2.49	2.49	3.13	2.18	21.6
Rooting depth	2.00	2.57	2.47	2.97	2.72	20.5
Microbial biomass	2.31	2.47	**3.47**	**3.40**		16.8
Drainage class	2.26	**3.54**	2.74	2.50		13.7
Soil temperature	1.90	2.04	2.21	2.43	2.59	10.8
Salinity	2.07	1.97	1.94	2.19	2.52	8.74
CEC	1.72	2.08	2.12	2.18	2.37	7.87
WHC	2.37	2.09	2.45	2.22		6.76
Groundwater table	1.84	2.42	2.27		2.54	6.42
Fe/Al	1.38	1.94	2.18	1.97	2.40	6.31
Earthworm community		3.23	1.64	**3.49**		6.16
Clay mineralogy	1.92	1.73	2.62	2.73		5.95
Soil slope	1.62	2.41	2.12	2.06		4.27
Bacterial community				**3.46**		3.46
Soil moisture	**2.78**		2.42			3.37
Microarthropod community				3.21		3.21
Fungal community				3.19		3.19
Top-layer infiltration capacity					3.11	3.11
Air-filled porosity					2.99	2.99
Field capacity days					2.96	2.96
Nematode community				2.96		2.96
Wilting point days					2.85	2.85
Enchytraeid community				2.75		2.75
Soil frost days	1.76	1.55	2.01	1.98		2.70
Redox state					2.60	2.60

Van Leeuwen, *et al.* (2017), **Gap assessment in current soil monitoring networks across Europe for measuring soil functions**. Environmental Research Letters, 1748-9326.
More info http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

WHAT IS MEASURED WHERE?



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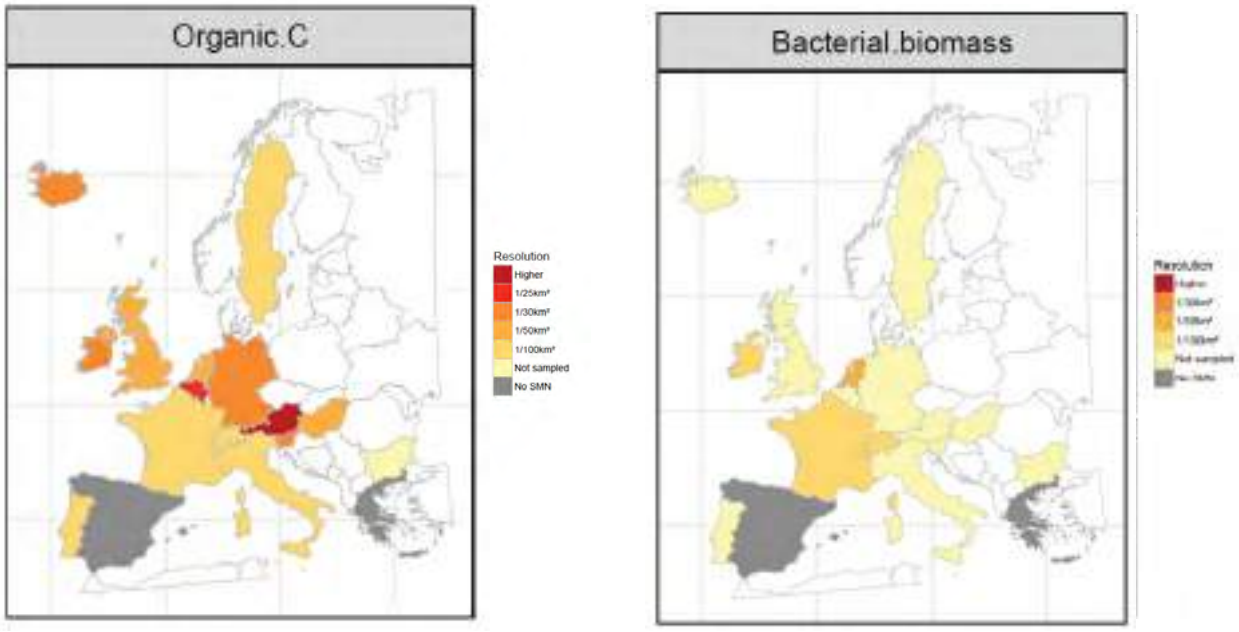
More info http://landmark2020.eu/publication-tree/publication-tree-n6-gap-assessment-current-soil-monitoring-networks-across-europe-measuring-soil-functions/

WHAT IS MEASURED WHERE?



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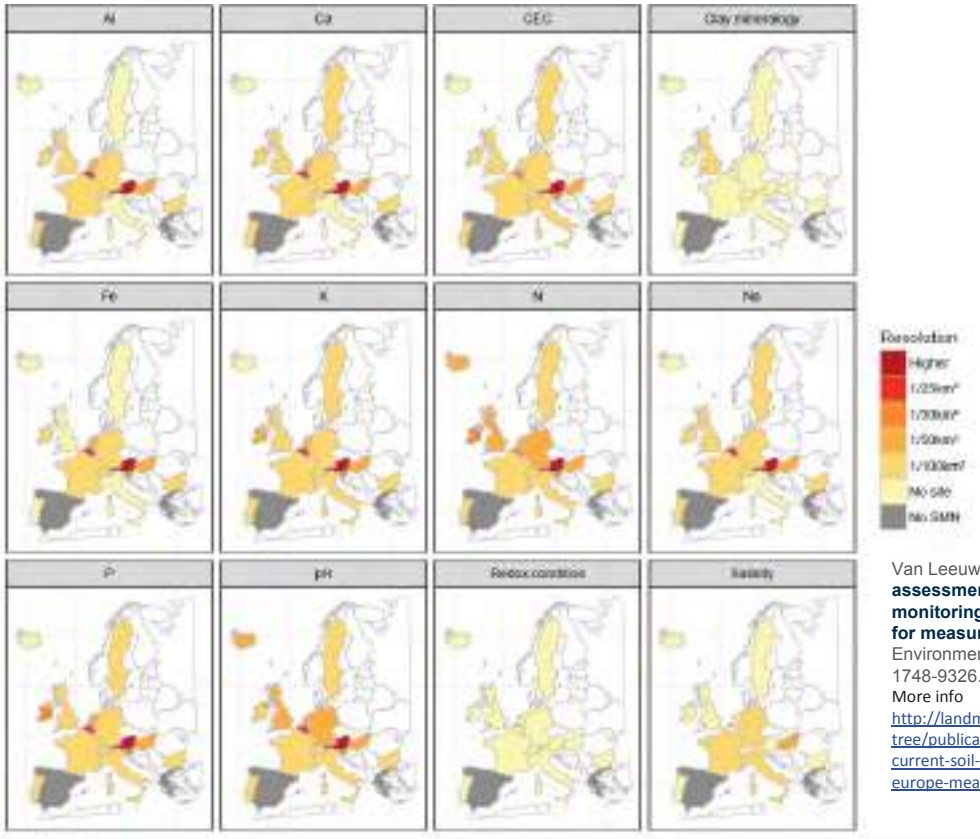

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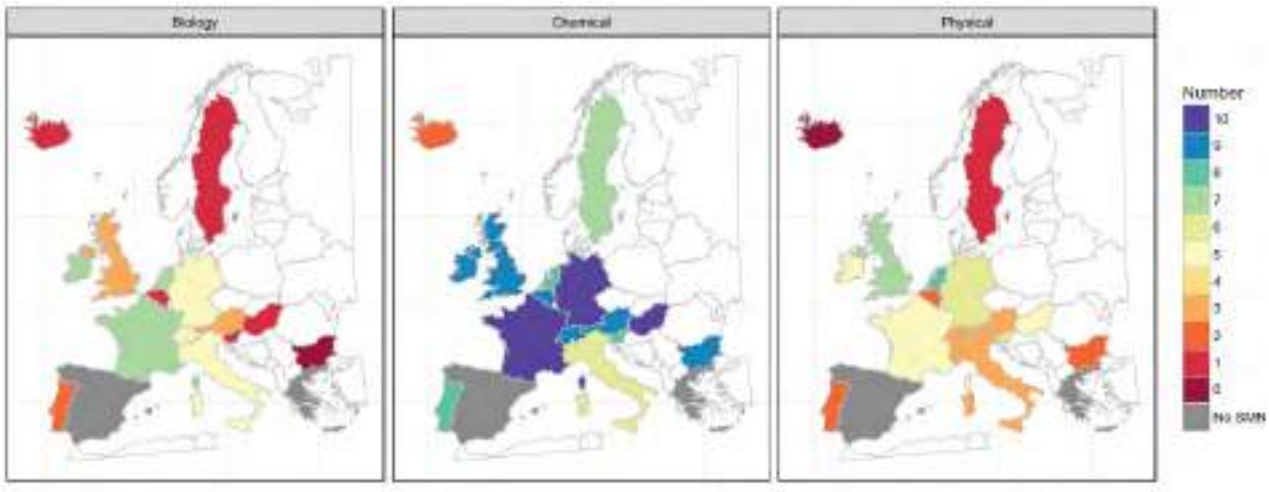

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DIRK VREBOS & JAN STAES

FUNCTIONAL LAND MANAGEMENT AT EUROPEAN LEVEL: DEMANDS ON SOIL FUNCTIONS AND SCENARIO ANALYSES


Funtional Land Management

Aim: Optimize the sustainable use of Europe's soil resource across all major land uses: grassland, arable and forestry.

1. Evaluate legislation in the EU and member states with regard to direct and indirect impacts on soil functions.
2. Translate policy and future trends into scenarios for demand for soil functions.
3. Optimize soil functions accross the EU in light of these scenario's.

Evaluate soil related legislation

Vrebos D, Bampa F, Creamer R, Gardi C, Ghaley B, Jones A, et al. The Impact of Policy Instruments on Soil Multifunctionality in the European Union. Sustainability 2017; 9: 407.

More info: http://landmark2020.eu/publication-tree/publication-tree-n-4-the-impact-of-policy-instruments-on-soil-multifunctionality-in-the-european-union/

The Impact of Policy Instruments on Soil Multifunctionality in the European Union

More info: http://landmark2020.eu/publication-tree/publication-tree-n-4-the-impact-of-policy-instruments-on-soil-multifunctionality-in-the-european-union/

Evaluation of EU legislation

35 different documents were considered important for their potential impact on soil functions in agricultural areas:

22 Directives, 8 Regulations, 4 Communications and 1 Decision.

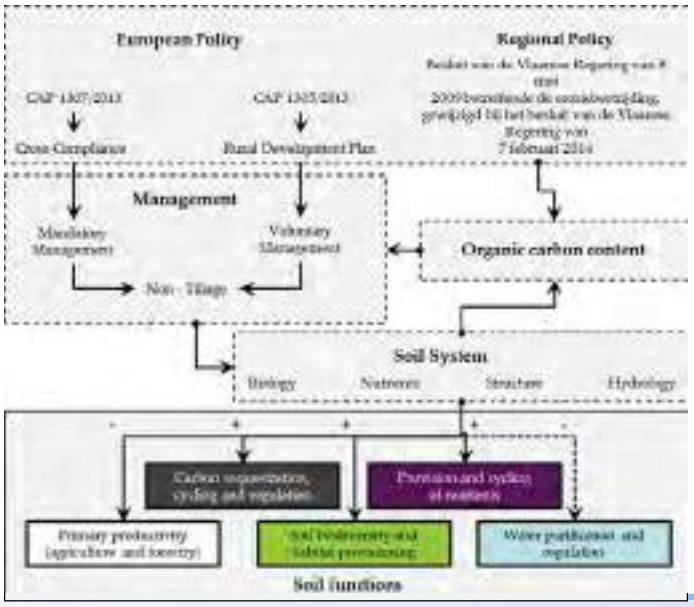
Table 1. Overview of 35 policy documents, which were analyzed for effects on soil functions. For each of the documents the general title, document type, and official number are given. For each document their impact, direct (**dark gray**) or indirect (**light gray**), on each of the five soil functions is given. If a direct impact is considered relevant, then the article numbers are given. In some cases almost the entire document has an impact on a function. In that case not all the article numbers are given, but a reference "Directive" or "Strategy" is given in the table.

Agricultural Policies	Type	No.	Production of Food, Fiber and (Bio)Fuel	Water Purification and Regulation	Carbon Sequestration	Habitat for Biodiversity	Recycling of (External) Nutrients/Agro-Chemicals
European Agricultural Fund for Rural Development	Regulation	1305/2013	Directive		Article 5, 34	Article 5	
Financing, Management and monitoring	Regulation	1306/2013	Directive	Article 93, 94, Annex II	Article 93, 94, Annex II	Article 93, 94, Annex II	
Direct Payment	Regulation	1307/2013	Directive	Article 46, 43	Article 46, 43	Article 46, 43	
Common organization of the markets	Regulation	1308/2013	Directive	-	-	-	-
Plant Protection Products Directive	Directive	91/414/EEC	Article 4b	Article 4b		Article 4b	Article 4b
Nitrates Directive	Directive	91/676/EEC	Article 5				Article 2
GMO Directive	Directive	2001/18/EC	Directive	Article 2-Annex II	Article 2-Annex II	Article 2-Annex II	Article 2-Annex II
Particulate Use Directive	Directive	2009/128/EC	-	-	-	Article 12	-
Industrial policies							
Industrial Emissions Directive	Directive	2010/75/EU	-		-	-	Annex II
Landfill Directive	Directive	1999/31/EC	-	-	-	-	-
Mining Waste Directive	Directive	2006/21/EC	-	-	-	-	-
Industrial Policies	**Type**	**No.**	**Production of Food, Fiber and (Bio)Fuel**	**Water Purification and Regulation**	**Carbon Sequestration**	**Habitat for Biodiversity**	**Recycling of (External) Nutrients/Agro-Chemicals**
Biocidal Products Regulation	Regulation	528/2012	-	Article 19	-	Article 19	Article 19
Waste Directive	Directive	2008/98/EC	ANNEX II	-	-	-	-
Urban policies							
Sewage Sludge Directive	Directive	86/278/EEC	Article 3, 7				Article 8
Urban Waste Water Directive	Directive	91/271/EEC	Directive	-	-	-	-
Climate policies							
Carbon Storage Directive	Directive	2009/31/EC	-	-	-	-	-
Renewable Energy Directive	Directive	2009/28/EC	Article 17				
Monitoring and reporting greenhouse gas emissions	Regulation	525/2013/EU		-	Article 7		-
Monitoring and reporting greenhouse gas emissions	Communication	COM/2018/479	-	-	-	-	-
2030 climate & energy framework	Communication	COM(2014) 15	-	-	Section 2.4	-	-

More info: http://landmark2020.eu/publication-tree/publication-tree-n-4-the-impact-of-policy-instruments-on-soil-multifunctionality-in-the-european-union/

Examples of Regional legislation

- Translation of EU policy to national/regional level differs and can interact with other region-specific legislation.
- Final outcome of EU policy on soil functions can therefor differ accross the EU.



Conclusions

- Soil functions are impacted by different policy domains and levels of legislation.
- Some functions are directly addressed by a policy, whereas others may be indirectly addressed, depending on the policy and on the location or region where it applies.
- Policy documents do not directly deal with all soil functions. In most cases, only a few functions are affected directly or indirectly within specific designated areas.
- More research is needed on the combined effect of European and regional policies on soil functions in agricultural ecosystems to understand their fully combined effects.

More info: http://landmark2020.eu/publication-tree/publication-tree-n-4-the-impact-of-policy-instruments-on-soil-multifunctionality-in-the-european-union/

WAGENINGEN UNIVERSITY & RESEARCH

LANDMARK STRATEGIC RESEARCH AGENDA

PROJECT COORDINATOR: RACHEL CREAMER (WUR2)

STRATEGIC RESEARCH AGENDA: APPROACH

SUSTAINABLE MANAGEMENT OF SOIL AND LAND

Maria Yeroyanni (European Commission, DG Research & Innovation)

Sustainable Management of Soil and Land (including Land Degradation)

MARIA YEROYANNI
Senior Expert
European Commission
DG Research and Innovation

Conclusions(1)

- Presented the SRIA and discussed pressing gaps in European research on Sustainable Soil, Land Management (including Land Degradation) bringing together researchers, policy makers, funders, end-users, public sector, SMEs and large enterprises wishing to innovate and contribute to a greener, more socially cohesive, smarter and more competitive Europe.

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European Commission

Conclusions(2)

- Land and Soil play a vital role in meeting societal needs for urban, peri-urban design and planning, food, drinking water, energy, shelter, infrastructure, climate change, non-renewable natural resources and environmental justice.
- Land and soil, including water and sediment, are finite resources facing growing pressures and conflicts over their use that contribute to over-consumption of natural capital.

Conclusions(3)

- Integrated Spatial Planning and Sustainable Land-use and Soil management needed to balance the supply of natural capital and ecosystem services with society's demands.
- Multi-stakeholder approach, multi-disciplinary, coordinated.
- Need for strong Soil, R&I policies all over Europe and support of the implementation of the Strategic Research Agenda.

Conclusions(4)

- The Sustainable Development Goals of the UNO and the World Soil Charter of FAO and the Soil Thematic Strategy.
- The Communication "Europe 2020 strategy for smart, sustainable and inclusive growth", (2010), highlights the concept of "Territorial cohesion", within the flagship initiative "Innovation Union" and states that one of its objectives is "To develop a strategic research agenda focused on challenges such as (…) land management".

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European Commission

Conclusions (5)

- The "Roadmap for a Resource Efficient Europe" of 2011stresses the importance of land use and sets that the rate of land take should be reduced to zero by 2050.
- The Seventh Environment Action Programme of 2014 recognises that soil degradation is a serious challenge and points to sustainable land management and to an appropriate level of soil protection.

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Conclusions(6)

- Urban Agenda for the EU includes the Sustainable use of land and nature-based solutions with the focus on urban sprawl, development of brownfields and on renaturing/greening urban areas.
- The European Soil Partnership is aiming towards federating all various stakeholders and institutions in Europe willing to adopt the principles of the World Soil Charter.

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European Commission

HABITAT III
QUITO - OCTOBER 2016

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

CBD

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Sendai Framework for Disaster Risk Reduction 2015-2030

European Commission

Conclusions (7)

- Land is an important issue which deserves attention in the Urban Agenda for the EU and Global Agenda.
- Urban partnership on Sustainable Use of Land and NBS

Conclusions(8)

- Urban and peri-urban issues, such as soil sealing, polluted soils, brownfields, soil and land degradation can be addressed through systemic solutions which have nature-based innovations at the intersection of technological, social, cultural, governance, financial ones and enhance the delivery of multi-benefit ecosystem services.
- Link with ongoing JPI, ERANETs,PRIMA Initiative

Conclusions(9)

- Capitalise on existing knowledge (80 Meuro EU funded research)
- Deliver against H2020 objectives and the EU's political priorities and three O's
- Maximise Impact
- International Cooperation
- Communication Activities to disseminate and share knowledge

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European Commission

Nature-Based Solutions: economic, social and environmental benefits

(& co-benefits)

Sustainable cities through nature-based solutions: 2016 topics

- SCC-02-2016: **Demonstrating innovative nature- based solutions in cities** (IA)
  - Demonstrating innovative nature-based solutions for **climate and water resilience** in cities
- SCC-03-2016: **New governance, business, financing models** and economic impact assessment tools for sustainable cities with nature-based solutions (urban re-naturing) (RIA)
- SCC-04-2016: **Sustainable urbanisation** (ERA-NET Cofund

16

WP 2017 relevant topics:

SCC-02-2017: Nature-based solutions for inclusive urban regeneration (IA);

SC5-08-2017: Large-scale demonstrators on nature-based solutions for hydro-meteorological risk reduction (IA);

SC5-21-2017: Heritage-led rural regeneration (IA);

European Commission

WP 2017 relevant topics: Structure

- **SC5-22-2017: Innovative financing, business and governance models for adaptive re-use of cultural heritage (RIA);**
- **SC5-32-2017: Biodiversity scenarios (ERA-NET COFUND);**
- **SC5-26-2017: Pre-commercial procurement on soil decontamination (PCP)**

Building a *community of practice* on Nature-Based Solutions for inclusive urban regeneration

Horizon 2020: Creating a community of practice on NBS

EKLIPSE NBS EWG	CSA	SC5-09-2014	European Knowledge and Learning Mechanism to Improve the Policy-Science-Society Interface on Biodiversity and ESS
INSPIRATION	CSA	SC5-10b-2014	Towards a strategic research agenda on soil, land-use and land management in Europe
ThinkNature	CSA	SC5-10-2015	Development of a multi-stakeholder dialogue platform and Think tank to promote innovation with Nature based solutions
NAIAD	RIA	SC5-9-2015	Insurance Value of Nature
Nature4Cities	RIA	SCC-03-2015	New governance, business, financing models and economic impact assessment tools for sustainable cities with NBS
Naturvation		SCC-03-2015	
CONNECTING	IA	SCC-02-2016	Demonstrating innovative NBS in cities/ water and climate resilience
GROW GREEN		SCC-02-2016	
UNALAB		SCC-02-2016	
Urban GreenUP		SCC-02-2016	
BiodivERsA3	ERA-NET	SC5-09-2014	Consolidating the European Research Area on biodiversity and ecosystem services

SCC-02-2016 cities involved

- **CONNECTING**: Front runner (red), follower (light red)
- **GROWGREEN**: Front runner (green), follower (light green)
- **UNALAB**: Front runner (blue), follower (light blue)
- **URBAN GREEN UP**: Front runner (purple), follower (light purple)

EU Funds invested to cities through H2020

- ✓ 'Horizon 2020' has invested EUR 1.5 billion (2014-2017) on Research & Innovation city related actions:
- ✓ out of which EUR 435 million (2014-2017) devoted to innovation actions for Smart and Sustainable Cities.

*Smart Cities and Communities lighthouse: 330 M EUR(2014-17) + Sustainable cities: 105 M EUR (2014-17).

WP 2018 Calls

- ✓ **CE-SC5-03-2018: Circular and regenerative cities (per-urban spaces; innovative solutions for closing the loop of urban material and resource flows within the nexus of water, energy, food, air, ecosystem services, soil)**
- ✓ **Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement LC-CLA-02-2019: Negative emissions and land-use based mitigation assessment**
- ◆ **Actions should analyse various land-use based mitigation options at global and regional level in relation to food, energy, water security, biodiversity and feedbacks between Land-use mitigation and climate change impacts.**

WP 2018 Calls

- ✓ **Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement LC-CLA-02-2019: Negative emissions and land-use based mitigation assessment**
- ✓ **LC-CLA-06-2019: Inter-relations between climate change, biodiversity and ecosystems (NBS& ecosystem conservation, restoration and management, to support climate change adaptation and mitigation strategies)**
- ✓ **LC-CLA-04-2018: Resilience and sustainable reconstruction of historic areas to cope with climate change and hazard events**

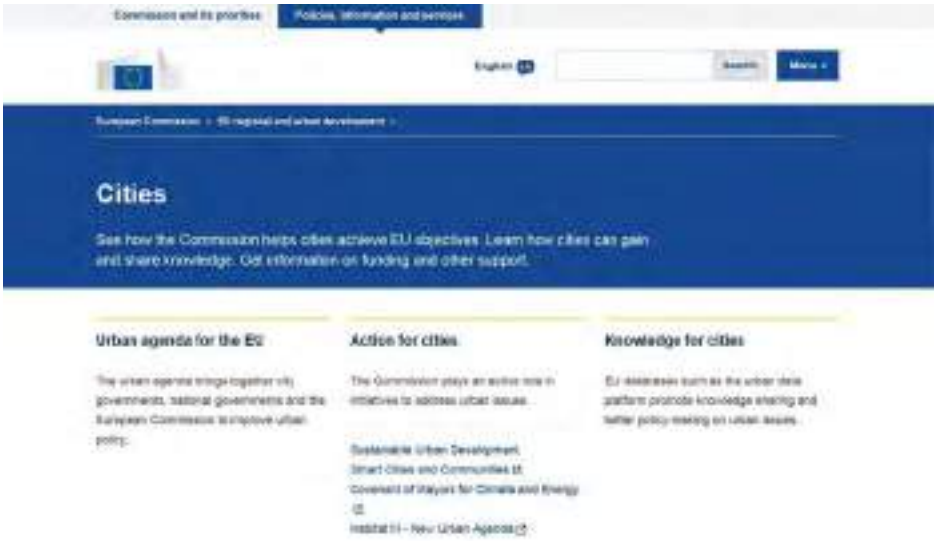
WP 2018-2020, SC5 "Climate Action, Environment, Resource Efficiency and Raw Materials"

https://ec.europa.eu/programmes/horizon2020/en/what-work-programme

https://ec.europa.eu/programmes/horizon2020/en/climate-action-environment-resource-efficiency-and-raw-materials-work-programme-2018-2020

EU Policy Context on Cities

Urban Agenda for the EU – DG REGIO
https://ec.europa.eu/info/eu-regional-and-urban-development/cities
Topic Page on Cities



EU Policy Context on Cities

Urban Agenda for the EU – DG REGIO

http://www.uia-initiative.eu/

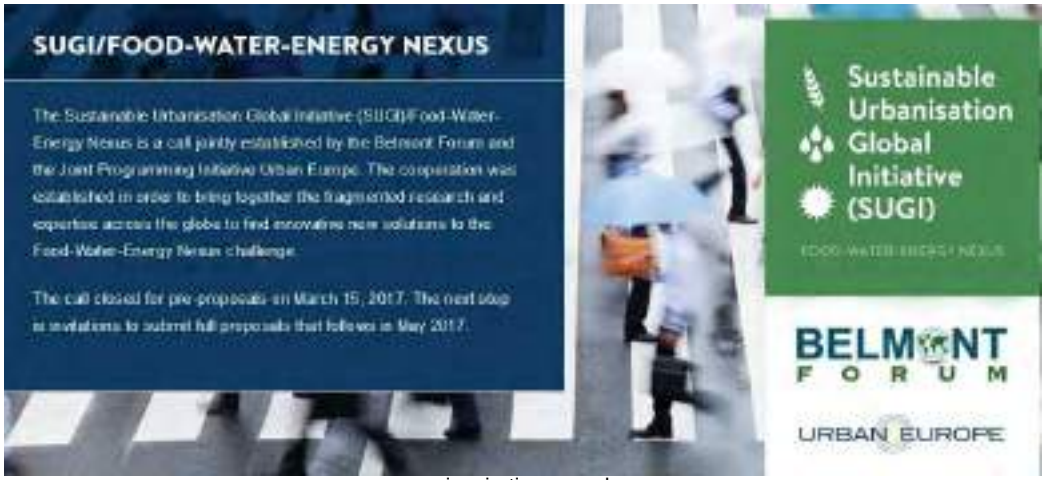
Urban Innovative Actions

EU R&I Policy on Cities - Instruments

Joint Programming Initiative Urban Europe – DG RTD

http://jpi-urbaneurope.eu/

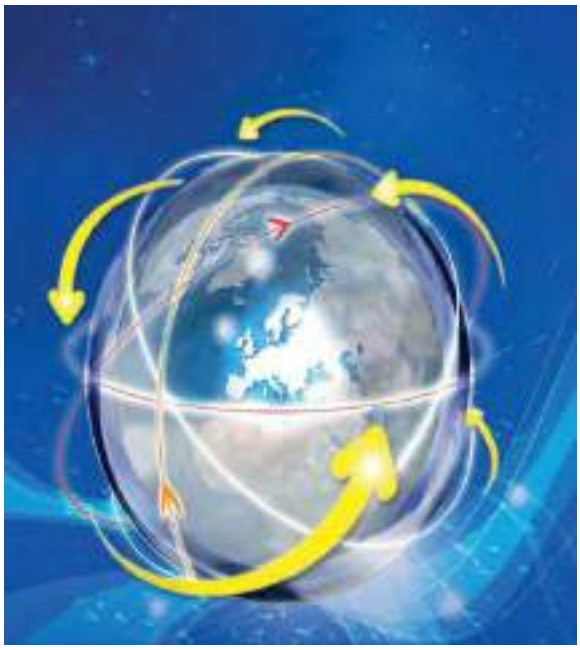
EU Member State initiative on Systemic Urban Innovation. Sustainable Research and Innovation Agenda: 'Transition towards sustainable and liveable urban futures'



Additional opportunities

- **JPI calls, PRIMA**
- **European Structural and Investment Funds (ESIF) 2014-2020**
- **Urban Innovative Actions** (Art. 8 ERDF Regulation)
  - EUR 371 million, to experiment novel ideas (Art. 8 ERDF Regulation)
  - Upcoming call to include nature-based solutions

International R&I cooperation on NBS



- Close collaboration with the **Belmont Forum**: **Sustainable Urbanisation Global Initiative – Food-Water-Energy Nexus (SUGI)**
- EU-China Partnership on Urbanisation
- EU-Brazil Sector Dialogue on Nature-Based Solutions for Sustainable Cities.

Close collaboration with the Belmont Forum

Sustainable Urbanisation Global Initiative (SUGI)
FOOD-WATER-ENERGY NEXUS

BELMONT FORUM
URBAN EUROPE

New for 2018-2019

- ***High Level Expert Group on innovating cities***
- **Urban Booklet with EU funded projects (Energy, Mobility, Health, CH, Social, Climate adaptation, Food, JPI)**
- ***Mapping for all FP6,FP7, H2020 urban Projects***
- **COMMISSION TOPIC PAGE**
- ***Policy Outcome Report FP7 projects***

European Commission

Thank you
marie.yeroyanni@ec.europa.eu

Find out more:
www.ec.europa/research/horizon2020

SOPHIE: INTERNATIONALLY COLLABORATE ON COST-EFFECTIVE SHP-PROPERTIES USE, DETERMINATION, AND DISTRIBUTION

Gerben Bakker (Wageningen University and Research / WUR)

Co-Authors: Martine van de Ploeg (WUR), Saskia Visser (WUR), Rik van den Bosch (ISRIC - World Soil Information), Winnie van Vark (WEPAL)

Why Motivation and problem statement

SOPHIE stands for SOil Program on Hydro-physics via International Engagement. Soil Hydro-Physics (SHP) properties are THE properties that determine the Soil-Water-interactions:

- water flow and water retention
- and with the water flow the transport of dissolved compounds, like nitrogen, phosphates, pesticides, antibiotics, organics, etc.

As a result SHP-properties play an important role in variety of societal issues: Crop water stress vs. food security, Salinity and Sodicity occurrence, Susceptibility for forest fires, Soil compaction, Dike stability, Greenhouse gas emissions, Soil health, etc.

The need for reliable SHP-properties is widely emphasized by researchers and consultants. However, concurrently it is recognized that harmonization, and the development of new techniques is difficult to accomplish. This is due to the missing attention and missing direct visibility of SHP-properties in the societal topics they address. As a result current methods are still time consuming, and thus not cost-effective, and are not sufficiently harmonized to be used on EU-scale research.

Still, there are opportunities to improve the situation drastically, but these methods require large scale adaptation, validation and standardization. Just one example is the adaptation, and innovation towards novel remote and proximal sensing techniques. When they are used in combination with modern field and laboratory techniques, they can lead to standardized SHP-properties, directly usable for extending current soil data bases, like LUCAS, and in large scale studies.

What Approach, results and key messages

To accomplish this, SOPHIE works on the development of an international network that is needed and will be used as a driving force to Harmonize, Standardize and Innovate towards cost-effective measurements of Soil Hydro-Physics (SHP) Properties. It has the ambition to provide a generally accepted degree of standardization of SPH property determination in field and laboratory, and to provide SHP data that is based on standardized procedures to be used as a support for the EU Soil Policies.

Key Conclusion and take home message

The workshop during the INSPIRE meetings in Brussels is used to build upon commitment among policy makers, manufacturers, developers, researchers, and users.

As the above described situation was underlined almost unanimously during the workshop, and representatives of the International Soil Modeling Consortium (ISMC), the International Soil Reference and Information Centre (ISRIC), and the other participants indicated their commitment towards developing SOPHIE, is was concluded that this initiative should be extended. In future events, prominent contributions from partners and EU policy makers, contributing to the strategic research agenda and program wise development, will be encouraged and highly appreciated.

SOPHIE

December 2017

Gerben Bakker & Martine van der Ploeg

WAGENINGEN
UNIVERSITY & RESEARCH

SOPHIE = SOil Program on Hydro-physics, via International Engagement

Hydro-physics properties are <u>THE</u> properties that determine the soil-water-interactions:

- **Effect of soil on water (dynamics):**
  flow rate, retention, moisture condition
- **Effect of water on soil:** temperature condition, shrinkage, organic matter decline, surface crust

And with water flow the transport of dissolved compounds: Nitrogen, Phosphates, Pesticides, Antibiotics, Organics, etc.

Nile region Achmim, Egypt (mid east)

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SHP properties essential in variety of societal issues
➔Outcomes strongly depend on Soil-Water-condition

Soil Hydro-Physics (SHP) 3 Main pillars	Soil-Water-Interaction directly affects
Water flow rate **Water Retention** **Moisture content**	• Crop water stress vs. food security • Salinity and Sodicity occurrence • Flow of Nutrients, Contaminants, Antibiotics • Waterlogging / ponding • Soil fauna and Nature development • Forest fires • Drainage design • Drinking water availability • Greenhouse gas (N_2O/CO_2) emissions • Compaction • Erosion • Weather / Climate • Dike stability • Soil shrinkage/cracks vs building/road damage


Dike breakthrough Wilnis Netherlands 2003

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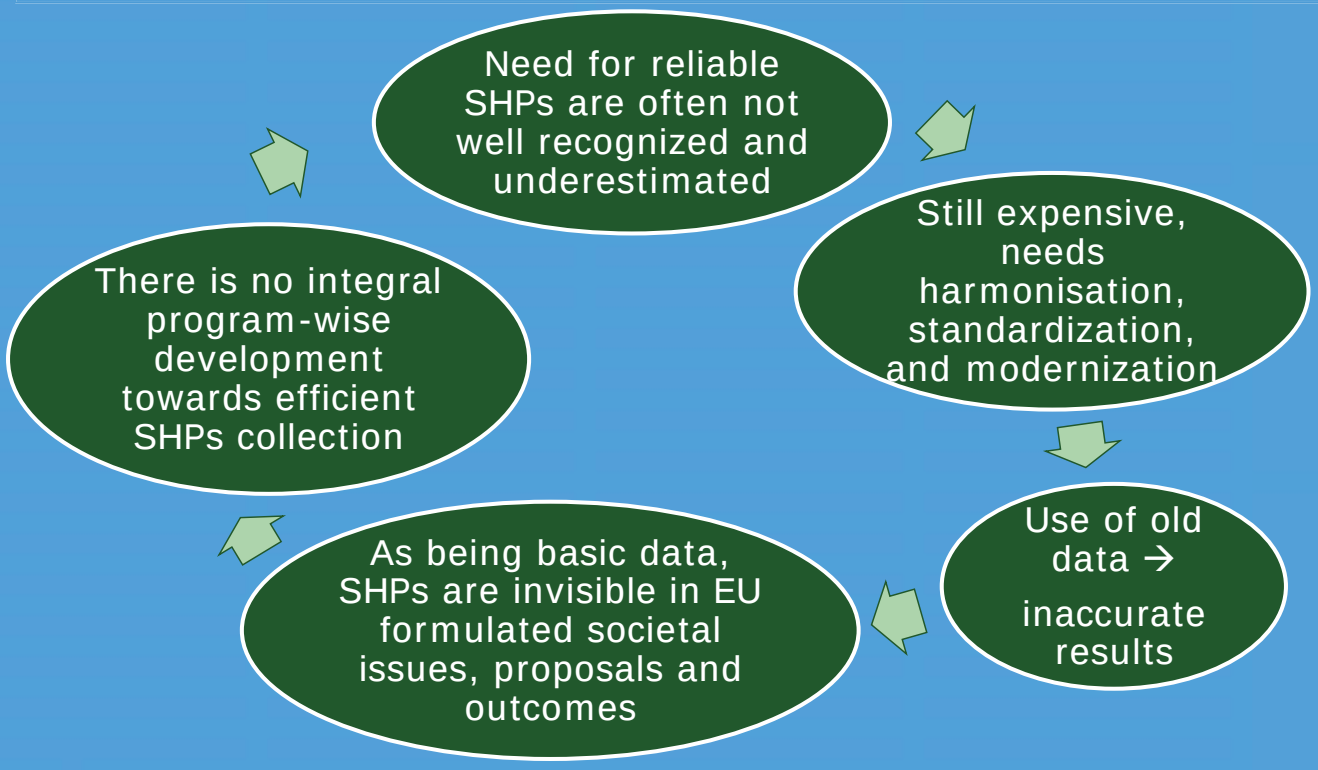
Challenges for SHP-properties (SHPs)



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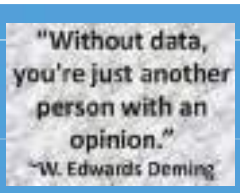
SOPHIE Ambition



Internationally collaborate on modernizing SHP-properties use, determination, and distribution

by

- **Harmonisation** (method and threshold comparison)

  International use of same golden, silver and bronze standards; inter-comparison via standard samples; use of comparable threshold values

- **Standardisation** (used methods: golden, silver, bronze)

  What parameters are crucial; How must they be determined; How must they be stored in dBase; standardize to general acceptable level

- **Innovation** (efficient equipment, models, dBases)

  Stimulate modernization into efficient field-, and laboratory equipment and model development, e.g. combine proximal sensing (PS), remote sensing (RS), field and lab techniques to increase output and reduce costs.

WAGENINGEN
UNIVERSITY & RESEARCH

Thank you

WAGENINGEN
UNIVERSITY & RESEARCH

Standardization and harmonisation for global soil data provision

Rik van den Bosch, Director

Contents

ISRIC – World Soil Information

Some features

- Founded in 1966, upon recommendation of UNESCO, FAO and the IUSS
- Independent foundation based in Wageningen
- Cooperation agreement with Wageningen University.
- 20 staff, plus guest employees, plus students
- Accredited as the World Data Centre for Soils (WDC – Soils) by the International Council for Science
- Participating Organisation of the Intergovernmental Group on Earth Observations (GEO)

Vision

A world where **reliable** and **relevant** soil information is **freely-available** and **properly used** to address **global** environmental and social **challenges**.

Mission

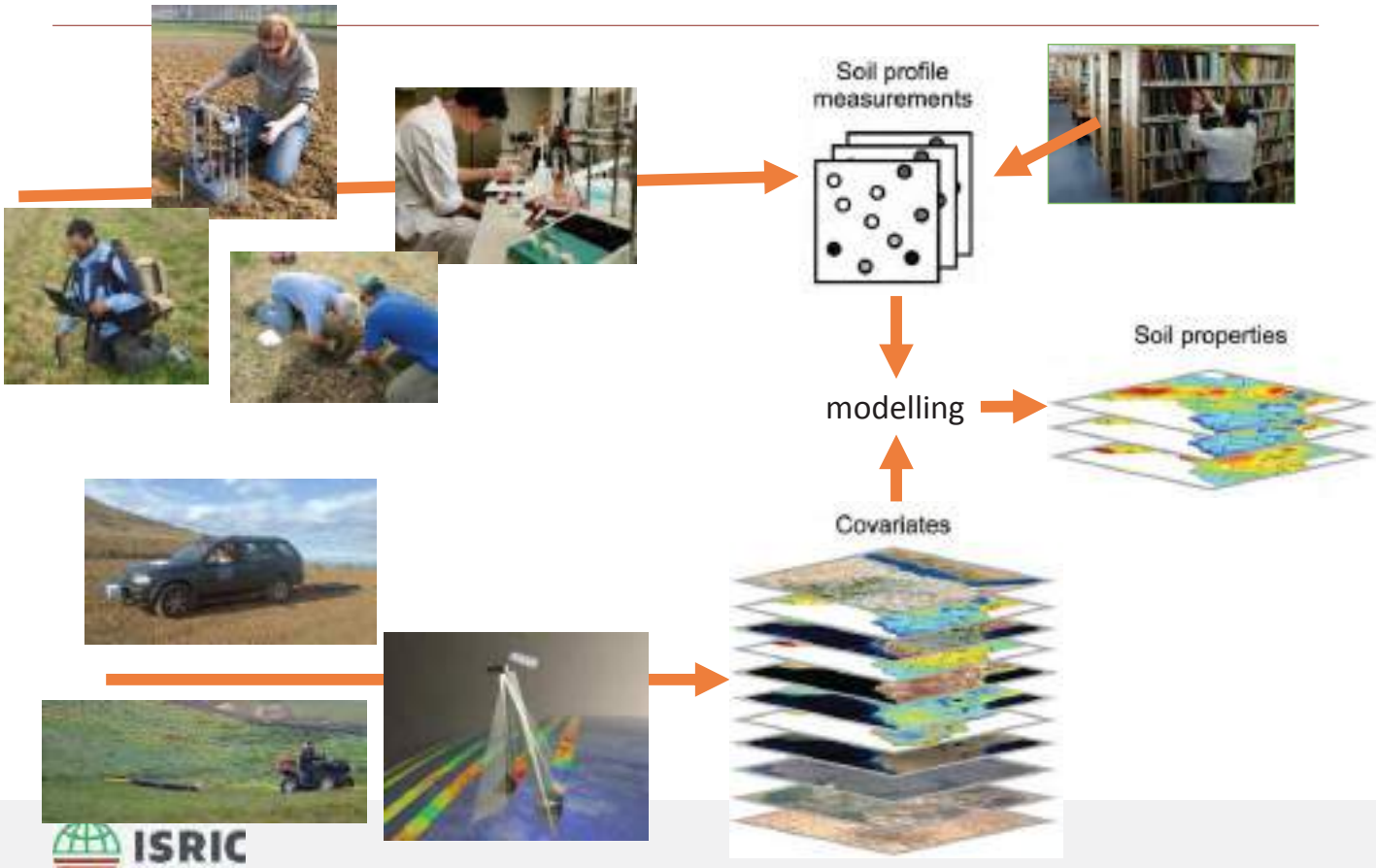
- We produce and serve **quality-assured soil information** together with our partners at global, national and regional levels.
- We stimulate the use of this information to address global challenges through **capacity building**, **awareness raising** and direct **cooperation** with users and clients.

Vision on our role

- We are a **service provider** to the international science communities, policy communities and the private sector
- ISRIC plays a significant role in **standard setting** for soil data gathering storage and serving ('Foundation')
- ISRIC is the **trusted broker** of global soil information for different client groups connecting global producers and users of soil information (Raison d'etre')
- ISRIC **develops capacity** for building and using soil information systems in developing countries ('connecting with the market')
- ISRIC develops **derived knowledge products** for sustainable soil and land management, together with clients and partners ('increasing impact')

ISRIC

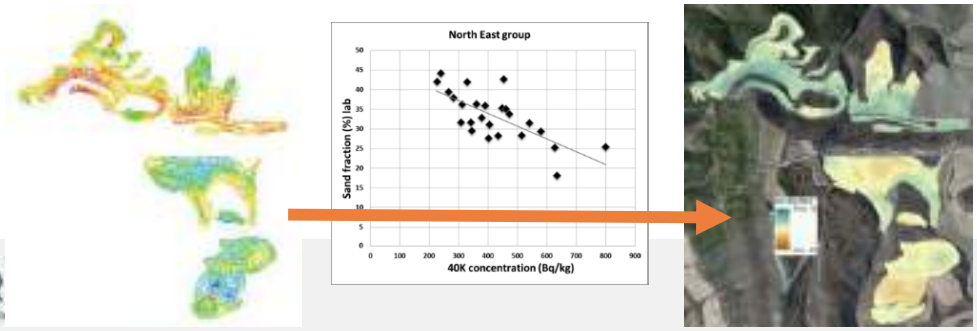
From measurements to information



ISRIC

Data acquisition process

- New point data (eg. AfSIS, LUCAS, project data etc.), lab or sensor based.
- New spatial information:
  - Estimation of properties through sensing
  - Covariates (eg. DEM, Land use satellite data etc.)
- Existing data and data collected for other projects



Work stream 1: Reference and Standard Setting ('The Foundation')

World Reference Base (WRB)

Soil Data Interoperability Experiment

Manaaki Whenua
Landcare Research

CSIRO

Federation

OGC®
Making location count.

ISRIC

GODAN Working Group on Soil Data

Initiatives:

IUSS WG - SIS

Partners:

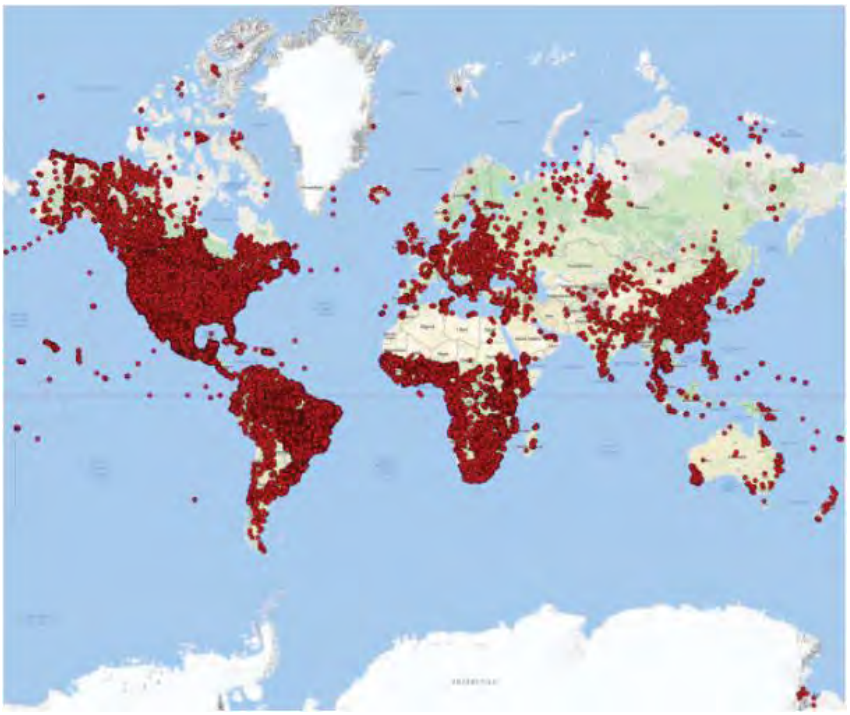
50 subscribers
38 organisations
7 international presentations in 2017

Your organisation?

Food and Agriculture Organization of the United Nations

Work stream 2:
Soil Information Brokering
(‘Raison d’être’)

Data holdings in WoSIS (June 2017)



- ~ **126 thousand** unique profiles
- ~ **111 thousand** profiles with geometry
- ~ **30 million** soil properties measurements of which
  - ~ **4 million** have been standardized so far
- Bulk density
- Calcium carbonate
- Carbon (Total & Organic)
- Coarse fragments
- pH
- Water retention
- Texture (Sand, Silt, Clay)
- Cation exchange capacity
- Electrical conductivity

- Classification: FAO, WRB, US Soil Taxonomy

ISRIC

WoSIS: World Soil Information Service

- PostgreSQL database developed to:
  - Store soil data with their lineage (e.g. licence)
  - Standardize and harmonize the disparate source data
  - Ultimately serve quality-assessed soil data for a range of applications
- Provides the basis for a distributed system

"Decision makers and managers must have access to the information they need, when they need it, and in a format they can use"
(GEO, 2010)

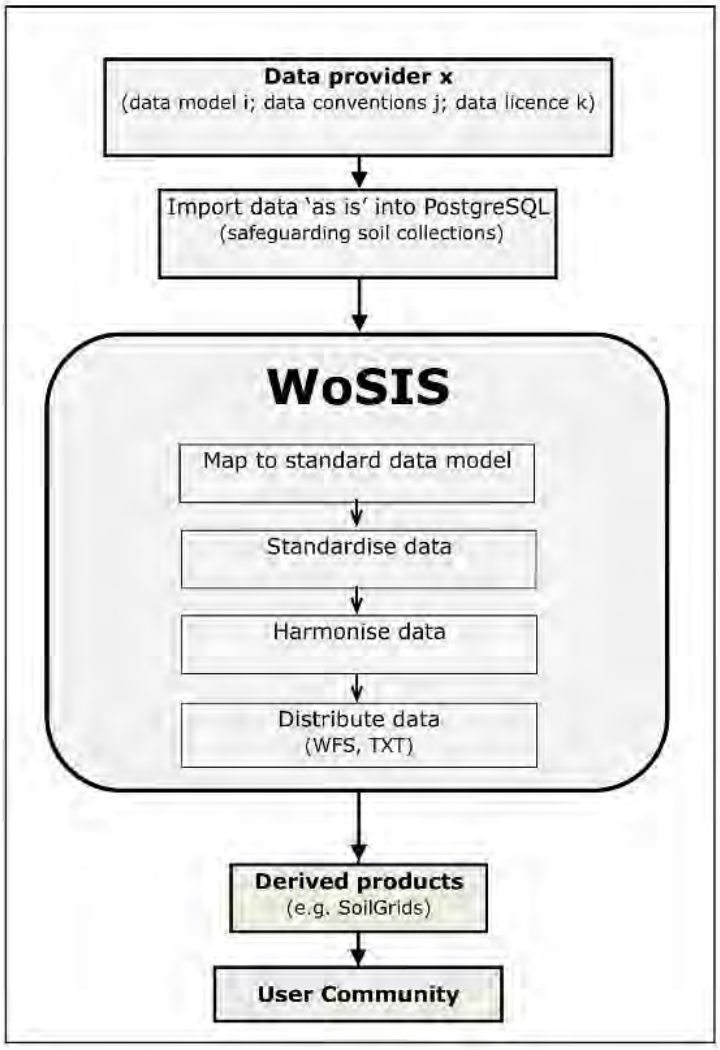
See: ISRIC Data and Software Policy

ISRIC

Main steps in data processing

And:

- Consistency checks & quality control scheme
- Managing intellectual property rights: respecting the IP of data owners/contributors



ISRIC

Standardisation steps

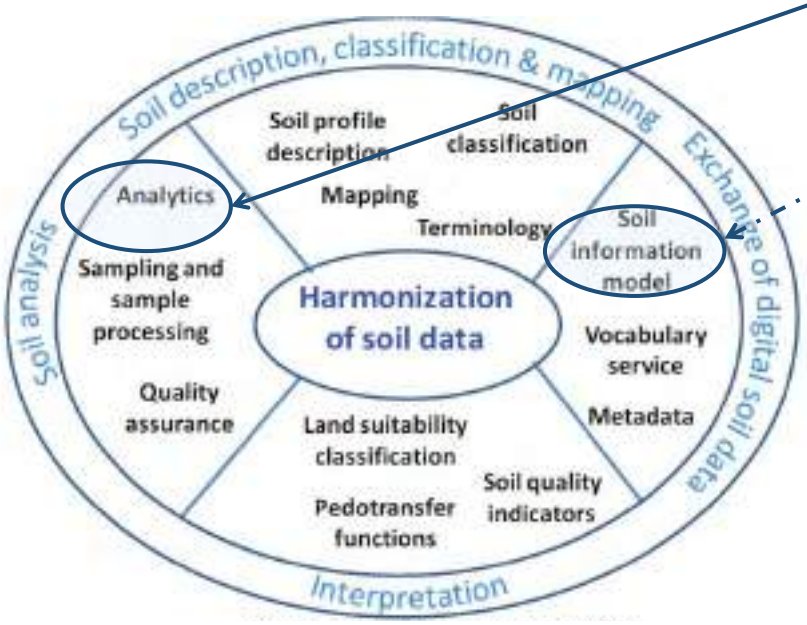
- Identify repeated profiles
- Attribute names
- Units (incl. conversion factors)
- Formats of measured values
- Analytical methods

➢ Current focus: soil properties considered in GlobalSoilMap specs

pH
Organic carbon
CEC
Bulk Density
Water Holding Capacity °
Calcium carbonate equivalent
Sand, silt, clay fractions
Coarse fragments (>2mm; as volume percent of whole soil)
Electrical conductivity

ISRIC

Areas of harmonization



Present focus in WoSIS
(soil data derived from routine soil surveys)

"Providing mechanisms for the collation, analysis and exchange of consistent and comparable global soil data and information"
(GSP Pillar V)

Harmonize to reference method 'Y'
(*not yet undertaken in WoSIS*)

- Make the data comparable, as if assessed by a single given (reference) method Y
- There is generally no universal equation for converting from one method to another in all situations
- GSP community will need to develop 'region' specific conversions building on comparative analyses of (archived or new) soil samples (GSP WG5, Baritz et al. (2014); GLOSOLAN)

Source: GlobalSoilMap (2013)

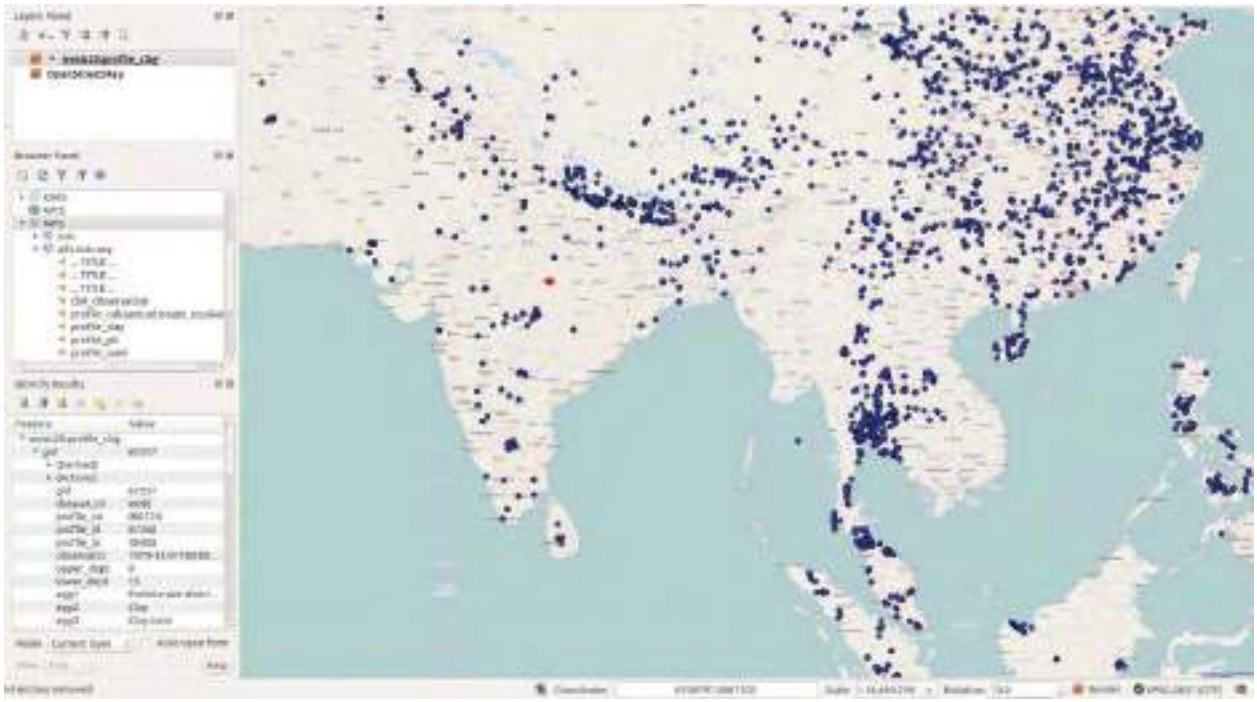
Harmonize to reference method 'Y'
(*not yet undertaken in WoSIS*)

Table 11 Example regression equations for converting values of pH between different methods

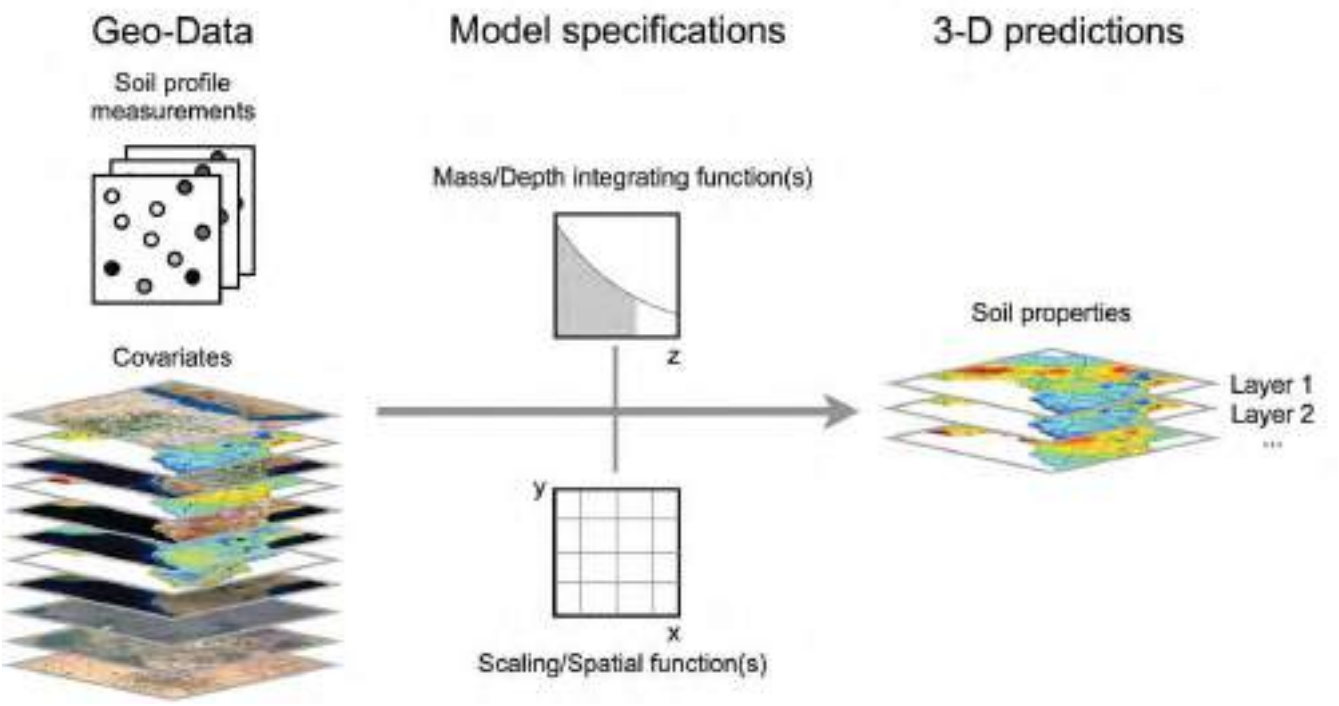
No.	Target Method (Y)	Source Method (X)	Equation	R2	Reference
1	pH (1:1 0.01 m CaCl2)	pH (1:1 water)	$y = 1.08(x) - 0.973$	0.98	Miller and Kissel (2010)
2	pH (1:1 0.01 m CaCl2)	pH (saturated paste)	$y = 1.10\ (x) - 0.923$	0.98	Miller and Kissel (2010)
3	pH (1:1 0.01 m CaCl2)	pH (1:2 water)	$y = 1.05\ (x) - 0.950$	0.97	Miller and Kissel (2010)
4	pH (1:1 water)	pH (1:1 0.01 m CaCl2)	$y = x + 0.267\ (EC\ 1:1\ water)^{-0.445}$	0.99	Miller and Kissel (2010)
5	pH (1:2 water)	pH (1:1 0.01 m CaCl2)	$y = x + 0.239\ (EC\ 1:1\ water)^{-0.505}$	0.98	Miller and Kissel (2010)
6	pH (1:5 0.01 m CaCl2)	pH (1:5 water)	$y = 1.012\ (x) - 0.76$	0.99	Conyers and Davey (1988)
7	pH (1:5 0.01 m CaCl2)	pH (1:5 water)	$y = 0.979\ (x) - 0.71$	0.68	Bruce et al., (1989)
8	pH (1:5 0.01 m CaCl2)	pH (1:5 water)	$y = 0.887\ (x) - 0.199$	0.88	Aitken and Moody (1991)
9	pH (1:5 0.01 m CaCl2)	pH (1:5 water)	$y = 0.197\ (x)^2 - 1.21\ (x) + 5.78$	0.92	Aitken and Moody (1991)
10	pH (1:5 0.002 m CaCl2)	pH (1:5 water)	$y = 0.948\ (x) - 0.308$	0.90	Aitken and Moody (1991)
11	pH (1:5 0.002 m CaCl2)	pH (1:5 water)	$y = 0.178\ (x)^2 - 1.043\ (x) + 5.10$	0.94	Aitken and Moody (1991)
12	pH (1:5 1 m KCl)	pH (1:5 water)	$y = 0.803\ (x) + 0.077$	0.81	Aitken and Moody (1991)
13	pH (1:5 1 m KCl)	pH (1:5 water)	$y = 0.233\ (x)^2 - 1.797\ (x) + 7.143$	0.98	Aitken and Moody (1991)
14	pH (soil solution)	pH (1:5 water)	$y = 1.28\ (x) - 0.613$	0.78	Aitken and Moody (1991)
15	pH (soil solution)	pH (1:5 0.01 m CaCl2)	$y = 1.105\ (x) - 0.140$	0.79	Aitken and Moody (1991)
16	pH (soil solution)	pH (1:5 0.002 m CaCl2)	$y = 1.050\ (x) - 0.112$		
18	pH (soil solution)	pH (1:5 1 m KCl)	$y = 1.175\ (x) - 0.262$		

Source: GlobalSoilMap (2013)

WoSIS web service for easy access



From points to grids



ISRIC

SoilGrids

- **Automated** soil information system
- Using **profile** data and **spatial** information (covariates)
- **Machine learning** algorithms
- 250m * 250m **resolution**
- Accessible through **web service** and mobile phone **app**

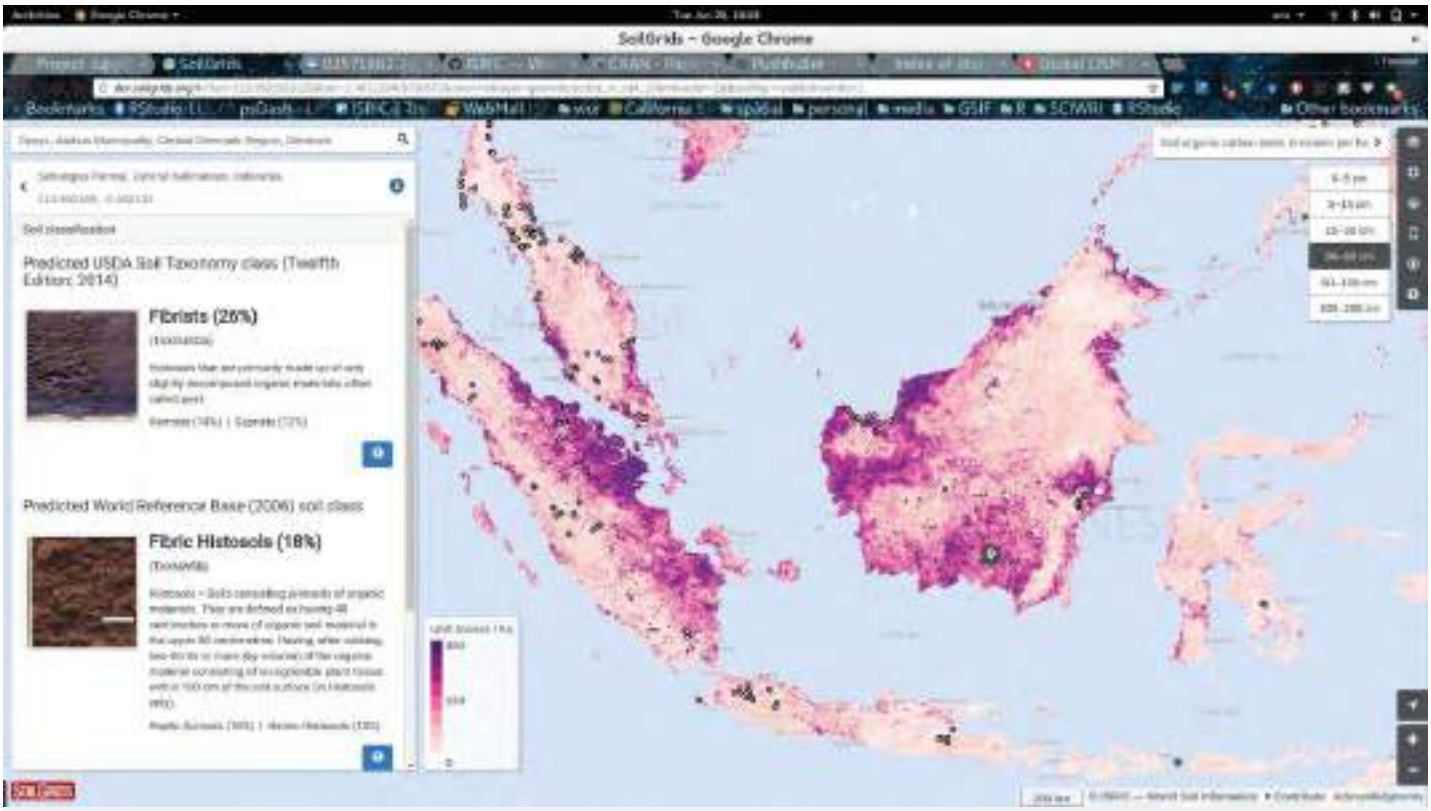
- Updatable
- Open data
- Moving towards crowdsourcing

SOILGRIDS
A system for automated global soil mapping
www.soilgrids.org
ISRIC

SoilGrids: clay content at -15 cm (%)

ISRIC

SoilGrids: SOC stock 30-50 cm (ton/ha)



ISRIC

Relevant Developments

Preferred supplier to UNCCD

Land Degradation Neutrality

- **SDG 15.3**
- **Three sub-indicators**
  - Land use change
  - Net Primary Production
  - Soil Organic Carbon (SOC)
- ISRIC provides baseline SOC data to all countries
- Challenge: monitoring

United Nations
Convention to Combat Desertification

The Global Soil Partnership

- Partners: governments, knowledge institutions, NGOs
- Goal: enhance sustainable soil management
- Pillars 1-5 (thematic)
- Regional partnerships
- ITPS (technical back-up)

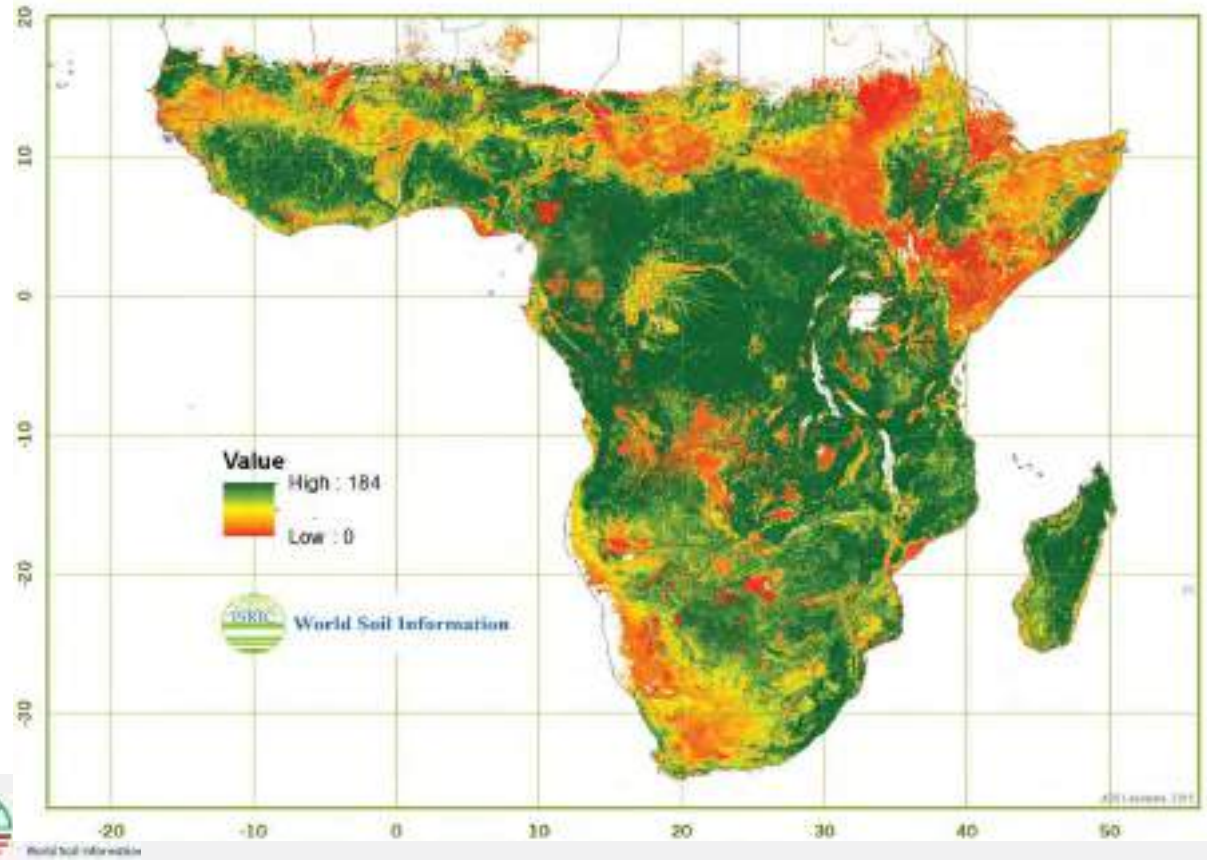
Pillars of Action

- **Pillar 1: Soil Management**
  - Promote sustainable management of soil resources
- **Pillar 2: Awareness Raising**
  - Encourage investment, technical cooperation, policy, education, awareness and extension in soil
- **Pillar 3: Research**
  - Promote targeted soil research and development focusing on identified gaps, priorities and synergies
- **Pillar 4: Information and data**
  - Enhance the quantity and quality of soil data and information
- **Pillar 5: Harmonisation**
  - Harmonisation of methods, measurements and indicator for the sustainable management of soil

Work stream 4:
Developing derived Products
('Boosting Impact')

ISRIC

Plant-available water holding capacity (mm, maize)



Information platform for production of site specific fertilisers

Concluding remarks

- Soil information and its derived products are **crucial for addressing global challenges**
- Standardisation and harmonisation of field and lab methods are of crucial importance for the **quality of global soil information products and the derived products**
- With partners we are working towards **global soil data inter-operability**
- The quality-assessed data will be served using an increasing range of **web-services through ISRIC's evolving SDI**
- **ISRIC supports SOPHIE** and its results can easily be accommodated in the WoSIS database structure.

More information:
rik.vandenbosch@isric.org
www.isric.org

SOPHIE: Common desires & actions

Martine van der Ploeg, board member International Soil Modeling Consortium

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ISMC International Soil Modeling Consortium

What is ISMC?

A recently formed and growing international group of soil process modelers is focused on improving the soil process description and overall parameterization of earth system models:

Global- and regional-scale climate models

Ecological models that include ecosystem services, soil carbon, etc.

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Current Status of Soil Model Development

Modeling soil processes is fragmented and dispersed, lacking exchange between different soil disciplines and across other disciplines

An improved visibility of soil research and modeling in the Earth Sciences Community is needed.

The scientific community lacks easy-to-access and available standardized and high quality data and protocols for calibrating and validating soil models

A better exchange of ideas, expertise and need for development of joint activities through cross-cutting topical areas

The International Soil Modeling Consortium (ISMC) aims to address these issues

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Challenge: A Need to Focus…

Substantial Soil influence

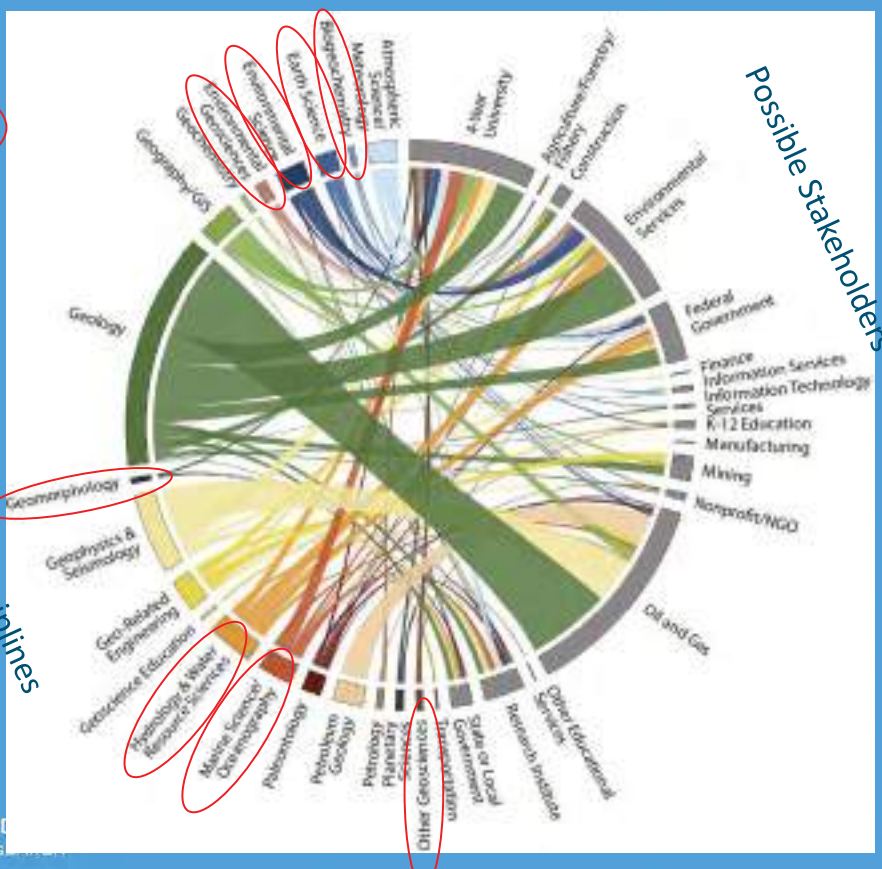

Image source: AGI, 2017

Better Soil Models: A Way to Integrate…

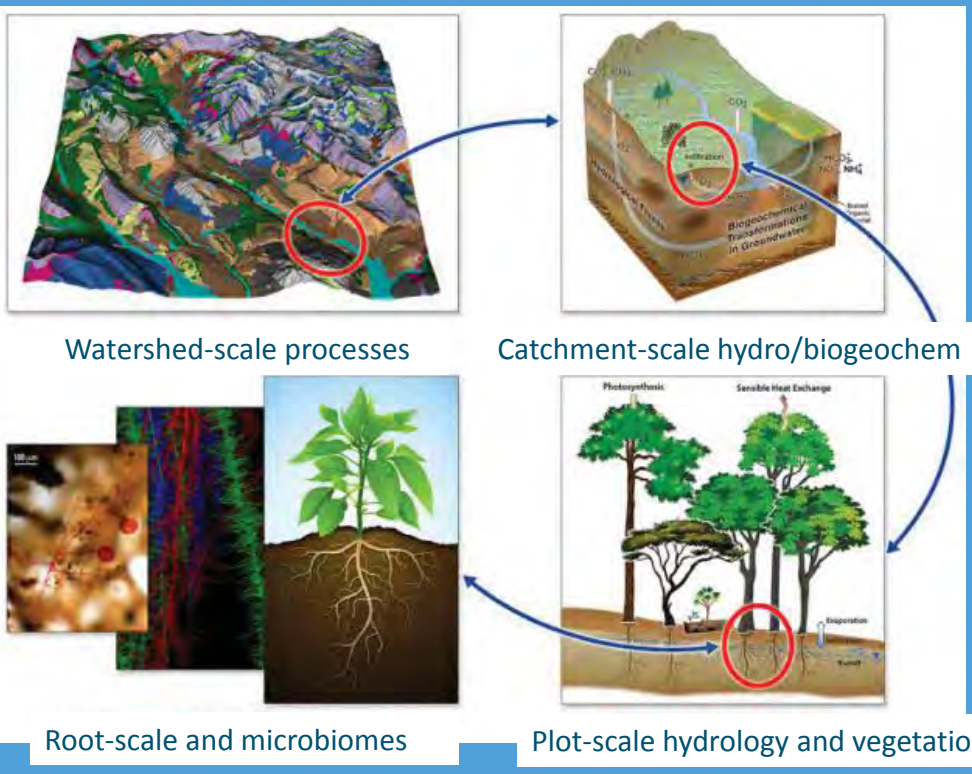

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Image source: USDOE 2015

…Soil Processes into Integrated Assessments

Soil goes here:

Source: Forseer tool, Julian Allwood, Univ of Cambridge, 2012, http://forseer.org

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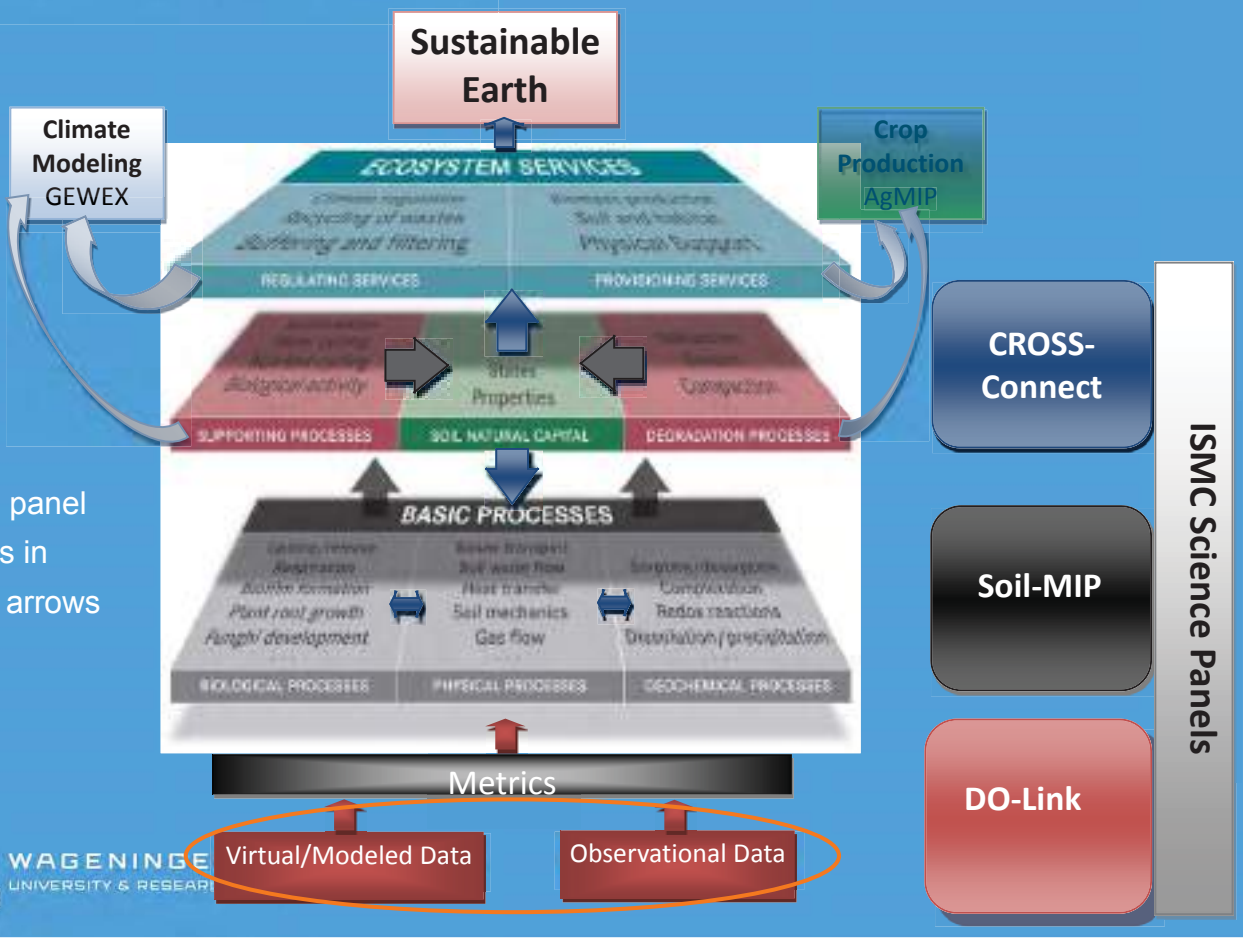
ISMC Schematic*



* Science panel activities in colored arrows

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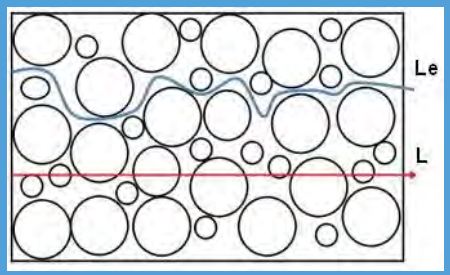
Soil process questions

Soil grain scale

- How does microbial diversity depend on variability in soil composition?
- To what extent does small scale heterogeneity matter at larger scales, for example for soil carbon or nutrients?



Top: Schematic soil structure. Bottom: Iron oxidizing Leptothrix bacteria (Credit: Bertram Schmidt, CC, distributed via imaggeo.egu.eu).

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Soil process questions

Profile scale

- How much does local variability in the soil impact carbon and nutrient cycling in soils?

Top: Cracks in clay soil (Credit: with kind permission from Bram te Brake). Bottom: Preferential flow patterns through soil (Credit: with kind permission from Esther Bloem)

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Soil process questions

Local/Farm scale

- How do small scale interventions on the landscape alter hydrological flow paths and sediment transport?

Top: Farm fields in Exmoore, UK (Credit: María Burguet, CC, distributed via imaggeo.egu.eu). Bottom: Pivot irrigation (Credit: Photo by John A. Kelley, USDA Natural Resources Conservation Service via Flickr under Creative Commons licence).

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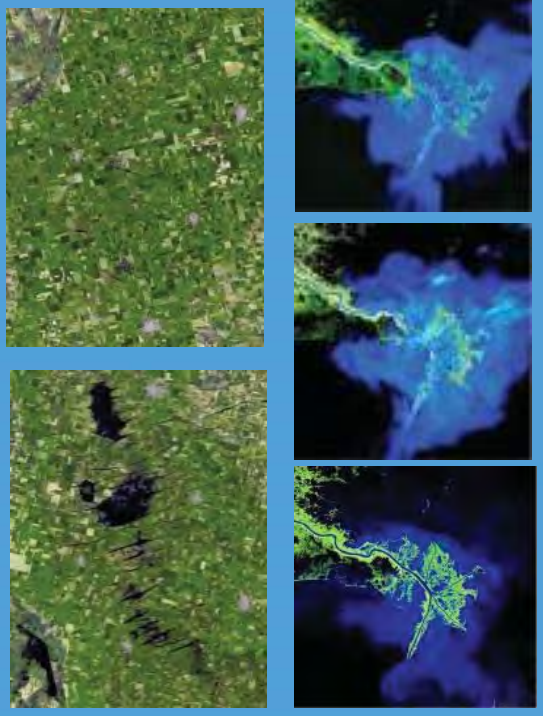
Soil process questions

Basin scale

- How are hydrological, sediment and habitat function altered by major infrastructure?
- How do vegetation patterns combined at river basin scale influence water and sediment transport?



Left: Landsat 8 imagery before (top) and after (bottom) flooding in Argentina. Right: Landsat 1, 5, 7 imagery of three decades of change in the birdsfoot delta of the Mississippi River (Data available from the U.S. Geological Survey.)

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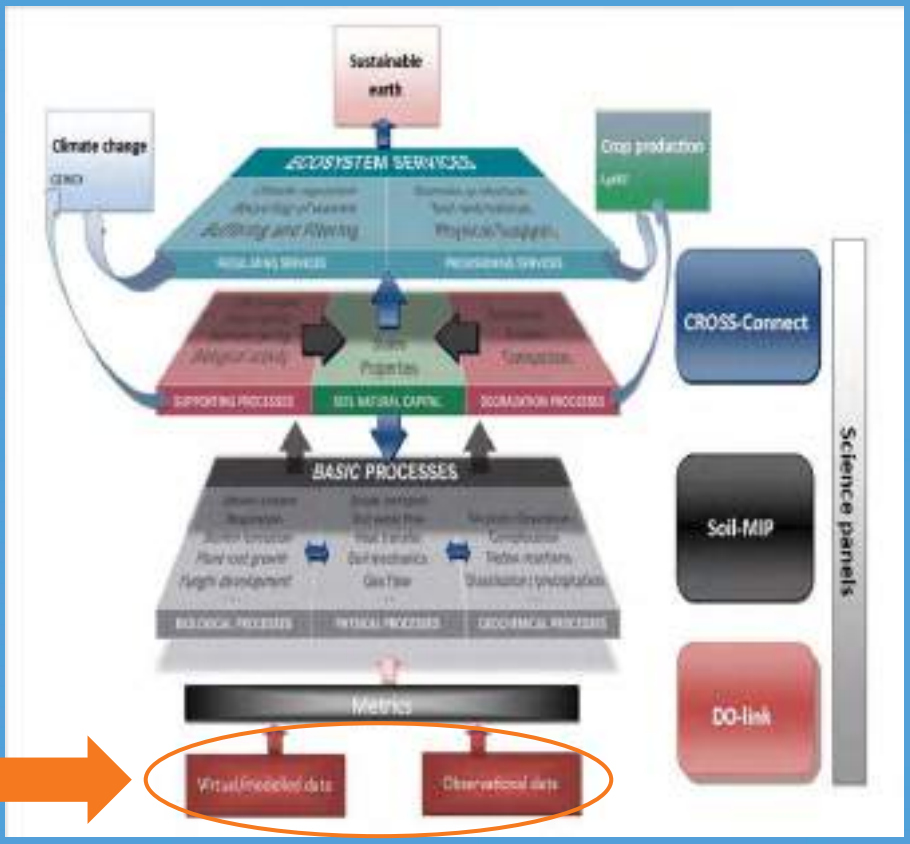
Need for well defined data



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Relevant Data Questions in ISMC and SOPHIE?

- Stakeholders have unique requirements
- Comparison laboratory data/field/regional/global data?
- Innovation in different sensors (remote sensing, big data)
- Are different sensors comparable (harmonisation)
- Which data sets can be used to calibrate models?
- Different labs, same results?

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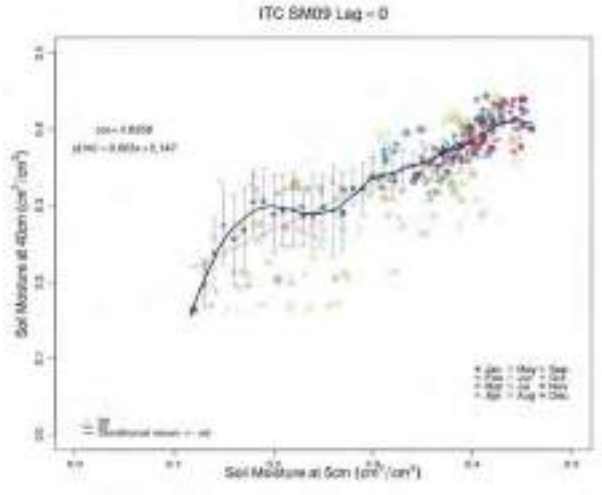
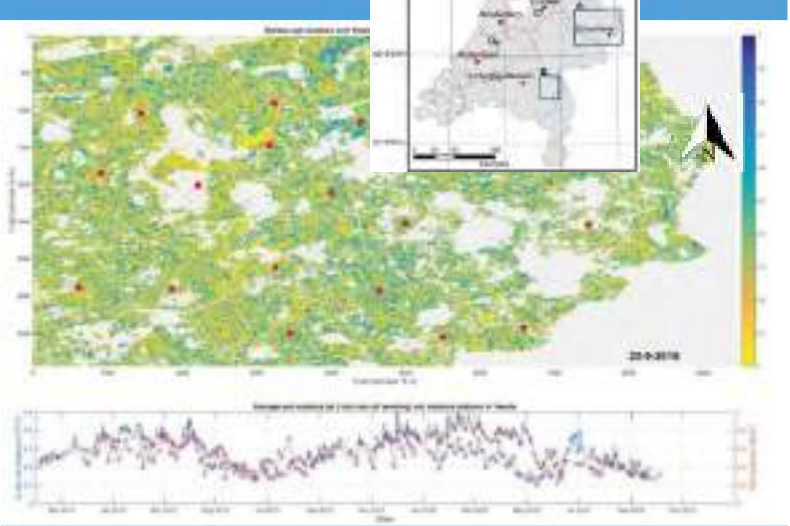
Emergent properties: Big data observations

- For example, soil moisture product from Sentinel-1
- For dynamic water management insight in subsurface response is needed.





Common Action

- Cost Action Application Global Soil Footprint
- Derived from the idea that (costs for) global exports depend on local soils. Soil threats are expressions of the global demand for resources.
- Connects part of ISMC & SOPHIE data questions
- ISMC modelling efforts with various stakeholders

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ZERO NET LAND DEGRADATION

Thank you for your interest

martine.vanderploeg@wur.nl

Have a look at soil-modeling.org

WAGENINGEN
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ISMC

International Soil Modeling Consortium

INSPIRATION STRATEGIC RESEARCH AGENDA AT A GLANCE

Overview of strategic knowledge needs

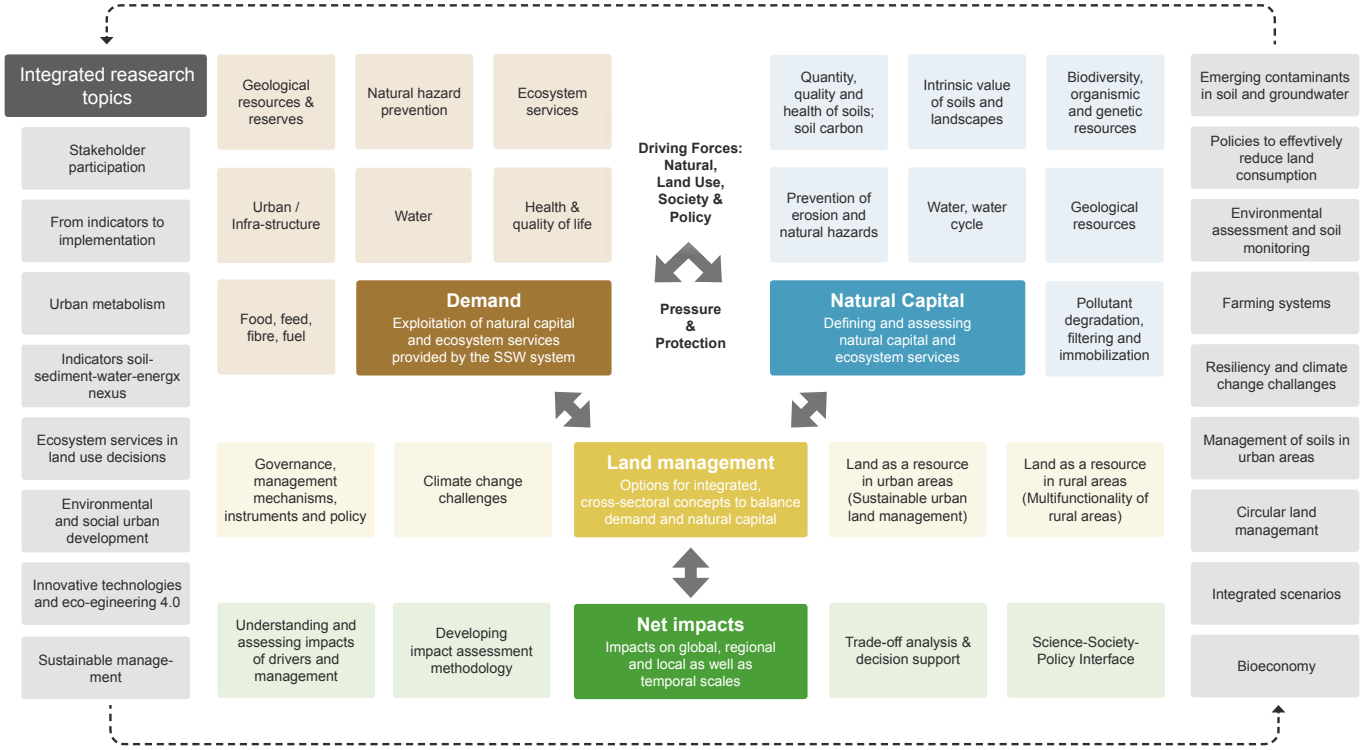
Strategic research agendas are of key importance for the allocation and prioritization of research funds. This is even more true for the creation of a competitive and efficient European research space. Moreover, the success of research and its implementation depend on the active involvement and recognition of it by society.

As a consequence, we involved more than 500 stakeholders from across Europe representing public bodies, businesses, academia and civic society to contribute to this agenda. They jointly identified shared land-related societal challenges and the accompanying research topics to help address them.

Over a three-year iterative process we integrated 17 national reports into 39 research priorities. These reflect a shared multinational perspective that highlights opportunities for co-funding across borders.

Find further details about the agenda development process on **www.inspiration-agenda.eu**.

The research needs are presented in a web-based searchable database open to all stakeholders. Parties interested in co-funding research projects can register their interest in the database. National contact points (see left) are able to assist in identifying co-funding partners.



Find details on all identified research needs at **www.inspiration-agenda.eu**

In the following, we present a selection of specific research demands that are examples of knowledge needs requiring research actions in Europe. To help implement these and other topics, please contact your INSPIRATION National Contact. - Details are provided below and updated on our websites.

STAKEHOLDER PARTICIPATION TO INNOVATIVELY CO-CREATE LIVEABLE CITIES

Involvement of stakeholders will enhance the success of sustainable solutions to urban land use conflicts as addressed in the UN and EU Urban Agendas

Why we need to act ? ▸ Balancing interests

Urban development and creating livable cities involve a huge variety of stakeholders, such as private households, businesses, planning authorities, land developers, conservationists. Urban land use is in constant transition due to the varying needs of different stakeholders. Sustainable urban land management is primarily concerned with the continuous search for a transparent and legitimate balance between the different interests. Moreover, it is about balancing these needs and pressures of urban dynamics with the opportunities and constraints of the environment and human well-being. The fundamental challenge is to create livable cities that integrate the different interests of the various stakeholders involved through the co-creation of acceptable solutions and finding appropriate instruments for resolving land-use conflicts resulting from this interplay of interests.

What we will gain ? ▸ Co-creation for sustainable urban land-use management

Against this background, stakeholder participation seems a promising approach in order identify mutual benefits but also conflicts between different interests.
The high demand for land leads to land-use conflicts, while well-designed and well-managed green and blue infrastructure may provide a range of ecosystem services to different actors simultaneously. Co-creation, in which different stakes are integrated and simultaneously addressed through smart design, may be the key to minimize urban land-use conflicts. Participation processes, related infrastructure and tools may also provide a platform for knowledge exchange and communication. However, a wide range of open questions has to be answered to exploit the full potential of participatory processes and to enhance decision-making in terms of legitimacy, acceptance and local ownership of the outcomes.
Different participatory approaches may entail pros and cons in any given context and in the course of planning and project development. The extent to which such stakeholder participation can occur without becoming too politicized needs to be established.
Stakeholder participation may bring along transaction costs and may reduce predictability of planning processes. So there is a need to identify cost-effective solutions and tools to realize the full potential of participation for supporting urban planning.

Key research areas

The INSPIRATION bottom-up approach shows an impressive variety of local and regional participatory approaches, e.g. on stakeholder involvement in land use planning and land and soil management. These experiences also generated numerous research questions, on methods, best practices, cost-effectiveness, and stakeholder motivation to ensure inclusive decision making and social empowerment.
Research is needed to symthesise and systematise previous experiences in order to learn lessons from successes and failures and to develop standards and procedures for future use.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

BETTER UNDERSTANDING OF THE NET IMPACT OF LAND MANAGEMENT

Investing in research increases our ability to discern the net impacts of today's land management and improves decision-making for tomorrow's

Why we need to act

The EU's prosperity and the well-being of its citizens are underpinned by natural capital, e.g. biodiversity and its ecosystem services. Intensive land use to meet growing demand for food, housing or bioenergy inevitably comes with ecological, economic and social impacts. Such impacts affect both the present and future generations. Only if we gain a sufficient understanding of the consequences of land management will we be able to take decisions that will contribute to growing a low carbon, resource efficient economy with a sustainable supply of raw materials.

What we will gain

Investment in research will yield the necessary knowledge to further develop impact assessment methodologies that will enable us to more systematically evaluate the consequences of alternative land use-decisions at different spatial and temporal scales. Such investment will help us recognise the impacts of still poorly understood risks and the potential benefits of novel land management practices, policy and administration, in both public and private sectors, and better informed consumers and citizens. Understanding the potential of co-production of knowledge and empowering people in decision-making will even further facilitate the transformation towards a more sustainable use of land, soils and water. This will help us build a liveable society within the limits of our natural capital.

Key research areas

INPSIRATION's bottom up approach revealed the most pressing research needs for understanding the net impact of our land management in the following areas (see INSPIRATION's SRA for details):

- develop indicators to monitor complex ecological systems
- exploit big data,
- understand impact of integrated valuations of land use management and land use change (recognizing ecological, economic and social impacts);
- improved understanding of the impacts of climate change on land use, of new and/or mixed contaminants on human health and ecosystem functions and of policies, planning and regulation on the (over-)exploitation of our natural capital;
- develop tools for trade-off analysis and decision support to resolve conflicting land management goals
- develop tools for spatially optimized land use strategies;
- enhance knowledge transfer from research into practice , increase acceptability of policy interventions by awareness-raising and stakeholder participation, and foster policy integration across different land use related policy sectors (e.g. agriculture, housing, traffic, environment).

How to become active?

Get in contact with your INSPIRATION national contacts at www.inspiration-agenda.eu to express your interest in collaborative funding of research to increase understanding of the net impacts of land management.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

A SOLID KNOWLEDGE OF NATURAL CAPITAL AND ECOSYSTEM SERVICES IS FUNDAMENTAL FOR A SUSTAINABLE DEVELOPMENT

Natural capital is an economic metaphor for the capacity of ecosystems to provide goods and services. A very cautious use of this capital forms the basis for sustainability.

Why we need to act?

The conceptual model of INSPIRATION includes the four themes (i) demand, (ii) natural capital, (ii) land management, (iv) net-impacts. These four themes interact with a number of cause-effect relationships, non-linear functions and feed-back loops. The concept of natural capital is of great importance within this network. Natural capital can be considered as an antagonist of the theme demand, i.e. a well-equilibrated balance between supply and demand is fundamental for a sustainable development. Land management decisions have to consider the potential and the limits of what natural capital can offer. Last but not least, a good knowledge of natural capital is essential to quantify net-impacts on ecosystems.

What we will gain?

In Europe space and resources are very limited and a sustainable development of our society requires careful political decisions. Costs and benefits of investments have to be evaluated not only from the viewpoint of economy but also with regard to ecology. Research on natural capital will provide qualitative and quantitative knowledge on natural resources and thus a solid basis for political decisions on land use. Well balanced decisions will be possible and detrimental long term effects on the environment can be avoided. Natural capital will not be exploited for imminent profit but preserved for future generations.

Key research areas

A detailed bottom up approach revealed six important research topics within the theme of "Natural capital"

- Quantity and quality of soils, health of soils, soil carbon, greenhouse gases: A careful assessment of soil quantity and quality is important for decisions with regard to agriculture, forestry, housing and infrastructure.
- Biodiversity, organismic and genetic resources: Biodiversity is a "life insurance" for a sustainable development.
- Water, water cycle: Water is a key issue particularly from the viewpoint of climatic change.
- Pollutant degradation, filtering and immobilization capacity: Healthy soils and water bodies are only possible if natural purification processes are active.
- Prevention of erosion and mud slides, natural hazards: Loss of fertile soil has to be avoided.
- Intrinsic values of soils and landscapes: Intrinsic values (e.g. aesthetic, cultural and social values) are ff paramount importance for the wellbeing of society.

How to become active?

Get in contact with your INSPIRATION national contact to express your interest in collaborative funding of research to increase understanding of natural capital and ecosystem services

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

NEW KNOWLEDGE FOR A BETTER COMMON AGRICULTURE POLICY

Investing in research delivers knowledge for targeted support of Europe-an agriculture for healthy food, circular economy and land stewarship

Why we need to act

Steering agriculture is a priority for European policy. European farmers have realized an incredible increase in productivity. This ensures food security and increasingly supports the step change to a bio-based economy. At the same time, new knowledge is needed to adjust CAP to international competition that increasingly requires low-cost production technologies, like monocultures or industrial life stock farming at expense of biodiversity and soil health. For example, fertilisers endanger fresh water resources that we depend on increasingly in times of climate change. New knowledge is needed to inform Common Agriculture Policy to become the game changer to an economically viable, environmental friendly and socially accepted agriculture in Europe.

What we will gain

Investment in research will yield the necessary knowledge for the CAP and the national transposition that enable the shift towards a bio-based and circular economy. Better informed policies will promote new business opportunities and solutions to technological challenges, such as smart precision farming. Targeted spending and regulation will optimise agricultural performance within the limits of our natural capital. It will make tax spending more effective while reducing the administrative burden. New policy incentives coupled with traditional farming expertise will enable farmers to become the environmental stewards of our land. Thus, Europe disencumbers from fossil resource dependency, exploits opportunities of nature based solutions addressing climate change with an agriculture that supports rural livelihoods while continually safeguarding food security.

Key research areas

Policy-making needs to be evidence based. We still face knowledge gaps on what the most economically viable, environmental friendly and socially beneficial agricultural practices and governance alternatives are. Research and innovation is to bridge the gap. INPSIRATION's bottom up approach revealed the most pressing needs for research in the following areas (see INSPIRATION's SRA for further details):

- quantifying the societal demand for divers agricultural products
- delivering technologies for smart precision farming
- recognizing the value of ecosystem services in agricultural policies
- indicators for a vision of sustainable agriculture shared by policy across scientific disciplines.

How to become active?

To express your interest in funding research that help EU CAP becoming the game changer for agriculture or to discuss the potential for co-funding with other European funders get in contact with your INSPIRATION national contact point.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

USING THE POTENTIAL OF LAND-BASED SOLUTIONS IN URBAN MANAGEMENT

Knowledge co-creation on integrated urban land management that connects disciplines and sectors in demonstration projects at the local and regional level, will contribute to innovative solutions to urban challenges as addressed in the UN and EU Urban Agendas

Why we need to act?

Cities are both the source of and solution to many of today's economic, environmental and social challenges. The New Urban Agenda of the UN, Habitat III, addresses how cities should be planned and managed to best promote sustainable urbanization. This includes protecting ecosystems and biodiversity, building urban resilience and a stewardship focused use of land and resources for urban development. The EU Urban Agenda prioritised sustainable use of land and nature-based solutions to improve quality of life in cities by focusing on land regeneration, constraining urban sprawl and encouraging brownfield reuse. INSPIRATION policymakers, local and regional authorities and companies identified climate change, greening of cities, the transition in housing stock and adaptation of infrastructure, urban sprawl, and reusing brownfields as major areas of research and innovation related to the availability of land. This perfectly matches the UN and EU urban agendas and is in line with the JPI Urban Europe research initiative to encourage the capacity for urban transition. Growing complexity and rapid technological and societal changes, make it increasingly important to have real-time and flexible responses to emerging problems and opportunities with respect to land. Environmental and societal objectives should be identified at an early stage of the planning process and balanced against purely profit driven economic targets. Spatial planning should reorient towards integrated land use management.

What we will gain?

Research and innovation is needed if urban land management in cities and regions is to support sustainable development. Continual regeneration of the built environment based on "circular land use" will ensure urban regeneration, brownfield renewal and energy efficiency in infrastructure and buildings. Land related adaptation and resilience to climatic and demographic change requires green infrastructure connected to Nature Based Solutions and multifunctional housing areas that transform cities into attractive and liveable places for the many not just the few. Research will help create new funding mechanisms through land acquisition funds addressing land for housing in growing Metropolitan areas. Local and regional development and land management agencies, could be supported to provide public stewardship that allows for greater impact in urban interventions, e.g. in brownfield regeneration. European regional development funds (ERDF) after 2020 as well as the orientations of national and regional regeneration programs are invited to support strongly needed urban investments by public and private sector. Both engagement and motivations are required. Research reveals the mechanisms of behaviour and interdependencies of public and private actors active in land-related policy areas. Existing conflicts including marked failures will be addressed based on scientific evidence to secure balanced decisions and appropriate solutions. Community-based developments will be a major driving force for urban transformations. The transdisciplinary approach, open laboratories and demonstration projects by researchers and urban practitioners ensures the support of public and private stakeholder as well as citizen engagement.

Key research areas

The INSPIRATION approach to focusing national research and innovation needs at an European perspective shows an impressive variety of innovative local and regional solutions for sustainable land management. Research is needed to understand and systemize these experiences to stimulate a stronger response to global economic mechanisms that threaten land functions.

How to become active

Local and regional authorities willing to implement demonstration projects on urban (and peri-urban) land management, co-funded by the EU, to direct regional development in a globalized economy, harmonized planning systems. CEMR Council of European Metropolitan Regions should take the initiative. JPI Urban Europe with initiatives on urban transformation capacities.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

RESEARCH FOR ACHIEVING LAND DEGRADATION NEUTRALITY

Achieving the sustainability goal of land degradation neutrality requires new governance, management, monitoring and assessment tools

Why we need to act?

The UN Sustainable Development Goals (SDGs) ask for Land Degradation Neutrality (LDN) by 2030. Land degradation is a global issue and encompasses a variety of impacts including erosion, contamination, soil sealing, land take, desertification. Trends and drivers are different within countries, regions and on the local level. Solutions to measuring and monitoring land degradation are predominantly needed at the local level. Research must contribute to develop scientifically based, measurable and locally applicable indicators that enable regions and countries to evaluate the progress in achieving LDN.

What we will gain?

The global conceptual framework of LDN is aimed at balancing losses and gains of land-based natural capital, including ecosystem services. New degradation must be compensated for by reversing past degradation elsewhere to achieve net neutrality. Research will assist in developing a deeper understanding of the LDN concept and will create a scientific foundation to guide LDN implementation and monitoring. The pros and cons of land use and land management activities will be better understood in terms of their potential to degrade or restore land and associated ecosystem services. Countries, regions and communities will learn how to adjust LDN to local conditions and gain tools to monitor and control LDN. Policy makers will be better able to identify the most effective policy areas for fostering LDN in order to support ecosystem functions and services and thereby enhance food security.

Key research areas

INSPIRATION's bottom up approach revealed pressing research needs for understanding land degradation. Examples are given below (see INSPIRATION's SRA for further details):

- Integrated Environmental Assessment and Soil Monitoring for Europe Monitor changes in soil quality with respect to levels impacting soil function, food security and human health and to measure progress on land degradation neutrality.
- Policies to effectively reduce land consumption for settlement development Knowledge on how to design effective policies given institutional constraints
- Sustainable management to restore the ecological and socio-economic values of degraded land Develop and demonstrate and region-specific restoration and rehabilitation approaches for valorization of different types of degraded areas.
- Prevention of erosion and landslides, natural hazards Develop alternative land use management strategies that will increase natural resilience to floods, fires, land subsidence, erosion and landslides
- Circular land management Understand the patterns of behaviour and interdependencies of stakeholders

How to become active?

Get in contact with your INSPIRATION national contact point to express your interest in funding research on Land Degradation Neutrality.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

EUROPE NEEDS CONTINUED INSPIRATION – A CSA FOR IMPLEMENTING THE AGENDA

Continued coordination and support action is needed to yield significant national funder contributions to implement the INSPIRATION agenda.

Why we need to act?

Spatial planning, land use and soil management are of substantial meaning for Europeans. The EU funded H2020 CSA "INSPIRATION" (2015-2018) identified in a unique bottom-up approach – engaging with more than 500 experts from more than 20 countries – the most pressing research needs for the next decade. They are clustered and presented in a Strategic Research Agenda (SRA) – www.inspiration-agenda.eu – to focus and stimulate future EU's and Member States' research investments addressing stakeholders' needs. This will contribute to an economically prosperous, socially sensitive and ecologically sensible Europe. To leverage such research investments, a targeted coordination and support action is needed.

What we will gain?

A targeted coordination and support action is an efficient tool to enable the implementation of the SRA (www.inspiration-agenda.eu). Potential regional, national and European funders interested in investing in the strategic research agenda have been screened in the current CSA. Further targeted support focused on implementation will translate their vision into reality! Funders will more likely invest as they can build on support of a network of national contacts who 1) elucidate the agenda's research priorities, 2) provide detailed information about transnational and EU funding interests, 3) make contact with national and European parties interested in co-funding, 4) identify mutual opportunities to pool resources and leverage outcomes. An implementation-targeted CSA will be DG Research's means to facilitate more transnational research in Europe on spatial planning, land use and soil management!

Key research areas

Transnational co-funding is key to leveraging impact from research investments in all topics identified in the strategic research agenda. The INSPIRATION agenda integrated research demands of 17 European countries into 39 research priorities. These reflect a shared multinational perspective on what knowledge is needed to address Europeans' societal challenges. The spatial planning, land use and soil management priorities span multiple disciplines and policy fields and are grouped under 5 themes:

1) Natural Capital and Ecosystem Services Supply
2) Demand for Natural Capital and Ecosystem Services
3) Land Use Management
4) Net Impact at different spatial and temporal scales
5) Integrated needs that cut across these themes.

How to become active?

DG Research should evaluate available means to support the implementation of the SRA (www.inspiration-agenda.eu). For any questions related to unique development and research priorities of this strategic research agenda, contact the project coordinators at contact@inspiration-agenda.eu. National funders are invited to contact INSPIRATION national contacts to discuss how they can support the research implementation.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

INTEGRATED APPROACH TO LAND MANAGEMENT AS A PRINCIPLE OF SUSTAINABLE DEVELOPMENT

Responsible land management is a key factor to ensuring sustainable development in Europe and to maintaining a balance between societal demands and the supply of natural capital

Why we need to act?

Land is a finite resource. A strategic approach to developing settlement patterns is needed as part of moving to an efficient use of Europe's land resource. Economic growth is coupled with resource consumption and hence land use and indeed consumption. Balancing demand for land and land availability in both urban and rural areas contributes to balancing demand of and supply for natural resources and ecosystem services. Research to understand the highly complex and dynamic issues in land management should strengthen our ability to cope with present and future resource stewardship challenges.

What we will gain?

Land management operates across multiple scales and crosses many territorial aspects. Much contemporary research on Land Management is fragmented across disciplinary boundaries within countries and often duplicated across countries with a consequent waste of resources. An integrated approach to land management, reflecting best practice, would be more likely if future practice was based on integrated research and co-operation of multi-national partners and organizations. Such Innovation and research should be focused not only on spatial planning and technical aspects but also on socio- economic impacts as well as preserving Europe's natural capital. Much contemporary research is fragmented within countries and often duplicated across countries with the consequent waste of resources. An integrated approach to land management should be based on integrated research and co-operation of partners, countries and organizations to ensure wide take up of best practice.

Key research areas

INSPIRATION's bottom up and demand-driven approach has identified research is needed to address the following issues.

- Achieving sustainable and effective land management given Europe's diversity of administrative and planning systems through introducing a generic European land use planning procedure supported by a comprehensive knowledge base about non- spatial issues such as conflict resolution, social cohesion, economic equality and honouring cultural heritage.
- Spatial planning and land management practices that account for climate change to ensure administrative, technical and societal preparedness for extreme weather and related hazards.
- Growing urbanisation and the related changes requires an innovative urban policies ensuring quality of life in European cities and increasing urban attractiveness. Research is required to understand and asses the patterns of urbanisation including urban sprawl, urban- rural partnerships, etc.
- Better understanding of the urban- rural interdependencies will contribute to efficient rural land management, development of sustainable agriculture, support preservation of nature and biodiversity and will provide options to deal with urban sprawl and rural depopulation.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information for a systemic approach on natural resources demand for goods and services supply.

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Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

ACHIEVING THE SDGS – WHAT DO WE NEED TO KNOW AND WHY REGARDING SOIL USE AND LAND MANAGEMENT?

Delivering the SDGs will be helped by research & innovation in multiple land use, water cycle and demand, and managing land use transitions

Why we need to act?

In 2015, the United Nations adopted 17 Sustainable Development Goals (SDGs) as a means of addressing and overcoming major societal challenges around the world. The European Commission and several European countries seek to put the SDGs at the heart of their policy frameworks, priorities and budgets. Notably, the Commission "commits to mainstreaming the SDGs into EU policies and initiatives … and into the Commission's everyday work". The stakeholder-driven research demands presented in the INSPIRATION SRA map on to the SDGs and will enable the Commission and individual countries achieve these goals.

What we will gain?

Sustainable land-use needs to be environmentally friendly, socially acceptable and economically affordable. The soil-sediment-water system has a role to play in achieving many of the SDGs. Coordinated and strategic research will provide a better understanding on the specific role of sustainable land use issues in the entire SDG framework. INSPIRATION's research needs have a particularly strong contribution to make to SDG 6: Clean Water & Sanitation; SDG 11: Sustainable cities and communities; SDG 13: Climate action; SDG 14: Life under water and SDG 15: Life on land. Research will help to inform indicators monitoring progress in achieving SDGs. Moreover, conflicts and synergies of targeting several societal challenges and SDGs need to be addressed.

Key research areas

Our bottom up approach revealed pressing research and innovation needs related to SDGs, e.g.:

- How can rural land be developed for multiple uses? SDG 15: "Sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss"
- What difference would an economic appraisal of the water cycle make on managing demand for water? SDG 6: Ensure water and sanitation for all.
- How can we transition to a circular and biologically based economy? Multiple SDGs: End poverty (1) and hunger (2), access to energy for all (7), promote economic growth (8), ensure sustainable consumption and production patterns (12), combat climate change (13), and promote sustainable use of terrestrial ecosystems (15).
- Given urbanisation and shrinking cities how will urban – rural interactions support sustained progress while managing land use transitions and preserving soil quality? SDG 11: Make cities inclusive, safe, resilient and sustainable.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

EMERGING CONTAMINANTS' IN SOIL AND GROUNDWATER

Europeans benefit from carefully designed fire fighting, pharmaceutical or personal care chemicals but must also deal with them in the environment

Why we need to act?

Emerging contaminants were designed to be recalcitrant (e.g. firefighting agents), to interact with human or animal biochemistry (e.g. pharmaceuticals) and often occurring in mixtures at low concentrations in the environment. They pose challenges of measurement, assessment and control. Greater knowledge about the properties of 'emerging' contaminants, and mixtures, their distribution in groundwater and soil, their toxicity to humans as well as soil and freshwater ecosystem services is needed to ensure public health and long-term provision of ecosystem services..

What we will gain?

Greater understanding of the impacts of 'emerging contaminants' will help us safeguard freshwater supplies and protect soil related ecosystem services. 'Emerging contaminants' (e.g. firefighting agents, endocrine disrupters, pharmaceuticals & personal care products) may worsen groundwater quality and degrade soil ecosystem services . However, their impacts on different temporal and spatial scales, the effects of mixtures and cost-effective strategies to minimize their discharge or to remediate contamination remains elusive. Environment specimen banks can provide samples for retrospective analysis (e.g. the German www.umweltprobenbank.de). More samples in multiple media are needed to understand the net-impact in the environment.

Key research areas

INSPIRATION's bottom up approach revealed pressing research and innovation needs for emerging contaminants in the following areas:

- Standardised ways of detecting and analysing, emerging contaminants
- Harmonised approaches to monitoring, risk assessing and where necessary remediating emerging contaminants

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu to identify joint funding options for this topic. For further information on this topic please contact Paul Nathanail (paul.nathanail@nottginham.ac.uk & @cpnathanail).

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

BIG DATA AND DATA SCIENCE FOR LAND USE MANAGEMENT

Deep understanding of socio-environmental systems and their response to future land management needs multi-disciplinary data science approaches

Why we need to act?

Big data refers to datasets whose size or type is beyond the ability of traditional data capture, management and processing tools. Big datasets are very large, are created rapidly and/ or are highly variable. Big data comes from sensors, video/audio capture, log files, transactional applications and social media - much of it generated in real time and in a very large scale. Improving preparedness for and responses to changing climate conditions and related hazards should include spatial planning as an instrument for coping with effects of a warming Earth. This needs a better understanding of climate change mitigation, adaptation and counteracting negative climate phenomena. New technologies are generating big datasets. Citizen science increasingly allows publics, e.g. with their smartphones, to contribute to rich datasets. Extracting knowledge and insight from such datasets requires interdisciplinary approaches spanning data science, natural science and social science.

What we will gain?

Integrated strategies on soil protection and land management should help reduce direct and indirect impacts of climate change. New technical and operational solutions can be developed using low cost and increasingly widely available data gathering technologies. Improved characterisation of the inter relationships between the soil-sediment-water nexus, including energy, and bio economic production is achievable with current big data and machine learning approaches coupled with improved monitoring and modelling techniques.
For circular land management, creative design, construction, decommissioning, rerolling and replacement of urban infrastructure to avoid the need for sprawl and increase the viability of public and shared services involves multi-disciplinarity and exploitation of big data to constrain activities.

Key research areas

INSPIRATION's bottom up approach revealed pressing research and innovation needs for exploiting big data and data science for land use management in the following areas:

- Development of low cost environmental monitoring and surveillance technology
- Deployment of big data analytics to understand socio-environmental system behaviour
- Development of simulation tools to predict socio-environmental system response to land use management

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu to identify joint funding options for this topic. For further information on this topic please contact Paul Nathanail (paul.nathanail@nottginham.ac.uk & @cpnathanail).

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OUR DEMAND FOR LIMITED SOIL-SEDIMENT-WATER ECO-SYSTEM SERVICES IS GROWING… UNTIL WHEN?

The long-term effects of our growing demand for Soil-Sediment-Water ecosystem services will be to threaten their supply and to compromise our quality of life.

Why we need to act?

Europeans demand ecosystem services from soil-sediment-water, not only for basic needs related to safe food, clean water, energy, raw and building materials, and support function, but also for higher level satisfaction of human needs like urban green spaces for recreation and the intrinsic aesthetic value of nature. This demand is growing while ecosystem services remain at best constant but potentially shrinking due to urban sprawl and pollution. Research and innovative solutions is needed to equilibrate supply of and demand for ecosystem services from soil-sediment-water.

What we will gain?

The demand for natural resources is driven by the overall consumption of goods and services of our societies. Research on a systemic quantification and mapping in time and space of the use of soil-sediment-water nexus as a resource will benefit to all of us. It will allows us to adapt our consumption and life style to resource availability. For example, circular economy principles could be promoted such as the use of bio-sourced goods in building materials to avoid consumption of raw resources. One of the challenges is to match long-term supply of and demand for ecosystem services to maintain and improve our well-being. Research will help prioritize innovation needs, consumption monitoring, education programs and objectives setting in resources policies.

Key research areas

INPSIRATION's bottom up approach (see INSPIRATION's SRA for details) identified pressing needs for research to understand the demand for ecosystem services from soil-sediment-water in the following areas:

- Understand, assess and optimize soil-sediment-water ecosystem functions and services,
- Develop specific methodology to evaluate demand for and supply of soil functions and services associated with urban, industrial, natural and production (agricultural, forest) ecosystems,
- Manage local and regional supply and demand of soil and aggregates through appropriate (re)use of excavated soils and temporary, pending reuse, storage of characterised materials,
- Evaluate potential for wood-based products to meet the demand,
- Enable efficient, socially acceptable and safe city centre development, brownfield regeneration, multiple function and temporary uses, densification and replacement of older buildings.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information for a systemic approach on natural resources demand for goods and services supply.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

RESEARCH FOR COMBATTING TRANSBOUNDARY SOIL DEGRADATION

More Knowledge about transboundary soil degradation is needed to estimate its impacts on soil, water, climate and food security

Why we need to act?

Soil degradation is caused by local activities but it can adversely impact the wider environment. Urban expansion or farming, for instance, may lead to local soil compaction, sealing, pollution or erosion. They may however also lead to wider impacts like loss of biodiversity, forests or water resources. Surface water can transport affected sediments into the wider environment including across national borders. Groundwater can transfer dissolved or non-aqueous phase contaminants across borders. Currently, there is no data to quantify the effects and economic impacts of soil degradation on transboundary environments.

What we will gain?

The loss of soil functions and the related decline of ecosystem services due to soil degradation have economic, political and social implications. Research will help estimate the extent and to calculate the costs of transboundary soil degradation. It will assist in providing new and comparable data in order to understand and quantify drivers and impacts of soil degradation as a trigger for practical and political response. Through cross border cooperation we will be able to address soil degradation effects on climate, water and food security more properly and at a larger scale.

Key research areas

INSPIRATION's bottom up approach revealed pressing research needs for understanding land degradation, including:

- Quantifying and assessing impacts of drivers and management – by gathering local and regional data on a larger scale
- Monitoring and evaluating soil functions, degradation and related costs
- Harmonization of pre-existing information on soil and land condition
- Integration of stakeholders in soil monitoring
- Raising awareness of transboundary effects of soil degradation
- Development of methods to calculate transboundary effects of soil degradation

How to become active?

Get in contact with your INSPIRATION national contact point at www.inspiration-agenda.eu to express your interest in funding research on effects of cross boarder soil degradation.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

DATA MANAGEMENT AND MONITORING SYSTEMS FOR LAND AND SOILS

Sustainable land management needs information about soil condition and trends in changes of land use and soil functions.

Why we need to act?

To estimate the impacts of human influence on land and soil a lot of data and information are collected by researchers and other stakeholders. This information is very heterogeneous and sometimes not available for consolidation. But for decision making, as well as for describing the effects of policy measures, we need reliable information. Therefore soil monitoring and survey systems are needed alongside methods of integrated data exchange, evaluation, and reporting..

What we will gain?

Long term field trials, permanent soil monitoring and surveys are important tools to observe changes in soil conditions and soil functions. This can be a warning systems to prevent hazards and risks to soils. By using data and information we could operate scenarios for land and soil management methods, land use changes, and their impacts to the environment.

Key research areas

INSPIRATION's bottom up approach revealed the most pressing research needs for understanding the net impact of our land management:

- developing indicators to monitor complex ecological systems
- exploiting big data,
- understanding the impact of integrated valuations of land use management and change (recognizing ecological, economic and social impacts);
- improving understanding of how climate change impacts land use, the risks posed by new and/or mixed contaminants to human health and ecosystem functions and the effectiveness of policies, planning and regulation on reducing (over-)exploitation of our natural capital;
- developing tools for trade-off analysis and decision support to resolve conflicting land management goals
- developing tools for spatially optimized land use strategies;
- enhancing knowledge transfer from research into practice.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic and for networking in the field of monitoring.

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

S.O.S. – SAVE OUR SEDIMENTS

Sediment shortage in river-sea-systems causes dramatic impacts, such as drowning deltas, worldwide. EU research can inform solutions.

Why we need to act

Human interferences, such as damming, have disturbed the sediment continuum in river-sea systems, worldwide. These interferences result either in a surplus or a lack of sediment. A surplus causes the siltation of reservoirs with negative effects on hydropower production and water storage; causes siltation of waterways with negative effects on navigation; and causes hyper-turbidity in estuaries resulting in the decline of ecosystem health. A lack of sediment causes coastal erosion and retreating or drowning deltas; causes erosion of river beds and degradation of channel morphology with impacts on river habitat and floodplain groundwater; and causes a lack of suited spawning material.

What we will gain

If scientists and stakeholders are given the opportunity, e.g. under EU Framework Programme 9, to team-up in research and innovation (R&I), this R&I can inform solutions that we urgently need to mitigate the societal, economic as well as ecological impacts resulting from either a surplus or from a lack of sediments in river-sea systems.

Key research areas

Sustainable and resilient solutions to disturbed sediment continua should be sought at the entire river-sea system scale. Presently, there are on-going R&I activities which only partially target "end-of-pipe" management solutions. Up to now, hardly any concerted R&I action is taken on the entire river-sea systems scale. R&I is needed which:

- Adresses entire river-sea systems, so crossing geographical as well as political borders;
- Carefully balances social, economic and environmental values;
- Involves stakeholders;
- Embraces the entire soil-sediment-water system (integrated solutions);
- Respects natural processes and functions;
- Not results in unwanted impacts elsewhere in the river-sea system (up- or downstream), not now, nor in the future;
- Recommends early solutions to decision makers where they can be implemented.

How to become active?

Contact your INSPIRATION national contact at www.inspiration-agenda.eu to identify joint funding options. For further information, in favour to see this topic in FP9 and/or want to suggest ingredients for the topic, then please contact Jos Brils (jos.brils@deltares.nl).

INSPIRATION acknowledges funding from Horizon2020 Framework Programme under grant agreement no 642372

Contact your INSPIRATION national contact at www.inspiration-agenda.eu for further information on this topic.

SOIL AND LAND RESEARCH FUNDING PLATFORM FOR EUROPE
Implementing strategic research for integrated spatial planning, land use and soil management

A flexible, self-financed platform of European funders to co-fund and disseminate research on sustainable management of soil and land

Who are we?

We are a group of initiative takers that strongly believe in the need for integrated soil and land research in Europe. We see added value through coordinating, co-funding and disseminating cross-border soil and land management research. We aim to establish a new self-financed platform of funders to implement integrated multidisciplinary research based on the experience of funders involved in SNOWMAN and other networks in order to address the knowledge needs identified by INSPIRATION and other initiatives. We welcome additional partners that share our vision and desire to collaborate.

What do we want?

We are interested in funding activities to implement the INSPIRATION Strategic Research Agenda (SRA) and SRAs of other initiatives by forming a funders' platform focusing on soil and land management research. We invite partners to join this flexible and self-financed platform that we are currently shaping. Partners of this platform may be public or private institutions that grant funding for research or knowledge dissemination, or other organizations willing to support these actions.

We wish to:

- Fund integrated soil and land research aimed at addressing the knowledge needs identified in the INSPIRATION SRA. We believe that transnational collaboration provides an added-value to the research and its impact.
- Avoid excessive administrative processes and preserve flexibility in research funding coordination.
- Produce implementable research and focus on its uptake by end-users, at all levels from the national to the local.

Why do we need to act now?

There is a growing sense of urgency that unless we improve our use of soil and management of land, societies will suffer and ecosystems will be damaged.

- Soil provides humans with key services related to several of the global Sustainability Development Goals formulated by the United Nations. While many severe threats to this resource have been recognized, soil and land degradation processes go on.
- Stakeholders in Europe have identified many knowledge needs related to soil and land – these were compiled in the Strategic Research Agenda by INSPIRATION and are now calling for action.
- Soil and land research needs coordination across regions, disciplines and stakeholder groups to properly address these knowledge needs. A targeted funders' platform around these issues is a key to leverage cross-country collaboration.

How do we want to act?

Our platform will allow partners to influence the choice of calls for proposals and then to co-fund proposals covering their priority topics while refraining from others. The technical appendix of this note gives further details.

For further information: contact Dr. Stephan Bartke stephan.bartke@uba.de or your INSPIRATION national contact at www.inspiration-agenda.eu

What will be gained by gathering into such a platform?

We will fund research in a more coordinated way and benefit from experience and skills from various professional backgrounds while keeping the overall picture provided by our common research agenda. Our platform will enable us to:

- Benefit from larger total budgets.
- Get wider ideas and views through multidisciplinary approaches.
- Complement each countries' expertise through cross-country collaboration.
- Ensure involvement of highly competent and skilled researchers and committed stakeholders from across Europe.
- Produce implementable research results (guidelines, recommendations, decision support tools, new technologies, etc.).
- Exchange experiences between platform members on specific topics.

How can you participate?

Partners of the INSPIRATION project act as facilitators of the funding platform until a governance has been agreed by the partners. For further information and to get involved, contact Stephan Bartke (stephan.bartke@uba.de) or any national contacts (listed at www.inspiration-agenda.eu) for further information on this platform. A workshop will be organized in spring 2018 to further discuss the possibilities of getting into action.

Technical appendix - How a joint funder platform could work

The collaboration will be flexible to respect every partner's objectives and domestic regulatory restrictions while leveraging the potential of trans-national collaboration. Details will be discussed and agreed with each potential partner. Based on experience, the following elements are foreseen:

- Ensuring a **self-financed platform** through a membership fee. Costs for a general platform secretariat are shared among "full members".

- Providing the **flexibility** of the platform by allowing for "full" or "affiliate" membership of funders:
  1. "Full members" help define strategy, provide overall direction and coordination of the platform and initiate joint calls. Full members support the joint secretariat. It is expected that costs for a full member will be in the range of 5,000 to 10,000 Euro/year depending on the total number of members in the platform. Members can be also allowed to substitute in-kind contributions (e.g. administrative staff time).
  2. "Affiliate membership" is time-limited and only open for research funds granting organisations or administrations in order to participate in a dedicated call and its associated costs.
  3. Full and affiliate members are free to define the budgets they are willing to assign in each call. Only those with a positive commitment to a call will bear specific associated call costs.

- Setting up a **Platform Steering Committee** with full membership funders and assisted by the joint secretariat in order to pursue 4 strategic objectives:
  1. Funding the implementation of Strategic Research through regular transnational calls for proposals , where each funder gives grants to its own country's research teams, yet as part of a common strategy.
  2. Periodically updating the research agenda based on emerging gaps and challenges – seeing the INSPIRATION SRA as a starting and living document open to other inputs.
  3. Transnationally disseminating knowledge acquired.
  4. Developing new funders´ partnerships.

- **Importance of dissemination**: Dissemination is a mandatory and important aspect of every funded project (e.g. website, conferences, publi- cations, …). A Knowledge Dissemination Task Team within the platform to support projects and enhance dissemination during and after the funded projects.

For further information: contact Dr. Stephan Bartke stephan.bartke@uba.de or your INSPIRATION national contact at www.inspiration-agenda.eu

IMPRESSIONS OF THE CONFERENCE

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INSPIRATION: NATIONAL CONTACTS

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INSPIRATION4EU

Your network to translate inspiration into reality

- National contact persons
- Detailed information about research priorities
- Implementing soil and land research
- Learn about transnational and EU funding interests
- Make contact with national and European parties interested in co-funding
- Find opportunities to pool resources and leverage outcomes
- Share national priorities in transnational and EU discussions

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