

D2.5

National reports with a review and synthesis of the collated information

Germany





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1. Introduction

1.1 About INSPIRATION

The aim of INSPIRATION is to establish and promote the adoption of a strategic research agenda for land use, land-use changes and soil management in the light of current and future societal challenges. Main objectives are:

- **Formulate, consult on and revise an end-user oriented strategic research agenda (SRA);**
- **Scope out models for implementing the SRA;**
- **Prepare a network of public and private funding institutions willing to commonly fund the SRA.**

The proposed methodology is based on a multi-stakeholder, multi-national and interdisciplinary approach that covers the variety of stakeholders (public bodies, business, scientific community citizens and society) and the variety of relevant funders. The vehicle to engage with relevant stakeholders across the Member States is a National Focal Point (NFP) in 17 countries¹. Between March 2015 and March 2016 The NFP's interviewed National Key Stakeholders (NKS), performed a desk study and organized workshops with national stakeholders of funders, end-users and researchers across the various soil and land management disciplines. The goal of these exercises was to gather information and support the main objectives as stated above.

The collated results will be structured along four integrative themes: 1) resources demand and efficiency; 2) natural capital stewardship; 3) land management; 4) net impact on global, EU and local scale (see section 1.3) and merging into thematic knowledge needs to satisfy the as yet unmet societal challenges and to ensure that knowledge contributes primarily to enable meeting these challenges. Based on these results, a cross-border and cross-discipline dialogue will subsequently be organized among the relevant user communities, funding bodies and scientific communities in Europe in order to reach a trans-national, prioritized SRA as well as a model for execution of this SRA. Thus a SRA will be produced which will give national funders confidence that for each Euro they spend, they will get multiple Euros worth of knowledge in return in order to address their national societal challenges.

Learn more about the INSPIRATION coordination and support action on the project's website: www.inspiration-h2020.eu and follow us on twitter: [@inspiration4eu](https://twitter.com/inspiration4eu).

¹ The Swedish Geotechnical Institute (SGI) with support of Formas is currently mirroring the INSPIRATION approach in Sweden. SGI has proposed to act as Swedish National Focal Point and to become a full member of the INSPIRATION consortium. This has been welcomed by the consortium. Currently formal negotiations are in place between SGI, the consortium and the EC to effectively implement this collaboration. This report furthermore contains some information for Denmark and Luxemburg – representatives of both countries joined the Belgium workshop – and for the Republic of Ireland – representatives joined the UK workshop – see below.)

1.2 This report

This country report is an excerpt from the INSPIRATION Deliverable 2.5 “National reports with a review and synthesis of the collated information”, which integrates 17 national reports. These 17 countries, in alphabetical order, and respective report authors are:

1. **Austria**,
Pia Minixhofer, Sophie Zechmeister-Boltenstern, Rosemarie Stangl, Andreas Baumgarten, Martin Weigl, Peter Tramberend,
2. **Belgium** (including some information for **Denmark** and **Luxemburg**),
Nele Bal, Bavo Peeters,
3. **Czech Republic**,
Petr Klusáček, Stanislav Martinát, Bohumil Frantál,
4. **Finland**,
Antti Rehunen, Teija Haavisto, Ritva Britschgi, Outi Pyy, Jari Rintala, Petri Shemeikka,
5. **France**,
Marie-Christine Dictor, Samuel Coussy, Valérie Guerin, Corinne Merly,
6. **Germany**,
Uwe Ferber, Stephan Bartke, Detlef Grimski,
7. **Italy**,
Matteo Tabasso, Sarah Chiodi, Giulia Melis,
8. **Poland**,
Anna Starzewska-Sikorska,
9. **Portugal**,
Thomas Panagopoulos, Vera Ferreira, Dulce Antunes
10. **Romania**,
Mihail Dumitru, Sorin Liviu Stefanescu, Andrei Vranceanu, Valentina Voicu, Nicoleta Vranceanu,
11. **Slovakia**,
Maros Finka, Maria Kozova, Zita Izakovicova, Lubomir Jamecny, Vladimir Ondrejicka,
12. **Slovenia**,
Boštjan Cotič, Barbara Mušič, Ina Šuklje Erjavec, Matej Nikšič,
13. **Spain**,
Pierre Menger, Gemma Garcia-Blanco, Efren Feliu,
14. **Sweden**,
Yvonne Ohlsson, Lisa van Well, Kerstin Konitzer,
15. **Switzerland**,
Regula Brassel, Marco Pütz,
16. **The Netherlands**,
Linda Maring, Jos Brils
17. **The United Kingdom** (including some information on **the Republic of Ireland**),
Paul Nathanail, Matt Ashmore.



Deliverable D2.5 concludes the activities of INSPIRATION Work Package (WP) 2 **“Demands of research from industry, end-users and funders (State-of-the-art at national levels)”**, task 2.5 **“Review and synthesis of the collated information”**.

The WP2 activities were executed in the 1st year of the INSPIRATION project (month 1 – 12), i.e. in the period from March 2015 to February 2016. In the WP2 project description, the final task executed in this period is described in the following way:

“The NFPs will organize at national level a 2-day workshop, where the collated information (task 2.4) will be reviewed and synthesized and prioritized under guidance of the NFP by the NKSs. The WP-leader will prepare – in consultation with the INSPIRATION core group – a generic outline for the agenda of the 2-day national workshops. That outline will then be tailored to specific national situations by the NFPs. The results of the workshop – i.e. reviewed and synthesised information regarding topic a-d as mentioned under the WP2 objectives² – will be described in a national report (in English) by the NFPs. Before finalizing these reports, the NKSs as well as the International Advisory Board (IAB) will be given the opportunity to review the draft report. In these cases where English is not the native language, the national reports will also contain an executive summary (policy brief) of the report in the native language.” (INSPIRATION Grant Agreement - Description of Action - DoA).

Deliverable D2.5 describes the results of NKS interviews and of the desk-exercise as performed in participating countries aimed at collecting national research demands, science-policy-interface experiences and funding options. This report builds up on the interim results presented in Deliverable 2.4.³ The methodologies followed for the information collation and synthesis are presented in more detail for each country below. In general, the following approach was applied (see also Figure 1):

1. In each country, national key stakeholders (NKS) have been identified (in a way to ensure broad representation of soil and land-use/management topics and affiliations in research funding / end-use / science or policy making);
2. Interviews (structured according to a common template: see Annex I and II) with circa 20 NKS per country have been conducted in order to collect national research needs as well as information on science-policy-interface and financing options (with interim result presented as D2.4);
3. In each country, a national workshop with NKS was conducted. Basis for the workshops was the input provided in the NKS interviews before the workshop. It was presented in order to synthesize the collated info, discuss and review the key national research topics. The workshop thus aimed to check, verify and enrich, and in some cases also already prioritize the suggestions provided by the NKS;⁴

² See section 1.5 for a description of topic a-d.

³ Brils, J. et al. (2015): National report on collated information following the template. Final version as of 01.12.2015 of deliverable 2.4 of the HORIZON 2020 project INSPIRATION. EC Grant agreement no: 642372, UBA: Dessau-Roßlau, Germany.

⁴ In several countries besides the NKS interviewed also more stakeholders were invited (i.e. it were open events), and participated and contributed to the workshops.

4. The results of the interviewing plus workshop process were documented in a report to become the respective final national reports. A draft version was to be send nationally to the NKS for review;
5. The national reports were aggregated in a combined document, on which the International Advisory Board (IAB) of INSPIRATION was asked to give feedback, too;
6. The D2.5 report has been finalised taking into account the IAB recommendations.

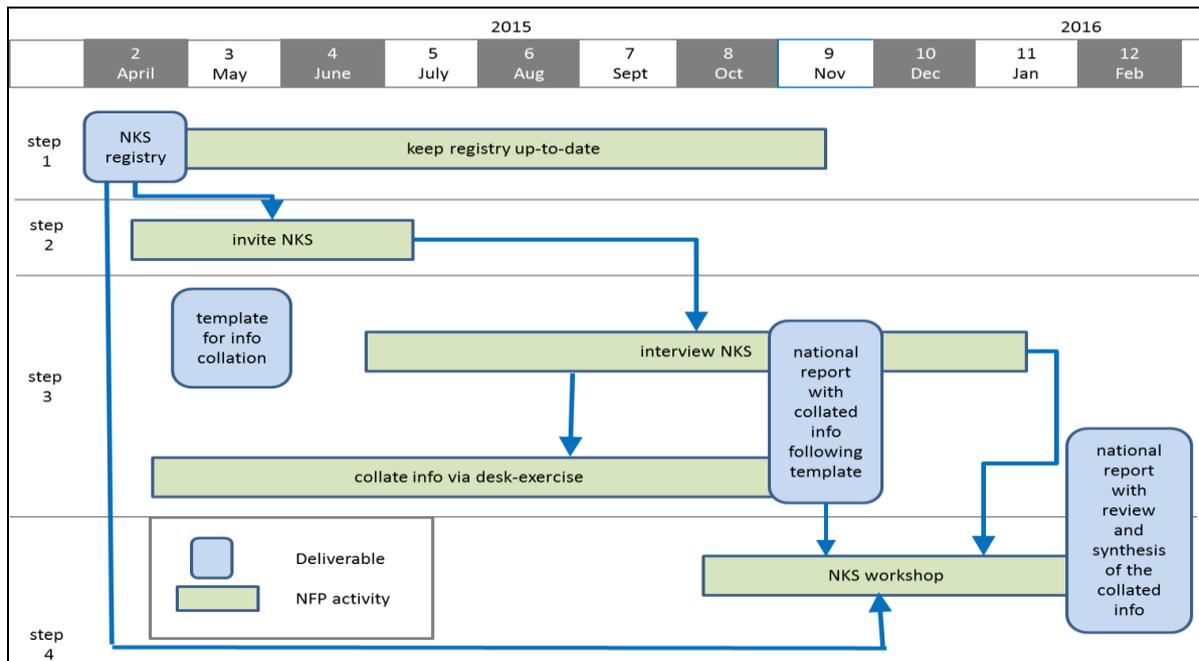


Figure 1: INSPIRATION's WP2 workflow.

The information collated in this report feeds into WP3 “Transnational commons aggregated under integrated themes”. According to the INSPIRATION DoA, the main objectives of WP3 will be to:

1. Achieve an overview of the transnational shared demands and experiences grouped under common themes based on the national state-of-the-art reports as produced by WP2,
2. Prioritise and elaborate the topics that could be included in the SRA (to be developed by WP4) under specific themes,
3. Elucidate the opportunity to match (to be done under WP4) individual stakeholders (as funders) to specific SRA topics that could be shared transnationally.” (INSPIRATION Grant Agreement - Description of Action - DoA).

Visit the INSPIRATION website for the up-coming deliverables of the network!

1.3 The INSPIRATION conceptual model and its themes

In order to identify cross-country and cross-sectorial knowledge gaps and research questions, the national Research and Innovation (R&I) needs will be analysed along four overarching themes identified in the INSPIRATION conceptual model. This model is presented in figure 2. It has been used to structure the information presented in this report on R&I needs following these guiding key-questions for each theme:

- **Demand:**
What does society demand from natural capital and ecosystem services including the SSW-system?
- **Natural capital:**
What has nature, including the Soil-Sediment-Water (SSW)-system, to offer and which determinants sustain the system?
- **Land management:**
What are options for an integrated, cross-sectorial land management to balance societal demands and natural capital?
- **Net-impacts:**
What are the impacts of different options of managing natural capital, including the SSW-system on global, regional and local as well as temporal scales?

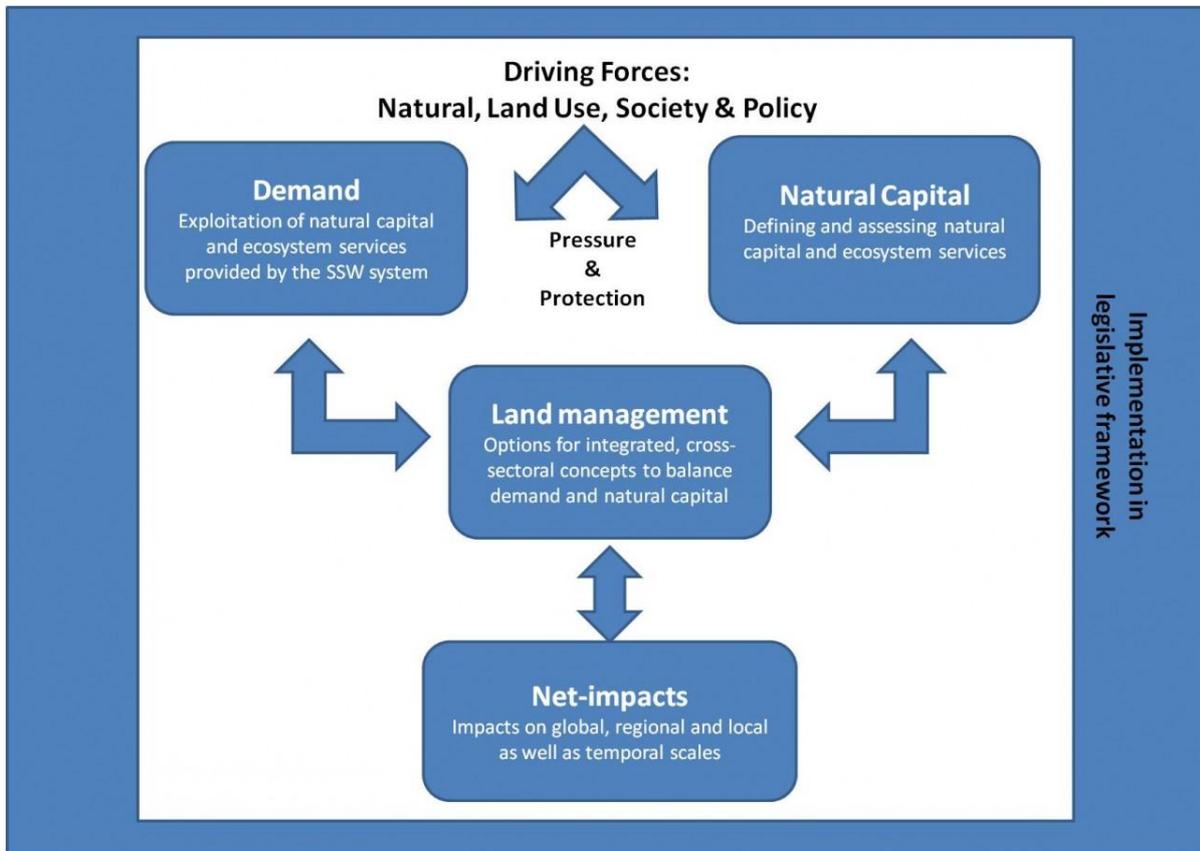


Figure 2: INSPIRATION's conceptual model.

1.4 Guide to the reader: outline of the country chapters

Each country chapter in Deliverable D2.5 follows a comparable outline:

Section X.1- Executive summary

This section provides an executive summary in English (X.1.1) as well as in the national language (X.1.2).

Section X.2 - Methodology followed

This section describes the methodology followed in the respective country including information on the stakeholder engagement (see also section 1.4).

The subsequent sections give a review and synthesis of the main results of the topics as mentioned under the WP2 objectives (see section 1.2).

Section X.3 Research and Innovation (R&I) needs

➤ **Topic a: Demand-driven*** suggestions for the Strategic Research Agenda (SRA), i.e. suggestions from the perspective of industry, end-users and funders.
*Related key question to be answered: **What (new) knowledge do these parties need to tackle societal challenges including the increase of job opportunities?***

* **Demand-driven** in INSPIRATION means focusing on the demands of those who are responsible or feel committed to tackle the societal challenges related to the INSPIRATION scope and themes, i.e. industry, end-users and funders. These parties could improve their business opportunities and/or take better informed decisions on what measures to take and execute in order to tackle other societal challenges if they would (be enabled to) use the knowledge as resulting from execution of the INSPIRATION SRA.

This section is divided in the sub-sections:

- Societal challenges and needs (X.3.1);
- Topics / research needs to include in the SRA (X.3.2).

The research questions under the topics in the X.3.2 sub-sections are divided by themes of the INSPIRATION conceptual model as described in section 1.3 of this chapter.

Section X.4 - Experiences regarding connecting science to policy/practice

➤ **Topic b:** Experiences regarding the exploitation of scientific knowledge to improve business opportunities and/or tackle other societal challenges.
*Related key question to be answered: **Where to improve the science-policy interface so that (new) knowledge can and will be more effectively exploited by the demand side?***

This section is divided in the sub-sections:

- Use of knowledge (X.4.1);
- Possibilities to set the agenda (X.4.2);
- Science – policy – practice (X.4.3).



Section X.5 National and transnational funding schemes

- **Topic c:** *Predominant, current as well as promising alternative funding schemes / mechanisms / programs for knowledge production and dissemination.*
*Related key question to be answered: **How to get with one Euro of national/regional funding a multitude of Euro's (from all sources) worth of knowledge in return contributing to EU and national demands? Or even how to get with one euro of EU funding a multitude of euro's (from national, regional, local, and private sector) worth of knowledge in return contributing to the R&I demands on Land and the Soil-Sediment-Water systems.***
- **Topic d:** *Experiences regarding the use of any trans-national, common budget for scientific knowledge production related to the scope of INSPIRATION.*
*Related key question to be answered: **How to set up/govern the appropriate funding option(s) resulting from INSPIRATION – based on previous learning experiences – so that: (1)the above demands will be fulfilled, (2) knowledge resulting from implementation of the SRA will be taken up and used and (3) funders experience that their invested, national Euros are indeed multiplied?"***

This section is divided in the sub-sections:

- Funding schemes and possibilities for research funding (X.5.1);
- Gaps in financial resources for research (X.5.2).

Section X.6 - Other remarks made by interviewees

This section is optional and is not taken up in all national reports. It contains remarks, points of attention and recommendations for INSPIRATION as given by the NKS.



1.5 Annexes

Annex I: NKS questionnaire template

This is the updated version of the questionnaire - reflecting inputs from the IAB and discussions at the NFP training in Vienna on 22nd – 23rd June 2015.

Note: this questionnaire template is meant to help National Focal Points (NFPs) to facilitate the interview/conversation with the National Key Stakeholders (NKS). Some questions are relevant to one NKS, other questions to another NKS. Hence, not all questions are relevant to each single NKS. The NFPs are required to adapt the template accordingly – keeping in it as many as possible of the issues to be addressed. If needed, the NFPs also translate the questionnaire into their national language.

The questionnaire (see next pages) has the following outline:

- A. **Interview information:**
To be filled out by the interviewer
- B. **Introduction:**
That the interviewer can use to start the NKS interview
- C. **Background information of the NKS interviewed:**
Mostly 'tick-boxes'
- D. **Strategic Research Agenda (SRA):**
NKS preferred topics, overarching themes and scope for the SRA and national state-of-the-art on research agendas that the NKS is aware of
- E. **Science-Policy-Interface:**
NKS experiences regarding the exploitation of scientific knowledge to: improve business opportunities; tackle other societal challenges; assist policy-implementation and/or policy revision
- F. **Funding:**
Predominantly used as well as promising alternative funding schemes / mechanisms / programs for knowledge production and dissemination that the NKS is aware of
- G. **Other:**
At the end there is some time advised to let the NKS give us their advice, some nice quotes (that we can use anonymously in our communications), examples etc.
- H. **Ending the interview:**
Explain follow up and if/how NKSs will be involved in the next steps of INSPIRATION

Questionnaire template

A. Interview information

Country:

Name of INSPIRATION researcher:

Date of Interview:

How does the NKS wish to be referred to: *[Anonymous, personal opinions, company's opinion. Choose when it is a good time to discuss this. In the beginning or later on.*

SHOW the interviewed NKS the ENGAGEMENT CONSENT FORM and ask him/her to fill it out. Please introduce the engagement consent form (available in 'D2.1 MoU' and editable by yourself) and hand a copy to the interviewee to read and fill in – make sure that you take this away with you and keep for your own records]

B. Introductions

[Please introduce your selves, the project and the purpose of the interview. You can use the handout as provided at the end of this template. This can also be sent beforehand to the NKS. Agree on a time span: approximately one and a half hour.]

C. Background information on the interviewee

1. Name of NKS interviewed:

2. Institution:

3. Role:

4. Are you a (multiple answers possible):

- National-regional-local authority
- University/research institute
- Small or Medium sized Enterprise (SME, i.e. < 500 employees) / consultant
- Business and industry
- Non-Governmental Organisation (NGO)
- Network representative / leader
- Other, specify: ...

5. Fields of expertise (multiple answers possible): *[Ask to specify background regarding the selected item(s) in order to understand expertise background of interviewee]*

- Soil
- Water
- Sediment
- Urban / spatial planning
- Landscape design
- Land management
- Other, specify:

6. Does your organisation provide external research funding?

- Yes. Please specify: ...
[e.g. as programme holder, public, private, ...]
- No

D. SRA

7. Which societal challenges do you regard as important?

[If needed, you can use the European Commissions (EC) list of societal challenges here. These EC themes are:]

- Contribute to food security and food safety;
- Ensure secure supplies of safe drinking water;
- Secure energy supply and distribution;
- Reduce raw material and resource consumption, Ensure efficient use of natural resources;
- Contribute to climate change mitigation and societal adaptation;
- Contribute to a healthy living environment;
- Ensure secure infrastructure

[Explain that these challenges may be used as bases for defining of the overarching themes for aggregating the research topics of our SRA.]

- a. If applicable, what additional, other or alternative challenges would you suggest/prefer?

[When needed, you can mention challenges as nature conservation, sustainable use of ecosystem services, halting the loss of biodiversity]

8. Starting with your own experience: which specific topics (research needs) should be included in the SRA?

[For each single topic mentioned by the NKS, use the following follow-up questions. The a, b and c sub-questions are mandatory. The other sub-questions are optional]:

- a. Explain – elaborate the topic

- *Who will be affected?*
- *Who is responsible?*
- *Is it a topic of concern of your organisation / department*
- *Is it only a national topic, or a shared topic by multiple countries?*
- *Where are we now, where do we want to be in x years (point on the horizon)?*
- *How can the newly gained knowledge be effectively used?*

- b. Priority:

1. *High priority*
 2. *Some priority*
 3. *Neutral priority*
 4. *Low priority*
 5. *No priority*
- *What is the urgency, i.e. what goes wrong if we do nothing?*

c. Who wants to/should fund this kind of research?

[Optionally: check the following WP3 key-words for relevance, i.e. if they raise any additional topics by the NKS. The key-words can be used as support / check list

Be sensible as interviewer if this is needed.]

- *Assessment of land resources*
- *Potential productivity of land and soils*
- *Demand for soil/land resources, imports and exports*
- *Competition between land uses (land-use conflicts)*
- *Concepts to identify and quantify relevant impacts*
- *Instruments to avoid / minimize impacts (feedback to decision-making process)*
- *Opportunities of innovative land-use technologies*
- *Resource-oriented land management systems]*
- *Soil regeneration*
- *Soil and groundwater remediation*

9. Linked to topics mentioned by the NKS:

- a. What are the important / relevant documents, research agendas, research programmes underpinning these topics? (state-of-the-art)
- b. Related to these agendas and programmes: what are timelines of programming and windows-of-opportunities to influence agendas / programmes?

[Note: question 9b is input for work package 5]

E. Science-Policy-Interfacing (SPI)

10. How would you define 'scientific knowledge'?

11. For what do you use scientific knowledge in your job?

12. Which sources of (scientific) knowledge do you use for doing your job?

[Open question and you can mention some of the sources underneath as examples]

- | | |
|--|---|
| ○ <i>scientific paper</i> | ○ <i>newspapers</i> |
| ○ <i>consultants</i> | ○ <i>television</i> |
| ○ <i>reports</i> | ○ <i>conferences Involvement in research projects</i> |
| ○ <i>colleagues</i> | ○ <i>data (bases)</i> |
| ○ <i>experiences /examples within my own country</i> | ○ <i>websites, such as:</i> |
| ○ <i>experiences /examples abroad</i> | ○ <i>other, specify:</i> |

13. To what extent do you use most recent/new scientific knowledge (i.e. state-of-the-art scientific insights/findings) for doing your job?

14. To what extent are you able to influence (and how) the setting of scientific research policies/agendas in our country?

15. To which extent do our national policies/agendas reflect your specific needs and priorities?

16. To what extent has been made use of the state-of-the art in scientific research for the formulation of existing policies in our country?

[Questions only for NKS from the non-science sector (business and policy):]

17. Have you ever been involved in:

- a. the formulation of scientific research questions?
- b. doing scientific research (i.e. knowledge co-creation)?
- c. synthesizing/wrapping-up of scientific knowledge, e.g. to feed into policy making or to increase business opportunities?

[When yes: Follow-up questions]

- How successful/satisfying was this, on a scale of 1-5?
 1. *Very successful/satisfying*
 2. *Successful /satisfying*
 3. *Neutral*
 4. *Unsuccessful/unsatisfying*
 5. *Very unsuccessful/unsatisfying*
- What went well
- What could be improved?
- What to avoid/not to do?
- Additional remarks?

[Question only to NKS who are likely to have insights here (e.g. research funders)]

18. (How) is the societal impact of scientific research related to the scope of INSPIRATION being assessed in our country?

[If they know: Follow-up questions:]

- How successful/satisfying is this, on a scale of 1-5?
 1. *Very successful/satisfying*
 2. *Successful/satisfying*
 3. *Neutral*
 4. *Unsuccessful/unsatisfying*
 5. *Very unsuccessful/unsatisfying*
- What indicators are used?
- What goes well?
- What can be improved?
- What to avoid/not to do?
- Additional remarks?

19. Which national Science-Policy-Interface documents do you know of / can you recommend?

F. Funding



20. Which experiences and expectations in funding schemes (public / private) do you have in your own field that could offer opportunities for future research on land-use and -management and related impacts to Soil-/Sediment-/Water-systems:

- Sub-nationally/regionally?
- Nationally?
- European? [e.g. H2020, Interreg, multi-lateral such as the Joint Programming Initiatives]
- International? [e.g. Belmont Forum, Foundations.]

[For all R&I questions aiming at achieving policy targets in the Land & SSW related system (like e.g. Sustainable Development Goals on soils, existing EU directives such as the Environmental Liability Directive, etc.) consider all Public and Private funding sources. Please ask to provide details and give most important references (documents, website) that could be relevant for explaining the answer]

21. How to increase the added value of different financial resources (i.e. achieve a multiplier) for doing research that contributes to EU and national demands, in particular to the R&I demands on Land and the SSW-system?

[CONSTRUCTIONS that (could) work. PP, PPI, etc. Just ask for, as open as possible for suggestions, ideas, experiences, good examples]

22. Are there areas of research and innovation (R&I) that you are aware of that are not (yet) covered by current funding mechanisms and which would need new/different funding schemes / infrastructures?

23. Integrated approaches (necessary for addressing particular societal challenges related to the use and management of land and related impacts to SSW systems) are usually difficult to fund / get recognized by the research funding communities. What would be necessary to improve this?

24. Based on previous learning experiences that you are aware of: how to best set up / govern funding option(s), so that societal demands will be fulfilled, knowledge resulting from execution of the SRA will be taken up and used; and funders experience that their invested, national Euros are indeed multiplied? *[if they know: follow-up questions]*

- How successful/satisfying was this, on a scale of 1-5?
 1. *Very successful/satisfying*
 2. *Successful/satisfying*
 3. *Neutral*
 4. *Unsuccessful/unsatisfying*
 5. *Very unsuccessful/unsatisfying*
- What went well?
- What could be improved?
- What to avoid/not to do?
- Additional remarks?

G. Other (remarks, suggestions, examples):

H. Ending the interview

Thank you for taking the time to participate in this interview:

- Would you like us to keep you updated about INSPIRATION progress?
- Would you suggest anyone else who we should be interviewed by us?
- Do you have further questions arising from this interview, or would you like to add anything else?
- What information are you interested in, and willing to give feedback on?

[Discuss the feedback mechanism and if they have expressed their opinions as a person or as a representative of their organisation/network. Checklist:]

a. Information to exchange / willingness to give feedback on:

- (complete interview, not recommended)
- summary of main conclusions
- national report, national contribution to D2.4
- complete D2.4, all countries

b. Preferred level of feedback:

- no feedback
- informal feedback
- formal feedback (e.g. on behalf of represented organisation)

[Check: have you discussed consent form / how to refer to interviewee]

INSPIRATION acknowledges the received funding from the
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Annex II: NKS hand-out: INSPIRATION interview at a glance

INSPIRATION interview at a glance

Aim of INSPIRATION:

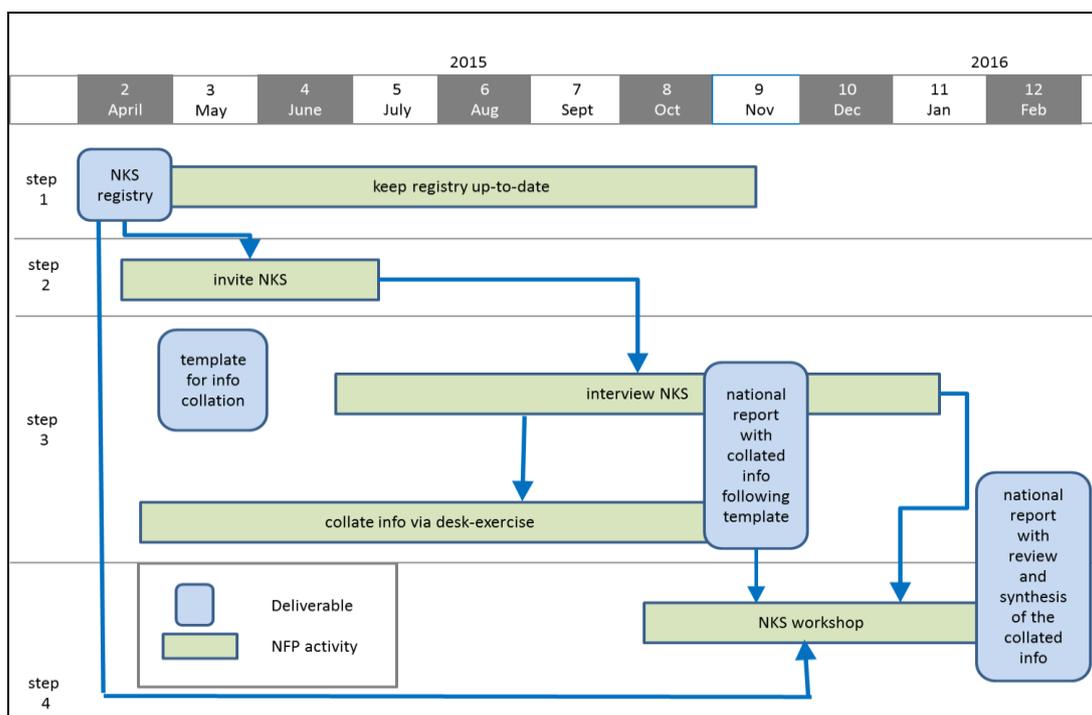
The main purpose of the EC-funded INSPIRATION project is to formulate an end-user driven strategic research agenda (SRA) for land-use, land-use changes and the related, impacted compartments of the Soil-Sediment-Water (SSW) system in order to meet current and future societal challenges and needs. Next to that, the project aims to scope out models of implementing the SRA and to prepare a network of public and private funding institutions willing to commonly fund the execution of the SRA.

National Key Stakeholders (NKS):

In a series of NKS interviews across EU nations the “National Focal Points (NFP) gather for nations individually information related to the INSPIRATION scope (land and SSW-system use and management) on:

- Research and Innovation (R&I) needs
- Experiences regarding connecting science to policy/practice
- National and transnational funding schemes

In the interviews we focus at NKS – like you – positioned at a strategic level, i.e. leading persons in their field of profession; with a good overview on opportunities; a clear vision on, and insight in knowledge demands (short, middle and long-term). Furthermore, these NKS are well positioned and participate in relevant professional network(s) and may also have potential to become an ambassador for INSPIRATION. We selected NKS to represent different disciplines and institutional backgrounds including: land-use planners; managers; soil, sediment and water experts; researchers, funders and regulators/policy makers.



Workflow in the first year of INSPIRATION



This interview:

Collecting input from you – an expert in your field – is crucial for the project in order to help us describing the state-of-the-art in our country as input into the European research agenda. In the interview we will go through a series of topics and questions: The interviews of NKS (ca. 20 per nation), together with a desk study on research needs and funding possibilities will be synthesized to a 'national report'. This synthesis will be reviewed in a national workshop, to prioritize the topics for the suggested Strategic Research Agenda (SRA) from our country's point of view. The national reports will finally be used as input for elaborating the European SRA and cross-nation matchmaking (matching research needs to possible funding).

Example questions:

Research and Innovation (R&I) needs

- Which societal challenges do you regard as important?
- Starting with your own experience: which specific topics (research needs) should be included in the SRA?

Experiences regarding connecting science to policy/practice

- How would you define 'scientific knowledge'?
- To what extent has been made use of the state-of-the art in scientific research for the formulation of existing policies in our country?

National and transnational funding schemes

- Does your organisation provide external research funding?
- Which experiences and expectations in funding schemes (public / private) do you have in your own field that could offer opportunities for future research on land-use and -management and related impacts to Soil-/Sediment-/Water-systems

Your benefits from participating:

- A chance to influence the European SRA on land and SSW management in the light of societal challenges and needs;
- Being able to make use of the results of the project: overview of research need and of existing and promising funding schemes on different levels (sub-national, national, European, international) and opportunities for a better connection between science and policy/practice;
- Use the matchmaking opportunity to get in contact with other networks in- and outside our country, and countries learn which shared challenges can be taken up jointly.

Contact and further information:

For general information on the INSPIRATION project visit our website: www.inspiration-h2020.eu

Contact the National Focal Point:	Contact the general project coordination:
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2. Germany

Report by Uwe Ferber, Stephan Bartke, Detlef Grimski

2.1 Executive summary

2.1.1 English version

Societal challenges and needs:

In Germany, sustainable land use has been increasingly understood as a key challenge receiving attention for example by the national Sustainable Development Strategy that aims at limiting land-take to 30ha/day by 2020. It is regarded as a cross-sectional topic, in which most of the relevant societal challenges are closely interrelated. It is recognized that the on-going intensification of land-use conflicts cannot be solved by improving discipline-oriented management alone. The scarcity of the resource land requires calls for sufficiency strategies and circular land management to revitalise brownfields and reduce urban sprawl. Food security and secure water supply can only be achieved through a sustainable management of agriculture and ecosystems in rural areas. These are challenged by the increased intensification of traditional agricultural practices. Last not least, the underestimation of the importance of soils in the general public and policy making was noted as challenging towards a broad recognition of soil in its holistic meaning for ecosystems and the society.

Topics / research needs to be included in the SRA:

Nine research fields have been identified in Germany based on interviews and a national workshop with more than thirty national experts conducted in Berlin in 2015.

Sustainable land use can only be achieved through accepted frameworks and objectives related to sustainability, the active cooperation of the various stakeholders and an effective cross-sectional management of the actors involved. Conflicting objectives exist in all types of spaces, on all scales. The scientific basis for the adequate balancing of decisions is missing and sectorial and spatial regulations are not compatible enough with one another. Also the interdependency between the actors of land-use decisions has been only partially understood up until now. Therefore **“Actors in Land Use Transition / Cross Sectional Management and Communication”** has been identified as a first research field.

Land use, the development of settlement areas and natural compensations influence the living quality in urban areas. This raises a number of research questions in the field **“Settlement Area Management, Circular Land Management, Material Flows, and their Role related to Urban Climate Adaption”**. Next to the creation of a more solid science-foundation for land management, improvement of knowledge transfer and implementation in what is currently regarded as insufficient execution standards are stated research priorities.

Land-use transition through agricultural production and the development of the countryside settlement structure are closely related to one another and the rural ecosystem services. Particularly, demographic change leads to the loss of the cultivated landscapes and massive abandonment of residential, commercial and former agricultural structures, but it also offers chances for experiments, new users and uses. Research in the field of **“Rural Areas, Landscape Transition and Ecosystem Services”** is needed on management and



steering mechanisms, the development of the land/real estate market and environmental compensation measures linked to ecosystem services.

“Field Soil Quality and System Understanding” is another research field as soil quality equally affects the ecosystem cycle as well as the soil services. As an integrated whole, it connects insights into specific scientific soil research and is suited for the development and implementation of new pragmatic solutions and realizable concepts within the context of land use strategies as well as soil and land management. Various issues related to pragmatic and realizable concepts, to new solutions for land-use strategies as well as soil and land management may be derived from an improved basis understanding. Important aspects include securing of soil and soil protection, sequestration of carbon dioxide in the soil, the evaluation of material and energy flows and the consideration of the relation of users and migration patterns.

“Agricultural Ecological Systems” are challenged by an increasing demand for farm products, limited availability of resources, loss of biodiversity, and climate change. Therefore, it is necessary to expand the field of agricultural research, in which spaces are seen as economic, evaluation, planning and research units and where ecosystem services are introduced as a measure for evaluation. This includes research on plants, bioenergy, cultural landscapes and policy aspects ("Greening"). Also, modern technology ("precision farming") can contribute to raising the efficiency of the processed nutritional and operation materials, while maintaining the high level of yields in connection with ecological points of reference.

Considering "sustainability", land use has to be economically viable, ecologically compatible and socially acceptable to consider it as sustainable. Research is required on the conflicts arising from the various goals of **“Sustainable Development and Land Use”** and how to measure them. There is a demand for improving the methods of sustainability assessment as well as for fostering the implementation of an evidence-based, transparent evaluation of sustainability for land-use decision-making from local to regional development.

Integrated research on **“Land Use in River Basins”** is currently being developed. This includes quantitative (e.g. polders) as well as qualitative aspects (diffused pollution input) of land use as well as the effects of regulation demands, such as the EU Water Framework Directive.

The analysis and evaluation of land use and land-use transition is hampered by the various existing definitions and missing or not openly available sources of information. **“Indicators, Information Bases and Monitoring”** are required to improve the evaluation of qualitative and quantitative aspects of land-take and to study land-use transition in urban and rural areas, including new technological means such as remote sensing or mobile applications in the context of "citizen science" related to topics such as land-take or soil quality.

A **“Global Perspective”** for the impact of land use is often too short-sighted, even if the public is increasingly recognizing global aspects, such as "Land sharing/land sparing", "Land Grabbing" or "Food security", of land use as a societal challenge. Therefore holistic assessments and integrated strategies and concepts are in demand.



Experiences regarding the connection of science to policy/practice:

Research for sustainable land development should provide better information, evaluation methods as well as planning and decision-making tools for future oriented actions and should deliver innovative solutions for a sustainable society. In Germany the concept of inter- and transdisciplinary research is currently a central theme in the running research programmes.

The improved diffusion of theoretical and conception aspects into the transdisciplinary methods was reiterated by the interview partners.. Solutions range from the substitution of individual research with a dialog oriented consulting process, the co-creation of knowledge or the co-designing of solutions with practice-oriented partners, the inclusion of a broad range of stakeholders and the development of new concepts for the involvement of the public.

The carrying-out of applied research programmes was seen by practice-oriented representatives as a chance to influence research and the application of scientific knowledge. As a consequence of this funding philosophy the municipalities are key to be involved in sustainability research.

National and transnational funding schemes:

The majority of the interview partners evaluated the German research funding landscape for the research field of land use as being exemplary and innovative with regard to the inter- and transdisciplinary methods applied.

Within the context of the interviews, representatives of public and private research funders, such as the Federal Ministry of Education and Research, the Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety, the German Research Foundation, Volkswagen Foundation or BASF, will follow the INSPIRATION process of developing a strategic research agenda.

2.1.2 German version

Gesellschaftliche Herausforderungen und Forschungsbedarf:

Nachhaltiges Boden- und Flächenmanagement wird zunehmend in Deutschland als wichtige Herausforderung anerkannt. Dies kommt etwa im 30ha/-Ziel zur Minderung der Flächeninanspruchnahme in der Nationalen Nachhaltigkeitsstrategie zum Ausdruck. Das Thema ist als Querschnittsaufgabe zu betrachten, die Bezüge zu unterschiedlichen gesellschaftlichen Herausforderungen aufweist. Die zunehmenden Anforderungen an die Landnutzung verschärfen Nutzungskonflikte und müssen durch eine integrative und disziplinenübergreifende Betrachtungsweise angegangen werden. Die Knappheit der Ressourcen Boden und Fläche erfordert Suffizienzstrategien bei der Inanspruchnahme von Land und die Etablierung einer Flächenkreislaufwirtschaft. Im ländlichen Raum kann die Sicherheit der Nahrungsmittelversorgung und der Schutz des Wassers ebenfalls nur durch ein nachhaltiges Management von "Agrarökosystemen" gewährleistet werden. Dies stellt große Herausforderungen an die traditionelle Landwirtschaft.

Nicht zuletzt ist kritisch, dass die Wahrnehmung des Bodens in der öffentlichen Wahrnehmung und bei politischen Entscheidungsträgern noch zu gering ist, um ihn in seiner ganzheitlichen Bedeutung für das Ökosystem und die Gesellschaft zu erfassen.



Themen und Forschungsbedarfe für die strategische Forschungsagenda:

Insgesamt neun Forschungsfelder wurden in Deutschland auf der Grundlage von Experteninterviews und dem nationalen Workshop mit mehr als 30 Teilnehmenden im Oktober 2015 in Berlin identifiziert.

Nachhaltige Landnutzung erfordert eine effektive Kommunikation, das aktive Mitwirken der zahlreichen Stakeholder und ein effektives Schnittstellenmanagement der Akteure. Zielkonflikte, die in allen Räumen und auf allen Maßstabsebenen bestehen, können dadurch überwunden werden. Defizite sind sowohl bei den wissenschaftlichen Grundlagen zur Entscheidungsunterstützung, bei planerischen Abwägungsprozessen als auch in der effektiven Abstimmung sektoraler Fachplanungen und räumlicher Zielsysteme erkennbar. Zudem sind Wechselwirkungen zwischen den Akteuren von Landnutzungsentscheidungen bisher nur unzureichend verstanden. Vor diesen Hintergrund wurde das **Forschungsfeld „Akteure, Schnittstellenmanagement und Kommunikation“** aufgerufen.

Die Lebensqualität in urbanen Gebieten wird unter anderem von der Flächennutzung und der Siedlungsflächenentwicklung beeinflusst. Daraus resultieren eine Reihe weiterer Forschungsbedarfe im **Feld „Bauleitplanung, Flächenkreislauf-wirtschaft, Stoffströme und Klimawandelanpassung“**. Neben der Verbesserung wissenschaftlicher Grundlagen für das Flächenmanagement kann Forschung dazu beitragen, den Wissenstransfer und einen effektiven Vollzug zu unterstützen.

Der durch die Landwirtschaft induzierte Landnutzungswandel und die Entwicklung der ländlichen Siedlungsstrukturen sind eng miteinander und mit den ländlichen Ökosystemleistungen verknüpft. Insbesondere Folgen des demographischen Wandels zeigen sich in den ländlichen Räumen durch einen Verlust an Kulturlandschaft und massivem Leerstand von Wohngebäuden, Gewerbeimmobilien und ehemals landwirtschaftlich genutzten Bauten. Allerdings bieten sich zugleich auch neue Spielräume und Chancen für neue Nutzer und Nutzungen. Das **Forschungsfeld „Ländliche Räume, Landschaftswandel und Ökosystemdienstleistungen“** umfasst das Monitoring und Management ländlicher Räume, die Entwicklung der Bodenmärkte sowie ökologischer Ausgleichsmaßnahmen im Kontext der Ökosystemleistungen.

Das **Forschungsfeld „Bodenqualität und Systemverständnis“** umfasst die Bodenqualität, ökosystemare Funktionen und Leistungen des Bodens gleichermaßen. Es verbindet als integrative Größe Erkenntnisse bodenwissenschaftlicher Spezialforschungen und ist geeignet, pragmatische und umsetzbare Konzepte und neue Lösungen im Kontext von Landnutzungsstrategien sowie von Boden- und Flächenmanagement zu entwickeln und zu implementieren. Wichtige Themenfelder hierzu sind u.a. Bodenerhaltung und Bodenschutz, Kohlenstoffsequestrierung in Böden, Agrarökosystemmanagement und eine nachhaltige Intensivierung der Landnutzung, die Bewertung von Stoff- und Energieflüssen und die Einbeziehung des Verbraucherverhaltens sowie von Migrationsbewegungen.

„Agrarökosysteme“ stehen im Spannungsfeld von steigendem Bedarf an Agrarprodukten, der Verknappung der Ressourcen (insb. Landwirtschaftsfläche), dem Verlust von Biodiversität und den Anpassungserfordernissen an den Klimawandel. In der Konsequenz ist eine Erweiterung der agrarwissenschaftlichen Forschung notwendig, indem Räume als Wirtschafts-, Bewertungs-, Planungs- und Forschungseinheit gesehen und Ökosystemdienstleistungen als Bewertungsmaßstab eingeführt werden. Dies schließt die



Pflanzenforschung, Forschungen zur Bioenergie, Kulturlandschaften und politikrelevante Felder, wie das "Greening" mit ein. Auch moderne Technologien ("Precision Farming") könnten wesentlich zu einer Effizienzsteigerung eingesetzter Nährstoffe und Betriebsmittel bei gleichbleibend hohen Erträgen unter Einbeziehung ökologischer Gesichtspunkte beitragen.

Dem Verständnis der Nachhaltigkeit folgend muss eine „nachhaltige Entwicklung und Landnutzung“ zugleich möglichst ökonomisch rentierlich und ökologisch verträglich sowie gesellschaftlich akzeptiert sein. Forschungsbedarf besteht hinsichtlich der Messbarkeit und Bewertung von Zielkonflikten konkreter Landnutzungsentscheidungen sowie deren Wirkung. Es fehlen Bewertungs- und Zielsysteme, die in der Lage sind, mit Zielkonflikten in verschiedenen Raum-Zeit-Kontexten umzugehen.

Integrative Forschungen zur „Landnutzung in Flusseinzugsgebieten“ stehen noch am Anfang. Dies betrifft quantitative (z. Bsp. Polder) wie qualitative Aspekte (z. Bsp. diffuser Schadstoffeintrag) der Landnutzung sowie die Auswirkung regulativer Anforderungen, wie der EU Wasserrahmenrichtlinie.

Die Analyse und Bewertung der Landnutzung und des Landnutzungswandels wird durch unterschiedliche Definitionen und fehlende bzw. nicht öffentlich zugängliche Daten erschwert. „Indikatoren, Informationsgrundlagen und Monitoring“ sind erforderlich, um quantitative und qualitative Aspekte der Flächeninanspruchnahme zu erfassen. Die Analyse und Bewertung des Landnutzungswandels und der zukünftig zu erwartenden Trends ist zu verbessern. Darüber hinaus sollten neue technische Möglichkeiten durch Fernerkundung sowie Apps im Rahmen von „Citizen Science“ und „Big Data“ auf ihre Eignung für die Themen Flächeninanspruchnahme und Bodenqualität geprüft werden.

Eine „Globale Perspektive“ auf die Wirkungszusammenhänge der Landnutzung kommt oftmals zu kurz obwohl diese Zusammenhänge als gesellschaftliche Herausforderung zunehmend auch öffentlich wahrgenommen werden. Die Forschungsfelder müssen durchgehend im europäischen und internationalen Kontext betrachtet werden. Beispiele hierfür sind Schlagworte des „Land sharing/land sparing“, „Land Grabbing“, „Nahrungsmittelsicherheit“. Hierfür werden ganzheitliche Strategien und integrierte Konzepte eingefordert.

Erfahrungen zum Wissenstransfer Forschung/Politik/Praxis:

Forschung zur nachhaltigen Landnutzung sollte verbesserte Informationsgrundlagen, Evaluierungsmethoden und Planungs- und Entscheidungssysteme bereitstellen, um damit einen Beitrag zu innovativen Lösungen des Landmanagements zu leisten. Dies wird in Deutschland mit inter- und trans-disziplinärer Forschung angegangen. Die Interviewpartner weisen darauf hin, dass so ein verbesserter Wissenstransfer sichergestellt werden kann. Weitergehende Vorschläge reichen hin zur Substitution von eigenständiger Forschung durch dialogorientierte Beratung, die „Co-Creation of Knowledge“ oder das „Co-Design of solutions“ mit Praxispartnern und einer breiten Anzahl zu beteiligender Stakeholder sowie die Entwicklung neuer Konzepte zur Beteiligung der Öffentlichkeit. Von Seiten der Praxisvertreter wird die Durchführung von angewandten Forschungsvorhaben als aktive Möglichkeit zur Einflussnahme auf Forschung und die Umsetzung wissenschaftlichen Wissens angesehen. Eine frühe Einbindung von kommunalen Partnern ist für eine aktive Mitwirkung von Praxispartnern und eine Umsetzung von Forschungsergebnisse von zentraler Bedeutung.



Nationale und transnationale Forschungsförderung:

Der überwiegende Teil der Interviewpartner schätzte die deutsche Forschungslandschaft im Bereich der Landnutzung mit Blick auf die Akzentuierung von inter- und transdisziplinärer Forschung als Vorreiter ein. Die befragten Vertreter von Forschungsförderorganisationen, wie dem Bundesministerium für Bildung und Forschung (BMBF), dem Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB), der Deutschen Forschungsgemeinschaft (DFG), der Volkswagenstiftung und der BASF, werden den INSPIRATION Prozess zur Erarbeitung einer strategischen Forschungsagenda weiter konstruktiv begleiten.



2.2 Methodology followed

The strategic research and innovation needs for Germany are based on 32 expert interviews and a national workshop with 31 participants from a diverse set of organisations including private and public research funders, end-users, scientists and societal interest groups related to soil, land-use and land management. The interviews were based on the INSPIRATION template and were conducted between August and October 2015. The two-day national workshop was based on a discussion paper, which summarized the outcomes of the interviews. In total, twelve research fields were identified to be of multi-stakeholder interest and relevance. These fields and related specific research topics were discussed each in 45 minutes workshop session with sub-groups of 10-20 participants. Each session was guided by a facilitator and based on a ten minute introduction by a participant, who acted as an advocate for the respective area (having been identified based on respective statements in the interviews). Other potential research fields identified in the interviews were presented on posters and participants were asked to either include them in the discussions on the twelve main fields or to raise them as a separate area – there was no need stated for the latter. The figure below illustrates a first assessment of the importance of these different research topics as discussed in the national workshop in Berlin in October 2015. In addition, aspects of Science-Policy-Interface and Funding were discussed with all participants.

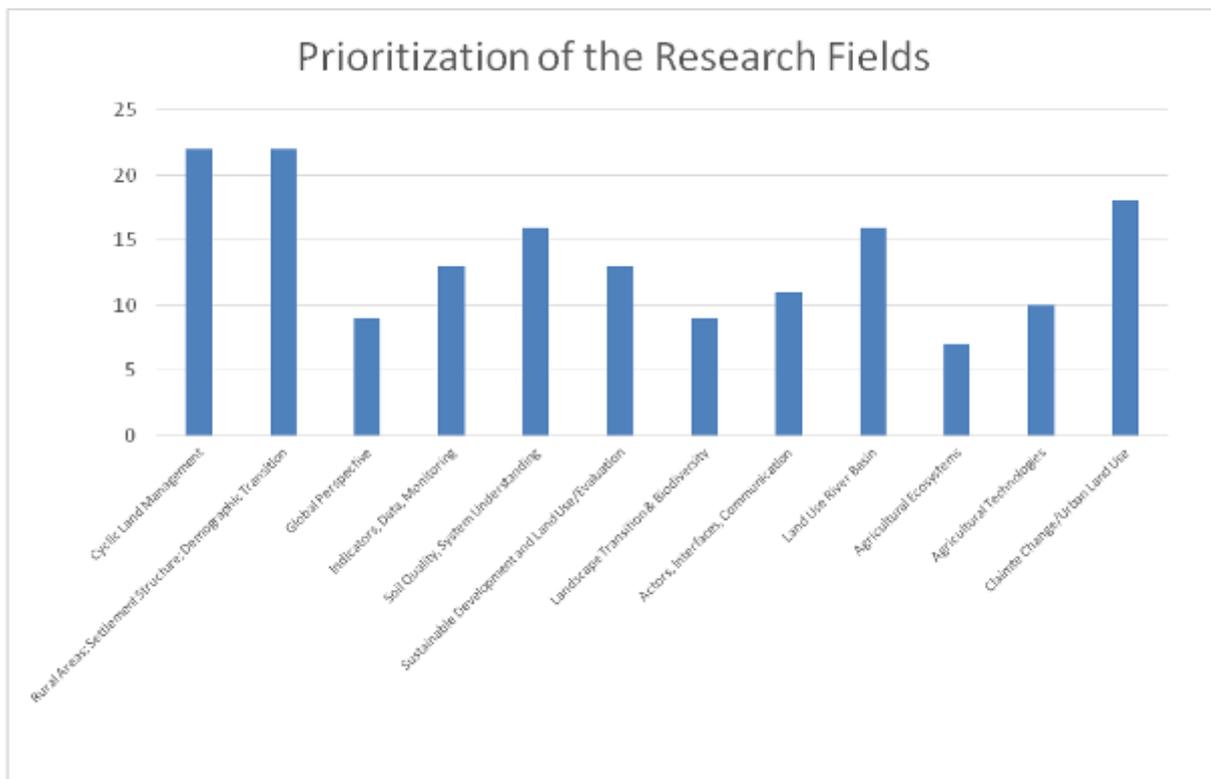


Figure: Interim research field assessment for Germany based on national workshop.

The workshop results were documented in a draft D5.2 German report, which was open for consultation between 15th December 2015 and 15th January 2016. Feedback and inputs from several participants as well as later on from the IAB have been integrated into the final version. Recommendations on a stronger focus and on less topics led to finally nine research fields stated for Germany.



DE-1: Research Field “Actors in Land Use Transition / Cross Sectional Management and Communication”

DE-2: Research Field “Settlement Area Management, Circular Land Management, Material Flows, Urban Climate Adaption”

DE-3: Research Field “Rural areas, Landscape Transition and Ecosystem Services”

DE-4: Research Field “Soil Quality and System Understanding”

DE-5: Research Field “Agricultural Ecological Systems”

DE-6: Research Field “Sustainable Development and Land Use“

DE-7: Research Field “Land Use in River Basins“

DE-8: Research Field “Indicators, Information Basis and Monitoring“

DE-9: Research Field “Global Perspective“



2.3 Research and Innovation (R&I) needs

2.3.1 Societal challenges and needs

As an introduction to the engagement process with stakeholders, societal challenges reflecting the policy priorities of the Europe 2020 strategy and addressing major concerns shared by citizens in Europe and elsewhere⁵ were introduced. Those challenges identified for Europe also were overwhelmingly agreed upon during the discussion with the German interview partners.

Notwithstanding, several more specific issues were expressed in addition by individuals. These challenges represent to a certain extent the background and respectively the interests of stakeholders in the soil, land-use and land management topics, such as in relation to food security from the representatives of the industry and agricultural sectors to give one example.

In Germany, also the current research funding programme FONA³ - Research for Sustainable Development refers to global societal challenges, such as climate change, the loss of biodiversity, land degradation and a lack of resources while at the same time securing social cohesion and our standard of living.⁶

The objectives of the EU 2020 Strategy With regard to sustainable land use, the strategy would be could lead to an intensification of land-use conflicts, which cannot be alone solved by improving discipline-oriented management. The scarcity of land as a resource requires dealing with sufficiency strategies, yet these are currently hardly mentioned in existing research. The question of sufficiency is continuously underestimated in the considerations made regarding the invention of new technological solutions.

Indeed, according to several interview partners, sustainable land use is a key challenge and deserves high attention. It is regarded as a cross sectional topic, in which most of the relevant societal challenges are closely interrelated. For example, food security and secure water supply can only be achieved through a sustainable management of agriculture and ecosystems. These are challenged by the increased intensification of traditional agricultural practices. It was also noted as challenging that soil is currently not seen and understood in a holistic way – recognizing for example also its regulatory and provisioning services. Soil is simply present and is not really appreciated by the majority of people. Investments in information and sensitivity training are required.

⁵ <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges>

⁶ <http://www.fona.de/en/17833>



2.3.2 Topics / research needs to include in the SRA

DE-1: Research Field “Actors in Land Use Transition / Cross Sectional Management and Communication”

DE-1.1 Actors and Cross Sectional Management CM 3

Sustainable land use can only be achieved through accepted frameworks and objectives related to sustainability, the active cooperation of the various stakeholders and an effective cross sectional management of the actors involved. Land use is mainly influenced by the decisions of private and public actors who weigh decisions according to individual decision patterns (Walsh, Knieling 2014). These are partially influenced by sectoral and planning and regulation strategies. Conflicting objectives exist in all types of spaces, on all scales and they reach beyond the set of instruments of spatial planning as “mutual spatial management process”. (Walsh, Knieling 2014) These conflicts exist, because the scientific basis for the adequate balancing of decisions is missing and sectoral and spatial vision systems are not compatible enough with one another. Also the interdependency between the actors of land use decisions has been only partially understood up until now and a strong demand exists for empirical research.

For this reason, research should clear up the following aspects:

- How do political sustainability goals (for example the SDGs) and regional/municipal spatial planning goals influence the practical land use decisions of actors and land use itself?
- Which actors are relevant to be considered and which interdependencies exist between them?
- What effects do sectoral expert planning (transportation, agricultural systems, nature protection...) have on land use decisions and how can they be integrated into spatial planning and development?
- What instruments have a trans-border effect and how can these be incorporated into existing/new European initiatives and departmental politics?
- Which level of planning is the most effective for the strategic application of planning instruments for the purposes of steering land use? How do higher levels of planning affect this (such as state/regional planning)?

This research is related to the INSPIRATION Conceptual Model (CM) 3 “Land management”, because cross sectional management of actors is crucial for effective implementation of sustainable land use.



DE-1.2: Communication CM1/2/3/4

The public is not well enough informed when it comes to the environmental medium of soil. Associations related to the topics of nature, planning and engineering are rarely connected. Also, public communication, as recently being supported by the “international year of soils”, is not able to inform and mobilize actors on the topic of land use in a groundbreaking way. In general it would be ideal, similar to the topic of climate protection, to touch upon measures and initiatives on the global level on the topic of soil protection. Through the explanation of the following questions, research should be able to contribute to this goal:

- How can new media and technology, for example social media with a “soil function app”, be used to engage with the broader public?
- What innovative evaluation instruments can support awareness raising (example sustainable shopping cart, ecological footprint “land” for food production, etc.)?
- Which existing and new instruments can be used to raise the understanding of land use decisions in the public realm and with which instruments and indicators/parameters can the transparency of the effects be measured? What is the influence on planning and permission granting decisions?
- How can science contribute to the dialog about the use interests of actors (for example between representatives of nature protection and agriculture), for example through the differentiated evaluation of large and small agricultural units as well as the regional context?

Communication issues are essentially related to all themes of the CM, but in particular to themes 1 “Resource demand and efficiency” and 3 “Land management” as these both are concerned with the direct demands and impacts of society regarding natural capital and ecosystem services, this means here communication can have immediate effects on soil, land use and land management.



DE-2: Research Field “Settlement Area Management, Circular Land Management, Material Flows, Urban Climate Adaption”

Land use and the development of the settlement area influence the living quality found in urban areas. Both are in a state of constant transition in relation to expansion, density and use type and this has effects on soil and city climate. Conflicting goals are manifold, urban areas have to use brownfield sites for new constructions and at the same time become more resilient to climate change by increasing the amount of green areas. This raises a number of research questions, the answers to which can contribute to the creation of a solid foundation for land management, as well as considerations of knowledge transfer and the implementation of support for what is currently regarded as insufficient execution standards. The regional framework conditions for these considerations are greatly different in Germany.

- Growing areas are faced with the duty of mobilizing land potentials despite strong competition for use
- Stagnant or shrinking regions have a surplus of land potentials which require concepts of deconstruction and the re-naturalisation of land.

DE-2.1: Circular Land Management (CM3)

In this context, the Circular Land Management (Ferber, Preuss: 2008) presents a comprehensive strategic approach for steering the development of settlement structures. The aim of the approach is rooted in the implementation of the land-related policy of the sustainability strategy of the Federal Government with a double strategy of safeguarding quality by preserving undeveloped outskirts areas through the development of inner areas. Circular land management also offers a starting point for the achievement of the international goals related to a “no-net-land-degradation” on the level of the EU and the UN. Furthermore, circular land management can contribute to the implementation of strategies for climate adaption and “healthy” cities. Research is required to understand the patterns of behavior and interdependencies of actors active in land-related policy areas. Examples include:

- Which causes are responsible for the consumption of land (for example private investments, city development or investment-oriented assistance programs)?
- How can stakeholders, especially landowners, be included in the circular land management to support integrated action plans?

DE-2.2 Settlement Area Management and Environmental Compensation (CM1,3)

Inner development in gaps in the built-up areas, brownfield regeneration, densification and replacement constructions are measures that confront municipalities with a number of challenges. These challenges include the establishment of new forms of cooperation between planning and environmental agencies, the adaption of planning and administrative processes to current demands and at the same time the development of management strategies in cooperation with private land owners. There are often conflicting goals in the revitalization of land regarding regulations related to nature and species protection and the potential presence of biotopes on degraded and abandoned land. The research questions resulting from these considerations are:



- How can the requirements of nature protection, especially species protection, be weighted and integrated in inner urban areas?
- How can the requirements of soil protection be integrated into the weighting of planning decisions, especially in sight of brownfield redevelopment with the aim of reducing the consumption of land in outskirts areas as well as soil-related compensation measures? (Stronger consideration of hemeroby concepts and climate impacts of natural sites)
- What scales and standards are to be used in the evaluation/weighting of spatial decision processes and conflicts? (especially in relation to the environmental medium of soil and (bio) agriculture)
- Development of uniform scales for compensation actions

Furthermore, through the new delineation of new settlement areas, an effect of “double compensation“ can currently be observed, which is characterized by the urban consumption of soil on the one hand and through the compensation measures undertaken on agricultural land on the other hand. Alternative mechanisms of compensation which do not create an effect of double soil consumption should be developed.

It is also important to better understand the integrated impacts of settlement reconstruction and land recycling and close existing research deficits in these areas. Research questions of interest here are:

- How can “settlement efficiency“ be defined and quantitatively improved?
- What effects does demographic change have on the delineation of new single family housing districts and how can the current reconstruction of the settlement from the 1960s and 70s (west Germany/Europe) minimize the consumption of land?
- What risks and cost factors have to be considered in the preparation of land parcels for construction and what impact do these have on the cost factors and structures for land recycling? (deconstruction cost, planning safety and approach to restrictions, for example the long-term ground water treatment)
- What impacts can be achieved through instruments of loss prevention, such as in the regulation for the reduced liability for contaminations for new investors in the new federal states and what effects could be expected from the expansion of these instruments?

DE-2.3 Material Flows (CM1,3)

In recent years, the approach undertaken by land recycling for soil and waste material management has led to a problem for land recycling. Individual cases instead of larger systematic solutions raise the cost of land recycling. For this reason the issue of “land recycling“ should be more closely connected to questions raised by energy and resource efficiency. Research is required for the following questions:

- What are the requirements of the material cycle management system for the use of construction materials and removed soil in relation to energy and resource efficiency?
- Can life cycle analyses be developed for construction materials and with this understanding new instruments be developed for, for example, the requirement of the reuse of construction materials?



DE-2.4 Operative land management (CM3)

The study of single plots and single cases is also not adequate in relation to the **mobilization** of land. Instruments are still missing for a comprehensive spatial and portfolio oriented analysis. The renovation of deficient properties beyond the borders of the land plots is encouraged along with the goal of minimizing development risks. It has to be considered how land planning can develop towards land development management for example through "Reallabore" – applying the concept of real world experiments⁷. In this context the existing experience with land acquisition funds, development agencies and land management agencies has to be evaluated and systematically considered through the work of research. The further development of the instruments of soil management is also required. The central and overarching research question is:

- How can an operative land management function?

DE-2.5: Urban Climate Adaption (CM 2,3)

A central topic for urban areas is the resilience of settlement structures in sight of **climate change** and the increase of extreme weather events (overheating, flooding, drought ...). Research dedicated to natural sciences, soil function maps, as well as the related city structure frameworks and pilot applications are present in Germany and are subject of ongoing research activities. However, current concepts are almost exclusively restricted to local specific impact factors and are burdened by conflicting goals as well as deficits in the weighting and implementation. Conflicting goals and weighting deficiencies exists in the quality of the density and compactness of the city. The interdependency of city density (densification versus the maintenance of open spaces) is especially under-researched. The following research questions are of interest:

- How can city structure frameworks be adapted and communicated?
- What methodological approach and content is required for concepts of climate change adaption?
- How can urban chains of reaction (thermal/hydro) be better understood?
- What planning tools are appropriate to display the interdependencies of city structural density?
- What basis does soil offer for a planning tool to address climate change? (Soil function evaluation)
- What would concepts of a "double inner development", whose goal it would be to connect and qualitatively improve the actions of ensuring the maintenance of urban open spaces and their use on the one hand and the development of available inner city plots on the other hand, look like?
- Are there innovative ownership and maintenance concepts for (to be created) public green spaces?

⁷ Cf. for example Gross, M., & Hoffmann-Riem, H. (2005). Ecological restoration as a real-world experiment: designing robust implementation strategies in an urban environment. *Public Understanding of Science*, 14(3), 269-284.



Many of the mentioned topics cannot be exclusively worked upon on the municipal level and require the recognition of the city – rural context. The following related research questions are:

- How can the development of settlement areas in the context of various European planning systems be steered on the regional (city) level and the distortion of the competitive field through “land dumping” actions be reduced?
- What are the overall effects of the “catching up” sub-urbanisation in the new German federal state and eastern European countries on the development of settlement structures?
- How can growth and shrinkage be balanced?
- The development of instruments to disregard non-usable sites from the cycle of use.

In summary, it is important to combine the strategies and instruments of circular land management through applied research and pilot case studies and in the sense of modular “tool boxes” to qualify a sustainable land management. Since many European standards are affected by this, this action should take place on the European level.



DE-3: Research Field “Rural areas, Landscape Transition and Ecosystem Services”

Land use transition through agricultural production and the development of the rural settlement structure are closely related to one another. The effects of the demographic change are especially noticeable in rural areas. It is leading to the loss of the cultivated landscapes in many rural areas, increasing the severity of the population decrease and ageing and it has resulted in massive abandonment of residential, commercial and former agricultural structures. These developments will also have an economic effect. However, they also offer new chances and room for experimentation for new users and uses, which, through the engagement of various citizens, are increasingly being utilized.

DE-3.1 Rural areas (CM1)

There is an overall research deficit in the fields of planning, management and steering mechanisms in rural areas. New guidance frameworks are required which are decoupled from the agricultural economic perspective and can direct the creation of independent development perspectives for villages and small cities in rural regions. The spatial planning system of central places used for the securing of a common standard of life quality must be further examined in relation to this issue and be further developed in "Reallabore", as seen in the Internationale Bauausstellung Thüringen – an international architecture exhibition – or the Reallabore in the Black Forrest region.

This especially concerns the research questions of

- Which good examples for the development of rural areas are existing on the national/international level and how do they operate? What is generalizable and can be learned from these examples?
- What concepts and tools are required for the adaption of existing and planned settlement areas in shrinking rural regions and which instruments are required for the support of decision-making in this regard? (example the further development of follow-up cost studies)
- How are rural spaces affected by the current migration movements (in the context of demographic change, but also refugees) and how do they affect land use? How can planning react to these aspects?
- Can research support or contribute to the improvement of concepts of inter-communality and stability in rural spaces?



DE-3.2 Land/real estate market (CM3)

The development of the land/real estate market in rural spaces is critical for the socio-economic perspective – the decrease in prices for settlement structures on the one hand and the increase in price for rural land on the other hand. Land resources are becoming an object of speculation on the global scale. In Germany, high land prices are already discouraging agricultural operations, especially in cases of organic farming. Thus, the following aspects require consideration in research projects:

- Which new instruments for soil planning in rural areas are required (for example the overcoming of "Realerbteilung" (gavelkind), continuation of the consolidation of land, relocation processes) in order to secure the interest of nature and landscape conservation as well as a locally socially responsible use of soil?
- How can sectoral and spatial assistance programmes, especially the various directions and areas for agriculture, be better coordinated with one another?
- What would a monitoring concept with a focus on natural science and social evaluation and assessment of land use transition, which keeps the contexts of agricultural structural transition and demographic change on an equally footing to one another, look like?
- How can dynamic scenarios for land use transition be displayed as a contribution to expert and spatial planning?

DE-3.3 Landscape transition (CM1,2)

Landscapes in Germany are influenced by a strong pressure towards change due to land use transition. This development is characterized by aspects such as consolidation of lots, expansion of settlement areas, the concentration of agriculture all the way to the current effects of the energy transition. Traditional cultivated landscapes are being lost and new landscape types are being developed. Land use competition, which is already present in the peri-urban areas of growth regions, is also increasing in rural areas. Wildlife networks which are spatially surrounded by similar areas valuable for protection, which are potentially within a close functional proximity with one another, are especially endangered. Biodiversity is decreasing. The research question related to these aspects are:

- Which steering instruments are suitable for influencing the form of the landscape within the context of the "energy transition" in rural areas?
- How can land use be controlled for the purpose of energy use?
- How can the concept of "green and blue infrastructure" be sharpened on the conceptual level and be carried into a transboundary dimension?
- How can wildlife networks be seen as an important starting point for the future derivation of reconnections?
- What optimizations are possible in the development of tools for land use transition, impact studies and material flow models?



- What communication and legal instruments can support “cooperative nature protection”?

DE-3.4 Compensation (CM3)

The arrangement of nature protection related compensation regulations also play an important role within the context of the German discussion and induces research demand. Instruments such as nature protection compensation measures are critically received due to the consumption of agricultural land.

- On which level would the impact/compensation process in transportation projects most efficiently take place (what role does spatial planning play)? Which effects can be expected from natural restoration as opposed to purely monetary compensation mechanisms (problematic with soils)? (exchange about European practice)
- How can biodiversity be raised through the bundling of sectoral compensation requirements from various EU framework directives (environmental liability directive, environmental impact assessment directive)?
- Can compensation measures be aimed towards the revitalization and renaturalisation of brownfields?
- How can the various compensation practices in Germany be evaluated?



DE-3.5 Ecosystem services (CM1)

In the light of the overview of the problems present in rural areas and the resulting societal challenges that are related to these, there is hope that a foundational paradigm change and strategic starting point from which to steer land use in rural areas can be created through the recognition and evaluation of ecosystem services. In particular, the functions and services of soil can be evaluated with ecosystem services and be understood as a foundation for knowledge diffusion and decision-making. For this to happen, ecosystem services must be evaluated in combination with, for example, regulation services (e.g. microclimate regulation), the importance of soil functions (in line with the natural sciences) as well as socio-economic services. Research questions are:

- How can sectoral approaches of agricultural research and general research be connected to the topic of ecosystem services?
- What impact does agriculture have upon the landscape and how can the integration of production and ecosystem services be improved?
- What importance do ecosystem services have in their relations to one another? Ecosystem services should be considered together and standards and/or indicators should be developed. In order for this to happen, synergies and ecosystem services trade-offs must be understood.
- How can the “bundle” of ecosystem services be gathered and evaluated (overview of social, ecological and economic ecological services)? The combination of various types of ecosystem services is important to be considered, since the services they provide are widely different and can have a significant effect on soil quality.

In summary, research should consider and help change the transition taking place in rural areas as well as support the actors, especially the citizens, with integrated methods. Promising forms of research are offered in the form of transdisciplinary methods as well as the research of transformation (establishments of "Reallabore")



DE-4: Research “Field Soil Quality and System Understanding”

DE-4.1 Soil Quality (CM2)

Soil quality equally affects the ecosystem cycle as well as the use functions of soil. As an integrated whole, it connects insights into specific scientific soil research and is suited for the development and implementation of new pragmatic solutions and realizable concepts within the context of land use strategies as well as soil and land management. In this regard, soil research in Germany already provides a sufficient foundation which recognises soil as a highly complex 3-phased (solid, fluid and gas phases) and a 4-dimensional (space and time) medium, and this understanding is the starting point for the definition of an improved system understanding. Soil, as a central foundation of life and non-renewable resource, serves a role in all of the seven societal challenges of Horizon 2020. The following central questions are of utmost importance:

- How can we maintain soil quality in Europe and worldwide (system understanding) and how can we secure the status (monitoring)? The maintenance of our soil as a foundation of life is a central aspect of all areas of current and future social challenges. This considers firstmost the sectors of health, nutrition and bioeconomics, energy and climate. Even the transportation sector, which uses soil as a carrier of its infrastructure, is connected to soil, as well as questions related to societal and personal freedom, security and quality of life. In order to use soil quality and its preservation as central measures for the evaluation of sustainable land use strategies, soil quality must be quantified and evaluated. This is possible with the current state of research and upon the foundation of European data structures and networks. The securing of the maintenance of soil quality can be achieved through the use of modern monitoring technologies, e.g. in the area of remote sensing.
- When will system boundaries of soil quality be exceeded, e.g. intensive uses (system understanding) and can we quantify these (tipping points)? System boundaries together with questions of soil quality can be put into relation to landscapes and regions whose natural capital is an important feature of the present soil quality. Administrative and functional areas also create specific system boundaries. These can include, among others, land use demands, operational framework conditions and relevant issues of nature protection. System boundaries in this case are the framework conditions for the maintenance of soil quality. Their study and qualitative analysis of the function of excessive use allow for the evaluation of system boundaries as an important steering mechanism for soil and land management.

DE-4.2 System Understanding (CM2,4)

Various research questions which could have an influence upon pragmatic and realizable concepts and new solutions in the context of land use strategies as well as soil and land management may be derived from this basis understanding. Important topics in relation to this are, among others, securing of soil and soil protection, sequestration of carbon dioxide in the soil, the evaluation of material and energy flows and the consideration of the relation of users and migration patterns. The following research questions are of importance:

- What effects do climate change and climate extremes (erosion events and the loss of humus, intrusion of materials beyond system boundaries) have upon the quality of



soil and how can we quantify and foresee these effects? How can we connect soil quality goals such as erosion protection and carbon dioxide sequestration to each other and integrate them into land use concepts? What potentials exist to reach out to various societal groups for the securing of the soil quality and to integrate them into the evaluation process of soil quality?

- What quantitative threshold values exist for the securing of soil quality and how can we quantify and integrate these into a sustainable soil and land management? In this context, how can we better understand the ecological structures of soil organisms and the role they play in the maintenance of soil quality and in turn use this understanding?
- Which processes play a role for the soil and water quality in the soil-sediment-water system boundaries and can they be quantified? How far can soil sediments be used for the securing and improvement of the soil and water quality within the framework of land improvement measures?
- What potentials do cyclic-soil approaches have to offer for the maintenance of soil quality and can these approaches be implemented in new land use strategies, even beyond system boundaries in relation to the city-rural sphere? Can the deregulation of methods and the changing of assistance mechanisms offer new potentials for the securing of soil quality and for the sustainable intensification of land use?
- How can soil quality goals take into consideration the anthropological input of harmful soil material and create a transparent basis for the evaluation of soil pollution as well as create the respective pollution-related measures for the various sources of these elements? How can soil quality be renovated and degraded land areas be brought back to value again?
- What contributions to an improved system understanding can offer experimental approaches (Ecotron, FACE/FATE units, long-term study, experimental agricultural operations, Reallabore)?



DE-5: Research Field: Agricultural Ecological Systems

DE-5.1: Agricultural ecological systems (CM 1,2,4)

Ecological systems are challenged by a raising demand for agricultural products, the limited availability of resources, the loss the biodiversity and climate change. Therefore, it is necessary to expand the field of agricultural research, in which spaces are seen as economic, evaluation, planning and research units and where ecosystem services are introduced as a measure for evaluation. Production strategies must be produced in connection with these, which are directly related to landscapes in the region and that recognize the relevant socio-economic and agricultural political framework.

The duty of research is to compare the usefulness of older methods (“Methusalem”) versus innovative methods to find solutions to current issues and to change the rules of “good agricultural practice” towards that of sustainable agricultural production. This requires an improved basis of information, in which research is required for:

- The evaluation of current soil conditions (potentials, degradation, eutrophication): new evaluation of area based soil information (maps, potential types). Soil information services as a duty of the national, European and international levels.
- Integrated analysis of production, functional structures, material and energy flows as an initial priority focus for sustainable agricultural production. Introduction of ecosystem services as a key indicator.
- Interregional evaluation of processes (material, energy, economy). Scientific and able to be communicated (footprints)

DE-5.2 Plant research (CM2)

There are close interdependencies to the field of plant research. In this context the potential of cultivated plants to raise yield productions can be used in an environmentally friendly context in view of ecosystem conditions. In relation to the energy transition taking place in Germany and the related stronger use of renewable energy sources, the following research questions are to be posed, such as:

- What risks are associated with the creation of renewable energy sources in view of land use competition and a changing agricultural practice (example of consequences for the plant yield with high corn content)?
- What steering parameters are suitable for a qualitative and quantitative production of biomass product? (Protection of cultural landscapes? Maintenance of biodiversity?)
- How can unwanted effects to the quality of the soil and the neighbouring environments be minimized?

DE-5.3 Sustainable Agricultural Ecological Systems (1,2,4)

Also, organic agricultural practices can support the development of sustainable agricultural ecological systems. In this case the following research questions need to be answered:

- What contribution can organic agriculture offer to increase yields and granting food security?



- How can the non-uniform administrative practices within the various federal states (for example standards in the regulation on "flower mix" be altered to support large scale and integrated analysis?
- Can goal conflicts be better understood (analyzed) and perhaps balanced through the implementation of Reallabore, e.g. conventional agriculture and biodiversity?
- How can the pressure be minimized upon (organic) agriculture and/or the small scale agricultural production, which is characteristic of certain landscapes (rental, sale, sharing deals)? What effects do price dynamics have (e.g. land as "slurry deposit")?
- How can areas with a slope be secured/renovated for a sustainable use?

DE-5.4 Greening policy (CM3,4)

On the other side one must consider practice. Demands of agricultural and forest production, goals of nature protection and the designing of the landscape are being handled in systems generally separate from each other, such as the systems for planning, administration and decision-making. Use conflicts, such as those of food security and nature protection are increasing. This begs the question as to how conventional agricultural production with high yield values is to be operated in the future under the consideration of biodiversity aspects as well as how the resources of water and soil can be better protected. **Greening** in the practical field is not connected to the integrated goals of land use (e.g. landscape, biodiversity, maintenance of the cultural landscape). Large operations dominate and follow internal optimization strategies. Research questions here are:

- How can the lack of useful land use steering instruments in the field of agricultural production be overcome?
- How can improved spatial information and planning foundations be made available and improved monitoring approaches be created?
- How can demands from the political level be based upon better scientific evidence and contribute to an improved level of planning security?
- Are new instruments for soil management of agricultural land required? (e.g. first to have the opportunity to buy during the transfer of ownership of agricultural land, minimization of speculation, prohibition of concentrations)
- What are the effects of regulation/deregulation? (for example financial compensation and agricultural policy of the EU and the ERDF funding) beyond individual sectors?
- What happens to the rural areas when one chooses to withdraw from sectoral funding sources? Discussion on the public assistance. Large operational structures / units would be strengthened, small ones weakened. Analysis of the interdependencies important here.



DE-5.5 Agricultural Technology (CM1)

Also, modern technology (“precision farming“) can greatly contribute to the raising of efficiency of the processed nutritional and operation materials, while maintaining the high level of yields in connection with ecological points of reference. The long-term shortage of plant food requires a new thinking in the use of resources, especially in relation to phosphor and potassium. Research questions here are:

- What potentials are offered by remote sensing by satellite?
- What developments in the technology are required in agriculture? E.g. use of drones
- How can the shortage of plant food nutrients be addressed?
- What are the development perspectives for agricultural factories (hydroponic) and what effects do they have upon land use?
- How can organic farming contribute (reduction of fertilizer / raised ability of plants to take in nutrients) and how can organic farming accompany transdisciplinary research assistance?



DE-6: Research Field “Sustainable Development and Land Use“

DE-6.1: Goals and Monitoring (CM 2,4)

Land use can serve various demands – however at the same time it is restricted in its ability to satisfy all demands at the same time. According to the understanding of sustainable development (WCED 1987 “Our common Future“ [Brundlandt Report]) land use has to be economically viable and ecologically compatible as well as socially acceptable to be able to be considered as sustainable. But how are these demands to be valued in the evaluation of specific land use decisions? Which actors are deemed able to determine with which instruments, what it is which will be considered within the dimensions of an evaluation, how the results will be aggregated and what end results can be considered as a sustainable form of land use? Evaluation and objective-forming systems able to address conflicting goals of various spatial-time-contexts are missing. Research is required for the following questions:

- What conflicts arise from the various goals of sustainable development?
- What formal and informal institutions and what levels of governance are to be addressed (SDGs, grand challenges, national, regional, local goals)?
- How/with whom can an appropriate system of development goals be created?
- How can global goals (SDGs) in the national and regional level be broken down and established?
- What interdependencies exist with other regions/sectors?
- How can spill-over effects (interdependencies with other regions/sectors) be understood?

DE-6.2: Land Use Evaluation Methods (CM 4)

There is also a demand in the methods of sustainable evaluation for a continual and future-oriented dynamic of analysis and evaluation.

- How can analysis and evaluation methods be dynamically organized and monitoring systems and statistics be adapted to this to enable a continual process of sustainability evaluation? (Keyword of follow-up monitoring)
- How can ecological, social (including cultural) and economic evaluation methods be integrated and what potentials are offered by the concept of ecosystem services and where are the gaps?
- How can concepts such as resiliency, sufficiency, vulnerability be integrated into the evaluation of sustainability?
- How can various timescales (long-term, short-term) be integrated into the sustainability effects of land use decisions?
- How can various spatial scales (landscape, region, nation, Europe...) be integrated into the sustainability effects of land use decisions?
- How can external development trends (politics, for example organic economic strategy, demography, demand and costs, technological development) be better anticipated for and their effect upon the small scale be analyzed? What interdependencies exist?



- What potentials are there to use the analysis of historical land use and development for improved future-oriented sustainability strategies?
- How can methods be designed so that the participation of the public is possible?

DE-6.3: Sustainable Land Use Implementation (CM2,4)

The implementation of an evidence-based, transparent evaluation of sustainability for the decision-making process require:

- Sustainability evaluation as a further development of the prognosis of the follow-up of technical systems (for example implementable for bioeconomy)
- Sustainability evaluation as an instrument for the development of policy (impact assessment); important connections to ex-ante, monitoring, ex-post and as an instrument of user information (certification and labeling of specific products)
- As an instrument of regional development
- As an instrument for foresight and the prognosis of follow-up effects

DE-7: Research Field “Land Use in River Basins“ (CM 2)

Integrated research on land use in river basins is currently being developed. This includes quantitative (e.g. diked land) as well as qualitative aspects (diffused pollution input) of land use as well as the effects of regulation demands, such as the EU Water Framework Directive. Example: Intrusion of surface waters through point-based or area-based study, especially in relation to land related anthropological burdens. Research questions include:

- Which land uses can take place in diked land, use and agricultural use in diked land areas (area pollution inputs/soil quality/saline content)?
- What are sustainable strategies for (existing) settlement structures in areas subject to flood hazard?
- Develop incentives for users/economic compensation models for agricultural use of dike areas
- How does the transportation of sediment material take place (erosion, sediment transfer, depositing and remobilization), quantification and dynamic of the rainwater run-off?



DE-8: Research Field “Indicators, Information Basis and Monitoring“

DE-8.1: Indicators (CM4)

The analysis and evaluation of land use and land use transition is hampered by the various existing definitions and missing and/or not openly available sources of information. The result of this is a deficiency in the quality and comparison of information related to site analysis, analysis and evaluation of land use transition and the trends which can be expected in the future. This is especially true of the goal set in the global sustainability strategy⁸ of a “land degradation neutral world” which requires further concrete and measureable indicators.

The indicator used in Germany as a description for the development of the settlement area, “development of the settlement and transportation area“ is generally seen as to be appropriate as well as in need of updating. Research is still required for assigning the inner municipal development potentials which must be analyzed and forecasted on the national level (and Europe-wide) and should also be better integrated into the existing systems of spatial monitoring and the cadastral system.

However, further indicators are required in relation to climate change and soil quality. Research approaches for the following research questions are required:

- Which indicators can improve the evaluation of qualitative and quantitative aspects of the consumption of land and study land use transition in urban and rural areas?
- How can the quality and comparability of the information basis for site analysis, data analysis and evaluation of land use transitions and the related trends be secured along with establishing connections to structural changes in the agricultural landscape (example agriculture: integrated administrative and control system – InVeKoS), energy transition, use transition in existing settlement structures, and transportation planning-induced use changes.
- Is an internationalization of the German model for classification of potentials, use changes and demographic changes as currently developed by BBSR meaningful?

⁸ <https://sustainabledevelopment.un.org>



DE-8.2 Monitoring technologies (CM 4)

Furthermore, new technological methods of remote sensing as well as mobile applications in the context of “citizen science” should be studied in terms of their relation to the topics of land consumption and soil quality. This requires scientific support for legal instruments to support the collection of information through private means and to secure access of this information to allow for it to then be used by research.

Direct uses resulting from research can be gained from:

- The analysis of soil sealing via remote sensing
- Legal analysis in relation to the collection of data and granting of access to the data for diverse stakeholders
- Methods for the combination of land information with soil information.

DE-9: Research Field “Global Perspective“ (CM4)

Even the public is increasingly recognizing global themes of land use as a societal challenge and strategies and concepts are in demand. Consideration for the presented research areas must be ongoing in the European and international context. In this context, Germany - with the support of the already developed competence areas in the research field of land use - is in an advantageous position to take an international leadership role. This includes especially for example,

- Land sharing/land sparing strategies: how can a division of functions between natural conservation and agricultural production be considered on the global level? (relevant to the level of ethical consideration and to also be included)
- Research field “Land Grabbing”: What are the aims of the effects of the globalization of the local good of land? Which strategies are required on which levels? (ref. the topic of climate change)
- How can a systematic consideration, including aspects of ethical, economic and social nature, be undertaken?
- In relation to water deficiency: up until today, this issue has not been solved through technological solutions such as conventional desalinization plants, which are unaffordable.
- Can an intensification of agricultural production help to close the gap?
- Development of a "Soil Stewardship council" for the development of suitable methods of sustainable development in agricultural production.



2.4 Experiences regarding connection science to policy/practice

2.4.1 Use of knowledge

Scientific knowledge on land use science has transitioned from fact or phenomenon based observation to searching for an integrative understanding of land use dynamics that goes beyond the limits of disciplinary knowledge and sectorial viewpoints (Zeischler, Rogge, 2014). The German INSPIRATION interview partners largely agreed with this point of view. Research for sustainable development should provide better information, evaluation methods as well as planning and decision-making tools for future oriented actions and should deliver innovative solutions for a sustainable society to support sustainability research in Germany.

As stated in the FONA programme: "Research for sustainable development should develop innovative solutions for these challenges and deliver decision-making tools for future oriented action. The spectrum covers everything from basic research to the development of application ready solutions."⁹ An example for this was the REFINA programme 2004 - 2008 "Research for the Reduction of Land Consumption and for Sustainable Land Management", which was like FONA funded by the Federal Ministry of Education and Research (BMBF). REFINA was part of the German National Strategy for Sustainable Development and supported the development and testing of innovative concepts for the reduction of land consumption in order to provide a scientifically reliable basis for decisions and measures. Research on land use has been exploring integrated strategies for land use and soil.¹⁰

In the application of existing and wide-ranging scientific knowledge, largely developed by universities and research institutions in the previous years, there is still recognition of existing gaps in the field of knowledge-transfer. In relation to this, the interview partners were critical about the following aspects:

- New scientific results are often separated from questions of practical application and even new legislation is not able to compensate for the discrepancies in practical application.
- Integrated research approaches do produce valuable new products for the practical sphere, however these are then often used by sectoral organisations in the public sector and in this manner the "end user" cannot be properly addressed,
- Scientific literature is commonly not available in public and administrative organisations and is rarely used by practice-oriented partners,
- Conferences and educational events in Germany are overwhelmingly catered towards specific disciplinary communities. In this manner, presentations from INSPIRATION are presented at various types of conventions, which leads to the result that the topic is not reflected upon in an integrated manner but instead in relation to a specific sectoral perspective,
- The participation in European/international research conferences is largely not possible for representatives responsible for implementation, especially those of the public administration due to financial reasons.

⁹ <http://www.fona.de/en/framework>

¹⁰ <http://www.refina-info.de>



In this context, the application of scientific knowledge should be improved in the practical arena. The BMBF aims to strengthen the initiative and involvement of municipalities in research and innovation in the framework of transdisciplinary research approaches with the “Innovative Municipality” programme (Kommune innovative)¹¹. “In this manner the municipalities and municipal departments are the first actors involved in sustainability research. The chances for the long-term application are greatly increased when new ideas and solutions are initiated with the cooperation of the municipalities and the scientific community. Creative and innovation friendly actors in the public arena should be granted the opportunity to realize new ideas in cooperation with the scientific community”.¹²

The improved diffusion of theoretical and conception aspects into the transdisciplinary methods was reiterated by the interview partners from the academic background. Solutions range from the substitution of individual research with a dialog oriented consulting process, the co-creation of knowledge or the co-designing of solutions with practice-oriented partners, the inclusion of a broad range of stakeholders and the development of new concepts for the involvement of the public. These aspects are being heavily discussed in US American research communities. For this to take place, a new understanding of the “integration” of all disciplines related to land use is required.

The INSPIRATION project aims to supply such an exemplary method through the application of the chosen bottom-up process.¹³

¹¹ <https://www.fona.de/en/17800>

¹² <https://www.bmbf.de/foerderungen/bekanntmachung.php?B=959>

¹³ Cf. Brils J et al. (2015): Template for national information collation. Update 1 version as of 02.07.2015 of deliverable D2.3 of the HORIZON 2020 project INSPIRATION. EC Grant agreement no: 642372, UBA: Dessau-Roßlau, Germany.



2.4.2 Possibilities to set the agenda

The majority of the interview partners, as well as a few practice-oriented partners along with the research institution representatives, were involved in the preparation of research programs. This includes work made by the DFG Board and the advisory boards of private foundations all the way to the direct role in the preparation of research programs and the evaluation of projects undertaken within the framework of the BMBF research funding program. Many participants were directly involved in the political supervision, for example as a representative of an association, and were thus able to use research results. In this respect, a deficit in the German research arena was especially noticed for the topic of land management.

The carrying-out of applied research programs was seen by practice-oriented representatives as an active chance to influence research and the application of scientific knowledge. The early involvement of municipal partners is of central importance for the active cooperation of practice-oriented partners and the application of research results. In general the “German research and administrative culture” was seen as to be “technical oriented”. Integrated problem solving and nature friendly methods were critically received and seen as difficult-to-implement projects by scientific decision advisory boards. Despite the positive methods of challenge-addressing and implementation-oriented research programs of the ministries for research or for the environment (BMBF and BMUB), the majority of research funding is oriented towards sectoral programs, for example conventional agriculture or the sectoral funding of transportation. Societal challenges are not properly addressed.

One imminent research problem is presented by the discontinuity of projects which commonly only run for 2-3 years. Long-term perspectives and the necessary structural changes are near-to-impossible to achieve within these timeframes. The processes of application submission and research project selection require a high level of predetermined agreements. Processes which do not coincide with these agreements are unrealizable, innovation that could be gained from new insights are hindered from the start.

Representatives from the private research arena mention the dominance of internal business networks, which is difficult to overcome for the purposes of inter-business cooperation. Undefined future research topics are hardly addressed, low reaction of the industrial research in relation to societal challenges (Germany/world-wide), for example the topic of food security is hardly discussed in Germany and also receives little attention in the debates about land use conflicts. Private businesses mention a successful method of knowledge transfer from research into practice can be found in the form of demonstration projects with those responsible for application, for example model operations of agriculture supported by scientific input.

2.4.3 Science – policy – practice

As already mentioned, the majority of the interview partners are already involved in the formulation of scientific research questions and/or are involved in research themselves. The use of research projects in the practical application and guidance of political decision-making is especially important in Germany. For example, political strategies and funding programs related to the reduction of land consumption have been supported and guided since the



1990s (Federal Environmental Agency / Environmental research plan, BBSR (ExWoSt "Fläche im Kreis", Federal Ministry of Education and Research / Refina, Innovation Groups).

The development of market-ready products was not a main focus of any of the interview partners, with the exception of the representatives from private institutions. This is a recognized deficit. (Gustedt)

The concept of inter- and transdisciplinary research is currently a central theme in the running research programs in Germany. As a consequence of this funding philosophy, private actors are becoming active in the evaluation and selection of research projects and are important practice-oriented partners.

Innovative methods to “science – policy – practice”

BMBF “Sustainable Land Management” innovation groups

The Federal Ministry for Education and Research (BMBF) is funding nine scientific-practice-teams that have combined into Innovation Groups. Until 2019, they will be developing future-focused and applicable solutions for handling land as a vitally important resource. <http://innovationsgruppen-landmanagement.de/en/>

Reallabore

“Reallabore” with a thematic connection to land use were implemented within the context of the Internationale Bauausstellung Thuringia (IBA) as well as in Baden-Württemberg. In “Reallabore”, scientific community members become involved in real transformation processes. They support activities such as for example the renovation of city districts or the introduction of new mobility and energy systems. Practice-oriented actors from municipalities, social and environmental organizations or businesses are included in research processes from the beginning in “reallaboren”. Research questions coming from an environmental association, an energy association, a bicycle club or even a technology business can therefore be considered. Open-ended knowledge, which is to have a direct impact in the field of implementation is a type of result to be achieved through the process. <https://mwk.baden-wuerttemberg.de/de/forschung/forschungspolitik/wissenschaft-fuer-nachhaltigkeit/reallabore/>

BFN-Research-Practice Project

Testing and development processes can be initiated and applied by practice-oriented partner within the context of the BFN research funding program. A preliminary study is undertaken by the BFN to determine the decision criteria to be implemented by a practice-oriented partner and supported through scientific input by the BFN. For example, compensation measures/ecological credit account with the State of Brandenburg.



2.5 National and transnational funding schemes

The majority of the interview partners evaluated the German research funding landscape for the research field of land use as being exemplary and innovative in view of the inter- and transdisciplinary methods applied. European research assistance has only been used by a few of the interview partners and is generally seen as relatively resource intensive and associated with higher levels of risk, especially during the phase of application submission.

The interview partners did not mention thematic gaps in the research funding programs. The reason for this is the possibility to address the topics discussed in Sub-Chapter 2 within the context of running programs and/or program consultations. The short project timespans as well as the inadequate possibilities to finance empirical studies of land use were seen as a deficit.

Within the context of the interviews, the representatives of public and private research funding organizations stated questions related to the topic of research assistance. An overview of the results is gathered in the following table.

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	Name*	Research and Innovation funder**	What and/or whom do they fund?***	More info****
Regional				
1	Real labs	Baden-Württemberg	Urban and rural development	https://mwk.baden-wuerttemberg.de/de/forschung/forschungspolitik/wissenschaft-fuer-nachhaltigkeit/reallabore/
National				
1	Research for Sustainable Development (Fona)	Federal Ministry of Education and Research (BMBF)	FONA ³ with initiatives on land innovation groups	www.fona.de
2	German Research Foundation (DFG)	German Research Foundation (DFG)	Cross cutting topic of different departments and decision-making commissions (Life science/Engineering)	www.dfg.de
3	Environmental research plan	Federal Ministry of Environment	Different topics related to land management	www.uba.de
4	Sustainable Land Use program	Volkswagen foundation	Demonstration projects - calls by detailed topics	www.volkswagenstiftung.de
6	Different land related topics e.g. nitrogen in agriculture	German Environmental foundation	Demonstration projects - calls by detailed topics	www.dbu.de
7	Research on sustainable agriculture	BASF	Industry research	www.basf.de
European				
1	see NL +			
2	Urban innovative actions	DG REGIO	Demonstration projects - calls by detailed topics	http://www.uia-initiative.eu/
3	URBACT	DG REGIO	City networking	www.urbact.eu
International				
1	GIZ	internal research	International co-operation projects	www.giz.de



2.6 Annexes

Annex Ia: NKS interviews in Germany

Date of Interview	Organisation	Interview	funder	end user	Knowledge provider	Nat.reg. loc. authority	Univ./re-search inst	SME /consult ant	Busi-ness & industry	NGO	network	other	soil	sediment	water	land use-management
03.06	Leibniz-Zentrum für Agrarlandschaftsforschung e. V.	Thomas Weith			1		1									1
04.06	Deutsches Institut für Urbanistik (DIFU)	Thomas Preuss			1		1									1
24.06	BASF SE	Folkert Bauer	1	1					1				1			
20.07	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit	Rolf Bräuer	1			1							1			1
20.07	Rat für Nachhaltige Entwicklung (RNE)	Isolde Magin-Konietzka		1								1	1			1
23.07	Akademie für Raumforschung und Landesplanung (ARL) 5 R Competence Network	Barbara Warner, Evelyn Gustedt			2		2									2
27.07	Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie (LfULG)	Bernd Siemer		1		1							1			

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31.07	Landeshauptstadt Stuttgart, Amt für Umweltschutz	Hermann Josef Kircholtes		1		1									1
06.08	Bundesamt für Naturschutz	Mathias Herbert	1	1		1							1		1
26.08	Helmholtz-Zentrum für Umweltforschung – UFZ Kommission Bodenschutz (KBU)	Bernd Hansjürgens			1		1					1	1		1
27.08	Deutsche Bodenkundliche Gesellschaft Universität Tübingen	Thomas Scholten			1		1				1		1		
04.09	Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz (MKULNV)	Wilhelm König		1		1									1
04.09	Dresden International University KBU	Franz Makeschin		1	1		1						1		
04.09	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit	Andreas Bieber		1		1							1		
07.09	Bundesinstitut für Bau- Stadt- und Raumforschung	Fabian Dosch, Giesela Beckmann, Janna Hoymann	1	1	1	1	2								3

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07.09	Bundesamt für Geowissenschaften und Rohstoffe	Eberhard Einen			1	1						1	1		
07.09	Bundesverband Boden	Maike Bosold			1					1		1			
08.09	Deutsche Forschungsgemeinschaft (DFG)	Patricia Schmitz-Möller	1								1				1
09.09	Universität Gießen	Hans Georg Frede			1		1					1			
11.09	HAW Hamburg	Susanne Heise			1		1						1		
21.09	Forschungszentrum Jülich GmbH	Kristina Gross	1								1				1
21.09	NABU - Naturschutzbund Deutschland eV.	Steffi Ober		1					1						1
22.09	Leibniz-Zentrum für Agrarlandschaftsforschung e. V. HNE Eberswalde	Katharina Helming			1		1					1			
24.09	Umweltbundesamt	Detlef Grimski, Stephan Bartke, Frank Glante	1	1	1	1	1			1		1			2
30.09	European Land and Soil Alliance	Detlef Gerdts		1						1		1			
09.10	Bundesverband der Landesentwicklungsgesellschaften	Anna Strattmann		1						1					1
09.10	Bundesverband gemeinnütziger Landgesellschaften (BLG)	Karl-Heinz Goetz		1						1					1



Annex Ib: NKS interviews in Germany

Organisation	Workhop	funder	end user	knowledge provider	Nat.reg.loc. authority	Univ./ research inst	SME /consultant	business & industry	NGO	network	other	soil	sediment	water	land use-management
Leibniz-Zentrum für Agrarlandschaftsforschung e. V.	Thomas Weith			1		1									1
Deutsches Institut für Urbanistik (DIFU)	Thomas Preuss			1		1									1
BASF SE	Folkert Bauer	1	1					1				1			
Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit	Rolf Bräuer	1			1							1			1
Rat für Nachhaltige Entwicklung (RNE)	Isolde Magin-Konietzka, Alina Ruppelt		2								2	1			1
Akademie für Raumforschung und Landesplanung (ARL®) 5 R Competence Network	Barbara Warner, Dennis Ehm			2		2									2
Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie (LfULG)	Bernd Siemer		1		1							1			
Landeshauptstadt Stuttgart, Amt für Umweltschutz	Hermann Josef Kirchholtes		1		1										1
Helmholtz-Zentrum für Umweltforschung – UFZ Kommission Bodenschutz (KBU)	Bernd Hansjürgens; Christope Schröter-Schlaak			2		2					1	1			1

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Deutsche Bodenkundliche Gesellschaft Universität Tübingen	Thomas Scholten			1		1				1	1			
Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz (MKULNV)	Wilhelm König		1		1									1
Dresden International University KBU	Franz Makeschin		1	1		1				1	1			
Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit	Andreas Bieber		1		1						1			
Bundesverband Boden	Maike Bosold		1	1					1		1			
HAW Hamburg	Susanne Heise			1		1						1		
Forschungszentrum Jülich GmbH	Kristina Gross, Ingo Fitting	2								2	1			1
NABU - Naturschutzbund Deutschland eV.	Steffi Ober		1					1					1	
Leibniz-Zentrum für Agrarlandschaftsforschung e. V. HNE Eberswalde	Katharina Helming			1		1					1			
Umweltbundesamt CABERNET ITVA KBU	Detlef Grimski, Stephan Bartke, Frank Glante	1	1	1	1	1			1		1			2
European Land and Soil Alliance	Detlef Gerdts		1						1		1			

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Bundesverband gemeinnütziger Landgesellschaften (BLG)	Karl-Heinz Goetz		1							1				1
Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Eric Borg			1		1								1
Deutsche Gesellschaft für internationale Zusammenarbeit	Dieter Nill	1									1			1
Stadt+	Uwe Ferber		1	1			1							1
IBA Thüringen	Bertram Schiffers	1	1	1							1			1
Bundesanstalt für Immobilienaufgaben (BIMA)	Martin Jürgens	1	1		1									1
Volkswagenstiftung	Franz Dettenwanger	1									1			1



Annex IIa: Sources

acatech (Ed.): „Soil – A Geological Resource, Economic Driver and Ecosystem Service Provider: recommendations for pooling scientific expertise in soil and land management (acatech POSITION PAPER)“, Heidelberg et al.: Springer Verlag 2012. Project lead: Prof. Franz Makeschin (Dresden University of Technology) The original version of this publication is available at www.springer.com or www.acatech.de

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Walsh, C., Knieling, J. (2014). „Planungswissenschaftliche Ansätze für ein Nachhaltiges Landmanagement: internationale Beispiele – innovative Lösungsansätze“

Zscheischler, Jana, Rogge, Sebastian. (2014). „Transdisciplinarity in land use science – A review of concepts, empirical findings and current practices“, as found in „Futures“, Is. 65 (2015) 28-44



Annex IIb: Science Policy Interface documents

FONA³

Recent Science Policy Interface documents in Germany have been developed under the responsibility of the Federal Ministry of Education and Research (BMBF) under the key program "Research for Sustainable Development FONA³" (Quelle) <http://www.fona.de/en/17833> Collaborating in the fields of science, economics, politics and civil society, an agenda process refined the programme and identified new research priorities. The core of the programme will consist of three flagship initiatives: Green Economy, the City of the Future and the Energy Transition in Germany. BMBF will be working on these core elements together with other federal and state departments, allowing the results to have a direct effect on their decision-making processes. The flagships are also designed to be application-oriented, and will involve the inclusion of stakeholders such as businesses and local communities in the research process at defined points. The overall aim is to support implementation processes and, by doing so, to stimulate sustainable development.

The FONA-Framework Programme represents the implementation of the German National Sustainability Strategy and the Federal Governments High-Tech Strategy. Under the sustainability strategy, the federal government has pledged to reduce CO₂ emissions by 40 per cent as compared to 1990 emission levels by 2020. In addition, the share of renewable energy is set to reach 20 per cent as well as a doubling of energy productivity by 2020 as compared to 1990. This applies to resource productivity as well, e.g. land consumption will be reduced from 130ha to 30ha per day.

Council for sustainable development: Soil protection

The Council for Sustainable Development has formulated the requirements for soil protection in the "A New Political Approach to Sustainability Requirements for Land Use in Europe" position paper from 2014 and has also recommended the creation of a world-wide "soil stewardship council". This should collect the efforts for the development of select methods of a sustainable development in the agriculture and develop methods and indicators. The methodological approaches should be further developed within the framework of a soil stewardship and be used for operational sustainability management.

Zukunftsstadt

As part of FONA3 the National Platform Zukunftswerkstadt: Strategic Research and Innovation Agenda the CO₂ neutral, energy/resource efficient and climate adapted city 2015. Developing upon the vision of a CO₂ neutral, energy and resource efficient and climate adapted, adaptable and livable city of the future, the Federal Government, in cooperation with the Federal Ministry of Education and Research (BMBF), for the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), for Federal Ministry for Economic Affairs and Energy (BMWi) and for the Federal Ministry of Transport and Digital Infrastructure (BMVI) called into life the „National Platform Zukunftsstadt“ (NPZ). The goal of the NPZ is for the common development of an interdepartmental strategic FINA, with the goal to improve the coordination of running and future research programs with each other, to connect them better with one another, and to identify new research demands in the context of the named challenges.



Thematic connections to land use are:

- The recognition of the key role of land in a city/region as a non-renewable resource and the complex user interactions between city and region, such as for example for the regional production of food and energy sources, or the urban water cycle.
- Climate friendly city redevelopment: development of strategies of city redevelopment in growing and shrinking regions and inner development potentials, securing of green area quality, improvement of central urban spaces and of city historical preservation P.410
- Integrated and sectoral vulnerability and risk analysis, which in coordination with various environmental media
- And spatial uses, for example through the further development of simulation tools
- Urban green infrastructure(UGI) are the foundation for a strategic planning application for the development of multifunctional green and blue infrastructures. 54
- Cross sectoral management in city planning in respect to the creation and improvement of ventilation routes, green zones, waterways and flood areas as well as new operation models and forms of finance
- Open data: collection and organisation of municipal experiences.

Acatech 2013

The German Academy for Technical Science (acatech) in 2013 published the “Recommendations for a Collection of the Scientific Component in Soil and Land Management” document. The document includes an overall analysis of the resource “soil” and its role as an ecosystem service and economic factor. Societal challenges, such as climate change, food provision and energy supply were presented. Acatech demands “interdisciplinary research”. It is important for research in the field of soil and land management to address these land use challenges. As a result of their historical development, the scientific disciplines in this area are extremely wide-ranging and this is reflected in the structural diversity of the relevant research institutions in Germany. The result of this is that this subject area receives different degrees of attention from different research institutions. However, the new circumstances facing us today require strategic coordination of research topics and comprehensive, interdisciplinary responses – something that Germany’s fragmented research community is currently in no position to provide. It is therefore imperative for German soil scientists to undertake interdisciplinary cooperation on the key research topics.

- More should be done to highlight the economic and social importance of soil as a finite geological resource at a national, European and global level
- Land productivity should be increased without impairing ecosystem services
- Land management practice should be adjusted to ensure a rapid response to the effects of climate change and innovative approaches should be developed for managing competition between different soil and land uses
- A consensus should be built regarding key research priorities
- Technical expertise should be pooled and interdisciplinary institutional cooperation between the relevant actors and stakeholders in Germany should be promoted
- Measures should be taken to ensure knowledge and technology transfer from the scientific community to businesses and



DFG Senate Commission on Agroecosystem Research

The Senate Commission on Agroecosystem Research has developed a foundational paper for the research agenda titled “Sustainable and resource-efficient intensification of crop production: perspectives of agroecosystem research.”(DFG, 2014) With this foundational paper, the Senate Commission presented the perspectives for the foundational research of sustainable intensification of cultivated plant production. The main call to action by the Senate Commission is for the extension of the agricultural scientific perspective. The evaluation of the relation between input and yield, which is mostly focused upon single crop types, must be expanded to include considerations for the potentials offered by the spatial and temporal diversification of production systems in relation to the local context, the context of the landscape as well as aspects of climate change. Production strategies adapted to entire landscapes and regions as well as in respect to relevant socio-economic and agricultural political contexts must be developed in order to tie in ecosystem services. In this context, the Senate Commission recommends three interdisciplinary research priority topics for the intensification of resource efficiency of land productivity:

- Full use of the potentials of crop cultures for the environmentally friendly yield increase in the context of ecosystem requirements.
- Sustainable intensification of the plant production in the context of the landscape
- Economic, societal and political dimension of yield increases of crop cultures.

Annex IIIa: Workshop Agenda

INSPIRATION Nationaler Key Stakeholder Workshop - Deutschland

Boden – Fläche – Landnutzung: Was sind die Forschungsthemen und -strategien der Zukunft?

13.-14. Oktober 2015 – in den Räumen der Helmholtz Gemeinschaft Berlin
SpreePalais am Dom, Anna-Louisa-Karsch-Straße 2, 10178 Berlin

13. Oktober 2015

- 12.15 Uhr** Ankunft – Registrierung, informelles Kennenlernen, leichter Mittagsimbiss
- 13.00 Uhr** Begrüßung und Einführung zu INSPIRATION
- 13.15 Uhr** Der Weg zur Europäischen Forschungsagenda „Boden-Fläche-Landnutzung“ – Hintergrund und Zielstellung des Workshops
- 13.30 Uhr** Vorstellungsrunde der Teilnehmer/-innen
- 14.00 Uhr** Überblick zu Interim-Ergebnissen der Interviews und Erhebung in Deutschland
- 14.30 Uhr** Kaffee/Tee-Pause
- 15.00 Uhr** Diskussionsrunden zu Forschungsfeldern in Kleingruppen
- 18.15 Uhr** Kurze Zusammenfassung des Tages
- 20.00 Uhr** Informeller Austausch und gemeinsames Abendessen in der Cocktailbar Oase, Georgenstraße 184, 10117 Berlin

14. Oktober 2015

- 08.30 Uhr** Begrüßung und informeller Austausch
- 08:45 Uhr** Fortsetzung Diskussionsrunden zu Forschungsfeldern in Kleingruppen
- 10.30 Uhr** Kaffee/Tee Pause
- 11.00 Uhr** Vorstellung und Diskussion / Evaluation der Kleingruppenergebnisse im Plenum und Priorisierung der Ergebnisse als Input für die strategische Forschungsagenda
- 12.45 Uhr** Mittagessen
- 13.30 Uhr** Auswertung der Priorisierung der Forschungsfelder
- 13.40 Uhr** Nationale und europäische Fördermöglichkeiten: Diskussion zu Finanzierungsinstrumenten zur Forschungsförderung und zu Implementierungsherausforderungen im Science-Policy-Interface
- 15.00 Uhr** Schlussplenum zur Klärung offener Fragen, der Abstimmung des weiteren Verfahrens und für individuelle Fazit

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Annex IIIb: Workshop Flyer

Einladung zum Workshop

**„Boden-Fläche-Landnutzung
– Was sind die Forschungsthemen und
-strategien der Zukunft?“**

Der interdisziplinäre Workshop bietet Austausch und Diskussion zu folgenden Fragen:

Welche Probleme sehen Sie in Bezug auf Raumplanung, Boden- und Flächenschutz derzeit? Wie soll die Zukunft in diesen Bereichen bundesweit oder in Ihrer Region/ Branche aussehen? Wo besteht perspektivisch welcher Forschungsbedarf?

Eine strategische Forschungsagenda für die Ressourcen Boden und Fläche wird derzeit im Rahmen des EU-Projekts INSPIRATION entwickelt.

Gesellschaftliche Akteure aus Raumplanung, Bodenmanagement und Landnutzung sollen ihr Wissen und ihren Bedarf dazu einbringen, um die zukünftige Ausrichtung der Forschungsprogramme mitzugestalten.

Ihr Wissen und Ihre Ideen sind gefragt!

Wann? 13.-14. Oktober 2015
Beginn 13:00

Wo? Geschäftsstelle Berlin
Helmholtz-Gemeinschaft
Anna-Louisa-Karsch-Str. 2
10178 Berlin

Kontakt und Anmeldung

National Focal Point - Anmeldung

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STADT+

Umwelt Bundesamt

Projekt-Koordination

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HORIZON 2020
THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

INSPIRATION has received funding from the European Commission's HORIZON 2020 R&I programme under grant agreement no 642372.

Gestaltung: P. Minixhofer
Text: S. Bartke, U. Ferber, D. Grimski, P. Minixhofer, S. Zechmeister

INSPIRATION

INTEGRATED SPATIAL PLANNING, LAND USE
AND SOIL MANAGEMENT RESEARCH ACTION

**Eine strategische
Forschungsagenda für
Landnutzung und
Bodenmanagement in Europa.**

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Das europäische Projekt INSPIRATION (INTEgrated Spatial PlannIng, land use and soil management Research ACTION) entwickelt eine **strategische Forschungsagenda** für Landnutzung und Bodenmanagement in Europa.



Boden und Fläche sind begrenzte Ressourcen. Die Art, wie wir unsere Bodenressourcen nutzen und unsere Landnutzung gestalten, ist eine zentrale Herausforderung im Streben nach einer **nachhaltigen Entwicklung** in Europa.



Allerdings wird die **Komplexität des Systems** und seiner Wechselwirkungen mit Umwelt und Gesellschaft nach wie vor nur unzureichend verstanden und kaum in praktische Empfehlungen zum Landmanagement eingearbeitet.



Stakeholder aus den Bereichen Raumplanung, Landnutzung und Bodenmanagement werden ihr Wissen einbringen, um die Zukunftsperspektiven der notwendigen Forschung mit auszugestalten.

Ziel von INSPIRATION



ist es, den Forschungsbedarf für das breite Themenfeld „**Landnutzung**“ auf Grundlage der Anforderungen von **Wissenschaft, Anwendung und Forschungsförderung** zu ermitteln.

Als Ergebnis soll eine strategische Forschungsagenda für Landnutzung und Bodenmanagement entstehen,

- die in ganz Europa Anwendung finden kann,
- notwendiges neues Wissen generiert,
- den Austausch von bestehendem Wissen fördert
- und gleichzeitig die wesentlichen gesellschaftlichen Herausforderungen anspricht.

Die **16 teilnehmenden Länder** führen nationale Workshops und Experten-/innen-Interviews durch, um die jeweiligen Forschungsprioritäten mit nationalen Stakeholdern zu erheben.



www.inspiration-h2020.eu

Gesamtkoordination
INSPIRATION wird vom
Umweltbundesamt koordiniert.
Kontakt: inspiration@uba.de



Um den Forschungsbedarf **gesellschaftlichen Herausforderungen** strukturiert gegenüber zu stellen, werden die national erhobenen Informationen durch Forscher der Dresden International University, ETH Zürich, BRGM Paris, IETU Katowice und dem UFZ Leipzig in vier Themenbereichen synthetisiert:



Treibende Faktoren der Nachfrage nach Flächen-, Boden-, Sediment- und Grundwasserressourcen



Integriertes Boden- und Flächenmanagement



Verantwortlicher und fürsorglicher Umgang mit dem Naturkapital



Netto Effekte: Verstehen indirekter Werte und globaler Landnutzungsauswirkungen



Annex IV: INSPIRATION at a glance – German

Hintergrund

Boden und Fläche sind begrenzte Ressourcen. Die Art, wie wir unsere Bodenressourcen nutzen und unsere Landnutzung bei teilweise gegensätzlichen Ansprüchen gestalten, ist eine zentrale Herausforderung im Streben nach einer nachhaltigen Entwicklung in Europa und der Welt. Durch Forschung und Wissensvermittlung hat sich das Verständnis von Zusammenhängen und Wechselwirkungen von Landnutzung und dem System „Boden-Sediment-(Grund-)Wasser“ in den letzten Jahrzehnten deutlich erhöht. Allerdings wird die Komplexität des Systems und seiner Wechselwirkungen mit Umwelt und Gesellschaft nach wie vor unzureichend verstanden und in praktische Empfehlungen zum Landmanagement eingearbeitet.

Ziele

Ziel von INSPIRATION ist es, den Forschungsbedarf für das breite Themenfeld „Landnutzung“ auf Grundlage der Anforderungen von Wissensanwendern und Forschungsförderern zu ermitteln. Im Ergebnis soll eine strategische Forschungsagenda für Landnutzung und Bodenmanagement entstehen, die in ganz Europa Anwendung finden kann, notwendiges neues Wissen generiert, den Austausch von bestehendem Wissen fördert und gleichzeitig die wesentlichen gesellschaftlichen Herausforderungen anspricht.

Teilziele von INSPIRATION sind die:

- Identifizierung zukünftiger Forschungsprioritäten im Kontext Landnutzung (inklusive der hiervon betroffenen Boden-, Sediment- und Grund-/Wassersysteme)
- Zusammenfassung des Sachstandes in übergeordneten Rahmenthemen
- Identifizierung von Wissenslücken zwischen aktuellem Wissensstand und Wissensbedarf zur Lösung gesellschaftlicher Herausforderungen
- Ausarbeitung, Konsultation und Abstimmung einer strategischen Forschungsagenda zur Schließung dieser Wissenslücken
- Identifizierung von praktikablen Modellen zur Förderung, Finanzierung und Umsetzung der Forschungsagenda
- Austausch und Abstimmung mit Politik, Forschungsförderungseinrichtungen, Forschungsinstitutionen und den nationalen, europäischen und globalen Nutzern von Forschungsergebnissen/-produkten.

Ablauf

INSPIRATION wird in 5 Bearbeitungsphasen durchgeführt:

1. Identifizierung des Forschungsbedarfs im Dialog mit Anwendern und Forschungsförderorganisationen: Welche gesellschaftlichen Anforderungen werden an eine nachhaltige Landnutzung gestellt? Welche Implikationen hat dies für den Boden-, Sedimente-, (Grund-)Wasserschutz?
2. Status-Quo-Analyse: National Focal Points (NFPs) führen Audit zu Forschungsaktivitäten und -kapazitäten durch
3. Zusammenstellung der thematischen Wissensbedarfe mit Blick auf noch nicht befriedigte gesellschaftliche Herausforderungen
4. Ausarbeitung einer strategischen Forschungsagenda (SRA) zur Adressierung der Wissens- und Forschungslücken
5. Umsetzungswege (Finanzierung, Partnerschaften) zur Implementierung der SRA

Nationale Kontaktpunkte

In jedem Teilnehmerland von INSPIRATION wurden Kontaktpersonen benannt (National Focal Points = NFPs), die für die Erhebung und Zusammenstellung von Informationen über die jeweils nationale Forschungslandschaft sowie Maßnahmen zum Wissenstransfer (laufende Aktivitäten, Ansprechpartner, Forschungsfördereinrichtungen) verantwortlich sind. Als Grundlage für eine kohärente Evaluation des Forschungsbedarfs wird diese Datenbasis anschließend nach Teilthemen strukturiert und analysiert.

Gegenwärtig sind 16 europäische Länder (davon 15 EU Mitgliedstaaten) an den Erhebungen in INSPIRATION beteiligt. Staaten, die nicht als Projektpartner teilnehmen, wird die Möglichkeit zur Teilnahme an den nationalen Workshops der Projektpartner gegeben. Zudem werden sie Gelegenheit haben, den Entwurf der Forschungsagenda zu kommentieren. Damit wird angestrebt, möglichst viele Belange aus allen 28 EU Mitgliedstaaten zu berücksichtigen.



Übergeordnete Rahmenthemen

Um die Forschungslandschaft und -bedarfe den gesellschaftlichen Herausforderungen strukturiert gegenüberstellen zu können, werden in INSPIRATION die national erhobenen Informationen in vier übergeordneten Themen integriert betrachtet:

1. Treiber der Nachfrage nach Boden-, Sediment- und Grundwasserressourcen
2. Verantwortlicher und fürsorglicher Umgang mit dem Naturkapital
3. Integriertes Boden- und Flächenmanagement
4. Netto Effekte: Verständnis für indirekte Werte und globale Landnutzungsauswirkungen.

In jedem Rahmenthema werden die relevanten Forschungsfragen zu Aspekten der Landnutzung und des Bodenschutzes durch eine erfahrene Expertengruppe in gegenseitiger Abstimmung gebündelt.

Arbeitspakete

INSPIRATION wird fünf Arbeitspakete beinhalten:

1. Projektmanagement und Kommunikation: AP 1 umfasst die Projektleitung und das -management sowie die Kommunikation mit externen Anfragen
2. Anforderung von Nutzern und Forschungsförderern: AP 2 startet mit der Erfassung der national, gesellschaftlichen Anforderungen. Es führt die nationalen Audits zu den Forschungsaktivitäten und -kapazitäten durch und ordnet sie übergeordneten Rahmenthemen.
3. Übergeordnete, integrative Rahmenthemen: AP3 gleicht den Stand der Forschung mit den erhobenen Bedürfnissen in vier Rahmenthemen ab, um Forschungslücken in den jeweiligen Schwerpunktthemen zu identifizieren
4. Ausarbeitung der Strategischen Forschungsagenda und Implementierungsmechanismen: AP 4 wird unter Einbeziehung aller Partner von INSPIRATION sowie besonders interessierter nationaler Akteure die zentrale Forschungsbedarf für eine koordinierte (länderübergreifende) Herangehensweise identifizieren. Im Mittelpunkt steht das zentrale Ziel einer nachhaltigen Landnutzung. Hierfür werden die zentralen Schwerpunkte und Forschungsbedarfe in den Themenfeldern priorisiert. Darüber hinaus werden im AP4 die zentralen Ansprechpartner der SRA auf Seite der Forschungsförderer adressiert und mit ihnen Möglichkeiten und Modelle für die Implementierung der SRA eruiert.
5. Externe Kooperationen - strategische Impulse und Dissemination: AP5 obliegt die Kommunikation mit externen Partnern und Netzwerken (insbesondere Politikvertretern und Forschungsfördereinrichtungen im Bereich der Landnutzung), die Beiträge zur Entwicklung und Umsetzung der SRA leisten können.

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HORIZON2020 CSA INSPIRATION

Deliverable D2.5 –
National reports with a review and synthesis
of the collated information





inspiration

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