Samenvatting

De Europese strategische onderzoeksagenda voor geïntegreerde ruimtelijke planning, landgebruik en bodembeheer

Land en bodem spelen een vitale rol bij het oppakken van maatschappelijke opgaven op het gebied van voedsel, drinkwater, energie, huisvesting, infrastructuur en uitdagingen zoals klimaatverandering, niet-hernieuwbare natuurlijke hulpbronnen en rechtvaardigheid op milieuvlak. Land en bodem, grondwater en sediment inbegrepen, zijn eindige hulpbronnen die steeds meer onder druk staan. Conflicten over land- en bodemgebruik nemen toe door toenemende overconsumptie van natuurlijk kapitaal. Het is geen optie om op dezelfde manier door te gaan. Er is een dringende behoefte aan slim landgebruik en bodembeheer om het aanbod van natuurlijk kapitaal en ecosysteemdiensten in balans te brengen met de maatschappelijke vraag.

INSPIRATION kijkt naar de wisselwerking tussen enerzijds aanbod en anderzijds (maatschappelijke) vraag van natuurlijk kapitaal. Deze wisselwerking wordt gedeeltelijk bepaald door het land- en bodemgebruik waarvan de impact vaak onvoldoende wordt begrepen. Deze vier thema's (aanbod van natuurlijk kapitaal, vraag naar natuurlijk kapitaal, land- en bodemgebruik en evaluatie van de impact) vormden de basis voor het identificeren van specifieke onderzoeksbehoeften.

The Strategische Onderzoeksagenda (Strategic Research Agenda: SRA), die binnen INSPIRATION is opgesteld, is gebaseerd op onderzoeks- en innovatiebehoeften van meer dan 500 Europese actoren, waaronder onderzoeksfinanciers, wetenschappers, beleidsmakers en overheden, mensen uit het bedrijfsleven en consultants.

De SRA omvat alle uitdagingen op vlak van bodem- en landgebruik, inbegrepen de relaties tussen het bodem-sediment-water (BSW) systeem en thema's zoals gezondheid, energie, klimaatverandering, duurzame watervoorziening. De agenda erkent dat er behoefte is aan nieuwe kennis en nieuwe toepassing van kennis om land en het BSW-systeem duurzaam te plannen, beheren en gebruiken.

De SRA is specifiek ontworpen om publieke en private financiers van onderzoek te helpen bij het identificeren van die onderzoeksvragen waarin zij willen investeren om te innoveren en zo bij te dragen aan een groener, slimmer, en competitiever Europa met meer sociale cohesie.

De Europese Commissie en verschillende Europese landen onderzoeken hoe ze de 17 Sustainable Development Goals (SDG's)[1], in 2015 gepubliceerd door de Verenigde Naties, centraal kunnen stellen in hun beleidskaders, prioriteiten en budget. De Commissie gaat voor "de volledige integratie van de SDG's in het Europese beleidskader en de huidige prioriteiten van de Commissie." De, op basis van de behoeften van de verschillende actoren opgestelde, onderzoeksvragen in de SRA sluiten aan bij de SDG's en helpen de Commissie en individuele landen om deze doelen te bereiken.

Een instrument om synergiën te creëren voor organisaties die in onderzoeksactiviteiten willen investeren is transnationale cofinanciering. Tot augustus 2019 zal ondersteuning voor

[1] https://unstats.un.org/unsd/statcom/47th-session/documents/2016-2-IAEG-SDGs-Rev1-E.pdf

geïnteresseerde partijen (financiers, actoren) beschikbaar zijn. De nationale contactpersonen (NCP) ondersteunen het proces en helpen om landoverstijgende contacten te leggen voor cofinanciering van onderzoeksthema's. De volledige onderzoeksagenda, achtergronddocumentatie en informatie over de NCPs zijn te raadplegen op www.inspiration-agenda.eu.

Naast de SRA is er ook een "Green Paper" (versie juni 2017) beschikbaar met voorlopige voorstellen ter inspiratie en om discussies met potentiële partners te voeden tijdens het matchmakingsproces van INSPIRATION.

"Bottom-up" vraaggestuurde onderzoeksbehoeften

In INSPIRATION zijn 17 geïntegreerde en 22 thematische onderzoeksbehoeften geïdentificeerd. Thematische onderzoeksbehoeften zijn verzameld voor "aanbod van natuurlijk kapitaal en ecosysteemdiensten" (Natural Capital and Ecosystem Services Supply: NC), "vraag naar natuurlijk kapitaal" (Demand for Natural Capital and Ecosystem Services (D)), "land- en bodemgebruik" (Land Use Management (LM)) en "evaluatie van de impact" (Net Impact (NI)). De geïntegreerde onderzoeksbehoeften (Integrated Research Needs (IRT)) zijn themaoverschrijdend.

Integrated Research Needs

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

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

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

IRT-4: Bio-Economy – unleashing potential while sustaining soils

IRT-5: Integrated scenarios for the Land-Soil-Water-Food system under societal pressures and challenges

IRT-6: Indicators for assessing the efficiency of the Soil-Sediment-Water-Energy system

IRT-7: Farming systems to maintain soil fertility and yields

IRT-8: Circular land management

IRT-9: Policies to effectively reduce land consumption for settlement development

IRT-10: Stakeholder participation to facilitate the development of liveable cities

IRT-11: Integrated management of urban soils

IRT-12: Environmentally friendly and socially sensitive urban development

IRT-13: Urban Metabolism – Enhance efficient use of soil-sediment-water resources through a closing of urban material loops

IRT-14: Emerging contaminants' in soil and groundwater – ensuring long-term provision of drinking water as well as soil and freshwater ecosystem services

IRT-15: Sustainable management to restore ecological and socio-economic values of degraded land

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

IRT-17: Improving preparedness and response for climate change and related hazards

Natural Capital and Ecosystem Services Supply

NC1: Quantity, quality and health of soils, soil carbon, greenhouse gases

NC2: Biodiversity, organismic and genetic resources

NC3: Water, water cycle

NC4: Pollutant degradation, filtering and immobilization capacity

NC5: Prevention of erosion and mudslides

NC6: Geological resources

NC7: Intrinsic values of soils and landscapes

Demand for Natural Capital and Ecosystem Services

D1: The 4 F´s: Food, feed, fibre, (bio)fuel

D2: Regulating Ecosystem Services

D3: Urban / infrastructure land

D4: Water

D5: Geological (and fossil) subsurface resources

D6: Natural hazard prevention and resilience

D7: Health and quality of life (living environment)

Land Use Management

LM 1: Governance, management mechanisms, instruments and policy

LM 2: Climate change challenges for land management

LM 3: Land as a resource in urban areas (Sustainable urban land management)

LM 4: Land as a resource in rural areas (Multifunctionality of rural areas)

Net Impact

NI 1: Developing impact assessment methodology

NI 2: Understanding and assessing impacts of drivers and management

NI 3: Trade-off analysis & decision support

NI 4: Science-Policy interface

Wat betekent de SRA voor onderzoeksfinanciers, eindgebruikers, onderzoekers en kennismakelaars en burgers?

Onderzoeksfinanciers

De onderzoeksagenda geeft de onderzoeks- en innovatiebehoefte weer vanuit een breed spectrum van invalshoeken en organisaties. De agenda is gebaseerd op de inbreng van meer dan 500 actoren vanuit Europa over hoe geïntegreerde ruimtelijke planning, landgebruik en bodembeheer verbeterd kan worden en wat deze verbeteringen kunnen opleveren.

Deze “bottom-up” vraaggestuurde onderzoeksagenda is erop gericht om investeringen in onderzoek gerichter en beter te sturen. Er zijn veel gedeelde onderzoeksbehoeften vanuit meer dan 17 landen. Individuele onderzoeksfinanciers die onderzoeken hoe zij hun budget efficiënter kunnen inzetten, kunnen cofinanciering inzetten voor specifieke onderzoeksactiviteiten, inclusief kennisoverdracht.

Onderzoeksfinanciers worden uitgenodigd om aan te geven welke onderzoeksgebieden zij willen cofinanciering met welk budget en voorwaarden, zodat INSPIRATION kan helpen verschillende onderzoeksfinanciers samen te brengen.

Eindgebruikers

Eindgebruikers kunnen de kennis die door de onderzoeksactiviteiten wordt ontwikkeld gebruiken. Zij die betrokken zijn bij landgebruik en –management en gebruik maken van het Bodem-Sediment-Watersysteem profiteren van nieuwe kennis die helpt te voorzien in de benodigde goederen en diensten terwijl de Europese en wereldwijde omgeving wordt beschermd.

Eindgebruikers kunnen veel baat hebben bij het meedoen in onderzoeksprojecten. Zij kunnen in een vroeg stadium helpen bij het formuleren van de vraag, bestaande kennis inbrengen, uitkomsten valideren en natuurlijk garanderen dat resultaten ook in praktijk gebruikt kunnen worden. De eindgebruikers zijn bedrijven en partijen die land gebruiken of beïnvloeden, drinkwater- en energieproducenten, nutsbedrijven, ruimtelijke (her)ontwikkelaars, consultants, saneringsbedrijven en aannemers, boeren, bosbouwers, voedselproducenten, financiers, beleidsmakers en bevoegde instanties.

Onderzoekers en kennismakelaars

Onderzoek leidt tot kennis die vertaald moet worden naar beleid, praktijk en naar de diverse toepassingsgebieden om impact te kunnen hebben. De SRA biedt aan onderzoekers de mogelijkheid om te werken aan vraaggestuurde onderzoeksbehoeften zoals geformuleerd door een unieke “bottom-up” aanpak die kan bijdragen aan onderzoeksfinanciering.

Onderzoekers en kennismakelaars worden voorzien van informatie over hoe het werken aan de geïdentificeerde onderzoeksbehoeften impact kan hebben op maatschappelijke opgaven.

Burgers

De Europese burgers profiteren het meest wanneer maatschappelijke opgaven opgepakt worden. Hun dagelijkse kwaliteit van leven wordt verbeterd door de uitkomsten van de onderzoeksactiviteiten in deze agenda. Projecten die zich richten op maatschappelijke opgaven hebben er baat bij dat burgers meedenken en/of participeren in de planning, uitvoering en rapportage van het onderzoek. De onderzoeksagenda zelf is versterkt door bijdragen van lokale burgerinitiatieven.

Integrating Research Needs

Integrated Research need	Likely impact
IRT-1: Integrated Environmental Assessment and Soil Monitoring for Europe	Long term monitoring to show changes in soil quality to levels impacting soil function, food security and human health and to measure progress on land degradation neutrality.
IRT-2: Recognizing the values of ecosystem services in land use decisions	Assessing magnitude and societal distribution of costs and benefits of land use options (e.g. through cost-benefit analysis, cost-effectiveness analysis or multi-criteria analysis) can help mainstream the value of ecosystem services into decision-making.
IRT-3: From indicators to implementation: Integrated tools for a holistic assessment of agricultural and forest land use	A move away from segregated decision makers and scientific disciplines towards integration by location and across disciplines to assess the role of agricultural and forest land use types or climatic regions (e.g. Nordic, Mediterranean) in meeting societal demands and local socio-cultural backgrounds. Research will develop (regional or land use type specific) methodologies for an integrated assessment.
IRT-4: Bio-Economy – unleashing the potentials while sustaining soils	Unleash the potential of soil to sustain a bio-economy in Europe by better understanding soil and economic systems in order to support land management for biomass production and consumption. Alternatives to non-renewable resources are needed. Soils can provide bio-based resources, but overuse must be prevented to sustain soil system functions.
IRT-5: Integrated scenarios for the Land-Soil-Water-Food system under societal pressures and challenges	Identification of land use scenarios that deliver benefits to society AND to the environment and lead to changes in soil management and spatial planning. Growing populations increase soil and land degradation thereby rendering the remaining scarce fertile soils vulnerable to overuse and further degradation. Scenarios modelling will help assess major impacts and decrease further degradation, secure food and identify ways of achieving land degradation neutrality. Changes in the economy and the society should estimate like growing / shrinking areas and their impact to the land-soil-sediment-water system.
IRT-6: Indicators for assessing the efficiency of the Soil-Sediment-Water-Energy system of resources	National, regional, local authorities would benefit from a more global and informed vision of the utility (private and public) of their decisions if they were supplied with indicators helping to measure the consequences of their decisions on the natural resources. This “footprint” type of indicators will permit a statistical scoreboard to be used to analyze environmental impacts through the whole global economic cycle and thus better balance societal benefits and ecological effects of different resource-use options.
IRT-7: Farming systems to maintain soil fertility while meeting demand for agricultural products	Understanding the potential of different agricultural food production systems while maintaining soil fertility and reducing negative environmental impacts associated with intensive conventional farming. Increased knowledge about economic and technical aspects of organic food production systems will improve their competitiveness and help mainstream sustainable agricultural practices.

Integrated Research need	Likely impact
IRT-8: Circular land management	Research is required to understand the patterns of behaviour and interdependencies of actors, especially land owners, active in land-related policy areas on a theoretical and practical level. It is important to combine the strategies and instruments by circular land management through applied research and pilot case studies and in the sense of modular “tool boxes” to qualify a sustainable land management.
IRT-9: Policies to effectively reduce land consumption for settlement development	Knowledge on how to design effective policies given the institutional constraints of their implementation and enforcement will be necessary to realize the benefits of reduced land consumption in rural and urban areas.
IRT-10: Stakeholder participation to facilitate the development of liveable cities	Understanding the potential of stakeholder participation will help to ensure the liveability of urban development and enhance transparency and legitimacy of decision-making.
IRT-11: Integrated management of soils in urban areas	Better understanding the role of urban soils in improving quality of urban space and consequently on health and living quality.
IRT-12: Environmentally friendly and socially sensitive urban development	Solutions that bridge the goals of urban environmental protection and social concerns of urban development are crucial to realize sustainable cities. Knowledge on environmental issues in urban planning as well as on social concerns is partly available but has to be deeper, up to date and better integrated.
IRT-13: Urban Metabolism – Enhance efficient use of soil-sediment-water resources through a closing of urban material loops	Without further development of the methodological concept of urban metabolism, it will be not possible to identify comprehensive measures to enhance urban resource efficiency, consistency and sufficiency. Urban metabolism instruments and tools are needed at different scales (local, regional, national and supranational) to address indirect impacts, such as rebound effects or indirect land consumption. Such new instruments and tools will help manage our common resource basis, minimize negative ecological effects, foster the local economy through a circular urban economy and support a long term, high level of urban quality of life.
IRT-14: Emerging contaminants’ in soil and groundwater – ensuring long-term provision of drinking water as well as soil and freshwater ecosystem services	Greater knowledge about the properties of ‘emerging’ contaminants, and mixtures, their distribution in groundwater and soil, their toxicity to humans as well as soil and freshwater ecosystem services is needed to ensure public health and long-term provision of ecosystem services. Methods of analyzing emerging contaminants are needed.
IRT-15: Sustainable management to restore the ecological and socio-economic values of degraded land	Dedicated research will elaborate degradation-type and region-specific restoration and rehabilitation approaches for valorization of degraded areas.

Integrated Research need	Likely impact
IRT-16: Innovative technologies and eco-engineering 4.0: Challenges for a sustainable use of agricultural, forest and urban landscapes and the SSW system	Improved rural and urban land use through appropriate sustainable technologies, exploitation of comprehensive data collected by high-quality on- and off-site sensors, and purposeful communication. Eco-engineering for the design, monitoring and management of rural and urban ecosystems can integrate human society into the natural and man-made environment. Identifying what is a sustainable intensification via industrial or organic agriculture and forestry will help planning and permitting.
IRT-17: Climate change challenges - improving preparedness and response for climate conditions and related hazards	Spatial planning could be an instrument for coping with effects of climate change, but only if we have a better understanding of climate change mitigation, adaptation and counteracting negative climate phenomena. Integrated strategies on soil protection and land management should help reduce direct and indirect impacts from climate change. New technical and operational solutions can be developed using low cost, widely available data science.

Natural Capital and Ecosystem Services Supply

Research need	Likely Impact
NC1: Quantity and quality of soils, health of soils, soil carbon, greenhouse gases	Land use conflicts may be solved by sustainable land use management concepts based on natural capital and the multiple ecosystem services provided by the soil-sediment-water system.
NC2: Biodiversity, organismic and genetic resources	Biodiversity loss will be halted when the societal benefits of biodiversity and ecosystems is quantified for different areas.
NC3: Water, water cycle	The delivery of the water demanded by society will become more stable and resilient to environmental and societal change, which will contribute to more safe, sustainable and healthy societies.
NC4: Pollutant degradation, filtering and immobilization capacity	We will be able to manage the legacy of soil contamination from the past more cost-effectively and sustainably, with knowledge on the natural capacity of the SSW-system to detoxify contaminants.
NC5: Prevention of erosion and mudslides, natural hazards	This research will reduce the occurrence, duration and severity of natural hazards, by developing alternative land use management strategies that will increase the natural resilience to floods, fires, land subsidence, erosion and landslides.
NC6: Geological resources	This research will decrease the environmental and societal impact of resource recovery, and protect natural capital by promoting recycling and use of alternatives. It will contribute to the transition towards a circular economy.
NC7: Intrinsic values of soils and landscapes	Aesthetic, cultural and social values of landscapes will be preserved better.

Demand for Natural Capital and Ecosystem Services

Research need	Likely Impact
D1: The 4 F´s: Food, feed, fibre, (bio)fuel	This research will strengthen the transition towards a circular and biologically based economy, by quantifying the societal demand of this transition for soil functions.
D2: Regulating Ecosystem Services	Assessment and mapping of soil ecosystem services are prerequisites for sustainable management of natural resources, to optimize soil functions and services.
D3: Urban / infrastructure land	This research will contribute to land use conflict management, the liveability of shrinking regions and villages, and increased brownfield remediation and re-use of land, which will safeguard soils for other purposes.
D4: Water	Current and future water demand scenarios will enable more futureproof land use decision making to ensure the delivery of sufficient and clean water for future generations.
D5: Geological (and fossil) subsurface resources	This research will help decrease the environmental and societal impact of resource recovery, decrease demand by promoting recycling and use of alternatives and contribute to the transition towards a circular economy.
D6: Natural hazard prevention and resilience	This research will reduce the occurrence, duration and severity of anthropogenically triggered natural hazards; reduce vulnerability by developing alternative land use management strategies, and; increase resilience to a range of hazards including floods, fires, earthquakes, volcanic eruptions, land subsidence, erosion and landslides.
D7: Health and quality of life (living environment)	Research on the contribution of nature to health and well-being will allow for better spatial design to optimize these health benefits, especially with respect to vulnerable groups in deprived areas.

Land Use Management

Research need	Likely Impact
LM 1: Governance, management mechanisms, instruments and policy	Improved policies, governance structures and institutions to promote sustainable land management throughout Europe.
LM 2: Climate changes challenges for land management	This will enable the design of effective and suitable spatial planning and land use management systems, to deal with extreme weather events, flooding, droughts and environmental stresses.
LM 3: Land as a resources in urban areas (Sustainable urban land management)	This research will contribute to the development of an healthy urban environment and sustainable and safe cities.
LM 4: Land as a resources in rural areas (Multi-functionality of rural areas)	This research will contribute to maintaining and improving soil fertility, and improved nutrient and pesticide management. It will also stimulate nature conservation and will provide options to deal with urban sprawl and rural depopulation, as well as to avoid land speculation.

Net Impact

Research need	Likely Impact
NI 1: Developing impact assessment methodology	Developing monitoring and impact assessment methodologies will enable us to detect and assess emerging threats from global change (such as climate change), land management and pollution to human health and well-being, biodiversity and ecosystem service provision as well as the prosperity of our economies.
NI 2: Understanding and assessing impacts of drivers and management	This research will provide us with an understanding of the magnitude of the ecological, economic and social impacts of land management decisions, emerging and/or mixed pollutants, socio-economic drivers of land management and land use change, and policies, planning and regulation.
NI 3: Trade-off analysis & decision support	Research on comparative assessment of land management options will support realizing synergies and trading off conflicts between different societal demands with regard to land use and land management.
NI 4: Science-Policy-Society Interface	Strengthening the science-policy-society interface will facilitate knowledge-based development and implementation of land use policies by awareness raising, stakeholder involvement and policy integration.