



## Policy-oriented research to achieve Land Degradation Neutrality



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**Key research priorities:  
Recommendations of the International Consortium  
of Science and Knowledge Networks  
on Sustainable Land Management (ICoN SLM)**

## Background

In early August 2015, the document describing the agreed wording of the Sustainable Development Goals (SDGs) was released. These SDGs, which will be formally adopted at the SDG Summit in September 2015, include a goal that we should “combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation neutral world” (goal 15.3) by 2030<sup>1</sup>. In this context and UNCCD debates on land degradation neutrality (LDN), there is increasing awareness in both policy and research arenas to identify the interrelationships between actions that successfully address LDN, as well as facilitate land-based adaptation to climate change, climate change mitigation and sustainable development. The independent scientific community underscores the need to address LDN by developing research which: i) highlights the most pressing research topics to combat land degradation/desertification and moves towards sustainable land management (SLM); ii) demonstrates the interlinkages between and the complementarities of various research topics; and iii) incorporates cross-sectoral, transdisciplinary and participatory approaches in order to have an effect on the ground.

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<sup>1</sup> <https://sustainabledevelopment.un.org/post2015/transformingourworld>

In this document, in which ICoN SLM sets out key research priorities, the term ‘thematic research module’ is used to define a stand-alone set of activities, designed to address a particular aspect of land degradation/desertification. Thematic research modules can be designed in a flexible yet complementary style so that they can also become an integral part of another thematic research module. ICoN SLM considers this modular approach may support funding agencies to direct or integrate one or more thematic modules into existing or planned research programmes. It also provides a basis for agencies to take a step-by-step approach in the funding of research. Overall, the research proposed by ICoN SLM will effectively support the achievement of LDN according to national, regional or international funding agendas, recognizing the value of each thematic module in the overall context of achieving LDN.

## **Key research priorities in support of land-based responses to land degradation and adaptations to climate change**

Science and policy still have a prescriptive approach when developing “good science and good interventions” that people should implement to manage their land. The prescriptive approach has been widely critiqued and is not seen to meet the needs of those affected by degradation or who are managing the land sustainably. This is clearly reflected in existing projections, which indicate land degradation and desertification are increasing worldwide. In addition, future research striving to achieve LDN and SLM will need to strengthen community adaptive responses to environmental pressures emerging from land degradation, as these will be aggravated by climate change impacts.

Science can provide co-learning approaches that are able to support research and policy making in addressing context-specific, land-based adaptive responses to climate change. Innovative projects may emerge e.g. from investing in cross-sectoral activities at local and regional scales; in terms of resources, infrastructures and skills; and by designing and implementing new spaces for learning at the community, research and policy levels. This section outlines some of the most pressing research areas.

## Thematic research module on knowledge-based negotiations and decision support models, tools and methods for preventing and combating land degradation and land-based adaptation to climate change

The research in this thematic module includes:

1. Analysing negotiation processes between stakeholders and identifying tools and methods for decision support
2. Identifying SLM practices and success stories to prevent and halt degradation, and restore or rehabilitate degraded lands in their specific ecological, socio-economic and cultural context, with a view to further testing for applicability in other locations, particularly under climate change conditions
3. Identifying and qualifying the impacts of different land management practices, and the costs and benefits of action and inaction
4. Identifying conducive policies that establish an enabling environment that permits better matching of land degradation problems with SLM solutions
5. Further developing ways to monitor the impacts of policies and legal frameworks on implementation on the ground
6. Developing science-based models supporting the implementation of SLM interventions in a participatory approach that involves affected communities and relevant decision- and policy-makers. Such models should include all forms of knowledge besides science (e.g. local and/or traditional knowledge).

This research module supports the proposals of the UNCCD's Science Policy Interface (SPI) to the Committee on Science and Technology (CST) at UNCCD COP.12, to:

- “Investigate the interlinkages between desertification/land degradation and climate change and their effects on human well-being” (SPI proposal 1; ICCD/COP(12)/CST/2).
- Develop “a user guide outlining the requirements of a systems approach to transdisciplinary research and policy development that recognizes the interactions between land degradation, climate change and biodiversity and between socio-economic and biophysical systems”; thereby also including

“advice on how to optimize the use of local, traditional and scientific knowledge and how to establish effective collaboration between policy makers, scientists and other stakeholders in identifying the most effective land-based adaptation to climate change, land-based climate change mitigation, and measures of rehabilitation and restoration of degraded lands” (SPI proposal 5; ICCD/COP(12)/CST/2).

- Develop “a user guide for researchers and policy makers on how to engage citizens in participatory monitoring (bottom-up) which is linked to broader policy efforts (top-down), in order to support national and local efforts to link desertification, land degradation and drought (DLDD) responses to sustainable development efforts.” (SPI proposal 24; ICCD/ COP(12)/CST/2).
- Support the proposed objective of SPI’s work programme 2016-2017 to “revisit traditional and local land use knowledge and experiences responding to dryland droughts, and assess their potential for climate change adaptation in drylands and other areas.” (Proposed objective 2b of SPI’s work programme, ICCD/COP(12)/CST/6).

## **Thematic research module on monitoring and assessing the biophysical impacts of land degradation neutrality (LDN)**

Monitoring the status of land and its ecosystem services and the productivity and other benefits from land under SLM is the fundamental basis for developing diverse opportunities to overcome the lack of investments in drylands through community-based and scientifically sound rural development actions. However, scientifically sound data on the biophysical extent and severity of land degradation/desertification do not currently exist. This information is crucial for the development of interventions. Estimates currently range from 20% of land cover being degraded with medium certainty<sup>2</sup> to 52 % of the land being degraded<sup>3</sup>. Additionally, there is no scientific assessment of the extent of SLM practices. To put SLM into practice, tools have to be developed which measure the status of land’s productivity and its ecosystem services. Thus, this research module focuses on the further development of scientific measurements and assessments of the:

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2 Millennium Ecosystem Assessment, MA (2005): Ecosystems and human well-being: Desertification synthesis. <http://www.millenniumassessment.org/documents/document.355.aspx.pdf>

3 <http://www.unccd.int/Lists/SiteDocumentLibrary/WDCD/DLDD%20Facts.pdf>

1. Spatial extent of degradation
2. Degree of severity of losses or damage to ecosystem functions and services which underpin the land's productivity (e.g. for agroforestry, cultivation and grazing)
3. Differences between land degradation processes which are human induced from those that are climate change led, as well as the links between them
4. Extent and effectiveness of SLM, rehabilitation and restoration practices and their social, economic and ecological impacts, on-site and off-site, and the overall costs and benefits of inaction and action
5. Processes and approaches to successfully prevent degradation, and restore or rehabilitate land and up-scale SLM
6. Temporal trend(s) in land degradation/desertification, SLM, rehabilitation and restoration
7. Actual and potential gains of SLM in view of all the conventions and global issues such as food security, water conflict resolution, climate change adaptation and mitigation, bio-diversity. For all these global (and local) issues, current land degradation/desertification and the up-scaling of SLM play a central but insufficiently recognized role.

This research module also needs to identify ways to develop and durably implement cost-efficient monitoring methods and impact assessments. Such methods include remote-sensing as well as on-the-ground monitoring methods and tools, including participatory monitoring and assessment. Data gained using each of these methods needs to be easily shared between



scientists, land users, policy and extension officers and other relevant stakeholders. The scientific design of these monitoring methods will have to explore ways to ensure the interoperability of measures across different geographic scales (local, national, regional, global), as well as being sufficiently robust and flexible to be used in a wide range of land uses, agro-climatic and socio-economic contexts.

This research module would support the SPI's proposals to the CST at UNCCD COP.12 , to:

- Encourage Parties, regional organizations and networks “to cooperate in developing drought management and water security policies and programmes that address the combined impacts of drought and land degradation” (SPI proposal 3; ICCD/COP(12)/CST/2).
- “Support and incentivize the establishment or expansion, as applicable, of integrated national observatories to assess the status of land degradation and the impact of climate change, sustainable land management (SLM), and land-based adaptation to climate change,...” (SPI proposal 22; ICCD/COP(12)/CST/2).
- Support the proposed objective of the SPI's work programme 2016-2017 to develop a “user guide for implementing LDN at the country level”. (Proposed objective 1 of SPI's work programme, ICCD/COP(12)/CST/6).
- Support the proposed objective of the SPI's work programme 2016-2017 to “encourage the development and implementation of specific rehabilitation, restoration and reclamation measures and practices in degraded lands.” (Proposed objective 3 of SPI's work programme, ICCD/COP(12)/CST/6).

## **Thematic research module on monitoring and assessing the transboundary social, economic and cultural impacts and risks of land degradation and the effects of SLM in a globalizing world**

Local, national and regional land management practices leading to land degradation or sustainable land use are inextricably linked to global change processes (e.g. demographic dynamics, globalized markets, migration, technology transfers and so on). In turn, the ecological, social and economic impacts emerging from land degradation and from SLM are having increasing trans-boundary effects.



This research module supports appropriate policy interventions by:

1. Developing systems models in order to unravel the interrelationships between local, national, regional and global social, economic and policy processes, triggered or enhanced by land degradation or the up-scaling of SLM. These models will be used to identify the local and regional impacts of land degradation and SLM and provide a basis for science-based projections (scenarios) on trends and development opportunities. In turn, these will facilitate development of reliable policy options
2. Identifying how all sectors can be engaged with tackling land degradation and up-scaling SLM in order to have the largest, least cost, least risk impact on achieving LDN.

This research module will include analyses of demographic development(s), social and cultural trends, social learning, gender issues, migration, land tenure, security, use of natural capital (biodiversity, soil, water) under different land use systems and varying socio-economic and cultural environments, as well as over different temporal scales.

This research module supports the SPI's proposals to the CST at UNCCD COP.12 to:

- Support the proposed objective of SPI's work programme 2016-2017 to "highlight the science-based synergistic potential of sustainable land management practices to address land degradation, climate change mitigation and adaptation". (Proposed objective 2 of SPI's work programme, ICCD/COP(12)/CST/6).





## Thematic research module on overcoming institutional barriers to implement economic assessment findings (move towards a “green economy”)

In the framework of the SDGs, this research module explores and proposes options as to how institutional barriers can be overcome to implement economic assessment findings and valuation methodologies for decision making in land-based sectors. Research under this topic focuses on:

1. Supporting a fairer and more just distribution of costs and benefits emerging from preventing or combating land degradation
2. Developing sustainable intensification to suit different contexts and to combat land degradation
3. Identifying ways to resolve institutional and policy conflicts that emerge through the interplay of policies targeting land degradation, climate change and biodiversity conservation
4. Identifying ways in which development trajectories can aim to reduce tradeoffs between adaptation and mitigation, whilst also building resilience.

This research module supports the SPI's proposal to the CST at UNCCD COP.12 to:

- Develop, “in consultation with the Science-Policy Interface (SPI), a user guide that describes incentives and disincentives to support SLM and land-based adaptation to climate change, including public-private tools such as produce certifications and other market-based incentives.” (SPI proposal 17; ICCD/COP(12)/CST/2).

## Conclusion: putting land degradation neutrality into practice

The following contributions of science are needed to put LDN into practice:

- A proper impact assessment of the different land management practices on land degradation is required. Monitoring the state of land under different management practices provides the basis for measuring the extent and severity of land degradation and SLM. This information is important to develop maps and models to identify trends. Monitoring provides the basis to measure, achieve and verify LDN and to identify development opportunities based on the robust knowledge of the impacts that different land management practices have on the natural as well as human environment.

- A participatory, systems-based research approach is indispensable because ultimately LDN can only be attained through changes in human behaviour and human uses of land and natural resources. Co-evaluation of existing knowledge and co-production of new knowledge can increase acceptance/adoption rates among communities through: i) local community engagement, ii) sharing success stories, iii) technical training opportunities (capacity development), and iv) combining local, traditional and modern knowledge.

Evidence-based decision making and combatting of land degradation to achieve LDN have to support cross-sectoral interactions in order to mainstream the necessary governance of sustainable land management practices at the national and local levels; and provide a basis to promote land-based adaption to climate change.

ICoN SLM is convinced that that drylands, which are especially hard hit by and at risk of land degradation/desertification provide diverse opportunities to sustain human well-being and development in a land degradation neutral world. This implies that land and its natural capital are under socially, economically and ecologically sound governance, and provide durable benefits to land users. In order to reach the 2030 goal of LDN, small and medium-scale land users have to be supported to:

- Enhance and maintain their adaptive capacity to changes so that livelihoods can be maintained to sustain their social, economic and cultural existence
- Participate in the co-production of knowledge; in the joint identification of area-specific land-based adaptation measures; and in the implementation of measures to achieve and maintain LDN.


Civil society organizations and extension services also need to support social learning using appropriate language and information and communication technologies. They can help build trust and understanding while reconciling the needs of local communities, consumer demands, research communities and political agendas, enabling concerted action between relevant stakeholders, and reducing the time-lag between knowledge generation and application.

ICoN SLM encourages the operationalization of the thematic research modules described in this document, in order to successfully fight land degradation/desertification to achieve LDN. ICoN SLM thereby stresses the need to adjust the research modules to the ecological, socio-economic and cultural realities in the target areas in order to guarantee maximum impact on the ground. ICoN SLM underscores the need to accompany prevention, rehabilitation or restoration measures with a clear message on the potential of drylands for investments to ensure sustainable development through the expansion of sustainable land management and alternative development opportunities which also take the pressure off degraded sites.



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