ABOUT THE CONFERENCE

The 3rd UNCCD scientific conference on **"Combating desertification/land degradation and drought for poverty reduction and sustainable development: the contribution of science, technology, traditional knowledge and practices"** was hosted by the Government of Mexico in Cancún from 9 to 12 March 2015, during the 4th special session of the Committee on Science and Technology (CST S-4) of the United Nations Convention to Combat Desertification (UNCCD). The scientific conference was organized by the 'Scientific and Traditional Knowledge for Sustainable Development' (STK4SD) consortium, under the guidance of the CST Bureau and the conference's Scientific Advisory Committee.

The conference aimed to attract the widest possible range of scientific, local and traditional knowledge that could be harnessed to achieve poverty reduction and sustainable development in areas susceptible to desertification, land degradation and drought. Indeed, the scientific conference format in itself is unique among multilateral environmental agreements in combining a scientific conference with a meeting of policymakers. **The conference thus gathered nearly 300 participants from 90 countries, half of which from the scientific community, and the other half from ministries, government agencies, international organizations and civil society organizations.**

One of the major challenges facing delegates to the conference was the development of new scientific insights and recommendations to policy makers with regards to the assessment of vulnerability of socio-ecological systems to climate change and current and future capacities to adapt. In preparation of the conference, an Impulse Report on "Climate change and desertification: Anticipating, assessing and adapting to future change in drylands" was published. Based on the inputs from the Impulse Report and from the participants' contributions, the conference then addressed three major challenges: **diagnosis of constraints** to adaptation of populations and ecosystems; **responses** to combat drought, land degradation and desertification; and **monitoring and assessment** of changes.

The proposed conference format was an experiment building upon the two previous UNCCD scientific conferences, with a view toward enhancing interactions between scientists and stakeholder participants. Each of those three challenges were thus addressed through a dedicated session featuring an introductory keynote address, followed by a series of five parallel workshops and ending up with a brief report presented in plenary. Within each workshop, contributions from participants were presented as posters, while a great deal of time was left for discussion, which was introduced, led and wrapped-up by a team consisting of a facilitator and two rapporteurs. Additional keynotes specifically addressed the synergies between the three Rio conventions, the role of local knowledge and actions implemented in Mexico.

The conference was expected to contribute to the combat against desertification and land degradation and to address the impact of drought, through delivering the following outcomes:

- **Better anticipation and prevention of the impact of climate change** on land degradation and desertification through capacity building;
- **Identification and promotion of sustainable and adaptive methods** of using ecosystems to reduce poverty and environmental degradation while achieving sustainable development;
- **Identification of pathways towards land-degradation neutrality:** by way of reducing degradation processes and scaling up restoration activities, the objective is to maintain and improve the quantity and quality of productive land.

The first key scientific findings and policy-oriented implications stemming from the conference are presented in this document. They will be further developed by the UNCCD Science-Policy Interface (SPI) to be presented at the 12th Conference of the Parties in Ankara next October. All conference input and output documents, including contributions from the participants, are available on the conference website: **http://3sc.unccd.int/**

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3rd UNCCD Scientific Conference

9-12 March 2015, Cancún, Mexico

"Combating desertification/land degradation and drought for poverty reduction and sustainable development: the contribution of science, technology, traditional knowledge and practices"

Preliminary conclusions

The Scientific and Traditional Knowledge for Sustainable Development (STK4SD) Consortium

United Nations Convention to Combat Desertification

2015 International Year of Soils

UNDDD 2010-2020 UNITED NATIONS DECADE FOR DESERTS AND THE FIGHT AGAINST DESERTIFICATION

The effects of demographic pressure and unsustainable land management practices on land degradation and desertification are being exacerbated worldwide due to the effects of climate change, which include (but are not limited to) changing rainfall patterns, increased frequency and intensity of drought and floods, rising temperatures, and profound ecological shifts. As a consequence, populations' abilities to generate livelihoods are limited, particularly in the drylands. Where land users are exposed and sensitive to changes and able to adapt, through flexibility and mobility in the use of the natural capital, resilience can be built. When they cannot adapt, land users become more vulnerable, which can lead to any number of undesirable consequences including increased poverty, malnutrition, outmigration, political insecurity, and conflict.

Human activities are the principal drivers of the processes of land degradation, desertification and climate change. Society must therefore mitigate or reverse these stresses through innovative approaches to attain land degradation neutrality. The very best modern science and technology will be needed, allied with local or traditional knowledge that has developed over time. Ultimately, we must change human behaviour and attitudes regarding the use of land and other natural resources. Doing nothing or maintaining the status quo is not an option. **To have a fighting chance of securing communities and ecosystems, and of moving towards land degradation neutrality, we must enable land-based adaptation through effective, multi-stakeholder partnerships and collaboration.**

The 3rd UNCCD scientific conference, held from 9 to 12 March 2015 in Cancun, Mexico, used a novel, participatory approach to explore the various forms of knowledge that link biophysical and social systems, the vulnerabilities of these systems and potential pathways to reach sustainable land management. Participants focused on salient questions raised in the conference Impulse Report to come up with specific scientific and operational recommendations to achieve impact. Scientific presentations and exchanges were organized into three sessions: ❶ **Diagnosis of constraints** that increase the vulnerability or limit the adaptability of socio-ecological systems; ❷ **Responses** that implement and promote better-adapted, knowledge-based practices; and ❸ **Monitoring and assessment methods** to evaluate the effectiveness of such practices.

KEY SCIENTIFIC FINDINGS

SESSION THEMES

POLICY-ORIENTED IMPLICATIONS

❶ DIAGNOSIS OF CONSTRAINTS

How to best characterize and understand the vulnerability and adaptive capacities of ecosystems (in particular agro-ecosystems) and populations in affected regions, including regions newly susceptible to the consequences of climate change?

■ There is increased recognition of the importance of local and traditional knowledge in developing sustainable land management practices to reduce vulnerability. Although an increasing number of biophysical indices for land degradation can be estimated cost-effectively through remote-sensing, **there is a need for operational indicators that integrate both scientific and local knowledge** to allow for a better understanding of adaptive capacities and a better anticipation of complex interactions between biophysical and social systems in specific settings.

■ Integrated and multidisciplinary studies on the links between climate change and land degradation processes are essential. **Greater compatibility among methods to diagnose constraints would improve our ability to share knowledge and enhance response** while facilitating downscaling of climate change scenarios to local contexts, and outscaling from local to wider contexts. Greater regional cooperation will also be needed to address the links between land degradation and natural disasters such as flooding and landslides.

■ The economic value of ecosystem services and their loss through degradation can be now estimated with greater accuracy. **More progress is needed, however, in the development of qualitative indices for services that cannot be easily monetized, such as cultural and spiritual indices,** for these are highly relevant to such key issues as food security and sustainable land use.

■ The cross-sectoral nature of climate change, land degradation and desertification means that these combined challenges are already impacting the nexus of food security, health, livelihood losses and poverty. **This demands systems and integrated landscape approaches to assess vulnerability and adaptation capacities.** Appropriate future governance styles at levels from the local to the international will not only have to take into account land degradation and desertification triggered by the severe exploitation of natural capital, but also the impacts of climate change.

■ Investments and more evidence-based decision making over the short, medium and long-term, which differentiate between direct and indirect climate change and human drivers of land degradation, can guide land-based adaptation options. **These options can be informed by models, participatory tools and scenarios that provide evidence to policymakers and other stakeholders in useable and accessible ways.**

■ **Appropriate governance structures, institutions and processes are required to enable effective use of this knowledge.** As land users are not necessarily land owners, property rights can limit the effectiveness of adaptation incentives. This is especially the case for small-scale land users that are already under acute pressure from food price volatility and climate variability.

❷ RESPONSES

How to build efficiently on available knowledge, success stories and lessons learnt to promote implementation of better adapted, knowledge-based practices and technologies?

■ **An environment of co-learning that places value on "hybrid knowledge" needs to be fostered in research.** In such an environment, the perceptions and experiences of local populations are recognized, and social, economic and biophysical information is integrated. Since cultural and socioeconomic factors influence adaptation options, local stakeholders must be involved in both the identification of scientific questions and the search for solutions. A "wiki" inventory of techniques and tools for land restoration could support such efforts. Improved and more efficient models of knowledge transfer are also needed. Modern Internet or cell phone technologies offer new opportunities in this regard.

■ **Systems analysis—including value chain and market analyses—is needed to identify incentives and barriers to sustainable responses,** including lack of traditional and local knowledge, poor access to capital or technology, language barriers, gender inequities, property rights structures and policy environments.

■ **Additional research is needed to assess social, economic and environmental impacts of market incentives,** with special focus on such institutional aspects as transaction costs and power relations, to assess their effectiveness in reducing vulnerability.

■ **Stakeholder knowledge brokering systems should be developed to share best practices.** Civil society organizations and extension services 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 and political agendas, enabling concerted action and reducing the time-lag between knowledge generation and application.

■ **Responses must be informed by robust, comprehensive economic valuations that include the economics of land degradation and climate change, consider the costs of action and inaction, and take into account non-monetary values.** Appropriate governance, combined with incentives and disincentives to avoid maladaptation, can foster sustainable land management at different scales and ensure that public-private tools and market-based incentives stimulate behavioural changes and reach their target with reduced transaction and social costs.

■ Land-based adaptation offers one way to harness greater financial support and make progress towards sustainable development goals. **There nevertheless remains a need to clarify how funding can be channeled into these activities, and to identify what resources are available at which scales and for which stakeholders.** The coordination of diverse stakeholder actions on the ground also requires effective governance and institutions to help ensure human well-being and justice, since system transformations also bear social costs, and can result in 'winners' and 'losers'.

❸ MONITORING AND ASSESSMENT

What are the new monitoring and assessment methods available to evaluate the effectiveness of these practices and technologies that provide improved insights on whether or how their implementation should be scaled up?

■ There are many exciting developments in the field of remote-sensing such as increasingly accessible, high-resolution satellite images, inexpensive drone-mounted sensors and crowd-sourced data using various smartphone applications. **Research should aim to consolidate these developments such that monitoring and evaluation can be done at different scales and by different stakeholders.** This will require new and innovative approaches to managing and combining large sets of heterogeneous data, as well as continued review, testing and assessment of methodologies to best use these new types of data.

■ If we are to use "hybrid knowledge" that draws upon both modern science and traditional or local knowledge, then a long-term perspective with clear objectives is required that uses indicators that are useful to diverse stakeholders. In addition, more effort is needed to distinguish indicators of the state of land degradation and climate change from indicators of the drivers of such processes. **Based on such indicators, a more coherent integrated framework for monitoring and assessment should be designed, and used to produce policy-relevant information.**

■ **It is of primary importance to develop datasets, indicators and monitoring and evaluation frameworks that are meaningful not only to scientists but also to engaged communities and policy-makers working to achieve land degradation neutrality.** Qualitatively, land degradation neutrality implies maintaining or improving the condition of the land resources, through the sustainable management of soil, water and biodiversity in order to fully realize their economic, social and environmental benefits. However, further efforts are needed to scientifically underpin this concept.

■ Satellite data offer information on change at multiple spatial scales, allowing identification of key areas for urgent, targeted interventions and providing a basis for assessing adaptation options. Satellite data must be integrated with and validated by ground observations, using technologies such as mobile phones to engage citizens, including women and youth, in participatory monitoring. **Capacity-building that targets short, medium and long-term needs is needed to facilitate multi-stakeholder engagement in monitoring sustainable land management.**

■ **Implementing land degradation neutrality at the national and international levels would involve political, organizational and technological challenges.** This implies that adequate and efficient information and monitoring systems have to be set up. Additionally, appropriate governance structures and institutions should ensure that investments in sustainable land management and land restoration are not carried out at the expense of livelihoods of local population and their future adaptation capacities.

■ **A common framework assessment across the three Rio conventions would facilitate a more balanced monitoring of multiple ecosystem services,** and provide insight into the multiple benefits of sustainable land management, including multiple win options for land, biodiversity, climate and poverty reduction.