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Convention to Combat Desertification

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Outcomes of the UNCCD 3rd Scientific Conference

Outcomes and policy-oriented recommendations from the UNCCD 3rd Scientific Conference

Report by the Bureau of the Committee on Science and Technology

Summary

The United Nations Convention to Combat Desertification (UNCCD) 3rd Scientific Conference was held from 9 to 12 March 2015 in conjunction with the fourth special session of the Committee on Science and Technology (CST S-4). The conference addressed the topic: "Combating desertification, land degradation and drought for poverty reduction and sustainable development: the contribution of science, technology, traditional knowledge and practices".

The UNCCD 3rd Scientific Conference aimed at producing sound scientific outputs which could inform policy formulation and dialogue at the Conference of the Parties. The key scientific findings and policy-oriented implications that emerged from the conference are conveyed to the twelfth session of the Committee on Science and Technology (CST 12) in the report on CST S-4.[1]

After the UNCCD 3rd Scientific Conference, the Science-Policy Interface (SPI), reviewed the outputs of the conference, and developed policy-oriented proposals for consideration by CST 12.

Pursuant to the provisions in decision 21/COP.11, this document contains: (a) a report by the Bureau of the CST on the organization of the UNCCD 3rd Scientific Conference; (b) the policy-oriented proposals developed by the SPI based on the outcomes of the UNCCD 3rd Scientific Conference; and (c) emerging policy issues compiled by the SPI which address future science-based activities of the UNCCD.

[1] ICCD/CST(S-4)/3.

Contents

I. Background

1. Pursuant to the provisions contained in decision 13/COP.8, paragraph 1 (a), and decision 21/COP.11, paragraphs 19 and 20, the Conference of the Parties (COP) decided that each future intersessional session of the Committee on Science and Technology (CST) would be organized in a predominantly scientific and technical conference-style format.

2. Since then, three scientific conferences have been held. The United Nations Convention to Combat Desertification (UNCCD) 1st Scientific Conference took place from 22–24 September 2009 in Buenos Aires, Argentina on the theme "Biophysical and socioeconomic monitoring and assessment of desertification and land degradation, to support decision-making in land and water management". The UNCCD 2nd Scientific Conference took place from 9–12 April 2013 in Bonn, Germany on the theme "Economic assessment of desertification, sustainable land management and resilience of arid, semi-arid and dry sub-humid areas".

3. The UNCCD 3rd Scientific Conference took place from 9–12 March 2015 in Cancun, Mexico, in conjunction with the fourth special session of the CST (CST S-4). In line with decision 18/COP.10, the UNCCD 3rd Scientific Conference addressed the theme: "Combating desertification, land degradation and drought (DLDD) for poverty reduction and sustainable development: the contribution of science, technology, traditional knowledge and practices".

4. The UNCCD 3rd Scientific Conference aimed at producing sound scientific outputs that could inform policy formulation and dialogue at the COP. The key scientific findings and policy-oriented implications which emerged from the conference are conveyed to the twelfth session of the Committee on Science and Technology (CST 12) in the report on CST S-4.[2]

5. After the UNCCD 3rd Scientific Conference, the Science-Policy Interface (SPI)[3] reviewed the outputs of the conference and developed policy-oriented proposals for consideration by CST 12, in accordance with its mandate expressed in decision 23/COP.11 which states, among other things, that the SPI should "…analyse, synthesize and translate relevant scientific findings and recommendations from DLDD-related scientific conferences, including upcoming UNCCD scientific conferences…into proposals to be considered by the CST".

6. By its decision 21/COP.11, paragraph 27, the COP also requested the SPI to make proposals to the Bureau of the CST for the subsequent consideration of the COP on topics for future UNCCD scientific conferences.

7. Pursuant to the provisions in decision 21/COP.11, this document therefore contains: (a) a report by the Bureau of the CST on the organization of the UNCCD 3rd Scientific Conference; (b) the policy-oriented proposals of the UNCCD 3rd Scientific Conference developed by the SPI; and (c) emerging policy issues identified by the SPI to be addressed in future science-based activities of the UNCCD, in line with the proposals on future institutional arrangements contained in document ICCD/COP(12)/CST/4.

[2] ICCD/CST(S-4)/3.

[3] The membership of the SPI comprises: (a) the five members of the Bureau of the CST; (b) five scientists, one nominated by each Regional Implementation Annex region; (c) ten scientists selected by the Bureau of the CST through an open call taking into account regional and disciplinary balance; and (d) three observers: one from a civil society organization, one from an international organization and one from a relevant United Nations organization (decision 23/COP.11).

8. The SPI provides these proposals for consideration in conjunction with document ICCD/CST(S-4)/3 so that they might ultimately contribute to an associated COP decision, in conformity with the provisions of the Convention.

II. Report on the organization of the UNCCD 3rd Scientific Conference

9. The UNCCD 3rd Scientific Conference was organized by the consortium Scientific and Traditional Knowledge for Sustainable Development (STK4SD), which was appointed by the Bureau of the CST at its meeting on 29–30 October 2012. The STK4SD consortium is composed of five major scientific organizations (Agropolis International, DesertNet International, the Consultative Group for International Agricultural Research, the Sahara and Sahel Observatory and the Argentine Institute for Arid Zone Research), plus two associate partners (the Institute for Environment and Sustainability of the European Commission's Joint Research Centre and the Desertification Research Centre of the University of Sassari). The memorandum of understanding between the UNCCD secretariat and the STK4SD consortium (represented by Agropolis International) was signed on 27 September 2013 in Windhoek, Namibia.

10. The conference was organized under the guidance of the Steering Committee which included representatives of the Bureau of the CST, the STK4SD, the UNCCD secretariat and the host country, Mexico. The Scientific Advisory Committee (SAC), whose members were selected by the Steering Committee at its meeting on 14 September 2013 in Windhoek, Namibia, guided all scientific activities in preparation for the conference.

11. The call for submission of abstracts was open from 13 June 2014 to 28 September 2014. A total of 206 abstracts were submitted: 52 (25 per cent) came from Asia, 39 (19 per cent) from Latin America and the Caribbean, 37 (18 per cent) from Africa, 21 (10 per cent) from the Northern Mediterranean and 18 (9 per cent) from Central and Eastern Europe. A total of 39 abstracts (19 per cent) were submitted by countries not belonging to a Regional Implementation Annex and by observer States to the Convention. All submitted abstracts were reviewed by the SAC; nine abstracts were not accepted because they were deemed to be outside the scope of the conference. All accepted abstracts were published in a book of abstracts and presented at the conference during poster sessions.[4]

12. An Impulse Report,[5] designed to inform the conference deliberations, was prepared under the guidance of the SAC with inputs from a multidisciplinary panel of experts. The Impulse Report focused on the topic: "Climate change and desertification: Anticipating, assessing and adapting to future change in drylands". The executive summary of the Impulse Report was presented for discussion at the conference, as contained in document ICCD/CST(S-4)/2.

13. The conference was organized in three main sessions: (a) diagnosis of constraints; (b) responses; and (c) monitoring and assessment. Keynotes addressed each of these

[4] The book of abstracts is available at: <http://3sc.unccd.int/documents-outputs/preparatory-documents/book-of-abstracts>.

[5] Reed, M. S.; Stringer, L. C. (2015). Impulse Report – Climate change and desertification: Anticipating, assessing & adapting to future change in drylands. Prepared with the contribution of an international panel of experts. Presented at the UNCCD 3rd Scientific Conference. United Nations Convention to Combat Desertification, Agropolis International, Montpellier, France. ISBN: 978-2-35682-379-3. Available at: <http://3sc.unccd.int/documents-outputs/preparatory-documents/impulse-report>.

themes, and additional keynotes specifically addressed issues relating to indigenous and traditional knowledge, synergies with the other Rio Conventions and actions implemented in Mexico, the host country for the conference.

14. With a view to enhancing interactions among participants, the conference used a novel, participatory format. The organizers opted for a structure and schedule that prioritized discussions around questions raised in the Impulse Report and poster contributions submitted by participants. Each session featured an introductory keynote address, followed by parallel workshops where participants discussed their contributions presented as posters. The main discussion points and conclusions of the 15 workshops were then presented in a plenary session.

15. The UNCCD 3rd Scientific Conference gathered 289 participants (67 per cent male and 33 per cent female) from a total of 90 countries, out of which 73 were officially represented.

16. 129 participants were from the scientific community, 105 were representatives of country Parties, 24 of intergovernmental organizations, 22 of civil society organizations (CSOs) and 9 of United Nations entities.

17. The majority of participants came from Latin America and the Caribbean (32 per cent or 82 participants), followed by Asia (19 per cent or 49 participants), Africa (14 per cent or 35 participants), Northern Mediterranean (8 per cent or 24 participants) and Central and Eastern Europe (5 per cent or 13 participants). In addition 21 per cent or 53 participants were from countries not belonging to a Regional Implementation Annex or observers States to the Convention.[6]

18. A conference satisfaction survey was circulated at a plenary session during the last session of the conference, and was completed by 99 participants. According to the survey, most attendees at the conference had postgraduate or doctoral qualifications. More than 60 per cent of respondents had either a postgraduate degree or a PhD, 23 per cent were professors and 11 per cent had just a bachelor degree. Participants in the survey were generally 'satisfied' with the UNCCD 3rd Scientific Conference, according to a rating scale ranging from 'very satisfied' to 'very dissatisfied'. Satisfaction peaked during the plenary sessions while the poster sessions, workshops and side events revealed slightly lower satisfaction levels. Some survey participants noted that the short time-window and tight spaces in which posters were displayed prevented in-depth exchanges with poster authors.

III. Policy-oriented proposals of the UNCCD 3rd Scientific Conference and emerging policy issues to be addressed in future science-based activities of the United Nations Convention to Combat Desertification

19. With respect to the UNCCD 3rd Scientific Conference, the SPI conducted analyses of: (a) the Impulse Report; (b) observations by the 22 SPI members who attended the conference; (c) the reports resulting from the 15 workshops organized at the conference; (d) inputs from organizers and keynote speakers of the conference obtained through semi-structured interviews and email consultation; and (e) the final report of CST-S-4, as contained in document ICCD/CST(S-4)/3.

[6] Representatives of intergovernmental organizations and United Nations entities are not included in these estimates.

20. The SPI also reviewed the outcomes of the first two scientific conferences through analysis of associated reports and publications, and (obtained through survey and interviews) the perspectives of key stakeholders from the broader scientific community as well as governmental and non-governmental officials, who were informed on or linked to UNCCD processes. The analysis revealed that the scientific conferences do not only address specific themes, but also represent a gradual process of increasing insight into all aspects of DLDD. Themes, scientific perceptions and knowledge gaps which were identified during the 1st and the 2nd Scientific Conferences re-emerged in the 3rd Scientific Conference, highlighting some fundamental and compelling scientific principles on DLDD at the science-policy interface that need to be addressed (see also documents ICCD/COP(12)/CST/4 and ICCD/COP(12)/CST/INF.2).

A. Policy-oriented proposals of the UNCCD 3rd Scientific Conference

21. The UNCCD 3rd Scientific Conference used a novel, participatory approach to explore links between biophysical and social systems, and between science and policy, with an emphasis on vulnerability to the combined impacts of DLDD and climate change. Climate change is a potential driver of land degradation, and land degradation caused by land use can play a role in driving climate change. This interrelationship, as well as the contributing roles of climate change and human activities, must be better understood. The discussions at the conference underscored the fact that addressing key knowledge gaps will require a shift in scientific research towards transdisciplinary and translational science focused on making a difference for people on the ground.

22. Based on the analysis and review of the conference's output, the SPI has developed the following proposals for consideration by the CST and, potentially, as the basis for recommendations by the CST to the COP. The proposed actions are intended to improve the relationship between the scientific-technological and decision-making sectors and civil society, and to form the basis of more effective informed decision-making in order to reduce the vulnerability of socio-ecosystems to the impacts of DLDD and climate change.

23. The proposals of the SPI are accompanied by short summaries of their scientific basis, and are grouped according to the three main themes addressed at the conference: (a) diagnosis of constraints; (b) responses; and (c) monitoring and assessment.

1. Diagnosis of constraints

24. Much is known about individual processes relating to land degradation and climate change impacts, whereas much less is known about interactions between these processes, and between the social and biophysical systems.

Proposal 1: The UNCCD encourages the Intergovernmental Panel on Climate Change (IPCC) to investigate the interlinkages between desertification/land degradation and climate change and their effects on human well-being. The Science-Policy Interface (SPI) is also encouraged to initiate and coordinate interactions on these issues with the IPCC.

Proposal 2: In order to reduce the time lag between knowledge generation and its application in policy, it is proposed that the SPI be requested by the Committee on Science and Technology (CST) to provide policy briefs on policy implications of the latest developments in scientific research relating to desertification, land degradation and drought (DLDD) and land-based adaptation to climate change. Further, it is proposed that the secretariat be requested to support the preparation of policy briefs by providing the SPI with information about ongoing activities which are relevant for the development of policy briefs.

25. The key climatic processes that are likely to interact with land degradation processes to threaten livelihoods are extreme weather events, such as droughts, heat stress and increased soil temperature and evapotranspiration rates. According to the Intergovernmental Panel on Climate Change (IPCC),[7] increases in the severity and duration of droughts are likely by the second half of the 21st century, and climate change will significantly reduce renewable surface water and groundwater resources in most dry subtropical regions.

Proposal 3: Parties and regional organizations and networks are encouraged to cooperate in developing drought management and water security policies and programmes that address the combined impacts of drought and land degradation.

26. The cross-sectoral nature of climate change and land degradation/desertification means that these combined challenges are already impacting on the nexus of food security, health, livelihood losses and poverty.

Proposal 4: Parties and relevant organizations and institutions are encouraged to develop and use a systems approach to assess vulnerability and adaptation capacities.

Proposal 5: The Committee on Science and Technology (CST), in consultation with the Science-Policy Interface (SPI), is encouraged to consider modalities for developing 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. The user guide could include 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.

2. Responses

27. There are a number of response options to enhance the adaptive capacity and resilience of ecosystems and human populations. It is argued that land-based adaptation to climate change and sustainable land management (SLM) have the potential to simultaneously reduce land degradation and provide adaptation to climate change, as well as often protecting or enhancing biodiversity, in what may be considered a "triple-win" outcome.

28. Adapting to climate change and simultaneously combating land degradation will require engagement with diverse and often conflicting stakeholder priorities, needs and perspectives. The co-construction and co-evaluation of knowledge increase problem-

[7] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

solving performance, and favour the acceptance and adoption of solutions among communities. For the implementation of effective and feasible strategies for land-based adaptation to climate change, multi-stakeholder participation is vital from early stages of problem identification up to final decision-making, implementation and monitoring.

Proposal 6: Parties are encouraged to institutionalize multi-stakeholder participation, making use of state-of-the-art participatory process design, knowledge systems and communication technology.

Proposal 7: Parties are invited to work continuously to identify and support new approaches to multi-sector collaboration across business, policy, science and civil society, including local communities, thereby also considering the contribution of different forms of knowledge (including local and traditional knowledge) and novel means of optimizing its use in order to increase adaptive capacity. This should include supporting small and medium enterprises (SME) and civil society organizations (CSO) with a direct interest in local, national or regional sustainable development in setting up networks of collaboration for successful land-based adaptation to climate change.

29. There is increased recognition of the importance of local and traditional knowledge in developing SLM practices to reduce vulnerability. SLM technologies often evolve through local traditional practices or benefit from these. SLM technologies are also often suited to particular biophysical or socio-cultural contexts. These factors mean that promoting adoption and scaling up these technologies is complex. Scientific testing and validation of local and traditional technologies can improve their relevance for policy-makers and their applicability across contexts.

Proposal 8: Parties are encouraged to support processes that ensure the consideration and use of locally and traditionally held knowledge.

Proposal 9: Parties and relevant organizations and institutions are invited to scientifically test and validate local and traditional knowledge on sustainable land management (SLM) technologies in projects and programmes, including potential trade-offs.

Proposal 10: Parties are invited to integrate scientific, local and traditional knowledge when developing national and locally relevant indicators.

30. In drylands, high rainfall variability and unpredictable droughts have led to the development of land-use systems, governance structures and processes that reflect and respond to these uncertainties through flexibility and mobility in the use of the land's natural capital. Knowledge transfer from drylands (including all forms of knowledge) is therefore invaluable for all, and needs to be promoted since it can effectively inform wider land-based climate change adaptation.

Proposal 11: The Science-Policy Interface (SPI) is tasked to analyse, as part of its work programme 2016–2017, local and traditional land-use knowledge and experiences that respond to droughts in the drylands, and to assess their potential in the context of land-based climate change adaptation in drylands and also in areas which are projected to face increasing droughts and other projected climate change-

related phenomena.

31. Knowledge exchange, whether based on science or on local or traditional knowledge, or all three, is of critical importance for land management, rural development and human well-being. Improved and more efficient models of knowledge exchange are needed to enhance knowledge about adaptation options for climate change and SLM. Modern internet or cell phone technologies offer new opportunities in this regard.

Proposal 12: Based on the encouragement given at the eleventh session of the COP for the formation of an independent consortium of scientific networks on desertification, land degradation and drought (DLDD) as well as regional science and technology platforms, both of which can interact with the Science-Policy Interface (SPI) for the provision of scientific advice (Decision 23/COP.11), in order to facilitate further regional and global knowledge exchange, the Parties are urged to strengthen national networks, and to work collaboratively to strengthen regional and global science and knowledge networks. These networks should contribute to enhancing the interaction among diverse stakeholders and to supporting the provision and sharing of multiple knowledge forms on DLDD, sustainable land management (SLM) and successful strategies for land-based adaptation. This should build upon the efforts to develop the "portal of portals" for DLDD known as the Scientific Knowledge Brokering Portal (SKBP).

Proposal 13: The secretariat is requested to develop the SKBP further into a knowledge portal enabling knowledge transfer from multiple sources, including sources on land-based adaptation to climate change. The SKBP shall facilitate and promote access to relevant knowledge through various communication channels, using the Internet and mobile phones.

32. Active incorporation of local strategies for land-based adaptation to climate change within policy planning is needed to enable effective adaptation on the ground.

Proposal 14: Parties are encouraged to mainstream adaptation to the combined effects of climate change and land degradation into their national development strategies.

33. Appropriate governance, combined with incentives and disincentives to avoid maladaptation, can foster the adoption of adaptation measures and ensure that public-private tools such as product certifications and other market-based incentives will reach their target with reduced transaction and social costs.

Proposal 15: Parties are encouraged to enhance support for systems research that can identify leverage points for potential interventions for land-based adaptation to climate change. This would encompass research into modelling the impacts of alternative scenarios including top-down and bottom-up financing, delineation of value chains that capture market and non-market values, and quantifying the socio-economic, environmental and cultural trade-offs from a multi-stakeholder perspective.

Proposal 16: Parties are encouraged to develop policies that enable the implementation of sustainable land management (SLM) and strategies for land-based adaptation to climate change, by providing market-based incentives for adaptation

and disincentives for maladaptation, exploring, for example, payments for ecosystem services (PES) schemes or similar governance.

Proposal 17: Existing scientific initiatives focusing on desertification, land degradation and drought (DLDD) and on the economics of land degradation (ELD) are invited 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.

34. As land users are not necessarily land owners, a lack of property rights can limit the effectiveness of adaptation incentives. This is specially the case for small-scale land users that are already under acute pressure from food price volatility and increasing climate variability.

Proposal 18: Parties are encouraged to ensure that policies governing rights to land and its natural capital, including the policies of large-scale foreign private sector investors, are socially and ecologically sound and provide long-term benefit to the small-scale land users and communities in the area where they are implemented.

35. The lack of public awareness is another important barrier to the adoption of adaptation measures. Civil society organizations (CSOs) and extension services can support social learning[8] using appropriate language and information and communication technologies. They can help build trust and understanding while reconciling the needs of local communities, consumer demands, and the requirements of research communities and political agendas, thereby enabling concerted action between relevant stakeholders, and reducing the time-lag between the generation of knowledge and its application.

Proposal 19: Parties should encourage civil society organizations and extension services to support social learning about land degradation, climate change, sustainable land management (SLM) and land-based adaptation to climate change using appropriate language and information and communication technologies.

36. Land-based adaptation to climate change offers one way to harness greater financial support and make progress towards the sustainable development goals. There nevertheless remains a need to clarify how funding can be attracted for supporting these activities, what resources are available at which scales, and for which stakeholders.

Proposal 20: The Global Mechanism (GM) is requested to assist affected country Parties in identifying and accessing domestic, foreign and innovative sources of funding for land-based adaptation to climate change.

[8] Social learning is defined as a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks. Reed, M.S., Evely, A.C., Cundill, G., Fazey, I., Glass, J., Laing, A., Newig, J., Parrish, B., Prell, C., Raymond, C. and Stringer, L.C., 2010. What is social learning? Ecology and Society 15(4): r1.

3. Monitoring and assessment

37. There is an increasing number of biophysical indices for land degradation that can be estimated cost-effectively through remote sensing. Remote sensing data offer information on change at multiple spatial scales, allowing the identification of key areas for urgent, targeted interventions and providing a basis for assessing the effectiveness of SLM.

Proposal 21: The Science-Policy Interface (SPI), supported by the secretariat, should be invited to explore progress on the development of interoperable international observatories (for example, the Global Earth Observation System of Systems (GEOSS) being built by the Group on Earth Observations (GEO), the Global Climate Observing System (GCOS), the Global Biodiversity Observing System (GBOS), and UNEP Live) in order to promote investment (of financial and human resources) in developing a Global Drylands Observing System (GDOS), which integrates and validates remotely sensed data with ground observations, and/or ensuring that desertification, land degradation and drought (DLDD) and land degradation neutrality (LDN) monitoring and assessment needs are fully integrated into existing efforts to systematically collect environmental observations. The SPI could, for example, explore potential for a special thematic group on DLDD/sustainable land management (SLM) in the GEOSS, thereby intensifying the activities and visibility of the UNCCD as a participating organization in the GEO, or it could seek linkages with the Copernicus global land monitoring services in order to further enhance action on, and the visibility of, land degradation/desertification issues in the global arena.

38. Remote sensing data must be integrated with, and validated by, ground observations. Furthermore, given the types of interactions likely to occur between climate change and land degradation, monitoring and evaluation needs to consider both biophysical and socio-economic changes arising from adaptations. Socio-economic (often qualitative) data are therefore essential to triangulate and supplement biophysical data. By taking a nested approach to indicator development, it may be possible to develop locally relevant indicators, useful to all stakeholders, around a core set of indicators that can enable cross-scale comparisons, and also contribute to the reporting on the state of the land.

39. To monitor progress on land degradation neutrality (LDN) and support policy formulation and implementation, integrated national observatories to assess the impacts of land degradation, climate change, SLM and land-based adaptation to climate change need to be established and maintained. To be effective, these national observatories need to be supported by all the national land-related sectors (for example, ministries of the environment, education, development, infrastructure, agriculture), and to include capacity-building (awareness raising on the socio-economic and ecological effects of DLDD amongst decision makers and land users), and training and incentives for members of rural communities so that they actively participate in monitoring the status of their lands.

Proposal 22: Parties are invited to 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, and to contribute actively to common global reporting initiatives in relation to the state of the land.

Proposal 23: Developed country Parties and relevant technical and financial organizations, including from the private sector, are encouraged to provide additional support to affected country Parties for the establishment and maintenance of national monitoring systems and for capacity-building to facilitate multi-stakeholder

engagement in monitoring SLM.

Proposal 24: The Committee on Science and Technology (CST), in consultation with the Science-Policy Interface (SPI), is encouraged to consider modalities for developing 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. This guide should ideally be developed in collaboration with the other Rio Conventions in order to improve its effectiveness and reduce redundancy.

40. A common framework assessment across the three Rio Conventions would facilitate efficient comprehensive monitoring of multiple ecosystem services and provide insight into the multiple benefits of SLM including multiple win options for land-based adaptation to climate change, biodiversity conservation, poverty reduction and food security.

41. A conceptual and a methodological framework for assessing the vulnerability of ecosystems and human populations to land degradation and climate change have been proposed in the Impulse Report (Reed and Stringer, 2015). A Resilience, Adaptation Pathways and Transformation Assessment (RATPA) framework, developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in partnership with the Scientific and Technical Advisory Panel (STAP) of the Global Environment Facility (GEF), was also presented at the UNCCD 3rd Scientific Conference as a tool to align approaches and monitoring towards common objectives, to contribute to integrated strategies, and to pursue synergies in reporting between the Rio Conventions.

Proposal 25: Parties are encouraged to strive for close cooperation between the three Rio Conventions and their scientific bodies, and the UNCCD secretariat is requested to promote further cooperation with the secretariats of the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biodiversity (CBD) to develop a common framework for assessment and reporting across the three Rio Conventions. The Resilience, Adaptation Pathways and Transformation Assessment and the assessment frameworks proposed in the Impulse Report (Reed and Stringer, 2015) should be considered as a possible basis for a common approach.

42. Qualitatively, LDN is a state whereby the amount and quality of the land's resources, necessary to support ecosystem functions and services and to maintain or enhance food security, remains stable or increases within specified temporal and spatial scales. However, further efforts are needed to underpin this concept scientifically.

Proposal 26: As part of its work programme 2016–2017, the Science-Policy Interface (SPI) is tasked to develop a user guide for implementing land degradation neutrality (LDN) at the country level, including a conceptual framework for putting LDN into operation that draws on all forms of knowledge.

B. Emerging policy issues relevant for future science-based activities of the United Nations Convention to Combat Desertification

43. The SPI used the scientific literature and ongoing interaction with the scientific and policy-making communities, capped by an intensive effort during and after the UNCCD 3rd Scientific Conference, to identify the following emerging policy issues considered relevant to the identification of future science-based activities of the UNCCD:

(a) The significance of drylands. The impact of land degradation and climate change on the drylands' land users is cross-boundary. In the context of globalized markets, impacts of land degradation and climate change on drylands have flow-on effects in other climatic and ecological systems through migration, markets, insecurity and conflict. These flow-on effects need to be explored scientifically, in order to increase global awareness, leading to pay further attention to reducing land degradation, specifically in drylands;

(b) Separating climate and land use drivers. Methods for distinguishing the effects of climate change from those of degrading land use on human and agro-ecological system performance need to be developed and employed;

(c) Land tenure of small holders. Robust and practical methods to identify differences in the rate of land degradation between land users who are owners and those who are not owners of the land are necessary to draw attention to property rights issues and to encourage social learning about land degradation in order to support measures for attaining SLM;

(d) Economic valuation is indispensable. Responses to the impacts of DLDD need to be informed by robust total economic valuations that include the economics of land degradation and climate change, considering the costs of action and inaction including non-monetary values;

(e) Land speculation. Increased speculation on land and large-scale land acquisitions are likely to have huge social consequences from the international to the local level, altering both access to and the use of natural resources, and so studies of current test cases are required;

(f) Land transformation and land degradation. Over short timescales, agricultural and rangeland ecosystems which have replaced natural ecosystems may not be degrading. However, the loss of ecosystem services that were provided by natural ecosystems prior to their transformation can bring about a degradation of agricultural systems, which could affect human well-being at medium to long timescales. The dependence of production landscapes on services provided by natural ecosystems needs to be further studied, to inform land-use planning and the balancing of intensification and extensification in land use;

(g) LDN and monitoring. Remote sensing data need to be integrated with, and validated by, ground observations using technologies such as mobile phones to engage citizens, including women and youth, in participatory monitoring, without which the LDN concept cannot be implemented;

(h) LDN across ecosystems. Addressing land degradation in one ecosystem type or biome does not necessarily balance losses in another (since the ecosystem services are different). Some provision for balancing land degradation within (rather than across) ecosystem types is therefore essential;

(i) LDN across livelihoods. Relatively recent trends towards major extractive land-use changes (such as mining) and landscape alterations for irrigated agriculture may lead to irreversible changes of landscape and land productivity, affecting future livelihoods

from such lands. These relatively new trends in land-use change need to be studied so that measuring and reporting LDN reflects all gains and losses;

(j) Vulnerability under environmental change. IPCC projections indicate the possible changes in natural capital under future climate scenarios. In order to guide options towards land-based adaptation to climate change, policy should invest in research into how climate change and land use affect each other, and what processes may be independent of each other;

(k) Local/traditional knowledge and adaptation. It is essential to further develop innovative means for capturing and applying local and traditional knowledge on land use in order to support the development of land-based adaptation to climate change;

(l) Income diversification and land-based adaptation to climate change. Income diversification has been demonstrated as an approach to reduce vulnerability. Studies are needed on the ramifications of income diversification (and the barriers to it) in rural drylands in the face of climate change and land degradation;

(m) Resilience-conferring actions. While research has been conducted into the rehabilitation or restoration of already-degraded land and mitigating land degradation under degrading use, less is known about resilience-conferring actions that can prevent or mitigate the degradation of land under non-degrading use, particularly also in the light of climate change.

C. Requirement for new research approaches

44. The SPI review identified requirements for innovative research approaches that must be considered in the effort to optimize the impact of the future science-based activities of the UNCCD and the science-to-policy process in general. These included:

(a) Strengthening relevant and timely knowledge generation through systems-based, multi-, inter- and transdisciplinary approaches that are designed to be:

(i) Integrated across human and socio-ecological systems;

(ii) Participatory, by engaging all stakeholders (including scientists) in the co-production of knowledge throughout the research process;

(iii) Gender-responsive in objective and design (with data-sets that can be disaggregated by gender);

(iv) Focused on system performance (including value chain and market/non-market ecosystem service analyses) and thus capable of identifying leverage points, incentives and barriers to sustainable responses, institutional transaction costs, and trade-offs among anticipated economic, social and environmental benefits;

(v) Designed to contribute to technical, market, governance and policy options capable of improving livelihoods and ecosystem integrity in dryland systems;

(b) Mainstreaming participatory processes (as part of problem identification, selection, assessment and monitoring of interventions) into policy decisions, by creating and improving mechanisms for cooperation and knowledge exchange between the different stakeholders (local communities, scientists, policy makers and other decision makers and the public);

(c) Facilitating the use of local/traditional knowledge and its integration with other forms of knowledge in scientific discovery and policy generation;

(d) Development of a systematic approach to measuring and monitoring trends in, and impacts of, DLDD and SLM through an appropriate mix of global observations and local data collection through multi-stakeholder engagement – representative of all interests including those of women and youth. The use of area-specific indicators with the support of science, extension services and local communities to monitor the status (that is, quantity and quality) of biodiversity, soil and water resources in cultivated or pastoral lands, can contribute to safeguarding the productivity of the land and its functions. Continuous monitoring of the status of the natural capital[9] will contribute to policy preparedness through the timely identification of key areas for urgent and targeted interventions, provide a basis for assessing the effectiveness of SLM in sustaining dryland system performance (including productivity) and support national reporting on the status of a country's land;

(e) Ensuring that reliable data and information on DLDD-relevant issues are available to all stakeholders in an easily accessible format for supporting policy formulation, developing management plans and taking action;

(f) Recognizing that scientific research findings need to be translated into practical advice, the effectiveness of which must be tested by end-users. This is not only essential to making the findings useful, but is also vital in order to increase acceptance and action among local communities;

(g) Facilitating the link between science and decision making through tools such as participatory modelling, multi-criteria decision aiding and collaborative scenario generation and evaluation;

(h) Addressing current weaknesses in communication between different stakeholders and at different geographic and institutional scales by capitalizing on the wide range of technological advances in facilitating user-generated content, mobile access, seamless interoperability, and user-verified usability;

(i) Exploring a common assessment framework across the three Rio Conventions in order to facilitate the simultaneous monitoring of multiple ecosystem services while providing insight into the multiple benefits derived from SLM. See also document ICCD/COP(12)/CST/3 for more details.

IV. Conclusions and proposals

45. The SPI provides the proposals contained in section III.A of this document, based on the outcomes of the UNCCD 3rd Scientific Conference, for consideration by the CST and as input to policy-oriented recommendations for consideration by the COP.

46. The SPI proposes that the CST recommend that the COP encourage Parties and national, regional and international research programmes and organizations to promote research on the emerging policy issues identified by the SPI as contained in section III.B.

[9] Natural capital refers to the world's stock of natural resources (including soil and biodiversity) which creates a long-term supply of goods or services.