WHITE PAPER II
Costs and Benefits of Policies and Practices Addressing Land Degradation and Drought in the Drylands

Economic assessment of desertification, sustainable land management and resilience of arid, semi-arid and dry sub-humid areas

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Authorship
Author: Lene Poulsen, Chair, Working Group II
Contributors and reviewers for White Paper II listed on p. viii

Working Group II for White Paper II
Chair: Lene Poulsen
Members: Elena Maria Abraham, Ferdo Bašić, Hatem Belhouchette, Guillermo Dascal, José Roberto de Lima, Herminia Francisco, Alemu Mekonnen Getnet, Antonia Corinthia Crisanta Navarro Naz, Olena Rakoid, Mary Seely, Mariya Sokolovska, Heather Tallis, Borut Vrščaj, Xiaohui Yang, Valentin Yatsukhna

Scientific Advisory Committee (SAC)
Chair: Jonathan Davies

Review Group
Viorel Blujdea, Jonathan Davies, Klaus Kellner, Pak Sum Low, César Morales Estupiñán, Mélanie Requier–Desjardins

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Pablo Olivieri (Trees in the wind)
Giulio Napolitano (Cattle walking to the well)
Arup Halder (Children transporting water)
Dibyendu Dey Choudhury (Women transporting water)


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ABBREVIATIONS

CST Committee on Science and Technology (of the UNCCD)
ELD Economics of Land Degradation (initiative)
FAO Food and Agriculture Organisation
GDP Gross Domestic Product
OECD Organization of Economic Cooperation and Development
SEEA System of Environmental-Economic Accounts
SNA System of National Accounts
TEEB The Economics of Ecosystems and Biodiversity (study)
UN United Nations
UNCCD United Nations Convention to Combat Desertification (in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa)
UNDP United Nations Development Programme
UNEP United Nations Environmental Programme
ABSTRACT

- Drylands are complex social-ecological systems, characterized by non-linearity of causation, complex feedback loops within and between the many different social, ecological, and economic entities, and potential of regime shifts to alternative stable states as a result of thresholds. As such, dryland management faces a high level of uncertainty and unpredictability.
- To strengthen the scientific foundation for sustainable dryland and drought risk management, there is a need for a system approach based on transdisciplinarity with emphasis on participatory research and involvement of practitioners as well as scholars from different scientific disciplines to address problems in an integrated manner.
- A critical means to achieve sustainable dryland and drought risk management is to strengthen resilience through capacity development of individuals, communities, and systems to survive, adapt, and follow a positive trajectory in the face of external and/or internal changes, even catastrophic incidents, and rebound strengthened and more resourceful while retaining essentially the same functions.
- Another critical means is the application of an ecosystem services approach to ensure proper attention to the dynamic and interlinked provisioning, regulating, supporting, and cultural dryland ecosystem services. The ecosystem services approach has proven particularly useful and challenging for economic valuation of sustainable dryland and drought risk management as a basic tool for direct management purposes as well as policy decision-making.
- Based on a comprehensive literature review of recent peer-reviewed scientific journals complemented with grey literature, this White Paper provides an introduction to current thinking about economic valuation techniques related to different aspects of dryland management and policy-making. The paper highlights the challenges that exist, the different opinions about the best way to address environmental economic valuations, and the many assumptions that need to be clearly identified for each exercise in order to communicate the results efficiently to decision-makers at all levels.
PREAMBLE

The term ‘drylands’ invokes different associations for different people: beautiful deserts, poor people desperately trying to make a living in a hostile environment, cowboys roaming on the prairies, proud Maasai people claiming their rights to continue their 1,000-year old pastoralist way of living, irrigated tomato fields, oases in the middle of endless miles of scorched soils, to name a few. That there are many different aspects associated with the dryland concept is not surprising, considering that drylands cover more than 40% of the Earth’s land mass and are distributed on all continents. Drylands therefore cover an endless number of cultures, traditions, and livelihoods as well as a great variety of dryland ecosystems. What unites those different areas is of course the dryness or the aridity and with that the constant need to adapt to actual and potential water scarcity whether it is a natural ecosystem or a social-ecological system. With the aridity comes the management of scarce resources and hence the importance of sound economic management to ensure sustainable use of the drylands.

Unfortunately, what also unites many drylands is the ongoing degradation and challenges in maintaining the important outputs that the drylands provide humanity, such as agricultural productivity, carbon sequestration, global biodiversity, and spiritual and recreational services. Over the last decades, the international community has therefore given increasing attention to ensuring sustainable land use management with emphasis on integrating social, economic, and environmental aspects. The need for a holistic approach to ensure sustainability in the drylands was highlighted at the Rio Earth Summit in 1992 and it is a key principle in the UN Convention to Combat Desertification and Mitigate the Impact from Droughts (UNCCD) from 1994.

The recognition that the Earth is one system with strong interrelationships and dependency among the economic, social, and ecological subsystems is also the basis for the broader concept of ‘green economy’. Over the last years, the importance of ‘green economy’ has gained increasing recognition and it was highlighted in the 2012 outcome document of the Rio+20 Summit: “The Future We Want.”¹ The document, furthermore, underlines that the green economy should be based on holistic approaches integrating sustained economic growth, improved human welfare, employment opportunities, social inclusion, and poverty eradication, while sustaining ecosystem services.

To foster sustainable dryland and drought risk management we need true interdisciplinary and multi-stakeholder involvement, i.e. a transdisciplinary approach in the development of a green dryland economy. Each discipline and each stakeholder group will have their own traditions for research, development, and communication and there will be many different approaches to address the dryland development issues. The challenge will be to ensure that the different stakeholders work together and that their input will be complementary and end up in a green dryland economy that makes sense for everybody and that will secure and improve dryland-based livelihoods throughout the world.

In March 2012, the organizers of the 2nd UNCCD Scientific Conference convened a working group for the preparation of two White Papers on Economic Assessment of Desertification, Sustainable Land Management, and Resilience of Drylands. In line with the principles of the new green economy, the working group consisted of scientists from different biological, physical, and socio-economic disciplines as well as dryland development practitioners from around the world. Together they agreed on a set of critical issues that should be addressed in White Papers on the economics of sustainable dryland development. As a result, we now have two White Papers presenting the current thinking of how to assess the economics of land degradation and sustainable dryland and drought risk management. This White Paper specifically addresses the costs and benefits of policies and practices for sustainable land and drought risk management, including resilience management based on an integrated system approach to social-ecological systems.

The subject is vast and there will be a number of omissions and probably also wrong interpretations of the discipline specific findings that form the basis of this White Paper. Your inputs and comments are therefore needed and very welcome.

Many Thanks,

Lene Poulsen
Chair of Working Group 2
Lene.Poulsen@gmail.com
### Members of Working Group 2

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elena Maria Abraham</td>
<td>Instituto Argentino de Investigaciones de las Zonas Áridas, IADIZA</td>
<td>Argentina</td>
</tr>
<tr>
<td>Ferdo Bašić</td>
<td>Faculty of Agriculture, University of Zagreb</td>
<td>Croatia</td>
</tr>
<tr>
<td>Hatem Belhouchette</td>
<td>CIHEAM-IAMM</td>
<td>France</td>
</tr>
<tr>
<td>Guillermo Dascal</td>
<td>Economic Commission for Latin America and the Caribbean, ECLAC</td>
<td>Argentina</td>
</tr>
<tr>
<td>Alemu Mekonnen Getnet</td>
<td>School of Economics, Addis Ababa University</td>
<td>Ethiopia</td>
</tr>
<tr>
<td>José Roberto de Lima</td>
<td>Center for Strategic Studies and Management CGEE</td>
<td>Brazil</td>
</tr>
<tr>
<td>Antonia Corinthia Crisanta Navarro Naz</td>
<td>Resources, Environment and Economics Center for Studies Inc.,</td>
<td>Philippines</td>
</tr>
<tr>
<td>Lene Poulsen</td>
<td>Karl International Development, KID</td>
<td>Denmark</td>
</tr>
<tr>
<td>Olena Rakoid</td>
<td>National University of Life and Environmental Sciences of Ukraine,</td>
<td>Ukraine</td>
</tr>
<tr>
<td>Mary Seely</td>
<td>Desert Research Foundation of Namibia &amp; Gobabeb Training and Research Centre,</td>
<td>Namibia</td>
</tr>
<tr>
<td>Mariya Sokolovska</td>
<td>Forest Research Institute, Bulgarian Academy of Science,</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>Borut Vrščaj</td>
<td>Agricultural Institute of Slovenia,</td>
<td>Slovenia</td>
</tr>
<tr>
<td>Valentin Yatsukhna</td>
<td>Belarusian State University,</td>
<td>Belarus</td>
</tr>
</tbody>
</table>

### Other Reviewers and Contributors to the White Paper II

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viorel Blujdea</td>
<td>Joint Reserch Center, EU</td>
<td>Italy</td>
</tr>
<tr>
<td>Jonathan Davies</td>
<td>Dryland Development Initiative, IUCN</td>
<td>Kenya</td>
</tr>
<tr>
<td>Niels Dreber</td>
<td>Biocentre Klein Flottbek and Botanical Garden, University of Hamburg</td>
<td>Germany</td>
</tr>
<tr>
<td>Klaus Kellner</td>
<td>School of Environmental Sciences and Development, North-West University,</td>
<td>South Africa</td>
</tr>
<tr>
<td>Pak Sum Low</td>
<td>Faculty of Science and Technology, University Kebangsaan</td>
<td>Malaysia</td>
</tr>
<tr>
<td>Melanie Requier-Desjardins</td>
<td>Institut Agronomique Méditerranéen de Montpellier</td>
<td>France</td>
</tr>
<tr>
<td>Lindsay Stringer</td>
<td>Sustainable Research Institute, University of Leeds</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Laura Torres</td>
<td>Instituto Argentino de Investigaciones de las Zonas Áridas, IADIZA</td>
<td>Argentina</td>
</tr>
</tbody>
</table>
PART 1: TECHNICAL DISCUSSION
1. **BACKGROUND**

1. The 1994 UN Convention to Combat Desertification (UNCCD) is a remarkable international agreement. Through the UNCCD, more than 190 ratifying countries as well as the European Union have committed to effectively address land degradation in the drylands, i.e. desertification, and reduce the risks of severe drought impacts. The UNCCD has definitely increased international attention to dryland degradation and related socio-economic predicaments such as marginalization, poverty, and food insecurity. Still, sustainable dryland and drought risk management remains a far-fetched goal. A critical challenge is the limited knowledge and understanding of the complex processes in dryland ecosystems. For instance, in a 2011 review of the implementation of the follow-up to the 1992 Rio Earth Summit, UNEP explains that the review did not cover land degradation because of lack of information that met the data criteria for the review. Likewise, the UNDP Disaster Risk Index from 2004 did not include country-specific information on drought risk because of methodological challenges.

2. The 2011 UN Global Assessment Report on Disaster Risk Reduction asserts that the fact that there is still no credible drought risk model is partly a result of the complexity of drought risks with many different social, biological, and climatic drivers. Moreover, droughts are slow-onset events that typically require a minimum of two to three months to become established. While droughts can continue for years socio-economic impacts are normally deferred over time making assessments more complicated and controversial. Consequently, drought is often left out of disaster risk management assessments and impact models. So in spite of improved methods to assess the biophysical aspects of land degradation and drought risks, there are still limited reliable socio-economic data on the costs and benefits of sustainable dryland and drought risk management. The methodological challenges are enormous. E.g., how to deal with indirect impacts, how to value environmental processes and stocks where market values do not exist, and what should be the space and time limits for the assessments? These challenges are even more pronounced when dealing with countries and regions with weak statistical systems, which is the

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2 The full name of the UNCCD is "United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa." The objective of the UNCCD is to "...combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification..." As such, the UNCCD addresses both desertification and drought. [unccd.int/Lists/SiteDocumentLibrary/conventionText/conv-eng.pdf](unccd.int/Lists/SiteDocumentLibrary/conventionText/conv-eng.pdf)

3 We use the term ‘drylands’ for arid, semi-arid, and dry sub-humid areas, i.e. areas classified according to their aridity and where the potential amount of water that is transferred from the land to the atmosphere is at least 1.5 times greater than the precipitation according to the definitions of the UNCCD. The UNCCD does not use the term ‘drylands’ but it is common practice to refer to ‘drylands’ in the context of desertification discussions. It should be noted, that in some contexts ‘drylands’ also include hyper-arids; i.e. deserts, which account for around 8% of the total land mass of the Earth, while arid, semi-arid, and dry sub-humids cover around 40%. The UNCCD does not include hyper-arids in the desertification definition.


5 In 1992, the first UN Conference on Sustainable Development, known as the Rio Earth Summit, was convened in Rio de Janeiro, Brazil to address the state of the environment and sustainable development. The Earth Summit developed the framework for a new generation of global environmental treaties, including the UNCCD.

6 The three data criteria were: 20-year temporal data, coverage of most countries, and reliable sources.

