

## Session 8: Education and Knowledge Sharing in Drylands

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### Synthesis of presentations

**A. Dr. Zafar Adeel, United Nations University International Network on Water, Environment and Health (UNU-INWEH), Canada.** Findings of the Global Desertification Assessment by the Millennium Ecosystem Assessment – A perspective for better managing scientific knowledge.

A new global assessment of desertification undertaken by the Millennium Ecosystem Assessment (MA) shows that desertification in drylands threatens the homes and livelihoods of millions of poor. Environmental impacts of desertification are further exacerbated by political marginalization of the dryland poor and slow growth of health and education infrastructure. The MA report also highlights the global nature of environmental and social challenges posed by desertification. Impacts on the global environment – increasing dust storms, floods and global warming – are well known and documented. Less well-known are the strong impacts of desertification on societies and economies, notably those related to human migration and economic refugees. The MA report points to a variety of integrated policy options to reverse the decline of drylands while optimizing economic output, and emphasizes the inclusion of these in the mainstream national strategies for poverty reduction.

The MA report suggests that full understanding of the significance of desertification is constrained by many uncertainties regarding the relationships among desertification, climate change, biodiversity, ecosystem services, and human well-being. The KM:Land initiative by a group of UN agencies aspires to develop a knowledge management network for issues relevant to land degradation, including desertification and deforestation.

**B. Dr. Mary Seely, Desert Research Foundation of Namibia, Namibia.** The unmet challenge of connecting scientific research with community action.

During the latter part of the past century the scientific community conducted extensive research related to or directly addressing desertification control and rehabilitation. Despite these efforts, little has improved amongst an increasing rural population faced with decreasing productivity. Causes include the situation that researchers usually don't translate and indicate ways of applying their results and communities and their support organisations don't have platforms for easily accessing, interpreting and facilitating application of useful research results. Policy makers must be included in the dialogue. Examples from Namibia explore the challenges of making these essential connections.

**C. Dr. Krishna Prasad, UNESCO-IHE, the Netherlands.** Development and management of drylands: the need for adapted education and knowledge sharing.

Growing population and unsustainable human activities leading to degradation and climate change pose increasing threats to integrity and productivity levels of drylands. Nevertheless, drylands are a substantial part of the world's land surface housing about a billion mostly poor

people. Exemplary societies and dryland management practices have evolved and local people often show remarkable resilience and innovative management strategies to cope with natural calamities and sustain ecosystem services.

A combination of understanding historical approaches and application of present-day technology can enable sustainable approaches for development and management of drylands. The importance of cultural and social context for learning and knowledge management, and attempts to expand these through participatory processes to achieve societal goals is acknowledged. Options for education and knowledge transfer were illustrated with pertinent examples.

**D. Dr. Mark Reed, University of Leeds, UK.** Integrating and sharing local and scientific knowledge bases to assess land degradation.

This paper develops and applies a learning process for land degradation assessment that integrates local and scientific knowledge bases. Results are reported from three degradation hotspots in the Kalahari, Botswana; ongoing research in UK uplands is discussed in relation to an international EU-funded project facilitating two-way learning and knowledge sharing between local communities, researchers and policy-makers to monitor land degradation and respond appropriately. Application of the process in Botswana identified innovative management options to prevent, reduce, reverse or help rangeland stakeholders adapt to land degradation. Communities identified a wide range of sustainability indicators, the majority of which were validated through field-based scientific research that could be applied without specialist training. Indicators and management options were integrated in a manual-style Decision Support System. Projects in southern Europe, China and USA extend the process by using an iterative combination of integrated modeling and focus group discussions to evaluate potential remediation strategies.

**E. Ms Hélène Gille, UNESCO, France.** A creative approach to environmental education: teaching resource kit for dryland countries

The UN Convention to Combat Desertification (CCD) recognizes the importance of capacity-building, education and public awareness in efforts to combat desertification. In drylands especially, educational programmes that define a pedagogical method to raise environmental awareness among pupils and help them learn about sustainable development is a major instrument to empower pupils and the population.

UNESCO's Man and the Biosphere (MAB) Programme is currently developing two teaching resource kits, one designed for use in dryland countries. The kits, for primary and secondary school teachers worldwide, use a creative approach to awaken environmental knowledge through creative and thought-stimulating activities that encourage rediscovery and appreciation of the natural environment and biodiversity. Sustainable development is introduced through application of creative activities in real-life situations and through specific exercises like creating illustrative inventories, role playing, scenario building, achieving frescoes and gardening. Pupils learn to think of people as playing an integral part in the ecosystem and develop their capacity to think critically about the impact of human activities on the environment. The kits are consistent with activities developed as part of the Decade of Education for Sustainable Development (2005-2014), of which UNESCO is lead agency, and with the vision of education developed by the Education Sector Paper as it specifies that "pursuing sustainable development through education requires educators and learners to reflect critically on their own communities; identify non-viable elements in their lives; and explore tensions among conflicting values and goals. ESD brings a new motivation to learning as pupils become empowered to develop and evaluate alternative visions of a sustainable future and to work to collectively fulfill these visions." An important point brought up during the

question period was the concept of how to integrate urban and rural understanding as peri-urban areas are amongst the most endangered.

**F. Prof. Farida Khammar, Laboratoire de Recherche Zones Arides, Algeria.** Environmental education: an alternative for development.

More than 30 years after the Belgrade Charter (1985) and the Tblissi Conference (1987), many countries are still in urgent need of environmental education to enable sustainable development and even survival. It is difficult to say what impact educational programmes have had up until now, due to lack of evaluation. However, today there is a widespread recognition that for environmental education to succeed, all spheres of society have to be more engaged.

Since the Johannesburg Summit in 2002, environmental education has become a priority for Algeria. The Ministries of Land Management and Environment, Education, and Vocational Training have agreed to integrate education into sustainable development programmes on the one hand, and to modify academic programmes to better accommodate this issue on the other.

**G. Ms Caroline King, United Nations University - International Network on Water, Environment and Health (UNU-INWEH), Canada.** Sustainable Management of Marginal Drylands (SUMAMAD): Success Stories from Indigenous, Adaptive and Innovative Approaches.

The Interagency project on Sustainable Management of Marginal Drylands (SUMAMAD) is a coordinated international initiative involving farmers, pastoralists and scientists in participatory research. With support from the Flemish Government, this project includes a network of research teams at eight study sites in marginal dryland areas in North Africa and Western Asia. The project approach, developed through a collaborative effort between UNESCO, UNU-INWEH and ICARDA, focuses on supporting local populations in their efforts to use their natural resources in a sustainable manner.

Over the past two years, a compilation of sustainable management approaches and technologies – indigenous, adaptive and innovative – has been made at each of the participating locations. These have included practices for water management, rangeland rehabilitation, and sustainable cultivation of crops, trees and livestock. Sustainable management approaches are supported by complementary alternative income generating activities, in order to reduce the pressures caused by overdependence on natural resources. Exploration and scientific testing of these management approaches is being undertaken by the study teams and local communities, with a view to combating environmental degradation, increasing dryland agricultural productivity, and enhancing resource conservation. Success stories reported so far enable considerable improvements to local livelihoods.

**H. Dr Thomas Schaaf, UNESCO, Division of Ecological and Earth Sciences, France.** UNESCO's Experience of 50 Years of Drylands Research and Outreach.

UNESCO's work related to drylands is based on: (1) environmental conservation using international normative instruments such as the World Heritage Convention and the World Network of Biosphere Reserves; and (2) on scientific studies on ecosystem structure, functioning and dynamics to better understand human-environment interaction in drylands. As the first UN agency, UNESCO initiated international drylands studies in the 1950s. With the launch of the UNESCO Man and the Biosphere (MAB) Programme in 1971 and the International Hydrological Programme (IHP) in 1975, UNESCO dryland studies continue to be carried out in the framework of these two intergovernmental programmes until today.

Several MAB international pilot projects implemented since the late 1970s illustrate a "learning" process in the field of drylands research and communication. While earlier projects focused primarily on natural ecosystem dynamics and natural resource use, later projects have taken

more fully on board socio-economic and socio-cultural parameters and dimensions to promote sustainable development in drylands. Today, information sharing among scientists and outreach of scientific results for the benefit of local communities and to decision-makers even across international boundaries is seen as key in putting dryland sciences at the service of sustainable dryland development.

### Conclusions

- a. A scientifically robust baseline is needed to assess land degradation and to make scientifically-informed decisions about drylands development. This requires a major global effort in monitoring and assessment, including close participation of communities living with aridity and land degradation.
- b. Land degradation is contextual: different methods lead to different understandings of degradation severity and extent. Only by integrating between methods and scales (including participatory approaches) and focusing on persistent reduction in provision of benefits from ecosystems, can we hope to provide realistic assessments of land degradation in the future.
- c. Information exchange requires robust platforms for people to interact so that information and needs for information from all levels can be exchanged amongst communities, service providers, researchers and decision makers. Decision-making at various needs to be linked directly to scientific information, such that science directly feeds the development approaches. Many good examples of best practices exist but they are not available, mutually understandable or shared.
- d. Site specific variations are important and need to be integrated into general principles. Synthesis of indigenous and scientific knowledge is essential. Land, water and income generation are all key considerations.
- e. Learning to learn from lessons of the past is still an issue after 50 years; while integration of urban and rural concerns for sustainable development is a recently recognised issue requiring attention.
- f. All people living in and managing dry lands need to develop capacity to understand environmental issues, and causes and solutions to problems. Critical thinking is the aim of all education and capacity building. The role of the researcher should be to raise challenges, rather than simply provide solutions.
- g. Evolution of research, education and knowledge sharing has shifted from a focus on the biophysical to the social and cultural, and now incorporates information exchange. In the future, even more emphasis must be placed breaking down communication barriers between different land user groups, and between land users and researchers from different disciplines, to better facilitate training, education and outreach.
- h. Research must not just document but must contribute to the Future of Drylands.