

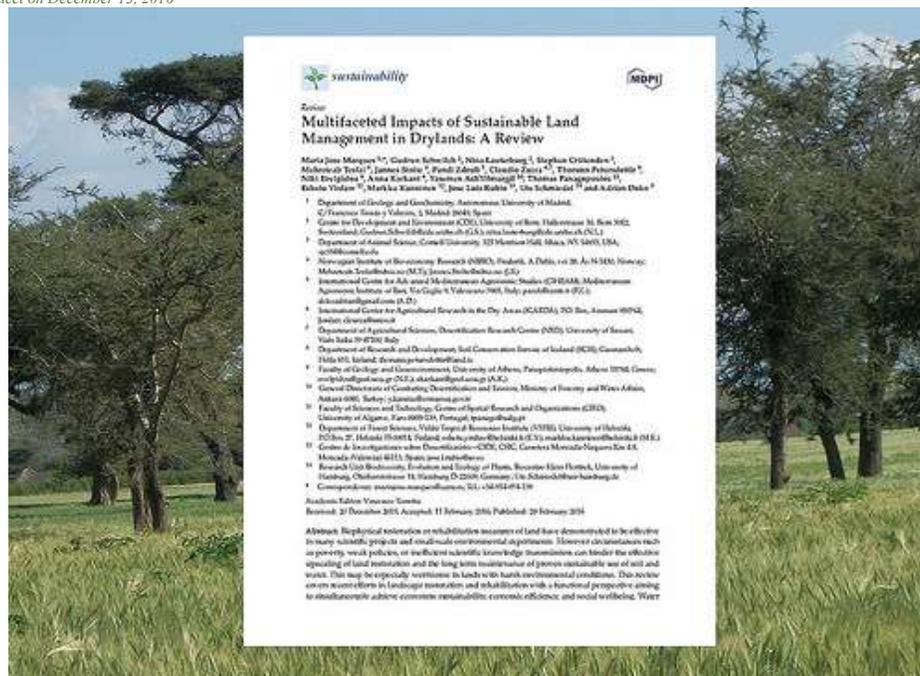


RESEARCH PROGRAM ON Dryland Systems

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## Publication Review: Multifaceted Impacts of Sustainable Land Management in Drylands

Submitted by Martina Antonucci on December 13, 2016



Currently **land degradation** affects 25% of land, causing severe impacts to global food security, climate and human and environmental wellbeing. The urgent need to reverse this trends calls scientific and development communities to take action and promote a shift to more **sustainable land management (SLM)** practices. Although many of the ecosystem restoration and rehabilitation interventions were successful in recovering the degraded environment, the effective upscaling and maintenance of sustainable practices is often hindered by several diverse factors such as poverty, weak policies, and insufficient knowledge exchange. The **integrated systems approach** utilized by the CGIAR Research Program on Dryland Systems aims to consider the interrelated effects and causes of land degradation in order to promote the best recovery interventions that are environmentally, economically and socially acceptable. The recently published article "[Multifaceted Impacts of Sustainable Land Management in Drylands: A Review](#)" gives us a look into the successful rehabilitation measures bringing biophysical and socio-economic benefits to degraded lands and examines the determinants that allow for effective upscaling of these measures. The review take into consideration restoration or rehabilitation activities in areas with harsh environments, particularly in drylands; rangelands, forests and coastlands are all targeted. Please read below for a more comprehensive explanation.

### Water management practices



Water harvesting to improve productivity and livelihoods in Tafila, Jordan.

Water management practices such as **water harvesting** yield important environment and socio-economic benefits by reducing environmental risks, improving soil health and increasing crop yields, particularly in dry areas. Several types of water harvesting practices can be implemented depending on soil type, geology, material and labour force availability: floodwater harvesting practices, micro and macro catchment water harvesting, and roof-top or courtyard rainwater harvesting. These are only some examples of water management practices put to work in the dry areas of Asia, Africa and South America.

The article suggests the key for successful implementation and management of these SLM practices is the provision of technical and financial support from local governments. Laws and local regulations help overcome land tenure and water distribution disputes, creating a smoother and more sustainable work model. Nonetheless, an integrated management approach is needed to ensure that upstream and downstream development are equally supported.

Governmental policies are needed to involve and motivate land users to adopt water harvesting practices. In fact, as stated in the article “Once communities reap the benefits from the project, and feel a sense of ownership of the resources in the catchment, they will play an active role in upscaling the water harvesting techniques for SLM.”

### Arable land



Workers on a maize farm, Zimbabwe. Photo credit: David Brazier/IWMI

Due to soil erosion and degradation, the amount of arable land is quickly declining at a global scale. Intervention preventing erosion and restoring degraded land is critical to reduce the pressure on arable land and ensure a sufficient yield production for food security. The three main types of SLMs in arable land are:

**Soil Fertility Management**, through the amendment of manures, compost or mineral fertilizers.

**Conservation agriculture**, which implies minimum soil disturbance, crop rotation and permanent soil covers.

**Structural and vegetative measures** to reduce slope steepness and/or length to lead to the restoration of croplands.

These practices have showed to be effective in improving soil structure and health, increase biodiversity, prevent erosion and water runoff and increase yield production, bringing as a consequence important socio-economic benefits.

In order to foster the adoption of these SLM measures, government subsidies are needed. Moreover, training courses and knowledge sharing are essential. The long length of time needed to see results can hinder farmers from changing their traditional agricultural practices. For this reason, activities to increase farmers' awareness on the multiple benefits of these practices are critical for long lasting adoptions.

### Rangelands



Grassland in Mongolia. Photo Credit: Derik van Zuetphen

Rangelands play an important role in sustaining the livelihoods of poor pastoralist communities in many of the world's drylands. However, overgrazing and mismanagement of rangelands are causing severe degradation, with direct social and economic impact on local communities. Several successful techniques to restore rangelands identified in the review are:

**Passive strategies**, such as grazing enclosure or rangeland resting.

**Active strategies** like vegetation reseeded, control and reduction of shrub encroachment, application of compost etc.

**Improving Grazing management**, for example with rotation grazing.

In this case, the uptake of these SLM has been successful when governments provided training, material and technical assistance to monitor the establishment. Moreover, a participatory structure of programs and stakeholder involvement has proven to be of critical importance in facilitating the implementation of the restoration measures.

## Forests



A woman collects leaves and fuelwood in Mali. Photo credit: Ake Mamo

In drylands, as well as in other areas, forests provide multiple environmental and socio-economic benefits crucial for rural communities. Depending on local conditions and needs, some forest restorations practices can be:

**Afforestation and Sustainable Management of Natural/Planted Forests**, including interventions to avoid forest fragmentation, protection of water lines, reduction fire susceptibility, elimination of invasive species etc.

**Agroforestry** implies the transformation of natural forests into complex multi-cropping systems.

**Forest Fire prevention/restoration**, including preventive measures (reduction of plants density, introduction of strip networks for fuel management) and post-fire restoration techniques, which are site-dependent and are intended to achieve compositional and structural conditions resistant and resilient to fire.

Many of these SLM interventions can be costly and require good ecological knowledge, therefore technical and financial support by governments is needed for their management. Moreover, they often require long-term commitment. Therefore, the community living in or close to the forest must be involved during the planning and the implementation of these measures. An active participation by the community will also prevent possible socio-economic disadvantages, like increased costs of agricultural products and the reduction of agricultural lands. Afforestation practices, or the failure to protect these ecological functions, can lead to forest density reduction.

### Sand dunes management



Desertification management in Morocco. Photo Credit: Richard Allaway

The management of sand dunes is important to preserve coastal environments, to protect villages from advancing dunes and improve soil and biomass conditions. Native species planting, monitoring dunes dynamics, reshaping of dunes, and controlling invasive species are some of the practices that can help maintain coastal zones and preserve the adjacent ecosystems.

### Recommendations

From the article we can conclude **stakeholder involvement** is a prerequisites for the success and acceptability of all restoration measures discussed. This is important in order to acquire an integrated approach and foster a sense of ownership of the project within the community.

To provide and reinforce policies on a local, regional and international scale, stakeholders must first look to educate, motivate, and empower the communities while monitoring their progress and assisting them with their needs. In order to ensure this occurs, the **scientific and policy sphere** have to work closely, facilitating knowledge and technology sharing.

In order to better assist policy makers, scientific research needs to acquire an **interdisciplinary and cross-sector approach**, without neglecting traditional knowledge and the needs of communities. Moreover, establishing **integrated indicators** to monitor and evaluate sustainable land management at different scales calls for considerable but essential future work and effort.

The benefits achieved through sustainable management of ecosystems are not limited to environment preservation. Such practices help tackle climate change adaptation, food security, social stability and economic growth. To discover the environment and socio-economic impacts of SLM practices and how to successfully disseminate them, read the full article [here](#).

#### Acknowledgment

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